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Prevalence and Severity of Plaque and Gingivitis in Armenian Adult Population

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Yerevan 2018

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INTRODUCTION

Oral Health

On September 6, 2016, the World Dental Federation (Fédération Dentaire Internationale (FDI)) proposed a new definition for oral health, to replace the traditional definition of mere absence of disease. According to this definition, "oral health is multi-faceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex."[1,2] It was proposed together with a companion framework showing the interaction between three core elements: disease and condition status, physiological function and psychosocial function.[1,2] This new definition acknowledges that oral health is multifaceted by nature and its attributes, and one of the integral components of general health and wellbeing.[3]

Maintaining oral health and wellbeing is a vital aspect to consider, otherwise according to the United States Surgeon General, the presence of oral disease and conditions can "…undermine self-image and self-esteem, discourage normal social interaction, and cause other health problems and lead to chronic stress and depression as well as incur great financial cost. They may also interfere with vital functions, such as breathing, food selection eating, swallowing and speaking, and with activities of daily living such as work, school, and family interactions."[4]

Globally, the most common non-communicable diseases are those of the mouth.[5] However, this study only explores the dental aspect of oral health, concentrating on certain conditions only.

Plaque and Gingivitis

Dental plaque is a sticky, colorless biofilm constantly formed on the surface of the teeth due to the interaction between bacteria in the oral cavity, mucus and some other particles.[6] Many factors, including oral hygiene, dietary components, host defenses and diurnal changes in saliva flow are responsible for plaque formation.[7] The American Dental Association recommends removing plaque by brushing teeth twice a day and cleaning the interdental area with dental floss daily.[8] If not properly cleaned bacterial plaque builds up and becomes a strong predictor for oral diseases.[8]

The most common oral diseases, after dental caries, are a group of inflammatory diseases of the tissues surrounding the tooth, known as periodontal diseases.[7] Globally, the severity and

distribution of oral diseases vary both between and within countries, with a higher percentage of oral disease among poor and disadvantaged populations, for both children and adults.[9,10] According to the WHO, approximately 15-20% of middle aged individuals (35-44 years old) have severe periodontal disease worldwide.[11] In the European region, this figure is 5-20% for people of the same age-group, and up to 40% for people from the 65-74 years old age-group.[12] In the USA, around 65 million people have signs of periodontal disease. This comprises 50% of the adult population who are above the age 30.[13]

The initial phase of periodontal diseases, during which the gums become inflamed, is the plaque induced gingivitis.[6,7,14] This is characterized by redness, swelling and bleeding of the gums, and is a clinical feature of disease commonly found among adults and children alike.[6,15] Plaque deposits are positively correlated with the presence of gingival inflammation, a causal effect which has been well documented.[16] The longer plaque is left on teeth, the more harmful it becomes and the more damage it causes.[6] Similarly, there is evidence supporting the association between regular plaque control measures and reduction in the incidence of gingivitis.[17,18]

Gingivitis can be treated quite easily through improved oral hygiene and specialized care.[6] However, if left untreated, gingivitis can become more complicated. In this later stage, the disease is called periodontitis, which may cause permanent damage to both soft and hard tissues (gums and bones) surrounding and supporting the teeth, and even lead to tooth loss.[6,14] When it comes to losing natural teeth, which greatly reduces the quality of life of an individual, periodontal disease and dental caries are major contributors. Currently, around 30% of 65-74 year-old adults in the world have no natural teeth.[11]

In order to reduce the risk of developing this more severe and destructive periodontal disease, it is necessary to prevent plaque accumulation on the surface of the teeth by practicing good oral hygiene on a daily basis and treating gingival inflammation in its early stages.

Numerous epidemiological surveys have established that the role of socio-behavioral and environmental factors, such as poor oral hygiene, unhealthy diet, use of certain medication, female hormonal changes, stress, heredity and excessive use of alcohol, is significant when it comes to oral diseases.[6,19] However, although there are many risk factors to periodontal disease, smoking is considered as the most significant,[11] which also has a negative effect on the outcome of treatment.[6] Moreover, as oral health is an integral part of the overall health, the condition of

the gums can have repercussions in other areas of the body. Infections in the oral cavity have been linked to heart disease, diabetes, cancer, as well as the birth of premature and low-birth-weight babies through various studies.[13,20]

From the reviewed studies where gingivitis and plaque-mediated gingivitis prevalence has been assessed, the subjects wearing fixed or removable prosthesis, as well as orthodontics appliances, female pregnant or nursing subjects, subjects with periodontitis or currently undergoing periodontal treatment, subjects with systemic conditions or receiving medicinal treatment known to predispose or exaggerate gingival inflammation (patients with diabetes mellitus, antihypertensive medication and antibiotics). These reviewed studies included individuals with at least 18-20 natural teeth.[18,21–24]

Situation in Armenia

After gaining independence from the Soviet Union in 1991, more than 200 health care institutions formerly owned by the state were privatized in the Republic of Armenia (RA), including dental polyclinics.[25] As a result, the dental care services are now almost entirely privatized and subsequently paid for directly by patients.[25] However, a certain amount of dental screenings and treatments provided are covered by the government for children under the age of 18 at public dental clinics.[26] Moreover, any user charges outside the government provided Basic Benefit Package (BBP) remain unregulated by the state and are largely regulated by the market.[25] There is currently no state water fluoridation or any other dental caries prevention method in the country.[27]

According to the National Statistical Services of the RA, in the year 2015 there were 1,623 stomatologists and dental technicians, as well 113 children's stomatologists providing services throughout the country.[28]

According to the 2016 Health Systems Performance assessment report of the RA Ministry of Health, 76.4% of the RA population follow oral hygiene instructions (brushing one or two times daily), while 10.3% do not brush at all.[29] Only 43.7% of the population above 65 years of age brush their teeth daily, compared to 89.1% of 15-19 year olds. More residents of Yerevan brush their teeth daily (83.1%), compared to rural residents (67.7%), with more women (81.5%) adhering to hygiene instructions than men (70.6%). Higher compliance to oral hygiene instruction is seen among individuals with higher education (91.1% among graduate and 93.5%

among undergraduate degree holders), compared to those with lower than secondary education (57.1%).[29]

According to the same report, during the survey conducted in 2015-2016 among RA residents (ages 15 and above), tooth ache was reported as one of the 12 most common ailments experienced by participants during the last month leading up to the survey.[29] Toothache was reported by 24.5% of the survey participants, showing a decline from the year 2012, when it had been reported by 29.4% of study participants. Toothache was reported more often by residents from both urban and rural communities of marzes (provinces) (reported by 30.4% of rural participants and 26.1% of the urban participants) as compared to residents of Yerevan (reported by 17.0 % of participants.)[29]

There is very limited information available on the overall oral/dental diseases status in Armenia, as well as very few published data on the plaque and gingivitis prevalence among the Armenian adult population. The last and only data available through the WHO online oral health database is for the period of 1985-1990, where Armenia had a 2.4 DMFT index among 12 year-old children. As stated above, studies conducted in this area are also very limited.[30] A study conducted among 12 year-old children in 2005 by the American University of Armenia reported 86% prevalence rate of dental caries, as well as a mean DMFT of 2.84 ± 1.95. Additionally, the study revealed an association between rural residence and worse DMFT index.[31]

Over the years, a few projects have been implemented in an effort to improve the oral health condition in Armenia by screening for dental caries and treatment. One such project was the UMCOR Dental Care Project, which was conducted in the distant Gegharkunik, Syunik and Lori regions in 2003 as part of the UMCOR School Nutrition Project. After screening around 3,400 schoolchildren, the project identified that four out of every five children had dental problems and required treatment.[32] Several other oral health projects have been conducted in Yerevan and the regions for the treatment of dental caries and improvement of oral health among children; some of these are still ongoing. Some of these project include: the American Dental Society of California, Children of Armenia Fund (COAF),[33] the Karagheusian foundation,[34] Hand in Hand Medical benevolent NGO,[35] and the student council of the Yerevan State Medical University.[36] However, the literature review we conducted did not identify any similar projects conducted among the adult population.

STUDY OBJECTIVES

The present study will assess the oral health status of the Armenian adult population, with a particular focus on gingivitis and plaque. The specific objectives guiding the study are:

- To estimate the prevalence and severity of plaque and gingivitis in adult population in Yerevan and Gyumri, Armenia.
- To identify determinants associated with plaque and gingivitis.

METHODS

Study Design

The research team implemented a cross-sectional study with two main components: survey of the participants and dental clinical examinations. The survey included a self-administered questionnaire on potential risk factors for the outcome variables of interest; and the clinical examinations included observation of plaque and gingivitis and calculating appropriate indexes.

Study Population

The target population of the study were adults (18 and over) living in Armenia. The study population included adult visitors of dental clinics who were able to read and sign the written informed consent form. The exclusion criteria were the following: women who were pregnant or breastfeeding, wearing braces, having less than 20 uncrowned teeth, using any antibiotics during the last two weeks, having periodontitis (self-reported), individuals who chronically used phenytoin (anticonvulsant), cyclosporine A (immunosuppressant), and nifedipine, verapamil, or diltiazem (calcium channel blockers).[15,18,24,37]

Study Settings and Participants Recruitment

The study settings included Yerevan (the capital city) and Gyumri, the second largest city of Armenia. We recruit 359 and 44 participants from Yerevan and Gyumri respectively to have proportional to size samples from each city.[38] The research team randomly selected five districts from Yerevan to assure diverse group of study participants. From each of these districts one

dental clinic was chosen based on convenience purposive sampling and meeting the selection criteria. One clinic was selected from Gyumri.

Only those dental clinics that had state licensing based on the criteria on technical and professional requirements of dental clinics, have been included in the study.[39] In addition, the research team used the expertise of the study team members with dentistry background to check the selected clinical sites. The team checked for the availability of appropriate sterilization methods and equipment used in dental clinics (pre-disinfection of instruments through Hexanios; 2. disinfection of hand pieces through Surfanios; and 3. sterilization through autoclave)[40] (Appendix 1).

The research team recruited the study participants among the visitors of the selected dental clinics. Every visitor who exited the doctor's office post examination was approached by a member of the team trained for recruiting the study participants. The latter used screening questions from the recruitment script developed by the study team (see Appendix 2 for the Fieldwork Manual for Recruitment) to check for participants' eligibility. Those who met the inclusion criteria were introduced to the content of the written consent form (Appendix 3) those who agreed were invited to read and sign the written consent form and a prospective participant read and signed it (Appendix 3). The recruitment team and the participant appointed a convenient day (during the next three days) to visit the clinic to take the survey and undergo dental examinations.

The decision to cooperate with the dentists of each clinic was made at the beginning of the study (during the pre-test phase). As having periodontitis and having less than 20 teeth were among the study exclusion criteria, the doctors of every selected clinic were informed in advance to notify their patients during the examinations if they had periodontitis and the number of teeth they had. This ensured that visitors of the selected clinics knew if they had periodontitis or not.

Study Instruments

In addition to the self-administered questionnaires and dental exam forms, the research team developed two types of journal forms (Appendix 4). The first form was used during the recruitment process to record all information on each approach made (refusal, eligibility, etc.). This form served the purpose of monitoring the recruitment process, calculating the response rate and the main reasons for refusal. The second form was attached to the dental exam forms and

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provided information on the completeness status of each dental exam form. This assisted with the filing process and improved the data collection management.

Self-Administered Survey Questionnaire

The survey questionnaire (Appendix 5) consisted of the following sections: 1) Oral health behavior; 2) Medical and dental conditions, including questions on chronic health conditions, self-reported health, oral health; 4) Smoking and alcohol consumption, and eating habits; and 5) Demographics and socio-economic status.

The oral health behaviors section includes questions on frequency of tooth brushing, regular dental check-up, and use of floss.[41]

Gingivitis Index (GI) Form

Gingival Index system is one of the quantitative indices measuring the degree of gingival inflammation.[42] It provides scores at 6 sites (disto-, mid-, mesio-buccal and disto-, mid-, mesio-lingual) of each tooth based on four criteria rated from the absence of inflammation to the severe inflammation (Appendix 6).

Dental Plaque Index (PI) Form

The Quigley and Hein Index assesses the plaque at 6 sites on the labial, buccal and lingual surfaces of teeth after using a disclosing agent.[43] The criteria of the index is based on a score of 0 to 5; the higher the score, the bigger the area of the tooth covered by plaque (Appendix 7).

Dental Examiners and Recruitment Team Trainings

Although, the dentists had been trained by the Colgate experts, this had been conducted a long time before the start of the project. Thus, in order to refresh their memories and provide more detailed instructions, the dentist examiners received a new training on plaque and gingivitis assessment. Several practice sessions were conducted with different patients.

This training and practice sessions aimed to:

   a. Improve the quality of the dental examinations
   b. Improve the practice in terms of accuracy and time

c. Improve intra- and inter-rater reliability and allow the co-examiners to conduct examinations consistently, thereby reducing variability in scoring from patient to patient or from examiner to examiner

d. Test and improve the applicability of examination forms and written field-guides (Appendix 8).

For this purpose, during the training and practice sessions each of the examiners was given a chance to examine the surroundings of each tooth of the same patient in terms of plaque and gingivitis condition. They then discussed their scores to reach consensus on their scoring techniques. In addition, the co-examiners were asked to re-assess the same patient to check consistency in their own assessment.

After the training the team decided the order of the examinations: 1) before proceeding the GI and PI assessments to cross check all existing crowned teeth on the indices forms, so during the PI and GI examinations, the doctors would not mistakenly include the crowned teeth in the assessment; 2) first conduct the GI and then plaque examination, as the color disclosing agent did not allow accurate assessment of the redness caused by gingivitis. This order of examinations is also supported by the literature.[44]

The guides were improved - unnecessary information was removed from the pages to allow more writing space in the forms and ensure that the scores recorded in haste during the assessment procedure were visible and clear. Also, it was decided to have a trained recorder during the dental examination who recorded the GI and PI forms according to the dentists' assessments. This ensured that dentists did not interrupt the assessment frequently to complete the forms.

In addition, during the training the study team decided to make a "Reminder guide" which included written and visual scoring for the GI and PI exams (Appendix 9). This guide was fixed on the wall visible to the examiners throughout the fieldwork, so they did not have to rely on their memory during the scoring.

Four recruiters with relevant experience were hired. They then participated in a training session. The training concentrated on methods for identification of eligible participants, using the recruitment script; effective explanation of the study to potential participants; obtaining written consent form from the participants; assignment of the appropriate ID numbers; administering the

self-administered questionnaire; recording all the necessary information; and maintaining ethical standards throughout these stages.

Ethical Considerations

In order to comply with the ethical requirements of a research involving human subjects for clinical examination, the study team applied to the AUA's clinical IRB with a comprehensive application form. The application included detailed description of proposed activities, clinical procedures and the disclosing liquid for the plaque assessment, including the main components that liquid consists of and its regulations by the US Food and Drug Administration (FDA), along with justification of research and inclusion/exclusion criteria for participants, description of potential risks (including physical harm and psychological discomfort) and benefits to the participants. In addition, a written consent form was developed based on the requirements of the clinical IRB procedures. The application was submitted for a review and has undergone several stages of revisions by the study team at the request of the IRB board members. After all comments made by the IRB members were addressed, the AUA IRB for clinical studies approved the study protocol allowing initiation of data collection.

Written informed consent forms were obtained from all subjects prior to their enrollment into the study. The purpose and description of the study in lay language, risks and benefits to participation and the subject's right to withdraw without prejudice at any time were explained to each subject. All study procedures were explained in non-technical terms. The subjects read, understood and signed prior to their participation in the study. The original signed and dated informed consent forms were retained by the research team.

All informed consent forms were documented in a log by date and subject ID; the log has been kept as a source documentation. All records of the participation in this study were without any identifiable data and were available only to the research team.

Pre-Testing and Data Collection

In order to pre-test the study protocol, and reveal potential issues in the recruitment process, the clinical exam procedure and timing, the study team initiated a pre-test of all the study stages prior to the start of data collection. The obstacles revealed during the pre-test were discussed with the team to find solutions. The study team came up with new procedures to make the data

collection process easier and more accurate. The AUA clinical IRB reviewed and approved the revised protocol.

Following the pre-test, after further improvements, and preparation, the main data collection began in October and continued through to the end of January 2018. During the data collection, participants first completed a self-administered survey questionnaire and then underwent the plaque (PI) and gingivitis (GI) examinations. Dentist examiners, who had prior training, conducted the GI and PI examinations. All teeth were examined at six sites per tooth, three facial and three lingual. Third molars and crowned teeth were excluded from the GI and PI scoring procedures. The participation per subject was considered finished when the self-administered survey and all clinical assessments were completed. After completing the self-administered questionnaire, the participants put them in an envelope that recruiters gave them and went for the dental examination. The average duration of completing the self-administered survey lasted 10 to 18 minutes, and dental examinations lasted about 35 minutes.

The whole process of data collection was guided by a fieldwork manual developed by the research team (Appendixes 2 and 8). The manual for Recruitment included the following sections: a) participants selection (with screening questions), b) introductory statement, and c) provision of consent form. The manual for the clinical examinations included the following sections: a) preliminary actions to be taken before dental examination, and b) examiners manual on gingivitis and plaque assessments.

In addition, the research team prepared educational brochures on oral health hygiene to provide to the participants at the end of the dental examinations (Appendix 10). The participants also received a gift card (for the amount of AMD 10,000) as an incentive to pay for services provided by the respective dental clinics in appreciation of contribution of their time to the research project. The gift cards (Appendix 11) and a system for their work were also developed by the research team in consultation with the Finance and Accounting Department at AUA.

Quality Assurance

The study team made frequent spot-checks through visits and random phone calls to participants, to make sure that the fieldwork was implemented according to the protocol. During the spot checks the study team members paid attention to checking if the recruiters followed the "recruitment script" appropriately to check for the inclusion/exclusion criteria, appropriately

introduced the consent form to the participants and assured that they took the copy of the signed consent form, properly recorded the participants ID. In addition, during the random phone calls the participants were asked whether or not they completed a questionnaire. Furthermore, the study team checked if the dentists followed the steps of the examination manual, provided appropriate counselling to patients after the dental examinations and if they distributed the educational booklets and gift cards to the participants.

In addition, the study team randomly contacted participants to check if they undergone the dental examinations, and if they received appropriate counselling, educational booklets, and gift cards after the examination. All these steps have been taken to ensure the quality of the data collection and to see if anything undesirable happened during the field work.

Challenges

Due to several issues that the study team faced during this research, the pace of the project was slower than planned. The protocol development, IRB approval and revisions took more time than planned. In addition, the team faced challenges while selecting the clinics and finding available dental chairs for renting. Dental clinics in Armenia pay monthly taxes for each dental chair, therefore it was hard to find a clinic which had a free chair available to rent full day for the study. The participant recruitment and dental examination times varied from clinic to clinic and from one day to another. Thus, the research team had to adjust the working schedules of the recruitment team and dentist examiners for each clinic.

One of the major complications during the data collection was the difficulty related to manual calculation of the tooth site scores. The assessment of teeth conducted during this study was very detailed, including six sites for each tooth of the participant. Thus, there were more tables for calculations, which complicated the process when trying to calculate an accurate result, leading to multiple human errors. In an effort to address this problem, the research team conducted an additional review of all exam forms, during which both numerators and denominators were re-calculated for each participant and found errors were corrected.

Data Management and Data Quality Control

Two individuals were hired and trained by the study team to conduct the data entry in parallel to data collection. Upon completion of their training, each of them entered the data from five

completed participant forms, which was then reviewed by the data entry trainer to assess the quality of their work and provide feedback. This was followed by double entry of all data into the database in SPSS 21 software.

The cleaning phase started upon completion of the data collection and entry. In order to check the accuracy of the recorded data and assure its quality, a trained study team member reviewed all exam forms, checked the recorded numbers, index scores and calculations. All identified errors were corrected on the forms, before proceeding onto the second stage of data cleaning. Subsequently, the databases were merged and compared, discrepancies were identified and resolved checking against the data collection forms.

Study Variables and Analysis

The data analysis provides descriptive statistics describing the characteristics of the study population. The prevalence of gingivitis and plaque were calculated and presented as mean scores per the following categories: gender, age group ($\leq$30, 30 to $\leq$45, 45 to $\leq$60, and >60), total sample and city sites. The categories of severity of gingivitis were presented as percentages.

The gingivitis and plaque scores between the demographic characteristics were compared using, ANOVA (for age categories), independent samples t-test (for gender and city sites), Pearson chi-square and Fisher's exact tests. A p value of $\leq$ 0.05 was considered statistically significant.

RESULTS

Administrative Results and Response Rate

Around 72 participants were selected from each five clinic in Yerevan and 44 participants from one clinic in Gyumri to reach the considered sample size.

Overall, it took 805 attempts to identify 403 eligible participants during the recruitment (Table 1). Out of these 805 attempts, 457 respondents met the inclusion criteria. Of 457 respondents who met the inclusion criteria, 22 respondents refused to participate and the rest 435 were recruited. However, of 435 respondents who were recruited, only 403 attended and completed the dental examinations.

The non-response rate was 9.4% taking into account those visitors who were eligible and refused to participate on spot during the recruitment and those who were eligible, signed the consent form and did not come for the examinations.

Table 1 provides the detailed description of the response rates and the main reasons for not meeting the inclusion criteria by the study sites.

Descriptive Characteristics of Study Participants

Descriptive statistics (means and standard deviations for age as a continuous variable and frequencies for age groups and gender as categorical variables) are presented by the total sample and study sites in Table 2. The majority of the participants were women (63.52%). The mean age of the total sample was about 30 ranging from 18 - 70 years. The majority of participants, 55.6% (n=224) were 30 years old or younger, 37.5% (n=151) were between 31 to 45 age range, 6.2% (n=25) between 46 to 60 age range and only 0.3% (n=1) was older than 60 years of age. This descending tendency of participants' numbers per increasing age group was similar across the cities.

The mean number of the total uncrowned teeth for the total sample and across the cities was about 26. No statistically significant differences in demographic characteristics were found between the samples from Yerevan and Gyumri.

The Level of Plaque and Gingivitis by Demographic Characteristics

Table 3 shows the average scores of PI and GI assessments based on the total sample, participants' age groups, gender, and city sites (Yerevan and Gyumri).

The average score for GI for the total sample was 0.65 (SD=0.36) ranging from 0.08 to 1.88, while the average score for PI was 2.61 (SD=1.03.) ranging from 0.39 to 4.79. The average scores for both GI and PI were statistically significantly higher in males than in females: for GI it was 0.72 (SD=0.37) and 0.61 (SD=0.37) respectively (p=0.006), and for PI 2.83 (SD=1.03) versus 2.48 (SD=1.00) respectively (p=0.001).

The participants 30 years old or younger had statistically significantly lower average score of GI compared to other age groups (p=0.002). For the participants from 46 to 60 years old, the average score for GI and PI (0.78; SD=0.38 and 2.80; SD=1.09 respectively), were the highest

among all age groups. However, no statistically significant difference was found in regards to these scores between the age groups.

The participants from Yerevan had significantly lower average scores for GI (0.61, SD=0.32) compared to Gyumri (0.99, SD=0.50, p<0.001). The same tendency was noticed regarding the PI (2.54, SD=1.02 vs. 3.19, SD=0.19, respectively, p<0.001).

The Severity of Gingivitis by Demographic Characteristics

Tables 4 shows the severity of gingivitis for the total sample and by gender, age groups and the city sites. It also shows the level of PI by gingivitis status.

In order to calculate the severity for gingivitis, the research team grouped the average GI score of participants into four categories: healthy gingiva (with 0 score), mild (0.1-1), moderate (1.1-2), and severe gingivitis (2.1-3) according to Loe.[44] In our sample we did not have any participants with "severe gingivitis" (who would score >2). It is possible that such cases were excluded by a couple of the clinics, due to their inability to differentiate between severe GI and Periodontitis, and because of receiving antibiotics (which was one of the study exclusion criteria), as in Armenia, dentists usually prescribe antibiotics for severe gingivitis.

Overall, in the total sample, 0.25% of the participants had normal gingiva, about 85.4% had mild and 14.4% moderate gingivitis. In all groups including age, gender and city sites separately, the overwhelming majority had mild gingivitis (Table 4).

In terms of gender, among men approximately 0.7% had healthy gingiva, 79.6% mild and 19.7% moderate gingivitis. Among women, about 88.7% had mild and 11.3% moderate gingivitis. This difference of gingivitis severity among men and women was statistically significant (p=0.017) (Table 4).

Among the participants 30 years old or younger, approximately 89.7% had mild and 10.3% moderate gingivitis. In the 31- 45 age group, about 0.7% had healthy, 81.5% mild and 17.9% moderate gingivitis. In the 46 - 60 age group, 72% participants had mild and 28% moderate gingivitis; the difference was statistically significant (p=0.029) (Table 4).

In Yerevan, 89.42% of participants had mild and 10.31% moderate gingivitis, while in Gyumri 52.27% and 47.73% had mild and moderate gingivitis, respectively. This difference was highly statistically significant (p<0.001) (Table 4).

Those who had mild gingivitis, the average score of the plaque was statistically significantly lower (2.45; SD=1 vs 3.55 SD=0.63, p<0.001) compared to those who had moderate gingivitis (Table 4).

Regression Analysis

We used simple linear regression to test the association between the GI and PI scores and to test for confounders. There was a statistically significant association between the GI and PI scores. Each one point increase in the PI score was associated with 0.18 point increase in the GI score, unadjusted for potential confounders (Table 5).

The simple linear regression between the GI and PI scores and other independent variables revealed that the following variables were associated with both GI and PI scores and confounded the relationship between them: age, city sites and the frequency of brushing teeth. Each year increase in the age increased both the GI and PI scores about 0.01. Being from Gyumri increased the GI and PI scores by about 0.38 and 0.65, respectively. The frequency of brushing teeth (categories - *a. do not brushing or rarely brushing, b. brushing a few times a week, c. once a day, d. two or more times a day*) decreased the GI and PI scores by approximately 0.15 and 0.32, respectively (Table 6).

The final multiple linear regression model included all variables that were confounding the relationship between the GI and PI scores. After adjusting for age, city sites and frequency of brushing teeth, the study found that each unit increase in the plaque score was strongly associated with 0.15 unit increase in the gingivitis score (p<0.001) (Table 7).

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TABLES

Table 1. Response rate and reasons for non-response

Response results	Yerevan	Gyumri	Total
Number of attempts	731	74	805
Eligible	384	51	435
Number of completed exams	359	44	403
Number of ineligible cases	320	28	348
Ineligibility reasons			
a) <18 years	25	1	26
b) pregnancy or nursing	16	1	17
c) having periodontitis	8	3	11
d) having less than 20 teeth	203	21	224
e) wearing braces	26	0	26
f) antibiotic usage	39	2	41
g) Diphenine, Deximune and usage of other drugs	0	0	0
h) antihypertensive drug usage	3	0	3
Refusal (refused to participate and did not attend the clinical examination)	43	0	43

Table 2. Descriptive characteristics of the study participants

Characteristics	Total sample	City Sites	
		Yerevan	Gyumri
Total number of teeth (mean, SD)	25.69 (2.30)	25.67 (2.30)	25.84 (2.30)
Age (mean, SD)	30.42 (8.88)	30.22 (8.89)	32.05 (8.72)
Age groups, n (%)			
≤ 30	224 (55.58)	201 (49.88)	23 (5.71)
31 to 45	151 (37.47)	135 (33.50)	16 (3.97)
46 to 60	25 (6.20)	20 (4.96)	5 (1.24)
>60	1 (0.25)	1 (0.25)	0 (0.00)
Missing	2 (0.50)	2 (0.50)	0 (0.00)
Gender, %			
Male vs Female	36.48 vs 63.52	32.01 vs 57.07	40.90 vs 59.09

Table 3. Average level of PI and GI by age groups, gender and total sample

Variable	Average score of GI		Average score of PI	
	Mean (SD)	P-value	Mean (SD)	P-value
Age groups				
≤ 30	0.59 (0.33)		2.52 (1.00)	
31 to 45	0.72 (0.90)		2.71 (1.04)	
46 to 60	0.78 (0.38)		2.80 (1.09)	
>60	0.59 (-)*	**0.002 [a]**	2.45 (-)*	0.261
Gender				
Male	0.72 (0.37)		2.83 (1.03)	
Female	0.61 (0.35)	**0.006**	2.48 (1.00)	**0.001**
City				
Yerevan	0.61 (0.32)		2.54 (1.02)	
Gyumri	0.99 (0.50)	**< 0.001**	3.19 (0.19)	**< 0.001**
Total	0.65 (0.36)		2.61 (1.03)	
Minimum & Maximum average scores	0.08 & 1.88		0.39 & 4.79	

* SD was not defined due to a small number of participants in >60 age group

a ≤ 30 age group vs. all other groups

Table 4. Severity of GI by age groups, gender and city sites

Characteristics	Gingivitis N (%)			
	Healthy gingiva	**Mild gingivitis**	**Moderate gingivitis**	**P-value**
Total sample	1 (0.2)	344 (85.40)	58 (14.40)	
Gender				
Male	1 (0.68)	117 (79.59)	29 (19.73)	
Female	0 (0.00)	227 (88.67)	29 (11.33)	**0.017**
Age				
≤ 30	0 (0.00)	201 (89.73)	23 (10.27)	
31 to 45	1 (0.66)	123 (81.46)	27 (17.88)	
46 to 60	0 (0.00)	18 (72.00)	7 (28.00)	
>60	0 (0.00)	1 (100)	0 (0.00)	**0.029**
City				
Yerevan	1 (0.28)	321 (89.42)	37 (10.31)	
Gyumri	0 (0.00)	23 (52.27)	21 (47.73)	**<0.001**
Plaque score	3.57 (-)*	2.45 (1.00)	3.55 (0.63)	**<0.001**

* SD was not defined due to a small number of participants (n=1)

Table 5. Simple linear regression: association between GI and PI

Variable	β coefficient	95% CI	P value
Plaque score	0.18	0.15-0.21	<0.001

Table 6. Simple linear regression: confounding variables

Variable	GI score	PI Score
	β coef., (95% CI), p value	**β coef., (95% CI), p value**
Age	0.01, (0.00 0.001), p<0.001	0.01, (0.00 0.02), p=0.031
City sites	0.38, (0.27 0.49), p<0.001	0.65, (0.33 0.91), p<0.001
Frequency of brushing teeth	-0.15, (-0.19 0.10), p<0.001	-0.32, (-0.45 0.19), p<0.001

Table 7. Multiple linear regression: associations between the GI and PI scores and confounders

Variable	β coefficient	95% CI	P value
Plaque score	0.15	0.12 0.18	<0.001
Frequency of brushing teeth	-0.08	-0.12 0.42	<0.001
City sites	0.24	0.15 0.33	<0.001
Age	0.01	0.00 0.01	0.001

APPENDICES

APPENDIX 1. CHECKLIST FOR OBSERVATION AND SELECTION OF DENTAL CLINICS

Standards	Yes	No	Comments
1. Existence of state licensing			
2. Pre-disinfection of instruments through Hexanios			
3. Disinfection of hand pieces through Surfanios			
4. Autoclaves are used to sterilize the instruments			
5. Mouth mirrors are available			

APPENDIX 2. FIELDWORK MANUAL FOR RECRUITMENT

Recruitment Script

Recruitment team members will approach visitors who finished their dental examination at the chosen clinics to check for their eligibility and recruit for the study. The following information will be presented to the patients:

Hello, my name is _____. I am from Turpanjian School of Public Health of the American University of Armenia. We are conducting a study regarding the oral health situation of Armenian adult population and would like to talk to you.

If **yes** continue and go to **Participants Selection**

Participants Selection
Before going into more details we have to ask you several questions about you.

a. Ask if the respondent is **between 18 + years old**. Otherwise STOP the interview *(Discontinue selection, thank the participant for their time, choose recruitment result code and fill in the Journal form.)*

b. If the respondent is female, ask if she is **pregnant or nursing**. If Yes STOP the interview. *(Discontinue selection, thank the participant for their time, choose recruitment result code and fill in the Journal form.)*

c. Ask the respondent if during the last dental visit he/she were told that they **have periodontitis**. If Yes STOP the interview *(Discontinue selection, thank the participant for their time, choose recruitment result code and fill in the Journal form.)*

d. Ask if the respondent is wearing dental braces, including removable ones. If yes **STOP** the interview. *(Discontinue selection, thank the participant for their time, choose recruitment result code and fill in the Journal form.)*

e. Ask if the respondent is currently **using antibiotics for any purpose**. If Yes STOP the interview. *(Discontinue selection, thank the participant for their time, choose recruitment result code and fill in the Journal form.)*

f. Ask if the respondent **uses any of following drugs: Diphenine, Deximune, Equoral or Sandimmun Neoral.** If Yes STOP the interview *(Discontinue selection, thank the participant for their time, choose recruitment result code and fill in the Journal form.)*

g. Ask if the respondent is **diagnosed with hypertension** (chest pain). If Yes, ask if he/she **uses any of the following drugs*: Nifedipine, Corinfar, Nifedi-denk, Cordipin, Verapamil, Tarka, Finoptin, Verapress or Diltiazem**. If Yes STOP the interview *(Discontinue selection, thank the participant for their time, choose recruitment result code and fill in the Journal form.)*

Once the respondent is selected, present the introductory statement:

We would like to invite you to participate in our study. Your participation involves a survey on oral health and clinical examinations of plaque, gingivitis. The survey will be conducted using a self-administered questionnaire. After completing the survey questionnaire you are invited to participate in a clinical examination of your oral cavity, aiming to explore dental plaque, gingivitis. To appreciate the time you dedicate to the project, we will give you a 10,000 AMD gift card to pay for services provided in this dental clinic.

If the respondent gives preliminary agreement ask him/her that you would like to make an appointment during the upcoming 3 days by the respondent's convenience to visit the same clinic you are in and complete the questionnaire and undergo the dental examination of his/her oral cavity.

If the respondent still gives an agreement, continue and provide the full consent form.

PROVIDE COMPLETE CONSENT FORM

h. Explain the main details of the consent form and ask participants to carefully read it.
i. If the participants signs the written consent form, gives a copy of the signed consent form to him/her and keep one copy with you. **Otherwise STOP** the recruitment.
j. Continue and make an appointment for the next visit. Ask if the participant can provide any contact number (cell phone.)
k. Fill the appointment form and give to the participant.
l. Ask the participant to refrain from brushing the teeth for 24 h prior to the visit.

APPENDIX 3. CONSENT FORM IN ENGLISH AND ARMENIAN

<div align="center">

American University of Armenia

Institutional Review Board #2

Written Consent Form for Participants' Enrollment

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Title of Research Project: Prevalence and Severity of Plaque and Gingivitis in Armenian Adult Population

Zvart Avedisian Onanian Center for Health Services Research and Development in collaboration with Colgate-Palmolive Company conducts a study, which aims to assess the prevalence and severity of dental plaque and gingivitis in the Armenian adult population.

You are one of the 400 participants, who are invited to take part in this study, because you are an adult living in Armenia, and a visitor of this dental clinic. Your participation involves a survey and clinical examination of plaque and gingivitis. It is a onetime participation and there will not be any need to contact you in the future. Your participation in this study is completely voluntary. Your decision to participate or refusal to do so will have no consequences on you, as well as on the services provided to you in this dental clinic.

The survey will be conducted using a self-administered questionnaire. The questionnaire contains close ended questions about your oral health habits, as well as questions about your medical and dental conditions. You may refuse to answer any of the questions or stop completing the questionnaire at any time. The information you provide will pose no risk for you and will not leave consequences on the services provided to you. The survey is completely anonymous, and only the research team can have access to the collected data. The data will be used only for research purposes without revealing your identity.

After completing the survey questionnaire you are invited to participate in a clinical examination of your oral cavity, aiming to explore dental plaque, gingivitis, which will take about 25 minutes. The examination will be performed by a trained dentist examiner, and the results will be recorded in special forms. Those forms do not contain any identifiable information about you. You can stop the dental examination any time you want. During the examination your dentition

will be disclosed with liquid disclosing solution, which will help the examiner to measure the level of plaque at various surfaces of the teeth. This disclosing liquid is a safe and widely used method to detect plaque on teeth surfaces. It poses no health risks under normal conditions of use. During the examination, your teeth will receive pink color which will wear off after you mouthwash and tooth brush.

After the dental examination, the examiner will inform you about your results on the plaque and gingivitis and provide an educational form on how to improve plaque and gingivitis situation. You can stop the clinical examination at any point you want, if you feel discomfort. Your decision to stop the clinical examination will not influence the services provided to you in this dental clinic. Once your participation is over you will receive a gift card in the amount of AMD 10,000 to pay for chosen services provided in this dental clinic in appreciation of contribution of your time to the research project.

In future you can contact the coordinator of this study Serine Sahakyan by (060) 61 25 61, if you have any questions regarding the study. If you feel you have not been treated fairly or think you have been hurt by joining the study you should contact Varduhi Hayrumyan, the Human Subject Protection Administrator of the American University of Armenia: (060) 61 26 17.

If you agree to participate in this study, please sign this document. You are asked to keep one of the copies with you, and give the other one to us.

If you do not agree to participate, there is no need to sign the document.

Date: _____

Signature: _____

Signature of the Research team member: _____

Date_____

Հայաստանի Ամերիկյան Համալսարան

Գիտահետազոտական էթիկայի թիվ 2 հանձնաժողով

Մասնակիցների ներառման գրավոր համաձայնության ձև

Հետազոտական ծրագրի վերնագիրը՝ Ատամնափառի և լնդաբորբի տարածվածությունն ու սրությունը Հայաստանի չափահաս բնակչության շրջանում: Հայաստանի Ամերիկյան Համալսարանի Ջուարթ Ավետիսեան Օնանեան առողջապահական ծառայությունների հետազոտման և զարգացման կենտրոնը Քոլգեյթ Փալմոլիվ Քոմփանիի հետ համատեղ իրականացնում է ուսումնասիրություն, որի նպատակն է գնահատել ատամնափառի, լնդաբորբի և ատամների կարիեսի տարածվածությունն ու ծանրությունը:

Դուք հրավիրվել եք մասնակցելու այս հետազոտությանը, քանի որ այն 400 ընտրված մասնակիցներից մեկն եք, ովքեր Հայաստանի չափահաս բնակիչներ են և հանդիսանում են մեր կողմից ընտրված ստոմատոլոգիական կլինիկաներից մեկի այցելու: Ձեր մասնակցությունը կներառի բերանի խոռոչի առողջության վերաբերյալ հարցում, ինչպես նաև ատամնափառի, գինգիվիտի (լնդաբորբ) և կարիեսի կլինիկական զննում: Այն կատարմանափակվի միայն մեկ հանդիպմամբ և ապագայում ձեզ նորից դիմելու կարիք չի լինելու: Ձեր մասնակցությունն այս հետազոտությանը լիովին կամավոր է: Ձեր մասնակցելու կամ մերժելու որոշումը որևէ հետևանք չի ունենա ձեր կամ այս կլինիկայում Ձեզ տրամադրվող ծառայությունների վրա:

Հարցումը իրենից ներկայացնում է ինքնուրույն լրացվող հարցաշար: Այն պարունակում է հակիրճ հարցեր ձեր ընդհանուր առողջության, բերանի խոռոչի խնամքի սովորությունների և առողջական վիճակի մասին: Դուք կարող եք հրաժարվել պատասխանելու հարցաշարի ցանկացած հարցի կամ ցանկացած պահի ընդհատել այն: Ձեր կողմից տրամադրած տվյալները չեն առաջացնի որևէ վտանգ Ձեզ համար և չեն ունենա որևէ հետևանք Ձեզ տրամադրվող ծառայությունների վրա: Հարցումը լինելու է ամբողջությամբ անանուն: Հավաքված տվյալները հասանելի կլինեն միայն հետազոտական խմբին և կօգտագործվեն զուտ հետազոտական նպատակներով՝ առանց Ձեր ինքնությունը բացահայտելու: Հարցաշարը լրացնելու համար ձեզանից կպահանջվի մոտ 10-15 րոպե:

Հարցաշարը լրացնելուց հետո Դուք կհրավիրվեք մասնակցելու բերանի խոռոչի կլինիկական զննման, որի ընթացքում կգնահատվի Ձեր ատամների ատամնափառի, գինգիվիտի և կարիեսի վիճակը: Դրա համար կպահանջվի մոտ 25 րոպե: Զննումը

կիրականացվի վերապատրաստված ատամնաբույժի կողմից, իսկ արդյունքները կգրանցվեն հատուկ ձևաթղթի վրա: Այդ ձևաթղթերը չեն պարունակի Ձեր անձր բացահայտող որևէ տեղեկատվություն: Զննման ժամանակ Ձեր ատամները կպատվեն ատամնափառը հայտնաբերող հատուկ լուծույթով, որը կօգնի ատամնաբույժին գնահատելու ատամի վրա առկա ատամնափառի մակարդակը: Այդ լուծույթն անպահով է և ունի լայն կիրառում: Զննման ժամանակ Ձեր ատամները կրնդունեն վարդագույն երանգ՝ այդ լուծույթի կիրառման արդյունքում: Գույնը կվերանա բերանի խոռոչը ջրով ողողելուց և ատամները խոզանակելուց հետո:

Ատամների զննումից հետո հետազոտողը ձեզ հետ կկիսի զննման արդյունքները, ինչպես նաև կտարմադրի ատամնափառի և լնդերի վիճակի բարելավման վերաբերյալ խորհուրդ և կրթական նյութ: Որևէ անհարմարություն զգալու դեպքում դուք կարող եք դադարեցնել զննումը ցանկացած պահի: Ձեր որոշումը չի ազդի այս կլինիկայում Ձեզ տրամադրվող ծառայությունների վրա:

Մասնակցության ավարտից հետո Դուք կստանաք 10,000 դրամին համարժեք նվեր քարտ որպես փոխհատուցում այս հետազոտական նախագծին Ձեր տրամադրած ժամանակի համար: Այդ քարտով դուք կարող եք վճարել այս կլինիկայում ձեր ցանկությամբ ընտրված որևէ ծառայության դիմաց:

Այս հետազոտության վերաբերյալ այլ հարցեր ունենալու դեպքում հետազայում կարող եք կապվել հետազոտության համակարգող Սերինե Սահակյանին՝ (060) 61 25 61 հեռախոսահամարով: Եթե Դուք կարծում եք, որ Ձեզ հետ անարդարացիորեն են վերաբերվել կամ մասնակցությունը Ձեզ վնաս է պատճառել, ապա կարող եք կապ հաստատել ՀԱՀ էթիկայի հանձնաժողովի համակարգող Վարդուհի Հայրումյանին՝ (060) 61 26 17 հեռախոսահամարով:

Եթե համաձայն եք մասնակցելու այս հետազոտությանը, խնդրում ենք ստորագրել այս փաստաթուղթը: Խնդրում ենք Ձեզ մոտ պահել օրինակներից մեկը, իսկ մյուս օրինակը փոխանցել մեզ:

Եթե դուք հրաժարվում եք մասնակցությունից, ապա փաստաթուղթը ստորագրելու կարիք չկա:

Ամսաթիվ՝ _____

Մասնակից. Անուն, ազգանուն, ստորագրություն _____

Հետազոտող թիմի անդամ. Անուն, ազգանուն, ստորագրություն _____

APPENDIX 4. JOURNAL FORM FOR ENROLLED SUBJECTS

City: Yerevan   **Clinic ID: 05**   **Date:** _____

DD/MM/YYYY

Participant ID: _ _ _ _ _ *(participant's consecutive number and Interviewer ID)*

Questionnaire	☐ Yes ☐ No (*Completed by interviewer*) *if no indicate the reason* _____
Gingivitis Index Form	☐ Yes ☐ No (*Completed by dentist*) *if no indicate the reason* _____
Plaque Index Form	☐ Yes ☐ No (*Completed by dentist*) *if no indicate the reason* _____
Total number of teeth	_____ (*Completed by dentist*)

Signature of examining dentist: _____

Journal Form for Participants Recruitment

City:

Date: _____

Recruiter ID: _

Dental Clinic ID: _

Attempt #	01	02	03	04	05	06	07	08	09	10	11	12	13
Result													
Attempt #	14	15	16	17	18	19	20	21	22	23	24	25	26
Result													
Attempt #	27	28	29	30	31	32	33	34	35	36	37	38	39
Result													

Recruitment Result Codes

1. Eligible
2. Ineligible
   a) pregnancy
   b) nursing
   c) antibiotic usage
   d) antihypertensive drug usage
   e) out of the age range
   f) having periodontitis
   g) wearing braces
   h) less than 18 number of teeth

3. Refusal
4. Other _____

Prevalence and Severity of Plaque and Gingivitis in Armenian Adult Population

City _____   Clinic ID_____

Participant's ID _____   Date (dd/mm/yy) _ _/_ _/ _ _

Instructions for Completing the Questionnaire

Dear participant, first read carefully each question and the possible response options. Choose the option that best represents your response and circle the number next to the option. Some questions will require you to answer in words or numbers. There are blank lines next to these questions for you to write your response.

Please follow the instructions in *italics* under the questions. These instructions will help you to complete the questionnaire.

Please try to answer all the questions.

Answer the questions starting from here!

1. Oral health behaviors

1. How often do you visit the dentist? *(Choose <u>one</u> option)*	1) Regularly (twice a year, or every six months) 2) When in pain 3) Rarely (less than once a year) 4) Other *(Specify)*_____
2. How often do you brush your teeth? *(Choose <u>one</u> option)*	1) I don't brush or rarely brush my teeth → **Go to Q_4** 2) Few times a week 3) Once a day 4) Two or more times a day
3. What kind of toothpaste do you use for tooth brushing?	1) Fluoride containing 2) Fluoride-free 3) I don't know
4. What else do you use besides your toothbrush? *(Choose <u>more than one</u> option)*	1) Dental pick or interdental brush 2) Dental floss, **if yes**, how many days during a week? _____

	3) Mouth rinsing with water, **if yes,** how often during a day? _____ **4)** Other (specify) _____ **5)** None of this
5. Have you ever worn braces on your teeth?	**1)** Yes **if yes**, specify when you have removed them? _____ (day, week, month, year ago) **2)** No
6. Did you use any antiseptic mouthwash for therapeutic reasons over the past 3 months?	**1)** Yes **2)** No **3)** Don't remember

2. Medical and dental conditions

7. How would you rate your current overall health on a scale from 0 to 10? *Write the number, considering that 0 is the poorest and 10 is excellent*	_____
8. Please, list any chronic diseases you have. *(You can choose <u>more than one</u> option)*	**1)** Diabetes **2)** Cancer **3)** Thyroid or hormonal disorders **4)** Cardiovascular diseases **5)** Osteoporosis **6)** Immune system disorders **7)** HIV/ AIDS **8)** Other *(Specify)*_____ **9)** None
9. In general how would you rate the health of your teeth and gums? *(Choose <u>one</u> option)*	**1)** Very good **2)** Good **3)** Fair **4)** Poor **5)** Very poor **6)** Don't know
10. Do any of your parents suffer from periodontal diseases (gingivitis, periodontitis)? (having constant gum inflammation, gum bleeding while tooth brushing, teeth become loose on their own, without an injury) *(Choose <u>one</u> option)*	**1)** Yes **2)** No **3)** Don't know

3. Smoking and alcohol consumption, and eating habits.

11. Have you smoked at least 100 cigarettes in your entire life?	**1)** Yes **2)** No → **Go to Q_16**
12. Do you now smoke cigarettes every day, some days, or not at all?	**1)** Every day → **Go to Q_16** **2)** Some days → **Go to Q_16** **3)** Not at all
13. When was the last time you smoked a cigarette, even one or two puffs?	_____ (day, week, month, year ago)
14. How often do you drink 1 or more portions of any kind of alcoholic beverages (1 or more glasses of wine, cans/bottles of beer, shots of cognac, vodka, or liquor)?	**1)** Never **2)** Less than once per month **3)** 1 to 3 times per month **4)** 1 to 3 times per week **5)** Almost everyday
15. Was there a period in your life when you drank 5 or more portions of any kind of alcoholic beverage almost every day?	**1)** Yes **2)** No **3)** Do not know / Difficult to answer
16. How often do you consume sweets (cakes, chocolate, candies, sweetened tea or coffee etc.)? *(Choose one option)*	**1)** Daily **2)** Several times a week **3)** Less than or once a week **4)** Rarely **5)** Never
17. How often do you consume sweetened beverages (soft drinks, lemonade, Coca Cola, Fanta, Sprite etc.)? *(Choose one option)*	**1)** Daily **2)** Several times a week **3)** Less than or once a week **4)** Rarely **5)** Never

4. Demographic and Socio-Economic Status

18. Please, indicate your gender.	**1)** Male **2)** Female
19. Please, indicate your age *(Completed years)*	_____
20. Please, indicate your height in centimeters.	_____
21. Please, indicate your weight in kilograms.	_____
22. What is your marital status? *(Choose one option)*	**1)** Married **2)** Separated/Divorced **3)** Widowed

	4) Single
23. Indicate highest level of education that you have received. *(Choose <u>one</u> option)*	**1)** No education **2)** School (12 years or less) **3)** Professional technical education **4)** Institute/University or higher
24. On average, how much money does your family spend monthly? *(Choose <u>one</u> option)*	**1)** Less than 50,000 AMD **2)** From 51,000 to 100,000 AMD **3)** From 101,000 to 200,000 AMD **4)** From 201,000 to 300,000 AMD **5)** Above 301,000 AMD **6)** Don't know/ Refusal

Ատամնաբժիշկի և ընդաբորբի տարածվածությունն ու սրությունը Հայաստանի չափահաս բնակչության շրջանում:

Քաղաք: Երևան   Կլինիկա ID 05

Մասնակցի ID _____   Ամսաթիվը _ _ / _ _ / _ _ _ _
                                                                Օր   ամիս   տարի

<u>Հարցաշարը լրացնելու ցուցումներ</u>

Հարգելի ՛ մասնակից, ուշադիր կարդացեք յուրաքանչյուր հարց և պատասխանի ներկայացված տարբերակները: Ընտրեք այն տարբերակը, որն ամենաճշգրիտն է բնութագրում Ձեր պատասխանը և շրջանակի մեջ վերցրեք այդ տարբերակի դիմաց նշված թիվը: Որոշ հարցերի պետք է պատասխանել բառերով կամ թվերի տեսքով: Այդ հարցերի դիմաց ազատ տարածք է հատկացված, որպեսզի Դուք գրեք Ձեր պատասխանը:

Խնդրում ենք հետևել հարցերի տակ *շեղագիր* գրված ցուցումներին: Այդ ցուցումները կoգնեն Ձեզ լրացնել հարցաշարը:

Խնդրում ենք, փորձեք պատասխանել բոլոր հարցերին:

1. Բերանի առողջության վերաբերյալ վարքագիծ

7. Որքա ՞ն հաճախ եք այցելում ատամնաբույժի: *(Ընտրեք մեկ տարբերակ)*	1) Կանոնավոր (տարին երկու անգամ կամ վեց ամիսը մեկ) 2) Երբ ցավեր եմ ունենում 3) Հազվադեպ (տարին մեկ անգամ կամ մեկ անգամից պակաս) 4) Այլ (մանրամասնեք) _____
8. Որքա ՞ն հաճախ եք խոզանակում Ձեր ատամները: *(Ընտրեք մեկ տարբերակ)*	5) Չեմ խոզանակում կամ հազվադեպ եմ խոզանակում → <mark>Անցեք 4-րդ հարցին</mark> 6) Շաբաթը մի քանի անգամ 7) Օրը մեկ անգամ 8) Օրը երկու կամ ավելի անգամ

9. Ինչպիսի՞ ատամի մածուկ եք օգտագործում ատամները խոզանակելու համար:	1) Ֆտոր պարունակող 2) Առանց ֆտորի 3) Չգիտեմ/կարևոր չէ
10. Ատամի խոզանակից բացի ուրիշ ի՞նչ ինամքի միջոցներ եք օգտագործում: *(Կարող եք ընտրել մեկից ավել տարբերակներ)*	1) Ատամի չթփիկ կամ միջատամնային խոզանակ 2) Ատամի ֆլոս/թել: **Եթե այո**, ապա քանի՞ օր շաբաթվա մեջ _____ 3) Բերանի ողողում ջրով: **Եթե այո**, ապա քանի՞ անգամ օրվա մեջ _____ 4) Այլ (մանրամասնեք) _____ 5) Նշվածներից ոչ մեկը
11. Երբևիցե կրե՞լ եք ատամների բրեկետներ:	1) Այո: **Եթե այո**, ապա ե՞րբ եք հեռացրել դրանք _____ (օր, շաբաթ, ամիս, տարի առաջ) 2) Ոչ
12. Վերջին 3 ամսվա ընթացքում, բուժական նպատակներով օգտագործե՞լ եք բերանի ողողման որևէ անտիսեպտիկ հեղուկ: (Օր.՝ հեքսիլոկ, …)	4) Այո 5) Ոչ 6) Չեմ հիշում

2. Ընդհանուր առողջական և ատամնաբուժական խնդիրներ

13. Ինչպե՞ս կգնահատեք Ձեր ներկայիս առողջական վիճակը 0-ից 10 սանդղակով: *(Գրեք թիվը հաշվի առնելով, որ 0 ամենավատն է իսկ 10 ամենալավը)*	_____
14. Խնդրում ենք նշել թե ինչ հիվանդություններ ունեք: *(Կարող եք ընտրել մեկից ավել տարբերակներ)*	10) Շաքարային դիաբետ 11) Քաղցկեղ 12) Վահանաձև գեղձի կամ այլ հորմոնալ խանգարումներ 13) Սիրտ անոթային խնդիրներ 14) Օստեոպորոզ 15) Իմունային համակարգի խանգարումներ 16) ՄԻԱՎ/ ՁԻԱՀ 17) Այլ (Մանրամասնեք) _____ 18) Ոչինչ

15. Ընդհանուր առմամբ ինչպե՞ս կգնահատեք Ձեր ատամների և լնդերի առողջական վիճակը: *(Ընտրեք մեկ տարբերակ)*	7) Շատ լավ 8) Լավ 9) Բավարար 10) Վատ 11) Շատ վատ 12) Չգիտեմ
16. Ձեր ծնողներից որևէ մեկը տառապու՞մ է պերիոդոնտալ խնդիրներով (լնդաբորբ, պարոդոնտոզ, պերիոդոնտիտ): Այսինքն երբ լնդերը մշտապես բորբոքված են, արյունահոսում են ատամները խոզանակելիս կամ ատամները սկսում են շարժվել առանց վնասվածք ստանալու: *(Ընտրեք մեկ տարբերակ)*	4) Այո 5) Ոչ 6) Չգիտեմ

3. Ծխելու, ալկոհոլի օգտագործման և սնվելու սովորույթներ

17. Դուք ծխե՞լ եք առնվազն 100 ծխախոտ ձեր ամբողջ կյանքի ընթացքում:	3) Այո 4) Ոչ → <mark>Անցեք 16-րդ հարցին</mark>
18. Ներկայումս որքա՞ն հաճախ եք ծխախոտ ծխում:	4) Ամեն օր → <mark>Անցեք 16-րդ հարցին</mark> 5) Որոշ օրեր → <mark>Անցեք 16-րդ հարցին</mark> 6) Ներկայումս ընդհանրապես չեմ ծխում
19. Ե՞րբ եք վերջին անգամ ծխել, անգամ մեկ կամ երկու ծուխս:	_____ (օր, շաբաթ, ամիս, տարի առաջ)
20. Որքա՞ն հաճախ եք իմում 1 կամ ավելի բաժին ալկոհոլային որևէ խմիչք (1 կամ ավելի բաժակ գինի, կոնյակ, օղի, լիկյոր, շիշ զարեջուր և այլն):	6) Երբեք 7) Ամիսը մեկ անգամից պակաս 8) Ամիսը 1-3 անգամ 9) Շաբաթը 1-3 անգամ 10) Գրեթե ամեն օր
21. Ձեր կյանքում եղե՞լ է ժամանակաշրջան, երբ գրեթե ամեն օր իմել եք 5 կամ ավելի բաժին որևէ ալկոհոլային խմիչք:	4) Այո 5) Ոչ 6) Չգիտեմ /Դժվարանում եմ պատասխանել
22. Որքա՞ն հաճախ եք օգտագործում քաղցրավենիք (խմորեղեն, շոկոլադ, կոնֆետ, քաղցր թեյ կամ սուրճ): *(Ընտրեք մեկ տարբերակ)*	6) Ամեն օր 7) Շաբաթը մի քանի անգամ 8) Շաբաթը մեկ անգամից պակաս 9) Հազվադեպ 10) Երբեք

23. Որքա՞ն հաճախ եք օգտագործում քաղցրացված ըմպելիքներ (լիմոնադ, հյութեր, կոկա կոլա, ֆանտա, սպրայթ և այլն) *(Ընտրեք <u>մեկ</u> տարբերակ)*	1) Ամեն օր 2) Շաբաթը մի քանի անգամ 3) Շաբաթը մեկ անգամից պակաս 4) Հազվադեպ 5) Երբեք

4. Ժողովրդագրական և սոցիալ-տնտեսական տվյալներ

24. Ձեր սեռը	3) Տղամարդ 4) Կին
25. Ձեր տարիքը *(Լրացած տարիները)*	_____
26. Ձեր հասակը (սանտիմետրով):	_____
27. Ձեր կշիռը (կիլոգրամով):	_____
28. Ձեր ամուսնական կարգավիճակը *(Ընտրեք <u>մեկ</u> տարբերակ)*	5) Ամուսնացած 6) Բաժանված 7) Այրի 8) Չամուսնացած
29. Ձեր ամենաբարձր կրթական աստիճանը	5) Կրթություն չունեմ 6) Միջնակարգ դպրոց (12 տարի կամ քիչ) 7) Միջին մասնագիտական/տեխնիկում 8) Բարձրագույն (Ինստիտուտ/Համալսարան) և ավել
30. Միջինում, ամսական որքա՞ն գումար է ծախսում Ձեր ընտանիքը: *(Ընտրեք <u>մեկ</u> տարբերակ)*	7) 50,000 դրամից պակաս 8) 51,000-ից 100,000 դրամ 9) 101,000-ից 200,000 դրամ 10) 201,000-ից 300,000 դրամ 11) 301,000-ից ավել 12) Չգիտեմ/ հրաժարվում եմ պատասխանել

Շնորհակալություն Ձեր մասնակցության համար:

APPENDIX 6. STUDY INSTRUMENT: DENTAL EXAM FORMS: GINGIVITIS

Gingivitis Index Form

Upper Teeth																	
Tooth #	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
Facial: Mesial																	
Middle																	
Distal																	
Lingual: Mesial																	
Middle																	
Distal																	

Lower Teeth																	
Tooth #	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
Facial: Mesial																	
Middle																	
Distal																	
Lingual: Mesial																	
Middle																	
Distal																	

Score = *Sum of all scores of all sites* = _____
          Total Number of sites scored

Gingival Index Examination

<u>Instruction to fill the form</u>

- Start from the participant's upper right second molar, corresponding no.2 on the index examination form.
- Start examining the tooth by placing the dental probe on the gingiva of the facial mesial aspect of the tooth
- Depending on the outcome write the score in the corresponding box of the sheet (Facial: mesial of tooth no.2).
    o Follow the same steps for the facial middle part of the same tooth.
    o Later the facial distal aspect.
- Move to the facial part of tooth no. 3, then tooth no.4 and so on till you reach tooth no.15. (Follow the same steps as for tooth no. 2).
- Move to the lingual part of the upper teeth.
- This time start with the lingual mesial part of tooth no. 15.
    o Then the lingual middle part of the same tooth.
    o Later the lingual distal part.
- Move to tooth no. 14 following the same order, then tooth no.13 and so on till you reach tooth no. 2.
- Move to the lower teeth.
- Start with the facial mesial part of tooth no.31, the lower right second molar,
    o Then move to its facial middle part
    o Later to the facial distal part.
- Move to the facial part of tooth no.30 later no.29 and so on until reaching tooth no.18.
- Move to the lingual part of the lower teeth by starting with tooth no.18.
- Start with the lingual mesial aspect
    o Then lingual middle
    o Later lingual distal.
- Move to tooth no. 19 later to tooth no.20 till you reach tooth no.31.
- Depending on the scores you had on the index sheet calculate the total score of each patient according to the following equation:

The gingival index = <u>Sum of all scores of all sites</u>

Total number of sites scored

Plaque Index Form

Upper Teeth																	
Tooth #	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
Facial: Mesial																	
Middle																	
Distal																	
Lingual: Mesial																	
Middle																	
Distal																	

Lower Teeth																	
Tooth #	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
Facial: Mesial																	
Middle																	
Distal																	
Lingual: Mesial																	
Middle																	
Distal																	

Score = *Sum of all scores of all sites* = _____
          Total Number of sites scored

Plaque Index Examination:

<u>Instruction to fill the form</u>

- Start from the participant's upper right second molar, corresponding no.2 on the index examination form.
- Start examining the tooth from the facial mesial aspect
- Depending on how much the plaque covers this part of the tooth write the score in the corresponding box of the sheet (Facial: mesial of tooth no.2).
  - Follow the same steps for the facial middle part of the same tooth.
  - Later the facial distal aspect.
- Move to the facial part of tooth no. 3, then tooth no.4 and so on till you reach tooth no.15. (Follow the same steps as for tooth no. 2).
- Move to the lingual part of the upper teeth.
- This time start with the lingual mesial part of tooth no. 15.
  - Then the lingual middle part of the same tooth.
  - Later the lingual distal part.
- Move to tooth no. 14 following the same order, then tooth no.13 and so on till you reach tooth no. 2.
- Move to the lower teeth.
- Start with the facial mesial part of tooth no.31, the lower right second molar,
  - Then move to its facial middle part
  - Later to the facial distal part.
- Move to the facial part of tooth no.30 later no.29 and so on until reaching tooth no.18.
- Move to the lingual part of the lower teeth by starting with tooth no.18.
- Start with the lingual mesial aspect
  - Then lingual middle
  - Later lingual distal.
- Move to tooth no. 19 later to tooth no.20 till you reach tooth no.31.
- Depending on the scores you had on the index sheet calculate the total score of each patient according to the following equation:

The plaque index = <u>Sum of all scores of all sites</u>

Total number of sites scored

APPENDIX 8. FIELDWORK MANUAL FOR CLINICAL EXAMINATIONS

Preliminary Actions to Be Taken Before Dental Examination

To ensure the safety of study participants and to prevent transmission of potentially pathogenic microorganisms through multiple-use dental instruments it is necessary:

- To have in-between disinfection air/water syringe tips and dental chair.
- A new set of sterilized instruments needs to be used after each examined patient.
- Surgical gloves and masks should be worn at the time of examination and should be changed before each new patient.
- The dental chair should be disinfected prior to the patient's entry to the examination room.
- The dentist should be wearing clean gown and scrubs.
- His/her hands should be washed thoroughly then covered by dental gloves. The face should be protected by dental face mask.
- Once the patient and the dentist are comfortably seated on their chairs, the dentist turns on the chair light and directs it to the patient's mouth for clear vision.[1,2]

Gingival Inflammation

The gingival index is used to assess the gingival condition by distinguishing the severity of its lesion and the location depending on the four areas of each tooth: facial, lingual, distal and mesial.

To examine the gingiva the dentist should use a disinfected multiple-use dental mirrors.

The probe is placed on the gingiva of each area of each tooth separately. And depending on the outcome the score is written on the index sheet:

0=Absence of inflammation

1=Mild inflammation (slight color change / little change in texture)

2=Moderate inflammation (moderate glazing, redness, edema and hypertrophy (tendency to bleed upon probing))

3=Severe inflammation (marked redness and hypertrophy, tendency to spontaneous bleeding)

Subsequent to completing the sheet the following equation is done for each patient:

Score= Sum of all scores of all sites= The gingival index
      Total number of sites scored

Dental Plaque

Plaque index is a way of measuring the state of oral hygiene by recording presence of soft debris (dental plaque) on the surface of teeth and areas adjacent to gingival margin.

Plaque can be seen only after application of disclosing agent, therefore before starting the actual process of assessing the PI, the patient needs to be asked to rinse his/her mouth with a disclosing agent for 10-30 seconds, which will eventually reveal/ paint the plaque and make it visible for dentist.

In order to record plaque accumulation on teeth dental professionals need to have a mouth mirror and a probe at their hand.

Plaque should be assessed in all surfaces: labial, lingual, mesial, and distal surfaces of all teeth other than third molars, dental crowns, and implants.

Based on the level of plaque accumulation the dentist has to choose one from below mentioned options:

0= No plaque present

1= Separate spots of plaque adhering to the gingival margin of the tooth

2= A thin continuous film of plaque (up to 1mm) adhering to the free gingival margin of the tooth

3= Film of plaque covering 1/3 (and not more) of the tooth surface

4= Film of plaque covering more than 1/3 but not more than 2/3 of the tooth surface

5= Film of plaque covering more than 2/3 of the tooth surface

Subsequent to completing the sheet the following equation is done for each patient:

Score=Sum of all scores of all sites=The plaque index
      Total number of sites scored
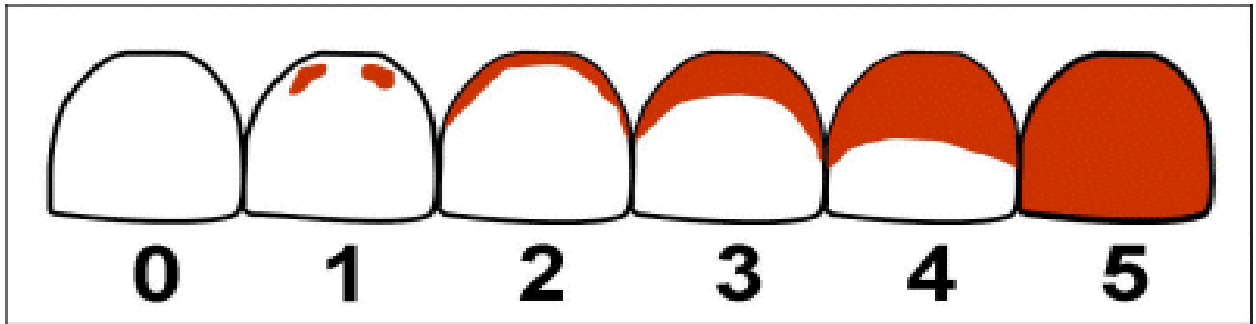
Score	Inference
0	No plaque/debris
1	Separate flecks of plaque at the cervical margin of the tooth
2	Thin continuous band of plaque (up to 1 mm) at the cervical margin of the tooth
3	Band of plaque wider than 1 mm but covering less than one-third of the crown of the tooth
4	Plaque covering at least one-third but less than two-thirds of the crown of the tooth
5	Plaque covering two-thirds or more of the crown of the tooth

Gingival Index

Scores	Gingival Status	Criteria
0	Normal gingiva	Natural coral pink gingival with no e/o inflammation
1	Mild inflammation	Slight changes in color, slight edema. No bleeding on probing
2	Moderate inflammation	Redness, edema and glazing. Bleeding upon probing
3	Severe inflammation	Marked redness and edema/ ulceration/tendency to bleed spontaneously

APPENDIX 10. EDUCATIONAL BROCHURES

Panel 1

Խորհուրդներ, թե ինչպես կանխարգելել ատամնաքարի և լնդերի բորբոքման առաջացումը

✓ Ատամները խոզանակել **օրը 2 անգամ**. խոզանակել **2 րոպե տևողությամբ**, կատարելով շրջանական շարժումներ վերևից ներքև՝ վերին ծնոտի ատամների համար, և ներքևից վերև՝ ստորին ծնոտի ատամների համար:

✓ Օգտագործե՛լ **ֆտոր պարունակող ատամի մածուկ**՝ ատամները կարիեսի առաջացումից պաշտպանելու համար:

✓ Խորհրդակցե՛լ ատամնաբույժի հետ, ով կիսշի, թե ինչ ատամի մածուկ է անհրաժեշտ օգտագործել:

ՀԻՇԻ՛Ր
Յուրաքանչյուր 3-4 ամիսը մեկ պետք է փոխել խոզանակը, քանի որ ժամանակի ընթացքում նրա վրա կուտակվում են մեծ քանակի մանրէներ, որոնք անզեն աչքով տեսանելի չեն:

Panel 2

✓ **Օրն առնվազն 1 անգամ օգտագործե՛լ ատամնաթել** խոզանակի համար դժվար հասանելի հատվածներում:

✓ Շտապաշտե՛լ բաղցրավենիքի՝ հատկապես ատամներին կպչող (օր.՝ չրեր, կարամել, իրիս) և բաղցր գազավորված ըմպելիքների օգտագործումը:

✓ Տարին 2 անգամ անցնե՛լ ատամների մասնագիտացված մաքրում ատամնաքարերի հեռացում:

✓ Ծծե՛լ, ծխելը փասում է լնդերը և ատամները:

✓ Մենեղակարգի մեջ տե՛ղ հատկացնել սպիտակուցներին ու վիտամիններով հարուստ մրգերին և բանջարեղենին:

✓ Յուրաբանսյուր տարի անցնե՛լ բժշկական կանխարգելիչ զննում վստահ լինելու, որ չունեք բերանի խոռոչի հետ կապ խնդիրներ հարուցող համակարգային որևէ հիվանդություն:

Մաղթում ենք Ձեզ առողջ ժպիտ:

Panel 3 (Cover)

American University of Armenia
Հայաստանի Ամերիկյան Համալսարան

Բերանի խոռոչի հիգիենա. ինչպե՞ս կանխարգելել ատամնաքարի առաջացումն ու լնդերի բորբոքումը

Ատամնաքար   Ատամի խոզանակ

Panel 4 — Բերանի առողջություն

Բերանի խոռոչի հիգիենան ներառում է ատամների կանոնավոր մաքրում խոզանակով և միջատամնային ատամնափայտի ու սննդի մնացորդների հեռացումը ատամնաթելով (ֆլոս՝ ատամների համար նախատեսված հատուկ թել):

ՀԻՇԻ՛Ր
Ատամներն անհրաժեշտ է խոզանակել **ամեն օր, օրը 2 անգամ** առավոտյան նախաճաշից հետո և երեկոյան քնելուց առաջ:

Հիգիենայի կանոնների չհետևելը, ինչպես նաև ատամնափայտն ու ատամնաքարերը, կարող են փչացնել ատամները (առաջացնել կարիես) և բորբոքել լնդերը (գինգիվիտ):

ՈՒՇԱԴՐՈՒԹՅՈՒՆ
Անհրաժեշտ է նպրբորեն խոզանակել նաև լեզուն, քանի որ փասակարը մանրէների մեծ մասը կուտակվում են դրա վրա:

Panel 5 — Ի՞նչ է ատամնափայտը

Ատամնափայտն ատամների մակերեսին ձևավորվող կպչուն, անգույն բակտերիաների շերտ է: Այս բակտերիաների արտադրած թթուները կարող են փասել ատամների ամբողջականությունն ու բերանի խոռոչի փափուկ հյուսվածքները:

Ատամնափայտ

Բերանի խոռոչի ոչ ճիշտ հիգիենայի կամ նրա բացակայության դեպքում ատամնափայտը կարող է վերածվել ավելի ամուր ու տհաճ ատամանաքարերի, որոնք կարող է հեռացնել միայն ատամնաբույժը հատուկ գործիքների միջոցով:

ՀԻՇԻ՛Ր
Տարին 2 անգամ զննման և խորհրդատվության նպատակով այցելելով ատամնաբույժին հնարավոր է կանխարգելել բերանի խոռոչում նոր հիվանդությունների առաջացումը:

Panel 6 — Ի՞նչ է լնդերի բորբոքումը (գինգիվիտ)

Գինգիվիտը լնդերի բորբոքման վաղ շրջանն է, որին բնորոշ նշաններն են՝

✓ կարմրած ու այտուցված լնդեր
✓ արյունահոսող լնդեր՝ ատամները խոզանակելիս կամ ատամնաթելով մաքրելիս
✓ բերանի տհաճ հոտ

Գինգիվիտի առաջացման պատճառներից են՝

✓ բերանի խոռոչի սխալ հիգիենան
✓ ծխելը
✓ շաքարային դիաբետը
✓ վիտամին C-ի պակասը
✓ որոշ խմբի դեղորայքներ
✓ հորմոնալ խանգարումները
✓ հղիությունը
✓ սթրեսը
✓ թերսնուցումը

ՈՒՇԱԴՐՈՒԹՅՈՒՆ
Չբուժված գինգիվիտը կարող է վերածվել պարոդոնտոզի, որը հանգեցնում է ատամն իր դիրքում ամուր ֆիքսող հյուսվածքի բայքայմանը, ատամների շարժունակության առաջացման և դրանց կորստին:

Առողջ լինդ և ատամ   Լնդաբորբ   Պերիոդոնտիտ

APPENDIX 11. GIFT CARDS

Վ. Տ.

ՀՀ, ք. Գյումրի

_____, 2017

Ծրագիր` *Առասնախադի և լնղաքրքի տարածվածությունն ու սրույթունը Հայաստանում*

"Էսկուլապ" կլինիկա

Մասնակցի h.h. (ID) _____

10000 ՀՀ դրամի համարժեք կտրոն

Կտրոնը վավեր է մինչև 1 հունիս, 2018

Կտրոնի օգտագործման կանոնները

•Կտրոնի միջոցով կարող եք ստանալ 10000 դրամին համարժեք ստոմատոլոգիական ծառայություններ միայն այս կլինիկայում

•Կտրոնը հնարավոր չէ կանխիկացնել:
Օրինակ` եթե ստացել եք 8000 դրամի ծառայություն, մնացած 2000 դրամը հնարավոր չէ կանխիկ գումարի տեսքով հետ ստանալ

•Այն կարող եք օգտագործել ինքներդ կամ փոխանցել մեկ այլ մարդու

•Հարկավոր է կլինիկա ներկայացնել կտրոնի բնօրինակը: Կտրոնի որևէ պատճնՆ կամ սկանավորված տարբերակ վավեր չի համարվի: