Preventive Approach for Oral Health Condition inside a Romanian Private Dental Office: A Epidemiological Study

Cristian Eugeniu Marin[1], Radu Costea[2], Rodica Luca[3]

[1]Private Practitioner, Med-Clinic – Curtea De Arges, Romania, [2]Department of Preventive Dentistry, Dentexpert Bucharest and Dentexpert Magic Brasov, Romania, [3]Department of Pedodontics, University of Medicine Carol Davila Bucharest, Bucureşti, Romania

ABSTRACT

Aim: The aim of this descriptive cross-sectional epidemiological research in the private dental clinic was to evaluate the preventive measures and oral health condition status that could take place inside the private dental office. The primary objective was to obtain a protocol by calculating and evaluating various indexes for the preventive measures in the private room. **Materials and Methods:** The study comprised of 499 patients in which 260 females and 239 were males from Romanian population who were checked and evaluated for complete oral health condition and decayed teeth (DT) by the decayed, missing, and filled teeth (DMFT) index, for the periodontal disease by community periodontal index treatment needs (CPITN) and gingival index, and for masticatory function by functional teeth unit index and new invented group strategy treatment index (SGTI) index. The data were obtained before and after the preventive treatment in DMFT and was compared and evaluated. Using a preformed Performa for this study all patients' oral health status data were recorded and observed. **Results:** Obtained data by SGTI index and others we found that poor oral hygiene and bad periodontal condition was observed ($P < 0.001$) in Romania tribes. Using preventive measures, giving education to patients for oral hygiene maintenance and dental implants we manage to pull back the DMFT index ($P < 0.001$) for 18% of the studied persons from an average of 14-30 DMFT to 12-20. The other indexes have showed a better health status with percentages between 0% and 87%. **Conclusions:** The results of our study could lead to a new approach to evaluate and prevent from initial caries, periodontal disease, and DT by restoration and treatment of missing teeth using implants, etc., inside the private dental practice. This is an original Research that presents two new and unprecedented ideas for decreasing DMFT index by using implants and rematerializing procedures, and the use of a newly invented index named SGTI for group strategy treatment. The use of epidemiologic index inside the private dental office is also an original approach to the dental procedures.

Key words: Community periodontal index treatment needs, decayed missing and filled teeth, functional teeth unit, gingival index, group strategy treatment index, index, oral disease, preventive

INTRODUCTION

Oral health diseases, such as caries and periodontal diseases, are still major problems in many cities around the globe, particularly among underprivileged groups in developed and developing countries. The global burden of oral conditions increased from 1990 to 2015, collectively affecting more than 3.9 billion people.[1] Dental caries is still a serious oral health enigma in most developed and developing countries, affecting principally school children, working and stressed individuals, and the vast majority of adults in rural and urban areas. To obtain the goals established by WHO we invest more efforts in the preventive strategies.[1] The carious disease has the epidemiologic screening value higher than other European countries [Table 1].

Access this article online	
Publisher	Website: www.renupublishers.com
Rp	DOI: 10.5958/2394-4196.2015.00017.5

Address for Correspondence:
Dr. Marin Cristian Eugeniu, Med Clinic – Curtea De Arges, Str. Eroilor nr. 45 – Romania. Phone: +40722240062.
E-mail: admin@med-clinic.net

Submission: 17 May 2015; **Revision:** 27 Jun 2015; **Acceptance:** 13 Aug 2015

The National Prevention Program started in 1999 to evaluate the carious activity of the schoolchildren in the main cities of Romania.[3] Still the situation is unclear in the small towns and rural areas. Epidemiologic studies are difficult to collect data because of lack of public dental offices in those areas. The private practice is the primary authority.

The foremost goal of our research was to discover a new way to evaluate the oral health conditions through a new epidemiological indexation technique. By this new technique, we can assess the patients in a group for the preventive measures accordingly to the gravity of the oral health condition. The most important and secondary objective was of this research was to obtain the best preventive measures by evaluating all the groups to decrease the decayed, missing, and filled teeth (DMFT) index in communities. The third and last goal was to ensure a preventive attitude by educating and making aware to patients about the varieties of the dental treatments available in today's era to obtain the prevention from the various oral diseases.

MATERIALS AND METHODS

The study took place in the private dental practice of the author in a small town named Curtea de Arges, Romania. A total of 499 subjects participated in the study with an average age of 37.51 years, standard error of the average 0.57 years, and average normal variation of 16.72 years. The sex distribution was 52.11% (260) females and rest 47.89% (239) were males. All the patients were evaluated and treated by only one practitioner, so no calibration was needed. The oral health hygiene and condition were visually assessed by examining and recording of data of all teeth present without using and disclosing solution as

Table 1: The evaluation of the carious disease representation amongst Romanian population[2]

Literature review							
Age (years)	Prevalence	DMFT	D	M	F	Evaluation year	Source
12	74.1	2.1	1.5	0.1	0.6	2008-09	Funieru C
12	NA	2.8	NA	NA	NA	2000	Petersen
14	78.5	3.6	2.5	0.2	1.0	2008-09	Funieru C
18	94	6.9	NA	NA	NA	1996	Marthaler
18-24	NA	8.9	5.7	2.2	1.0	1994-95	Petersen
25-34	NA	9.9	4.9	2.7	2.3	1994-95	Petersen
35-44	NA	10.2	4	3.7	2.5	1994-95	Petersen
45-55	NA	11.9	2.7	7.6	1.6	1994-95	Petersen

NA: Not applicable, DMFT: Decayed, missing and filled teeth

1. Plaque covering less than one-third of tooth surfaces - Good
2. Plaque covering more than one-third but less than two-thirds of tooth surfaces - Fair; and,
3. Plaque covering more than two-thirds of tooth surfaces - Poor.

The worst score was recorded as a representative for that subject. The results were compared with the beginning and the end of all treatments if required at each patient for 7 years.

At the first presentation, the statistical index was collected namely DMFT, gingival index, functional teeth unit (FTU), and community periodontal index treatment needs (CPITN) (plaque, gingival, papilla bleeding, and probable pocket depth). Only 499 patients from the total of 885 have been validated for the relevance of the DMFT index.

Because of the differences between those patients we invented another index to group the patients for the treatment strategy. Namely Group Strategy Treatment Index (SGTI) this index was based on DMFT score as follows:

- SGTI 0: Grouping the patients with DMFT between 0 and 6 with the smallest carious risc
- SGTI I: For all the subjects with DMFT between 7 and 13
- SGTI II: Where we have put the patients with DMFT between 14 and 20, also named the high risk group
- SGTI III: With DMFT bigger then 21 for the patients with poor health status.

The patients were grouped into four groups. The first group consisted in 87 patients who achieved no preventive treatments – Named the witness (ROMANIAN-MARTOR) group. The second group received protetic treatments consisted in dental implants and prosthetic works were named implant group. In the third group, the patients received prosthetic treatments on the remaining teeth according to SDA concept – named works (ROMANIAN-LUCRARI). In the fourth group, the patients received only dental treatments – named treatment (ROMANIAN-TRATAMENT) group. The age distribution is showed in Table 2.

The preventive treatments consisted in sanitary education for the local methods of dental hygiene, topic application of chlorhexidine (CHX) 0.2% or 1%, topic application of fluoride, tartar removal using

Table 2: Age distribution of the patients

Age distribution	Group		Total
	Witness	Study	
Adults			
Count	63	333	396
Percentage within LOT	72.4	80.8	79.4
Childrens			
Count	18	47	65
Percentage within LOT	20.7	11.4	13.0
Seniors			
Count	6	32	38
Percentage within LOT	6.9	7.8	7.6
Total			
Count	87	412	499
Percentage within LOT	100.0	100.0	100.0

ultrasonic procedures, and application of different methods of hygiene at home (mouth rinse with CHX, OxyJet, Tooth picks, Floss, etc.). The studied groups were subdivided into subgroups accordingly to the preventive measures applied.

The results were collected in an MICROSOFT WORD AND EXCEL 2007 spreadsheet were used for analysis and evaluation of recorded data and were statistically compared using the biostatistics data program SPSS from IBM version no 22.0, using paired *t*-test, Student's *t*-test, Wilcoxon matched pair (W) test, McNemar test, and Chi-square (χ^2) test where applicable in order to find the statistic relevance of the analyzed cases. According to scientific protocols, the statistic significant results were considered valid if $P < 0.05$. As variables were classified the case diagnosis at the first presentation and number of sessions required endodontic treatment until the end of the same type of root canal in both groups compared aiming at a positive or negative result after treatment.

Ethical Committee approval was taken in ARGES County prior to study under Colegiul Medicilor Dintilor Dentisti Arges Sediu: Str. Bucovina, nr. 83, Bl. BC83, Sc. A, Ap. 41, Pitesti, Jud. Arges.

Decayed teeth (DT) was assessed as per World Health Organization (1997) guidelines under natural daylight by a single calibrated examiner using a mouth mirror and CPITN probe.[4] Buccal, lingual, occlusal, mesial, and distal surfaces of all teeth were examined for signs of decayed or caries. The number of DT, missing teeth (MT), and filled teeth (FT) were identified based on dentition status and DMFT score was obtained by adding DT, MT, and FT. Oral mucosa was checked using mouth mirror and the oral conditions were categorized as per WHO oral health survey assessment form (1997).[4] CPITN was used to assess periodontal status as recommended by WHO oral health assessment form.[4]

RESULTS

The witness group compared to the study group showed a significant ($P < 0.001$) difference between the results of the preventive procedures mainly visible through the comparison of the DMFT index. The average values of the DMFT index decreased (improved) more than 10% in the study group while in witness group it did not changed (improved) significantly ($P > 0.05$) [Figure 1].

Between the study groups named works, treatment and implant we have reached the following results [Figure 2]. From initial to final DMFT scores, the highest and significant improvement (decrease) was observed in implant group (14.21 vs. 10.54, 26.0%, $P < 0.001$) followed by works group (17.37-15.88, 9.0%, $P < 0.05$).

Oral health status as indicated by CPITN is shown in Figure 3. The results were also shown in the treatment group with healthy condition were recorded in DMFT was 11.62 ± 11.48 [Figure 2]. The mean number of sextants with bleeding was 2.04 ± 1.55 [Figure 3].

By analyzing the SGTI index, we have discovered that after applying the preventive measures 78 patients have upgraded the risk group by raising one step up. This means that 18.5% have improved the health status significantly ($P < 0.001$) [Table 3].

The index percentual variations of two groups (study and witness) are summarized in Table 4. Table 4 showed that the variations in DMFT, GT, and CPITN was 18.1%, 23.3%, and 3.3% higher, respectively in witness group as compared to study group. Conversely, the variations in FTU were 30.7% higher in study group as compared to witness group. The index percentual variations differed significantly ($P < 0.01$ or $P < 0.001$) between the groups except CPITN.

Regarding the preventive approach, we have found the following results between the initial and final examination at the studied groups [Figure 3]. The results were validated with the nonparametric test WILCOXON for $Z = -8.226$ and $P = 0.000$.

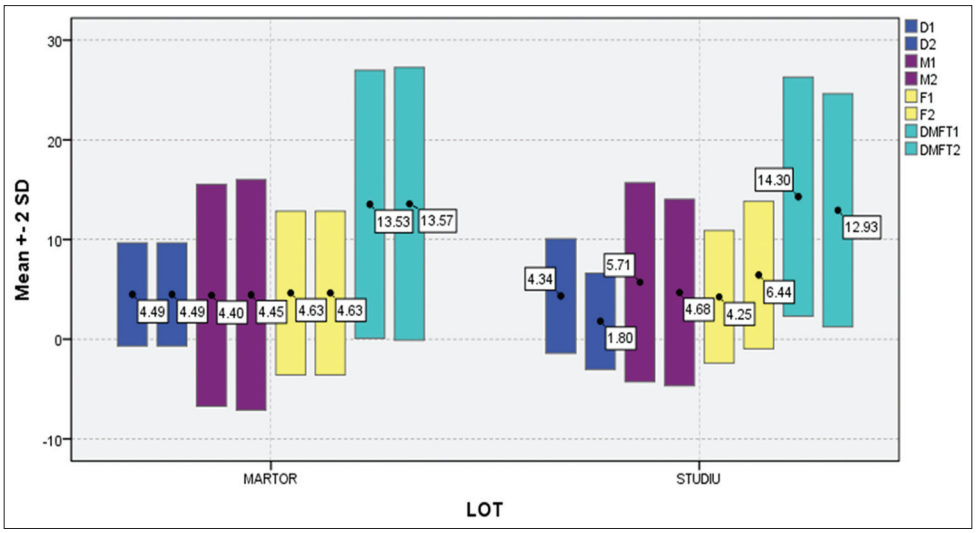

Figure 1: The decayed, missing and filled teeth index between whitens group and study group at the beginning and at the end of treatments

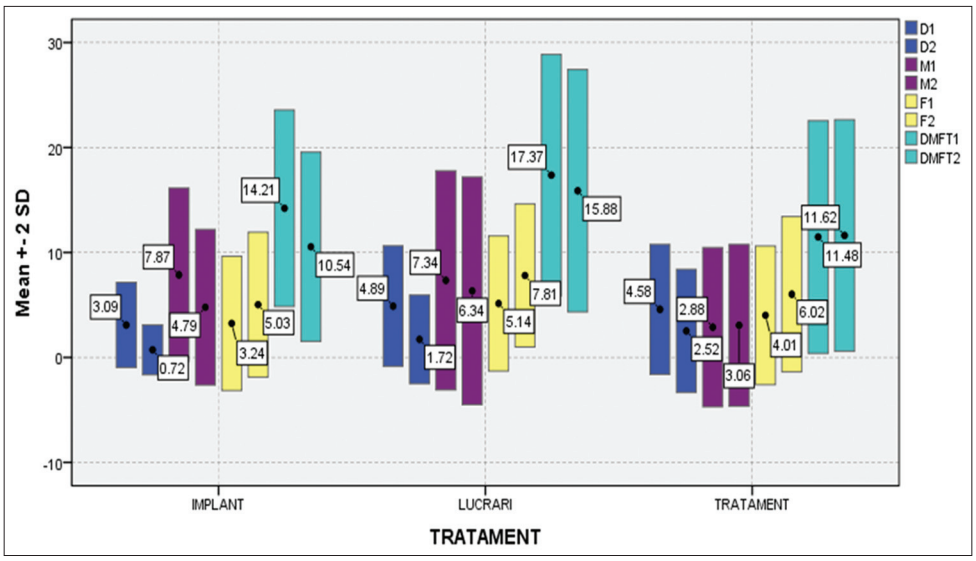

Figure 2: The variation of decayed, missing and filled teeth between the studied groups

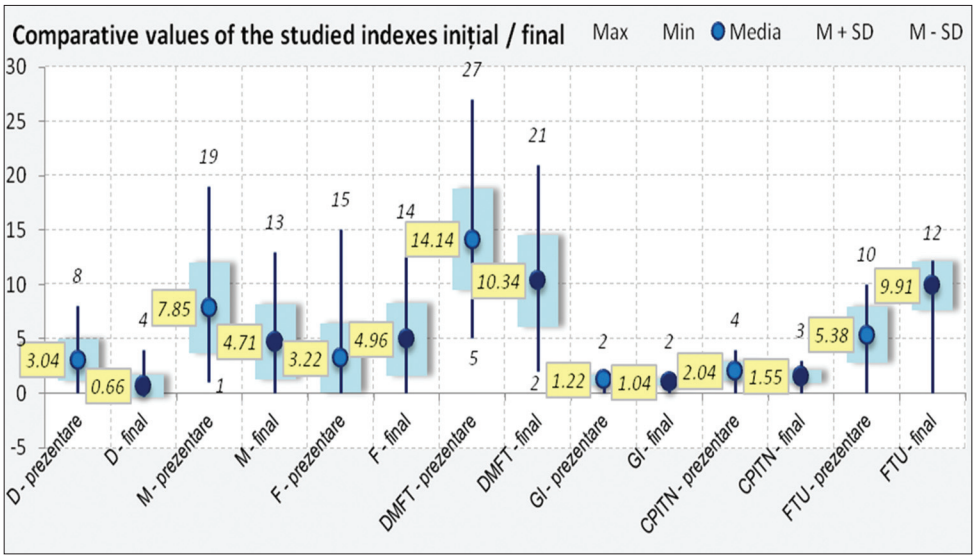

Figure 3: The evolution of the main indexes at studied group

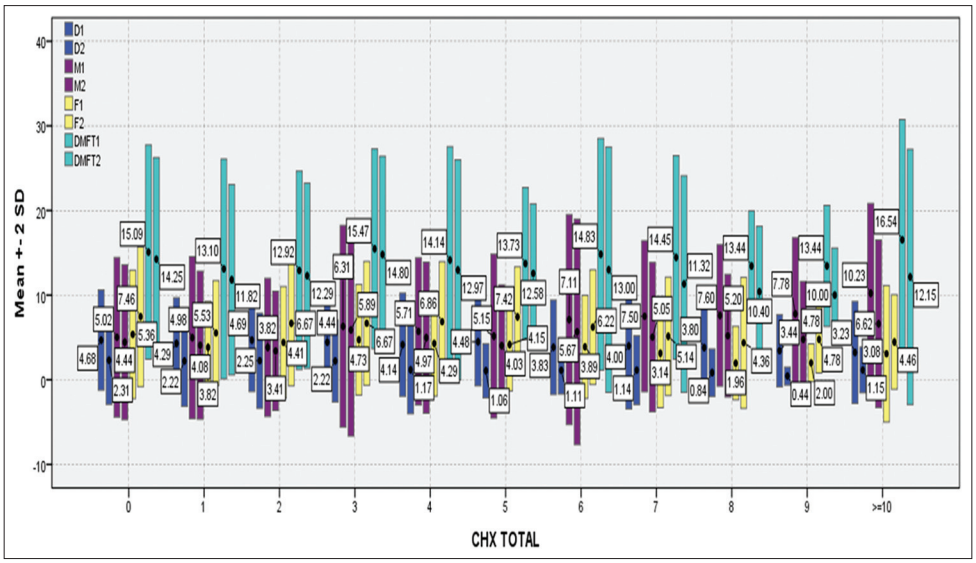

Figure 4: The relevance of the chlorhexidine use for the studied group

Table 3: SGTI index variation at the beginning and at the end of treatments

SGTI initial	SGTI final				Total
	I	II	III	O	
I					
Count	148	4	0	19	171
Percentage within SGTI2	78.7	3.8	0.0	24.7	41.5
II					
Count	38	83	1	1	123
Percentage within SGTI2	20.2	78.3	2.4	1.3	29.9
III					
Count	1	19	40	0	60
Percentage within SGTI2	0.5	17.9	97.6	0.0	14.6
O					
Count	1	0	0	57	58
Percentage within SGTI2	0.5	0.0	0.0	74.0	14.1
Total					
Count	188	106	41	77	412
Percentage within SGTI2	100.0	100.0	100.0	100.0	100.0

SGTI: Group strategy treatment index

Table 4: Index percentual variation between study and witness groups

Index scores	Witness	Study	Difference	Difference (%)
DMFT	19.90	16.30	3.60	18.1
GI	1.63	1.25	0.38	23.3
CPITN	1.84	1.78	0.06	3.3
FTU	4.24	6.12	−1.88	30.7

DMFT: Decayed missing and filled teeth, GI: Gingival index, FTU: Functional teeth unit, CPITN: Community periodontal index treatment needs

DISCUSSIONS

This study is based on the premises that the new developed index SGTI which involves DMFT index was decrease after prevention and education given to patients that show the improvement of the oral health status, as all the others epidemiological indexes do.[4] We have considered that a decline in the DMFT is gained with every dental implant by one point, with every demineralized enamel decay.

The SGTI index is a self-made index used for the first time in this made to group the patients to establish a better approach. As the CPITN index orders the therapeutic approach for the patients with CPITN bigger than 2, with the SGTI index, we could group the patients in risk groups for having the best approach. The groups SGTI II and SGTI III have arranged a greater carious development.

The comparative evaluation of the dental status of the patients is very difficult. It is possible that some errors could alter the results in time because the difficulty to see the difference between obturated teeth and intact ones, off establishing how many implants there are, which teeth have been replaced because of decay, fracture or periodontopathic. Furthermore, in the case of bridges is difficult to evaluate the status of the underneath teeth. The criteria's were self-proposed and could be further discussed.

The values of the find indexes show a value with 10% bigger than the values presented in the literature. Compared to the medium European values our values are three times more significant. That means that the health status of the Romanian adult population is destitute.[2,5]

The preventive and curative methods used in the process of this work has a great influence. The most significant improvement has been found in the case

of using CHX during the dental procedures and at home as the mouthwash.[5] Using fluoride we have obtained a better remineralization of the enamel caries and an improvement of the DMFT index.[6,7] By explaining the hygienist on techniques and the food and beverages carioprotective diet, we also have helped the mentioning of the actual health status and sometimes even improved it.

In prosthetic dentistry, the use of implants must be integrated within the well-being concept of the patient's health.[5] The significant health improvement has been clinical and epidemiological proved, and it is imperative that further studies to continue and develop this approach.

Eugeniu *et al*.[8] In a study on CHX stated that CHX has been used in various concentrations (0.002-2%) with different periods of contact time between the disinfectant and different microorganisms. As per these results, 2% CHX solution was far more efficient in the shortest period than were all other concentrations tested.[9]

Ogunbodede *et al*.[10] In 2005 defined FTUs as pairs of occluding posterior natural teeth (i.e., sound, restored and D1-D4 scale carious/DT) and artificial teeth on implant-supported, fixed (bridge pontics) or removable prostheses.

On the basis of our study, we found that the poor oral health conditions can be improved with proper evaluation and early detection of DT and preventive care. In fact, WHO suggests educational programs and integrating oral health promotion in colleges and schools by with short awareness programs. WHO has set the aim of successfully reaching the goal to decrease the oral health diseases by minimizing the impact of oral and craniofacial diseases on general health and psycho - well-being by 2020.[8] The high degree of use implants[11,12] should be addressed in the treatment of MT in Romania. Our indications and this new technique of collecting and evaluating epidemiological data tool, not in dental clinics but health institutions may probably change the policies for oral disease prevention and health promotion in future.

Eugeniu, *et al*. in year 2015[8] does a study on CHX and demonstrates that the solution of CHX could be successfully used in treating microbial contaminated root canals with a success rate superior to conventional NaOCl solution, providing sufficient sterilization.

On evaluation of the oral health condition in Romania private dental office practices, it was observed that the majority of the patients from various groups brushed their teeth once daily.

Limitations

The main limitation in this study was that the influence of oral habits, such as tobacco chewing and smoking, was not recorded and evaluated with the severity and progression of oral health diseases or on gingival or periodontal condition.

CONCLUSIONS

The actual oral health status index after survey and evaluation of adult population in a small town named Curtea de Arges in Romania was found poor with an average DMFT index value 14.16 and which was also compared to the few past published studies.

The innovation of using a new index named SGTI (group treatment index) for grouping the patients with similar carious activity helped us to provide the best collective approach, making aware about oral hygiene and obtain the best individual results. Furthermore by establishing SGTI technique, we approach to find a new view to collect and evaluate data in modern preventive dentistry for community surveys by using earlier mentioned preventive techniques, such as DMFT and CPITN, in modern dentistry.

After using data of SGTI index and by taking preventive measures we have obtained an improvement of the oral health status and also decline in the DMFT score. The future studies must involve SGTI index to improve the calculation strategies for DMFT, CPITN, FTU, and GI index for group survey. Furthermore, a protocol for the preventive methods could help the private practitioners handle better in the worst oral health conditions.

REFERENCES

1. Marcenes W, Kassebaum NJ, Bernabé E, Flaxman A, Naghavi M, Lopez A, *et al*. Global burden of oral conditions in 1990-2010: A systematic analysis. J Dent Res 2013;92:592-7.
2. Petersen PE, Baez RJ. Oral Health Surveys Basic Methods. Vol. 5. Geneva: World Health Organization; 2013. p. 5-35.
3. Available from: http://www.mah.se/CAPP/Country-Oral-Health-Profiles/EURO/Romania/Oral-Diseases/Dental-Caries/. [2015 Mar 03]. Available from www.mah.se.
4. World Health Organization. Oral Health Survey: Basic Methods. 4th ed. Geneva, Switzerland: World Health Organization; 1997.
5. Danila I. Preventive dentist. National Library Romania: Ed .

Teaching and Pedagogical Bucharest; Year XIII, no. 12; December 2010. p . 42-95
6. Dãnilã I, Amariei C. Orientãri profilactice în stomatologie (The preventive concept in dentistry). Lasi Romani: Ed. Syrinx-Med Constanţa; 1997. p. 25-78.
7. Luca R, Poesina ND, Popa S. Criteria for the evaluation and estimation of iatrogenic prosthetic factors – Semiology and symptomatology. Prosthet Dent 2013;3:298-305.
8. Eugeniu MC, Radu C, Vlad P. Chlorhexidine as endodontic cleaning solution compared to sodium hypochlorite: An *in vivo* study. Int J Dent Med Spec 2015;2(1):2-6.
9. Thelen DS, Bårdsen A, Astrøm AN. Applicability of an Albanian version of the OIDP in an adolescent population. Int J Paediatr Dent 2011;21:289-98.
10. Ogunbodede EO, Fatusi OA, Akintomide A, Kolawole K, Ajayi A. Oral health status in a population of Nigerian diabetics. J Contemp Dent Pract 2005;6:75-84.
11. Petersen PE, Danila I, Delean A, Grivu O, Ionita G, Pop M, *et al*. Oral health status among schoolchildren in Romania, 1992. Community Dent Oral Epidemiol 1994;22:90-3.
12. Marthaler TM, O'Mullane DM, Vrbic V. The prevalence of dental caries in Europe 1990-1995. ORCA Saturday afternoon symposium 1995. Caries Res 1996;30:237-55.

How to cite this article: Marin CE, Costea R, Luca R. Preventive Approach for Oral Health Condition inside a Romanian Private Dental Office: A Epidemiological Study. Int J Dent Med Spec 2015;2(3):3-9.

Source of Support: Nil; **Conflict of Interest:** None