Author’s response to reviews

Title: Association of caries experience and dental plaque with sociodemographic characteristics in elementary school-aged children: a cross-sectional study

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Author's response to reviews: see over

We thank all the Reviewers for their valuable feedback and taking the time to provide useful comments to improve our manuscript entitled “Association of caries experience and dental plaque with sociodemographic characteristics in elementary school-aged children: a cross-sectional study”.

Based on the constructive comments the following changes have been made:

Response to Reviewer 1 – Dr Luciane Maria Pillotto:

Comment in the title:

"Socio demographic" or "sociodemographic"?

Response: We have deleted socio demographic word from the title and the word sociodemographic now replaces it. Page 1 Line1.

Comment in the abstract:

1. In the background, although it is possible to identify the propose of the study, it could be specified. Suggestion: "Thus, the proposal of this study..."

Response: We have deleted this clause 'Therefore, it is necessary to investigate oral health indicators and associated factors to help plan for oral health promotion and oral disease prevention' from the background of the Abstract and the sentence now reads as follows:

To estimate treatment needs and guide health initiatives, epidemiologic current data are required. Such data are currently unavailable for dental health. The purpose of this study was to assess
caries experience, dental plaque, and associated factors in primary school children from Iran. Page 1 lines 19-22.

2. The bracket is not necessary: 7-8 years [6.53 (SD=4.37)]. Review the use of the bracket in the results section and the tables as well.

Response: We have deleted bracket in the results section of Abstract, Results section and the tables and the changes have been highlighted by yellow in pages 2 line 8 and page 8 lines 1&2 and table 3&4.

3. Please review the interpretation of the result, because girls had dmft smaller than boys: "The chance of developing dental caries (dmft) was 0.475 time higher in girls than in boys (p<0.001)". This same phrase is used in the Results and Discussion section.

Response: We have deleted this clause from the Interpretation of the result section of Abstract and Results section and the sentence now reads as follows:

‘The chance of developing dental caries (dmft) was 0.47 times lower in girls than boys (p<0.001).’ In Abstract Page 2 lines 15-16 and in Results section page 9 lines 10-11. We have deleted this sentence from the Discussion section.

According to table 2, we have added these sentences in Result section of Abstract: The proportion of decayed teeth in 7 years old children based on dmft index was 80.36 percent, moreover, the proportion in 12 years old children was 40.17 percent based on the DMFT index. Page 2 lines 10-12.

We have added these sentences in the Result section of Abstract: PI increased by 2.44 times per one year increase in age. Page 2 line 17.

4. The authors could standardize the number of decimal places used with the OR, usually 2 decimal places are used.
Response: We have standardized the number of decimal places used with the OR and changes have been highlighted by yellow.

We have deleted this paragraph “Therefore necessary measures is suggested to be implemented in order facilitate access to dentistry services and prevent development of oral diseases. If no action is taken, government and community will be confronted with tremendous costs for materials, equipment, and workforce needed to treat pain and dental problems.” from the Conclusion of the Abstract and the sentences now reads as follows:

Therefore sufficient interventions to improve access to restorative treatment and preventive measures are urgently required in elementary school-aged children in Hamadan.

Comment in the Introduction;

1. It would be important for the authors to contextualize the situation in Hamadan province as there are important differences between the regions in Iran.

Response: Thank you for your valuable comment. We have added more information to the background to give a clear view of the situation in Hamadan and logically present our aim of the study. Corrections have been included in the manuscript page 4 lines 4-11.

2. Correct: dentistry care, - dentistry care and comment 3 Correct: entire regions in Iran Besides - entire regions in Iran. Besides

Response: These two comments are in the paragraph below. We have deleted this paragraph “Several barriers have been listed as to dental care provision in Iran such as: the huge costs of dentistry care, lack of appropriate dental insurance (patients are accountable to pay for 90% of dental care costs), delivering over 91% of dentistry services in private health care centers, long time waiting lists waiting room, need for facilities and equipment, and lack of access to dentistry services across entire regions in Iran. Besides that, dental services’ costs comprise 15-20% of total health care-pharmaceutical services costs in Iran. So dental services are the second leading contribution, to amount of health care costs in Iran after hospitalization (8-10). Therefore, prevention is the most important and best approach to decrease oral diseases (11). Given that oral health indicators have not yet been comprehensively investigated among elementary school children, the aim of the present study was to investigate oral health indicators and associated
factors to help plan for oral health promotion and oral disease prevention.” from the Interpretation of the Background and the paragraph now reads as follows:

“In the past years few national surveys have been conducted on oral health in Iran which the most recent one was in 2012. Therefore epidemiological information of dental caries and dental plaque in Iran is limited (9) because of different data sources for assessing oral diseases and lack of surveillance system (10). Although the role of socioeconomic factors on oral health behaviors have been studied and some associations have been found in Iranian adolescent population but we don’t have current and comprehensive information on this area in school aged children (10). Therefore the aim of this study was to assess the oral health status of adolescents by measuring caries prevalence and plaque index in western Iran using the indexes for decayed, missed, and filled teeth for primary and permanent teeth (DMFT, dmft) and O’Leary index. Also sociodemographic characteristics (age, sex, Dental pain experience, Parent Supervision, Parental education, Parental occupation and District) of caries conditions in 7-12 year olds were assessed in association with decayed, missing and filled teeth (DMFT, dmft index) and plaque index status in 7-12-year-old Iranian schoolchildren.” Page 4 lines 12-24.

Comment in the Methods:

1. The use of dental explorer is not indicated for diagnosis of dental caries. The use of this instrument could overestimate the diagnosis or cause cavitation that could influence the increase of future index. In addition, the use of plaque disclosing tablets to measure plaque may increase the value found. Perhaps these facts influenced the outcome and could be discussed in the paper.

Response: The examiner used ball-ended explorer according to World Health Organization guideline. Dental caries diagnosis included all teeth which had cavitated decay, undermined enamel, softened floor or wall of undermined enamel. In cases where these descriptions could not be verified by visual inspection ball ended-explorer was used. Manuscript method, Dental examinations section, page 6 line 20.

As dental plaque is not noticeable by the naked eye, its elimination is difficult. To overcome this issue and improve oral hygiene, the use of disclosing agents has been recommended since the early twentieth century. Furthermore studies using disclosing tablets have shown them to be effective in improving hygiene of patients (1). Although disclosing tablets stain very thin layers of plaque and might influence amount of plaque scores. However results of this study on plaque numbers were in accordance with the national survey in Hamadan (2) and a study on laboratory
modeling of disclosed plaque showed area-based plaque indices can be scored or recorded precisely and with least variability within or between examiners (3).

Corrections have been included in the manuscript discussion, limitation section page 15 lines 23-25 and page 16 lines 1-2. Two references have been added to the references list as numbers 72 and 73.


2. In this section, there is a sentence describing the use of logistic regression and linear regression to investigate association between independent variables and oral health indicators. Please explain how the DMFT/dmft variable was treated in the regression model. Moreover, in my opinion, I would consider the use of plaque presence as an explanatory variable rather than outcome.

Response: Thank you for your kind comment. We treated DMFT/dmft as outcome variable and in a dichotomous way as having caries experience or not having this experience. This explanation has been added to the manuscript method, section of data analysis page 7 lines 10-16. Also as one of our research questions in this research project was to identify the oral hygiene status of school children and investigate its association with different socio-demographic factors we have used plaque presence as an outcome variable.
According to table 2 we have added the following sentences in Data analysis section of Method: Multifactor analysis of ANOVA while controlling for age was used to study the relationship between dt/DT, mt/MT and ft/FT with the sociodemographic variables of the children. Page 7 lines 8-10.

Comment in the Results:

1. The authors wrote: "The boys had 77.5% primary teeth and 47.08% permanent teeth with caries and the girls had 68.2% primary teeth and 45.9% permanent teeth diagnosed with caries" - DMFT/dmft > 0 (%) does not indicate the percentage of decayed teeth but the percentage of children with caries experience (decayed, missing or filled teeth). Additionally, the numbers reported for dmft are incorrect. In the Discussion section it is also written as percentage of decayed teeth.

Response: We have deleted this clause from the Result section and the sentence now reads as follows:

The boys had 77.5% caries experience in primary teeth and 30% caries experience in permanent teeth and the girls had 68.2% caries experience in primary teeth and 40.8% caries experience in permanent teeth. Page 7 lines 22-24. Also we have deleted this clause from the Discussion section. Additionally the numbers reported for dmft have been edited.

According to table 2, we have added these 3 paragraphs in Result section: The mean (SD) of decayed teeth was 2.68 (3.05) based on dmft index and 0.33 (0.85) based on the DMFT index (Table 2). The proportion of decayed teeth in 7 years old children based on dmft index was 80.36%, moreover, the proportion in 12 years old children was 40.17% based on the DMFT index. The proportions of decayed teeth in female children based on dmft and DMFT indices were 75.31% and 35.7%, respectively, while the proportions in male children were 73.26% and 50% respectively (Table 2). A significant difference was observed between the mean value of decayed primary teeth in children (1.82±2.41) who were supervised by their parents when brushing their teeth with children (3.14±3.26) who were not supervised by their parents (P<0.001, Table 2). The same results were observed when we assessed the permanent teeth of children. The mean value (SD) for decayed teeth in children who had supervised teeth brushing was 0.42 (1.01), and for children who had unsupervised tooth brushing was 0.28 (0.74), and the difference between these two was significant (p<0.001, Table 2). The difference between females (6.60±1.23) and males (0.29±0.77) in terms of the number of filled permanent teeth was significant (p<0.001, Table 2).
The difference between number of filled permanent teeth (0.50 ±1.08 vs. 0.36 ±0.96) of children living in the center and those living in the suburb significant difference was observed (P=0.04, Table 2). The difference in terms of the number of filled primary teeth was also significant between these two groups (p<0.001, Table 2).

There was a significant association between the number of decayed primary teeth and mother's education level according to the multifactorial analysis of ANOVA (p=0.005, Table 2). The Tukey post hoc test demonstrated that the significant difference (p<0.05) was between the groups of children whose mothers had an education level lower than primary (3.66±3.71) with those that their mothers had a high school education level (2.69±3.05) and those that their mothers had higher than high school education (2.03 ±2.43). Whereas, the difference between two groups of mothers, as those with high school education level and those with higher than high school education was not significant (p>0.05). Page 8 lines 3-25 and page 9 lines 1-4.

2. The data mentioned in this sentence are not in Table 1: "The highest dmft was seen in boys aged 7-8 years [7.87 (SD= 4.36)], the highest DMFT in girls aged 12-13 years [1.43 (SD= 2.10)], and the highest dental plaque in boys aged 12-13 years [52.78 (SD= 25.71)] (Table 1)."

Response: Thank you for your valuable comment. These information are not displayed in the table but have been extracted from the data and we have deleted the (Table1) in this sentence.

3. In the Methods section, it is written that the inclusion criteria were age range of 7-12 years old, but in the results (see above) and in other parts of the text appears the age group of 12-13 years. Please check ages.

Response: The correct age group is 7 to 12 year olds. We have edited age group in results and other parts of the manuscript and changes have been highlighted by yellow.

4. Review the use of the world "higher" in the sentence: "The chance of developing dental caries was insignificantly higher in school..."

Response: Thank you for your kind comment. We have deleted this sentence.
5. Correct: pain(p<0.05) - pain (p<0.05)
Response: We have edited and pain (p<0.05) is correct. Page 9 Line 13.

6. There was no loss of data in any variable?
Response: Thank you for your valuable comment. The clinical examinations and interviews were performed for school children in this study who followed the disciplines of school and the staff and teachers which are rigorous specially on health related issues. In addition questionnaires for all selected students were completed by perseverance of the researcher after two follow-ups. So there were no missing data in this study. Corrections have been included in the manuscript method page 6 lines 2-5.

Comment in the Discussion:

1. This study is important because it provides information on oral health in children aged 7-12 years of Hamadan, but the generalization of the findings may be compromised since the schools were selected by convenience sampling. Authors need to be cautious in their assertion.
Response: The method of sampling was simple random sampling. The sentence is reworded: Accordingly, seven schools were selected from district 1 and nine schools from district 2 by simple random sampling. The explanation has been added to the manuscript method. Page 5 line 19.

2. Correct: Hamdan- Hamadan
Response: Hamadan is correct. We have edited the word. Page 9 line 24.

3. I'm sorry but I'm confused by the interpretation of the authors in this sentence: "According to current study, dmft has increased by 1.15 times in children aged 7-8 years and DMFT increased by 0.60 time in children aged 12-13 years in Hamadan compared to the corresponding figures in national survey in 2012-2013." In my understanding, DMFT decreased in this period.
Response: Thank you for your kind comment.
We have deleted this clause from the Interpretation of the Discussion and the sentence now reads as follows:

According to current study, dmft has increased by 1.15 times in children aged 7 years and DMFT did not change in children aged 12 years in Hamadan compared to the corresponding figures in national survey in 2011-2012. Page 10 lines 2.

4. In this section, the authors emphasize that high caries rates are due to inadequate oral hygiene habits or lack of knowledge. Currently, there is a wide discussion about the influence of social determinants on oral health. It would be interesting for the authors to address this issue

Response: We have emphasized in the discussion that huge costs of dentistry care, inequality in delivering dental services in the public oral health care system, lack of information and knowledge on oral health such as social determinants contribute to high caries experience. Page 10 lines 23-25 and page 11 lines 1-6. Also additional information regarding social determinants on oral health has been added to the manuscript. We have added this sentence ‘High caries experience might be explained by the lack of national preventive programs, insufficient number of pediatric dentists in Iran, and the lack of preventive and educational measures’ Page 10 lines 8-10.

5. Water fluoridation influences the caries index and the authors do not mention this fact in this section. Reference 4 may help with this. Furthermore, in this study the variables father/mother's education-father/mother occupation and parent supervision were not significant.

Response: As you have kindly pointed out, studies have shown the role of adequate fluoride concentration in drinking water on probable reduction of dental caries prevalence (% with dmft /DMFT > 0) by 15% and in absolute terms by 2.2 dmft/DMFT (23). Furthermore in Iran various studies have shown that fluoride concentration in Iranian population drinking water is lower than the standard level however there are no community water fluoridation interventions going on in Iran at the moment. We have added this information to the manuscript. Page 10 lines 10-15.

Furthermore, in this study the variables father/mother's education-father/mother occupation and parent supervision were not significant.
Response: Similar to previous studies (1-6) in the present study, we observed that children whose parents had a better socioeconomic status (academic educations and governmental occupations) and supervised their children's oral hygiene had a higher proportion of filled teeth and a lower proportion of decayed teeth, compared to those children without parental supervision, similar to previous studies (Table 2). This issue resulted in a higher prevalence caries experience (dmft and DMFT) in this group of children. Accordingly, it can be postulated that similarity of dental caries experience in children with different socioeconomic levels resulted in a non-significant relationship between oral health status of children and their families’ socioeconomic level (7). Page 14 lines 24-25 and page 15 lines 1-5.


6. The meaning of the last paragraph in Discussion section is not clear to me. Please explain what the relation of study design limitation is if the demographic characteristics did not show any association between parental socioeconomic characteristics.

Response: Thank you for your valuable comment. We have included some factors that might explain the current results. They might be possibility of receiving socially acceptable responses by parents (page 16 lines 17-22) and indirect effect of socio economic situation of families on the children's oral hygiene status that were not studied in this research project:

Studies have demonstrated that the socioeconomic level of families can have indirect and mediating effects on the children's oral health status (30, 70), and this could be a reason for observing non-significant relationships between demographic variables and current oral and dental status of children. So the socioeconomic level of a family can affect children's oral hygiene status indirectly through such factors such as oral health literacy, dietary habits, willingness for brushing teeth, and the use of dental care services (30, 71) which were not that was not studied in this research project. Page 15 lines 6-12 and page.

7. In the discussion, the authors reinforce some preventive strategies that seem to be repeated within this section and at the conclusion. Some results are also repeated here. Please review the last paragraphs and the conclusion.

Response:

- The authors reinforce some preventive strategies that seem to be repeated within this section: We have deleted these sentences from the discussion “In addition, the current study demonstrated that the number of decayed teeth, either primary or permanent, was higher than the filled teeth such that 90.8% of children aged 7-8 years and 44.8% of those aged 12-13 years had decayed tooth. The proportion of untreated teeth in this study was partly consistent with corresponding results in the developing and underdeveloped countries such as India, Afghanistan, and Ethiopia (19-21) and higher than those in comparably more developed countries such as Israel, Spain, and Brazil (22-24). However, inequality in delivering dental services in the public oral health care system (oral health education, research and application of
findings in real setting, periodical examinations of children, and delivering free necessary treatments and preventive services) has been less frequently taken into consideration although potential benefits of such activities and systems in the developed countries has been confirmed (25). In Iran, dental care is not delivered for free and many of these services are not covered by health insurance; therefore, families are forced to use private sector that is costly. This condition represents a main barrier to receiving dental care services in Iran. In addition non treated dental decay can be due to lack of information and knowledge on oral health and incorrect attitudes towards necessity of receiving dental prevention and treatment services as well as giving low priority to oral health care compared to other needs (8-10).” and the sentence now reads as follows:

The results of the present study demonstrated that decayed primary and permanent teeth constituted a large and considerable proportion of DMFT and dmft indices, so that the proportion of filled teeth in dmft index of 7-year old children was as low as 6.4 percent and in DMFT index of 12-year children was 55.55 percent. A high proportion of decayed teeth observed in the present study is similar to those reported by other studies conducted in other developing and undeveloped countries such as India, Afghanistan, and Ethiopia (24-26) and is higher than those reported in developed countries such as Israel, Spain, and Brazil (27-29).

Previous studies have demonstrated that the experience of dental caries is a function of dental caries prevalence and the use of dental services such as oral hygiene training, regular dental examinations, dental treatments, and free prevention services (30). Although such services are readily available for public in developed countries such as Finland, Portugal, and Czech Republic, but they are rarely provided in developing countries (30).

In developing countries like Iran, dental services are commonly expensive, there is no proper insurance for dental services, and in some points of the country do not have any access to such services (21, 22). Accordingly, the prevalence of dental caries among groups of people with a substandard economic situation is high (30). The results of the present study are in accordance with previous studies (31, 32) by reaffirming the aforementioned statements so that families with higher education levels had a higher number of filled primary teeth (Table 2).

The results also demonstrated that the number of filled permanent teeth was higher among children whose fathers had a governmental occupation than others. Essentially, it is expected that self-employed fathers have a higher income, consequently, enabling them to use restorative
services more often (33, 34). Nonetheless, the specific economic situation and the economic downturn in Iran have resulted in a long-term decline in the income of most of the self-employed occupations, and governmental occupations have more security during these years (35).

Similar other studies (32, 36, 37) have demonstrated that children living in the suburb had a lower number of filled primary and permanent teeth compared to those of children living in city center. The reason is somewhat obvious, the children living in the suburb have difficulties in access to dental services and normally have low socioeconomic status (32, 37, 38). In this regard, we found that 2.1 of parents of children living in the city had an education level lower than primary, whereas, 11 percent of parents of children living in the suburb had such an education. Moreover, three percent of urban children had parents with higher than high school educations while this value for suburb children was equal to 20 %. Furthermore, the number of urban children's fathers with a governmental occupation was 27 %, whereas, 15 % of suburb children's fathers had a governmental occupation. Moreover, the prevalence of worker fathers was higher in suburb families than in urban families (18.7 % vs. 8.9 %, Table 2). Page 10 lines 16-25 and page 11 lines 1-25.

We have deleted this paragraph “Besides that, educating students and engaging parents and teachers in this process can contribute greatly to promoting oral health, improving knowledge and attitude, and changing behaviors in school children. Moreover, it is essential to conduct community-based education, use continuing educational programs and combined techniques, to best approach and promote elementary students' oral health (26). In Iran, such measures are not taken (27).”

We have deleted this sentence “It is argued that elementary students have insufficient knowledge and poor management skills and intention to maintain and promote their oral health and therefore need continuous education in this regard (28).”

We have deleted this clause “In addition, being female was found to increase the chance of DMFT and dmft by 1.703 times and 0.475 times, respectively. Presenting dental pain frequently in the past year increased the chance of DMFT and dmft by 1.729 and 2.796, while presenting dental pain infrequently in the past year increased the chance of dmft by 2.191” from the Interpretation of the Discussion and these paragraphs have been replaced as follows:
This can be due to several reasons, such as the commutative effect of plaque and calculus by aging, which accelerates the decay and erosion of teeth (54, 55). The mean value of DMFT was higher in girls than boys (Table 1). However, the number of decayed teeth was higher in girls than boys (Table 2). The increase in the number of filled permanent teeth was significant, which can be due to several reasons; permanent teeth begin to grow earlier in girls than boys (56) as well as, females tend to visit dentists and utilize dental services more than males (57). In addition to the aforementioned reasons, cultural issues should not be overlooked as parents, in Iran, commonly pay more attention to the appearance of their girls than boys (58).

In the present study, it was found that children who experienced toothache more often in the previous year had more decayed primary teeth, filled teeth, and extracted teeth (Table 2). As recommended by The American Dental Association (ADA), taking care of primary teeth should be started as early as the first primary tooth eruption begins (59). However, young children do not acquire the required cognitive and functional skills for taking care of their teeth. Consequently, it is the duty of their parents to take care of their kids’ teeth (60).

Unfortunately, Iranian parents do not pay enough attention to the health of primary teeth and delay the dental treatment until the pain becomes intolerable for children. In such situations, tooth extraction is the only option (61, 62). Similar to previous studies (63, 64), we observed that the number of decayed or extracted primary teeth in children whose parents supervised their tooth brushing was lower than others (Table 2). However, the number of decayed permanent teeth in these children was higher than others (Table 2). The high dependency of DMFT on age may be a reason in this regard. Furthermore, as the permanent teeth are completed in the early adolescence and people are strongly opinionated in this period of their lives, they have a high tendency to oppose their parents on their oral hygiene instructions which can lead to a higher prevalence of dental caries (65).Page 13 lines 5-25 and page 14 lines 1-4.

We have deleted this paragraph “This finding can be explained by lack of general information on dental caries and triggering factors among all people at any socioeconomic status, not having access to necessary information on treating oral diseases, mothers' shortage of information and skills regarding caretaking of children's primary teeth, not having adequate knowledge on children's tooth brushing and using dental floss and mouthwash, and adopting treatment-centered approach among people and dentists due to financial and professional attractions (48-50).” from the Interpretation of the Discussion and the paragraph now reads as follows:
The lack of awareness about the oral hygiene in all layers of society with different socioeconomic status can be an explanation for this finding. The results of our study demonstrated that the proportions of decayed primary teeth in children with higher than high school educated father and mother were 66.45 percent and 66.55 percent, respectively. Moreover, there was no significant relationship between mother's education level and the number of decayed permanent teeth. The lack of awareness and necessary skills regarding taking care of primary teeth can be an influential factor. Similar to previous studies (31, 70) the present study demonstrated that the number of decayed primary teeth had an inverse association with the mother's education level (Table 2). Moreover, the proportion of decayed primary teeth in children whose parents did not supervise them tooth brushing was 74.23 percent. Parents' incorrect insistence on treatment rather than prevention may also be another reason. In this regard, the comparison of our results with the results of a national study (2) conducted five years ago demonstrated that the proportion of filled permanent teeth has increased, while the proportion of decayed teeth has remained steady. Page 14 lines 10-23.

We have deleted these clauses “However, association between socioeconomic status and oral health conditions in the elementary students of Hamadan can offer valuable information to policy maker and health planners and professionals to implement large-scale prevention programs.” And these “Accurate sampling and generalizability of the findings can be considered the strengths of the present study.” from the Interpretation of the Discussion and the sentence now reads as follows:

However, the interpretations should be considered in the context of the methodological strengths and limitations of the study. The current study benefits from the following strengths: first, the sample included over 900 locally representative 7-12 year-old children and there was an excellent participation rate; second, distribution of children was well-performed (two different district from the richest to the poorest areas); third, all the oral examinations were performed by one examiner. However, this study also had some potential limitations. Page 15 lines 15-20.

The authors reinforce some preventive strategies that seem to be repeated within at the conclusion Please review the conclusion:

We have deleted the Conclusion “According to the findings of this study, a high rate of developing dental caries and a high percentage of dental plaque were seen in children aged 7-12 year in Hamadan. Nowadays, although using oral health aids such as toothbrush, toothpaste, and
mouthwash is more frequent than the past, no remarkable improvement of dental caries has been observed due to lack of paying serious attention to practical education and unsatisfactory learning outcomes. Despite increased number of education centers, dental departments, health care centers, and dentists working across the country, oral health and oral disease prevention services have not yet been promoted and instead dental treatment services have been mainly developed further. Therefore, in addition to the necessity of access to corrective treatments for children aged 7-12 years, prevention programs and basic strategies should be implemented to improve dental caries-associated behaviors at both individual and community scale. Some of these strategies are as follows: Educating and informing children under 12 years and the groups influencing them such as parents especially mothers, elementary school teachers, health care centers' staff, and providers of health services (especially treatment team) (26), delivering preventive services (e.g. fluoride varnish and fissure sealant) to prevent dental caries and gum disease and taking measures to accentuate the benefits of these services or reduce barriers ahead of welcoming such services by target groups such that they receive these services at economical and logical costs, because when preventive services are integrated into the comprehensive prevention program and delivered alongside a six-month program of oral health and topical application of fluoride, dental caries decrease by 87.5% (51), convincing the community decision makers to codify and enforce oral health promotion laws and regulations that can lead to funding, providing necessary equipment and facilities, supplying human force, and codifying oral health-related policies and laws, and indirectly making arrangements to welcome measures to prevent dental caries (26,51).” from the Interpretation of the Conclusion and the Conclusion now reads as follows:

This study provided accurate epidemiological information on oral health status of 7 to 12 year olds in order to further assist caries prevention and maintenance of oral health interventions. The percentage of children with dental plaque and one or more caries lesions was too high considering the currently ongoing national oral health preventive campaign. The recorded DMFT and PI indexes, in comparison with other countries, illustrate poor oral health, low oral hygiene, and consequently ineffective oral health preventive actions in Hamadan, as well as a need to invest in modern preventive and therapeutic methods. Page 17 Lines 1-7.

- Some results are also repeated: We have deleted these clauses “According to the findings of this study, 73% of the boys had primary tooth decay and 35.3% of them had permanent tooth decay. The highest primary and permanent tooth decay was seen in boys aged 7-8 years and girls aged 12-13 years, respectively. Boys aged 12-13 years had the highest dental plaque. ” from the Interpretation of the Discussion and the sentences now reads as follows:
This study showed that our population’s current statuses not in accordance with WHO’s goal for 2010 of DMFT in 12-year-olds which should be below one (17). The mean (SD) DMFT of children aged 12 years, dmft of children aged 7 years and plaque index of children aged 12 years in our study were 1.17 (1.77), 6.53 (4.37) and 51.97 (25.86) respectively. According to results of this study, the age, sex and dental pain experience were the only variables associated with the experience of dental caries (Table 3). Furthermore age was studied in relation to caries development in permanent teeth, and the risk increases by getting older. Page 9 lines 16-22.

8. Correct in reference 4: iran – Iran

Response: Iran is correct. We have edited. Page 18 line 24.

Response to Reviewer 2 – Alexandre Baumgarten

Comment in the title:

1. The title of this manuscript refers to ‘dental caries’. However, the authors used the DMF index, which is well established as a measure of caries experience in dental epidemiology.

Response: Thank you for your kind comment. We have deleted ‘dental caries’ words from the title and now ‘caries experience’ replaces it.

Comment in the abstract:

1. Background: The objective needs to be clearly stated and defined. It is unclear how the authors will "help plan for oral health promotion and oral disease prevention."

Response: Thank you for your kind comment. We have deleted this clause ‘Therefore, it is necessary to investigate oral health indicators and associated factors to help plan for oral health promotion and oral disease prevention’ from the background of the Abstract and the sentence now reads as follows:

To estimate treatment needs and guide health initiatives, current epidemiologic data are required. Such data are currently unavailable for dental health. The purpose of this study was to assess
caries experience, dental plaque, and associated factors in primary school children from Iran. Page 1 lines 20-23.

2. Results: The presentation of this section needs to be standardized.

Response: We have standardized the presentation of this section:

The mean (SD) age of the school children was 9.64 (1.73) years. In general the mean (SD) for decayed-missing-filled teeth (DMFT) was 0.79 (1.35), mean dmft was 3.61 (3.58), and mean dental plaque 46.50 (23.70). The highest dmft was seen in children aged 7-8 years 6.53 (4.37) and the highest DMFT and dental plaque was in 12 year olds recorded as 1.17 (1.77) and 51.97 (25.86), respectively. The proportion of decayed teeth in 7 years old children based on dmft index was 80.36 percent, moreover, the proportion in 12 years old children was 40.17 percent based on the DMFT index. Age, gender, and dental pain within the past year were significantly associated with DMFT and dmft. The odds of developing dental caries (DMFT) was 1.70 times higher in girls than in boys (p<0.001) and 1.72 times higher in the students that reported dental pain frequently than in those who did not (p<0.01). The chance of developing dental caries (dmft) was 0.47 times lower in girls than boys (p<0.001). Age was significantly correlated with dental plaque such that PI increased by 2.44 times per one year increase in age (p<0.001).

3. Conclusion: The conclusion does not essentially correspond to the objective of this manuscript.

Response: We have deleted these sentences “Therefore necessary measures are suggested to be implemented in order facilitate access to dentistry services and prevent development of oral diseases. If no action is taken, government and community will be confronted with tremendous costs for materials, equipment, and workforce needed to treat pain and dental problems.” from the Conclusion of the Abstract and the sentences now reads as follows:

Therefore sufficient interventions to improve access to restorative treatment and preventive measures are urgently required in elementary school-aged children in Hamadan. Page 2 Lines 19-23.
4. Key words: Justify the choice for 'dental health'.

Response: Thank you for your useful comment. We changed “dental health” to caries experience and added dmft/DMFT. So the current key words are: caries experience, elementary school, DMFT/dmft, dental plaque.

Additional information regarding DMF/dmft index has been added in table 2. We have added these sentences in Result section of Abstract: The proportion of decayed teeth in 7 years old children based on dmft index was 80.36 percent, moreover, the proportion in 12 years old children was 40.17 percent based on the DMFT index. Page 2 lines 10-12.

We have added these sentences in the Result section of Abstract: PI increased by 2.44 times per one year increase in age. Page 2 line 17.

Comment in the Introduction;

1. It is necessary to revise and improve the background section, including the objective, in order to create conditions to sustain the exploration of the factors investigated. The section presents subjective aspects, which are not covered at the paper.

Response: Thank you for your valuable comment. We have inserted changes in the background in order to highlight the importance of assessing caries experience among this specific age group and the intended outcomes.

Following paragraphs have been added/revised in the background: Page 3 Line 9 and 25, page 4 lines 1-24.

In this regard Oral Health office in the Ministry of Health and medical science in Iran has started implementing the Program entitled “National oral health promotion program for primary school students” from April 2015 on preventive oral health interventions. The main focus of the oral health development plan is currently on prevention and accurate and up to date research on oral health status of this age group is on their priority list (3).
In the oral health surveys conducted in Iran, initial lesions have not been counted as needing dental treatment therefore number of dental treatment needs may differ from dental decay reports and this phenomenon is generally seen in epidemiological oral health studies (8).

According to the report of Iran Ministry of Health and Medical Education 2011-2012, in Hamadan mean dmft was 5.64 and the mean prevalence rate of dental caries was 95.12% among children aged 5-6 years which was higher than the country average. In addition, the mean DMFT was 2.05 and 3.46 and the mean prevalence rate of dental caries 88.14%, and 86.89%, among Hamadanian children aged 12 and 15 years, respectively. While the DMFT index in the 12-year-old children going to school in Hamadan is roughly the same as the country average, its contribution to caries is higher. The average of this indicator in the 15-year-olds is also higher than the national average (2).

In the pass years few national surveys have been conducted on oral health in Iran which the most recent one was in 2012. Therefore epidemiological information of dental caries and dental plaque in Iran is limited (9) because of different data sources for assessing oral diseases and lack of surveillance system (10). Although the role of socioeconomic factors on oral health behaviors have been studied and some associations have been found in Iranian adolescent population but we don’t have current and comprehensive information on this area in school aged children (10). Therefore the aim of this study was to assess the oral health status of adolescents by measuring caries prevalence and plaque index in western Iran using the indexes for decayed, missed, and filled teeth for primary and permanent teeth (DMFT, dmft) and O’Leary index. Also sociodemographic characteristics (age, sex, Dental pain experience, Parent Supervision, Parental education, Parental occupation and District) of caries conditions in 7-12 year olds were assessed in association with decayed, missing and filled teeth (DMFT, dmft index) and plaque index status in 7-12-year-old Iranian schoolchildren.

2. About the sentence: 'Meanwhile, children aged 6-12 years old represent a top priority in oral health programs'. Not clear to me. I suggest further develop this paragraph, explaining in which oral health programs. Is it for Iranian public health or a specific program?

Response: This is because “Oral Health office in the Ministry of Health and medical science in Iran” has started implementing a Program entitled “National oral health promotion program for primary school students” from year 2016. Therefore detailed and up-to-date information on the
oral health of this age group from our study could be helpful for the accurate implementation of the program. Corrections have been included in the manuscript as follows, page 3 lines 9-13:

In this regard Oral Health office in the Ministry of Health and medical science in Iran has started implementing the Program entitled “National oral health promotion program for primary school students” from April 2015 on preventive oral health interventions. The main focus of the oral health development plan is currently on prevention and accurate and up to date research on oral health status of this age group is on their priority list (3).

3. In the third paragraph the authors already describe known factors for the increase of the dental caries in Iranian children. Why they were not presented and evaluated concomitantly in the statistical model? The presentation of such data could justify paragraphs in the discussion and background.

Response: Thank you for your valuable comment. This study is part of a greater project which we will study some of the variables mentioned in the introduction such as oral health-related behaviors, children's and families’ knowledge levels on oral health in second step. This classification is because of limitation in resources and time. Therefore we mentioned this in the discussion as a limitation as why other possibly related variables have not been measured in this study. Corrections have been included in the manuscript page 15 lines 9-12.

4. Page 4 - First paragraph

This paragraph is confused. If the prevalence of dental caries is 81.83% and 86.89%; why a small number of children need treatment? I suggest further develop and clarify.

Response: Thank you for your kind comment. We have revised and added more information to this paragraph to give a clear vision of the current situation. However in the oral health surveys conducted in Iran the definition used for dental caries is based on World Health Organization (WHO) diagnostic criteria. As initial lesions have not been counted as needing dental treatment so this underestimation is generally observed in epidemiological studies (1,2). Page 3 Lines 25 and page4 lines 1-3:

In the oral health surveys conducted in Iran, initial lesions have not been counted as needing dental treatment therefore number of dental treatment needs may differ from dental decay reports and this phenomenon is generally seen in epidemiological oral health studies (8).


5. Page 4 - Second paragraph:

The study does not support this paragraph. It still presents review errors and requires references. The first part of the paragraph is confused and has no connection with this study. There are descriptions of access barriers, however this paper did not investigate them. The authors do not mention whether they are barriers of public or private system. The objective needs to be clearly stated and defined.

Response: Thank you for your valuable comment. We have deleted this paragraph “Several barriers have been listed as to dental care provision in Iran such as: the huge costs of dentistry care, lack of appropriate dental insurance (patients are accountable to pay for 90% of dental care costs), delivering over 91% of dentistry services in private health care centers, long time waiting lists waiting room, need for facilities and equipment, and lack of access to dentistry services across entire regions in Iran. Besides that, dental services’ costs comprise 15-20% of total health care-pharmaceutical services costs in Iran. So dental services are the second leading contribution, to amount of health care costs in Iran after hospitalization (8-10). Therefore, prevention is the most important and best approach to decrease oral diseases (11).” from the Interpretation of the Background and the paragraph now reads as follows:

“In the pass years few national surveys have been conducted on oral health in Iran which the most recent one was in 2012. Therefore epidemiological information of dental caries and dental plaque in Iran is limited (9) because of different data sources for assessing oral diseases and lack of surveillance system (10). Although the role of socioeconomic factors on oral health behaviors have been studied and some associations have been found in Iranian adolescent population but we don’t have current and comprehensive information on this area in school aged children (10). Page 4 lines 12-17.
We have deleted this paragraph “Given that oral health indicators have not yet been comprehensively investigated among elementary school children, the aim of the present study was to investigate oral health indicators and associated factors to help plan for oral health promotion and oral disease prevention.” from the Interpretation of the Background and the paragraph now reads as follows:

“Therefore the aim of this study was to assess the oral health status of adolescents by measuring caries prevalence and plaque index in western Iran using the indexes for decayed, missed, and filled teeth for primary and permanent teeth (DMFT, dmft) and O’Leary index. Also sociodemographic characteristics (age, sex, Dental pain experience, Parent Supervision, Parental education, Parental occupation and District) of caries conditions in 7-12 year olds were assessed in association with decayed, missing and filled teeth (DMFT, dmft index) and plaque index status in 7-12-year-old Iranian schoolchildren.” Page 4 lines 18-24.

Comment in the Methods:

1. Seems to be appropriate for this study, but some extra information is required. The sample size calculation was performed? Without the description of the variables, it is impossible to evaluate specific questions in results section. So, for each variable, give sources of data and details. Clearly define the outcomes and describe any efforts to address potential sources of bias. It is not clear how missing data were addressed.

Response: Thank you for your valuable comment. Additional information regarding sample size calculation has been added. We have added this paragraph ‘The sample size was estimated for infinite population by using the formula \( (z^2 \alpha/2 \) \( \sigma^2/d^2 \) where standard deviation of DMFT index was taken as 2.72 (11). The required precision of the estimate (d) was set at 22% and Confidence Interval 95%. Using the above-mentioned formula, the sample size was estimated to be 580. After adding the non-response error of 10% and Design effect of 1.5 an additional 300 subjects were included. Thus, 988 subjects were selected for this study.’

We have added these sentences ‘A total of 988 students were selected. According to sample size calculation required 159, 161, 157, 161, 178, 171 participants respectively in 7, 8, 9, 10, 11, 12 years old; the full sample comprised 988 children’. Page 5 lines 4-9 and lines 22-24.
For each variable, sources of data and details have been explained in the manuscript. We have added this paragraph ‘Data on demographic factors that would represent individual characteristics were collected; it included the sociodemographic characteristics of children and their families, including the following: Dental factors: Dental pain experience, Parent Supervision

Social and demographic factors: Gender, Age, Parental education, Parental occupation, Living District

Subjects were asked about dental pain experience through a single question, as follows: “Have you experienced toothache in the last twelve months?” Subjects were asked about Parent Supervision through a single question, as follows: “do parent Watch or advise you while brushing your teeth?” Parental occupation and level of education were collected from children’s parents’. Page 6 lines 6-15.

We treated DMFT/dmft as outcome variable and in a dichotomous way as having caries experience or not having it. We have deleted these clauses “To investigate association between independent variables and oral health indicators, logistic regression and linear regression were conducted. Age, gender, parental education and occupation, place of residence, dental pain within the past year, and tooth brushing under parental supervision were independent variables investigated in this study. Confidence interval (CI) and odds ratio were considered 95% and P < 0.05 was considered the level of significance” from the Interpretation of the Method and these sentences now reads as follows: ‘Multiple linear regression analysis was employed to analyze the association of various sociodemographic (Age, gender, parental education and occupation, place of residence, dental pain within the past year and tooth brushing under parental supervision) and outcome variable included plaque index. Multiple logistic regression analysis was executed to test the associations of preset independent variables (Age, gender, parental education and occupation, place of residence, dental pain within the past year and tooth brushing under parental supervision) with outcome variables included dental caries (DMFT, dmft), expressed as odds ratios (OR) with 95% confidence intervals (CI).’ Page 7 lines 9-16.

Regarding sources of error in this study, the non-response rate was included in the sample size estimation and more students were selected.
Regarding missing data the clinical examinations and interviews were performed for school children in this study who followed the disciplines of school and the staff and teachers which are rigorous specially on health related issues. In addition questionnaires for all selected students were able to be completed by perseverance of the researcher after two follow-ups. So there were no missing data in this study. The more rigorous data collection and two follow-ups by the researcher were incorporated to prevent missing data. Corrections have been included in the manuscript page 6 lines 2-5.

2. If the authors performed a "cluster multistage sampling", why "seven schools were selected from district 1 and nine schools from district 2 by convenience sampling"? All had an equal chance of being selected?
Response: Thank you for your kind comment. The numbers of final schools selected were proportionate to the total number of schools in each district as illustrated in the diagram. We have reworded the sentence as: Accordingly, seven schools were selected from district 1 and nine schools from district 2 by simple random sampling. Page 5 Line 19.

3. Figure 1: The title is inappropriate. The figure presents formatting errors and missing data. The lower text boxes are confusing and difficult to understand.
Response: We have refined the Title ‘Fig1. Flow diagram illustration of the sampling process and selection of study subjects from the two general educational districts that 13 schools were finally chosen, and in each school six classes were selected randomly for clinical examination and interview.’ The lower text boxes were deleted. We didn’t have missing data.

4. More details are needed about the questionnaire applied.
Response: Thank you for your valuable comment. We have added this paragraph ‘Data on demographic factors that would represent individual characteristics were collected; it included the sociodemographic characteristics of children and their families, including the following: Dental factors: Dental pain experience, Parent Supervision’
Social and demographic factors: Gender, Age, Parental education, Parental occupation, Living District Subjects were asked about dental pain experience through a single question, as follows: “Have you experienced toothache in the last twelve months?” Subjects were asked about Parent Supervision through a single question, as follows: “do parent Watch or advise you while brushing your teeth?” Parental occupation and level of education were collected from children’s parents’. Page 6 lines 6-15.

5. Dental examinations section: It was not clear whether one or several students conducted the exams. Was calibration performed? Reference 14 shows an error.

Response: The examinations were conducted by a dental student at the last year of general dentistry program. He was trained by the community oral health department faculty of Hamadan dental school. We have deleted calibrated word in this sentence. Reference 14 has been changed.

6. O'Leary index was performed (as indicated in abstract), but it is not presented in this section.

Response: We have deleted this sentence ‘Dental plaque was measured by plaque disclosing tablets’ from the Interpretation of the Method and the sentence now reads as follows: Dental plaque was examined according to O'Leary index. Page 6 lines 24.

Additionally information regarding DMF/ dmft index has been added in table 2. We have added these sentences in Data analysis section of Method: Multifactor analysis of ANOVA while controlling for age was used to study the relationship between dt/DT, mt/MT and ft/FT and the sociodemographic variables of the children. Page 7 lines 8-10.

Comment in the Results:

1. No information about participants was presented. Report the numbers of potentially eligible students, missing data, refusals and motives. A division of the DMF index in this section would qualify the study.

Response: Thank you for your valuable comment. The clinical examinations and interviews were performed for school children in this study who followed the disciplines of school and the staff and teachers which are rigorous specially on health related issues. In addition questionnaires for
All selected students were able to be completed by perseverance of the researcher after two follow-ups. So there were no missing data in this study. Corrections have been included in the manuscript page 6 lines 2-5.

Additional information regarding DMF/dmft index has been added in table 2. We have added these paragraphs in Result section:

The mean (SD) of decayed teeth were 2.68 (3.05) based on dmft index and 0.33 (0.85) based on the DMFT index (Table 2). The proportion of decayed teeth in 7 years old children based on dmft index was 80.36 %, moreover, the proportion in 12 years old children was 40.17 % based on the DMFT index.

The proportions of decayed teeth in female children based on dmft and DMFT indices were 75.31% and 35.7%, respectively, while the proportions in male children were 73.26% and 50% respectively (Table 2). A significant difference was observed between the mean value of decayed primary teeth in children (1.82±2.41) who were supervised by their parents when brushing their teeth with children (3.14±3.26) who were not supervised by their parents (P<0.001, Table 2). The same results were observed when we assessed the permanent teeth of children. The mean value (SD) for decayed teeth in children who had supervised teeth brushing was 0.42 (1.01), and for children who had unsupervised tooth brushing was 0.28 (0.74), and the difference between these two was significant (p<0.001, Table 2). The difference between females (6.60±1.23) and males (0.29±0.77) in terms of the number of filled permanent teeth was significant (p<0.001, Table 2).

The difference between number of filled permanent teeth (0.50 ±1.08 vs. 0.36 ±0.96) of children living in the center and those living in the suburb significant difference was observed (P=0.04, Table 2). The difference in terms of the number of filled primary teeth was also significant between these two groups (p<0.001, Table 2).

There was a significant association between the number of decayed primary teeth and mother's education level according to the multifactorial analysis of ANOVA (p=0.005, Table 2). The Tukey post hoc test demonstrated that the significant difference (p<0.05) was between the groups of children whose mothers had an education level lower than primary (3.66±3.71) with those that their mothers had a high school education level (2.69±3.05) and those that their mothers had
higher than high school education (2.03 ±2.43). Whereas, the difference between two groups of mothers, as those with high school education level and those with higher than high school education was not significant (p>0.05). Page 8 lines 3-25 and page 9 lines 1-4.

2. Table 1: The title is inappropriate. The table needs to be standardized and formatted. The same age is in two categories (Example: 7-8; 8-9 years). Present values with the same number of decimal places in all its cells (standardization). What means >0 in the cell >0(%)?

Response: Thank you for your valuable comment. We have deleted the title “Frequency distribution and mean±SD of student's characteristics” and the Title now reads as follows:

Characteristics of student’s oral health indexes dmft, DMFT and PI according to their demographic variables.

The Table has been standardized. Age categories have been edited (7; 8; 9; 10; 11; 12).

The following description sentence has been added below Table 1: Proportion of children with any decayed, missing, or filled tooth: dmfT/DMFT > 0 in %.

3. Table 2: The title is inappropriate. The regression was adjusted for which variables? Table 2 was not cited in the second paragraph of page 7.

Response: We have deleted the title “Multiple Logistic regression results between predicted values and DMFT and dmft” from the manuscript and the Title now reads as follows:

Relationship between demographic factors and DMFT/ dmft by Multiple Logistic analysis.

This table was cited in the second paragraph of page 9 line 13.

The regression was adjusted for age and sex. Corrections have been included in the manuscript page 7 line 17.

4. Table 3: The regression was adjusted for which variables?

Response: The regression was adjusted for age and sex. Corrections have been included in the manuscript page 7 line 17.
Comment in the Discussion:

The discussion presents, in several occasions, restatement of results, which is not necessary. There are numerous comparisons with other studies, but without theoretical depth. The authors discuss topics and make statements on items not investigated by this research. Although the authors indicate an increase in dental caries, which cannot be confirmed with this cross-sectional study, no new associated factor, in addition to those already discussed deeply in the literature has been presented.

Thank you for your valuable comment. We have made a considerable amount of revision to the discussion part of the manuscript according to your helpful comments.

Page 7 - Fourth paragraph:

This part can be discussed in limitation paragraph: "To the best of our knowledge, the current study is first to provide […] be considered the strengths of the present study". The second part of this paragraph is reaffirmation of results and can be suppressed. I suggest that the authors present key results with reference to study objectives.

Response: Thank you for your valuable comment.

We have deleted these clauses “According to the findings of this study, 73% of the boys had primary tooth decay and 35.3% of them had permanent tooth decay. The highest primary and permanent tooth decay was seen in boys aged 7-8 years and girls aged 12-13 years, respectively. Boys aged 12-13 years had the highest dental plaque. ” from the Interpretation of the Discussion and the sentences now reads as follows:

This study showed that our population’s current statuses not in accordance with WHO’s goal for 2010 of DMFT in 12-year-olds which should be below one (17). The mean (SD) DMFT of children aged 12 years, dmft of children aged 7 years and plaque index of children aged 12 years in our study were 1.17 (1.77), 6.53 (4.37) and 51.97 (25.86) respectively. According to results of this study, the age, sex and dental pain experience were the only variables associated with the experience of dental caries (Table 3). Furthermore age was studied in relation to caries development in permanent teeth, and the risk increases by getting older. Page 9 lines 16-22.
We have deleted these clauses “However, association between socioeconomic status and oral health conditions in the elementary students of Hamadan can offer valuable information to policy maker and health planners and professionals to implement large-scale prevention programs.” And these clauses “Accurate sampling and generalizability of the findings can be considered the strengths of the present study.” from the Interpretation of the Discussion and the sentences now reads as follows:

However this should be considered in the context of the methodological strengths and limitations of the study. The current study benefits from the following strengths: first, the sample included over 900 locally representative 7-12 year-old children and there was an excellent participation rate; second, distribution of children was well-performed (two different district from the richest to the poorest areas); third, all the oral examinations were performed by one examiner. Page 15 lines 15-20.

Page 8 - First paragraph:

There is no reference for "A national oral health survey in Iran was conducted in 2012-2013 that demonstrated the mean dmft of children aged 7-8 years was 4.94 nationally and 5.64 in Hamdan.

There is lack of information in references 16 and 17

Response: Reference 2 to a document describing this information in detail has been added. Page 9 Line 24.

Page 8 - Lines 31-36

The results that the authors exposed were not presented in the results section.

Response: Thank you for your valuable comment. According to Table 2 corrections have been included in the manuscript. We have deleted these clauses “In addition, the current study demonstrated that the number of decayed teeth, either primary or permanent, was higher than the filled teeth such that 90.8% of children aged 7-8 years and 44.8% of those aged 12-13 years had decayed tooth. The proportion of untreated teeth in this study was partly consistent with corresponding results in the developing and underdeveloped countries such as India, Afghanistan, and Ethiopia (19-21) and higher than those in comparably more developed
countries such as Israel, Spain, and Brazil (22-24). However, inequality in delivering dental services in the public oral health care system (oral health education, research and application of findings in real setting, periodical examinations of children, and delivering free necessary treatments and preventive services) has been less frequently taken into consideration although potential benefits of such activities and systems in the developed countries has been confirmed (25). In Iran, dental care is not delivered for free and many of these services are not covered by health insurance; therefore, families are forced to use private sector that is costly. This condition represents a main barrier to receiving dental care services in Iran. In addition non treated dental decay can be due to lack of information and knowledge on oral health and incorrect attitudes towards necessity of receiving dental prevention and treatment services as well as giving low priority to oral health care compared to other needs (8-10)."

The results of the present study demonstrated that decayed primary and permanent teeth constituted a large and considerable proportion of DMFT and dmft indices, so that the proportion of filled teeth in dmft index of 7-year old children was as low as 6.4 percent and in DMFT index of 12-year children was 55.55 percent. A high proportion of decayed teeth observed in the present study is similar to those reported by other studies conducted in other developing and undeveloped countries such as India, Afghanistan, and Ethiopia (24-26) and is higher than those reported in developed countries such as Israel, Spain, and Brazil (27-29).

Previous studies have demonstrated that the experience of dental caries is a function of dental caries prevalence and the use of dental services such as oral hygiene training, regular dental examinations, dental treatments, and free prevention services (30). Although such services are readily available for public in developed countries such as Finland, Portugal, and Czech Republic, but they are rarely provided in developing countries (30).

In developing countries like Iran, dental services are commonly expensive, there is no proper insurance for dental services, and in some points of the country do not have any access to such services (21, 22). Accordingly, the prevalence of dental caries among groups of people with a substandard economic situation is high (30). The results of the present study are in accordance with previous studies (31, 32) by reaffirming the aforementioned statements so that families with higher education levels had a higher number of filled primary teeth (Table 2).
The results also demonstrated that the number of filled permanent teeth was higher among children whose fathers had a governmental occupation than others. Essentially, it is expected that self-employed fathers have a higher income, consequently, enabling them to use restorative services more often (33, 34). Nonetheless, the specific economic situation and the economic downturn in Iran have resulted in a long-term decline in the income of most of the self-employed occupations, and governmental occupations have more security during these years (35).

Similar other studies (32, 36, 37) children living in the suburb had a lower number of filled primary and permanent teeth compared to those of children living in city center. The reason is somewhat obvious, the children living in the suburb have difficulties in access to dental services and normally have low socioeconomic status (32, 37, 38). In this regard, we found that 2.1 of parents of children living in the city had an education level lower than primary, whereas, 11 percent of parents of children living in the suburb had such an education. Moreover, three percent of urban children had parents with higher than high school educations while this value for suburb children was equal to 20%. Furthermore, the number of urban children's fathers with a governmental occupation was 27%, whereas, 15% of suburb children's fathers had a governmental occupation. Moreover, the prevalence of worker fathers was higher in suburb families than in urban families (18.7% vs. 8.9%, Table 2). Page 10 lines 16-25 and page 11 lines 1-25.

Page 9 - First paragraph

The authors make statements that cannot be answered with this research.

Response: Thank you for your valuable comment. We have deleted these clauses “In Iran, dental care is not delivered for free and many of these services are not covered by health insurance; therefore, families are forced to use private sector that is costly. This condition represents a main barrier to receiving dental care services in Iran. In addition non treated dental decay can be due to lack of information and knowledge on oral health and incorrect attitudes towards necessity of receiving dental prevention and treatment services as well as giving low priority to oral health care compared to other needs (8-10).”

Page 9 - Second paragraph

Again the authors make statements that cannot be answered with this research.

Response: Thank you for your valuable comment. In this study we have tried to emphasize the role of preventive approach or actions in the field of oral health. So although some variables
have not been actually measured in present study but they have been mentioned to give a realistic and systematic view of the general oral health conditions in Iran. Furthermore, office of oral health has taken large steps to fund preventive dental care for school children under 12 year olds. These two categories together highlight the role and necessity of preventive actions on oral health and accurate measurements in Iran and specifically in the city of Hamadan. We have deleted these clauses “Besides that, educating students and engaging parents and teachers in this process can contribute greatly to promoting oral health, improving knowledge and attitude, and changing behaviors in school children. Moreover, it is essential to conduct community-based education, use continuing educational programs and combined techniques, to best approach and promote elementary students' oral health (26). In Iran, such measures are not taken (27).”

Page 9 - Third paragraph

Reference 35 does not apply to the paragraph. Again the authors make statements that cannot be answered with this research.

Response: Thank you for your valuable comment. Reference 35 was deleted. We have deleted these sentences “It is argued that elementary students have insufficient knowledge and poor management skills and intention to maintain and promote their oral health and therefore need continuous education in this regard (28).”

Page 10 - Second paragraph

The statement 'Meanwhile, schools may be the best place to deliver training on oral health to children, because about one billion children worldwide spend greatest and effective part of their day in schools...' is not depth discussed.

Response: Thank you for your kind comment. We have deleted these sentences ‘Meanwhile, schools may be the best place to deliver training on oral health to children, because about one billion children worldwide spend greatest and effective part of their day in schools’ from the Interpretation of the Discussion and the sentence now reads as follows:

Meanwhile, schools may be the best place to deliver training on oral health to children, as they provide an appropriate setting for children’s health promotion by offering an educational environment for improving health, through increasing self-esteem, health literacy, self efficacy
and sense of control over their lives (47). The positive messages and practical interventions can be reinforced throughout the consequent years which children are studying in the school. Some believe schools are more influential than families because of positive exposure to teacher support and peer networks (48). Page 12 lines 15-20.

Page 10 - Third paragraph

Dental plaque was only associated with age, however it is discussed that 'the present study demonstrated that age, gender, and dental pain in the past year were derived predictors'. A paragraph discussing the difference between the results for dental plaque and caries would qualify the study, as well the following sentence: 'In addition, being female was found to increase the chance of DMFT and dmft by 1.703 times and 0.475 times, respectively.'

Response: Thank you for your valuable comment. We have deleted these sentences ‘age, gender, and dental pain in the past year were derived predictors of dental caries and plaque after adjusting for other variables' effects.’ from the Interpretation of the Discussion and the sentence now reads as follows:

Age, gender, and dental pain in the past year were derived predictors of dental caries (Table 3). However dental plaque was only associated with age after adjusting for other variables' effects (Table 4). Page 13 lines 2-3.

We have deleted this clause “In addition, being female was found to increase the chance of DMFT and dmft by 1.703 times and 0.475 times, respectively. Presenting dental pain frequently in the past year increased the chance of DMFT and dmft by 1.729 and 2.796, while presenting dental pain infrequently in the past year increased the chance of dmft by 2.191” from the Interpretation of the Discussion and these clauses have been replaced as follows:

This can be due to several reasons, such as the commutative effect of plaque and calculus by aging, which accelerates the decay and erosion of teeth (54, 55). The mean value of DMFT was higher in girls than boys (Table 1). However, the number of decayed teeth was higher in girls than boys (Table 2). The increase in the number of filled permanent teeth was significant, which can be due to several reasons; permanent teeth begin to grow earlier in girls than boys (56) as well as, females tend to visit dentists and utilize dental services more than males (57). In addition to the aforementioned reasons, cultural issues should not be overlooked as parents, in Iran, commonly pay more attention to the appearance of their girls than boys (58).
In the present study, it was found that children who experienced toothache more often in the previous year had more decayed primary teeth, filled teeth, and extracted teeth (Table 2). As recommended by The American Dental Association (ADA), taking care of primary teeth should be started as early as the first primary tooth eruption begins (59). However, young children do not acquire the required cognitive and functional skills for taking care of their teeth. Consequently, it is the duty of their parents to take care of their kids’ teeth (60).

Unfortunately, Iranian parents do not pay enough attention to the health of primary teeth and delay the dental treatment until the pain becomes intolerable for children. In such situations, tooth extraction is the only option (61, 62). Similar to previous studies (63, 64), we observed that the number of decayed or extracted primary teeth in children whose parents supervised their tooth brushing was lower than others (Table 2). However, the number of decayed permanent teeth in these children was higher than others (Table 2). The high dependency of DMFT on age may be a reason in this regard. Furthermore, as the permanent teeth are completed in the early adolescence and people are strongly opinionated in this period of their lives, they have a high tendency to oppose their parents on their oral hygiene instructions which can lead to a higher prevalence of dental caries (65). Page 13 lines 5-25 and page 14 lines 1-4.

Page 11 - Second paragraph

The paragraph contradicts the results, since education is not associated for your study. I suggest suppressing.

Response: Thank you for your valuable comment. According to Table 2 corrections have been included in the manuscript. We have deleted these sentences “This finding can be explained by lack of general information on dental caries and triggering factors among all people at any socioeconomic status, not having access to necessary information on treating oral diseases, mothers' shortage of information and skills regarding caretaking of children's primary teeth, not having adequate knowledge on children's tooth brushing and using dental floss and mouthwash, and adopting treatment-centered approach among people and dentists due to financial and professional attractions (48-50).” from the Interpretation of the Discussion and these clauses have been replaced as follows:

The lack of awareness about the oral hygiene in all layers of society with different socioeconomic status can be an explanation for this finding. The results of our study demonstrated that the proportions of decayed primary teeth in children with higher than high
school educated father and mother were 66.45 percent and 66.55 percent, respectively. Moreover, there was no significant relationship between mother's education level and the number of decayed permanent teeth. The lack of awareness and necessary skills regarding taking care of primary teeth can be an influential factor. Similar to previous studies (31, 70) the present study demonstrated that the number of decayed primary teeth had invert association with the mother's education level (Table 2). Moreover, the proportion of decayed primary teeth in children whose parents did not supervise them tooth brushing was 74.23 percent. Parents' incorrect insistence on treatment rather than prevention may also be another reason. In this regard, the comparison of our results with the results of a national study (2) conducted five years ago demonstrated that the proportion of filled permanent teeth has increased, while the proportion of decayed teeth has remained steady. On the other hand, children whose parents had a better socioeconomic level (higher than high school educations and governmental occupations) and supervised their children's oral hygiene had a higher proportion of filled teeth and a lower proportion of decayed teeth (Table 2). This issue results in a higher prevalence caries experience (dmft and DMFT) in this group of children. Accordingly, it can be postulated that similarity of dental caries experience in children with different socioeconomic levels resulted in a non-significant relationship between oral health status of children and their families’ socioeconomic level (30). Studies have demonstrated that the socioeconomic level of families can have indirect and mediating effects on the children's oral health status (30, 70), and this could be a reason for observing non-significant relationships between demographic variables and current oral and dental status of children. So the socioeconomic level of a family can affect children's oral hygiene status indirectly through such factors such as oral health literacy, dietary habits, willingness for brushing teeth, and the use of dental care services (30, 71). That was not studied in this research project. Page 14 lines 10-25 and page 15 lines 1-12.

Page 11 - Third paragraph

Indicating only the design of the study as limitation, evidence the poor development of this paragraph.

Response: Thank you for your valuable comment. We have added these paragraphs:

Furthermore disclosing tablets stain very thin layers of plaque and might influence amount of plaque scores. However results of this study on plaque numbers were in accordance with the national survey in Hamadan (2) and a study on laboratory modeling of disclosed plaque showed area-based plaque indices can be scored or recorded precisely and with least variability within or between examiners (72). In addition the outcome of using disclosing tablets has shown to be
effective in improving hygiene of patients and has been recommended since the early twentieth century (73).

The use of DMFT index is another limitation of the study. The estimates provided by this index regarding dental caries may be lower than the actual value (74). The value of this index contains no information about the decay situation, its stage, penetration depth, restoration type, and its situation. Moreover, this index is unable to guide the practitioners in determining the type of required health surveillance, treating decayed teeth, or their periodic examination (8, 75). Consequently, researchers have recommended utilizing other indices such as international caries detection and assessment system (ICDAS). Because, in Iran, DMFT is still the routine approach for assessing dental caries, and the use of ICDAS needs special training, accurate calibration and specific conditions during clinical examination in the present study we used DMFT index. Moreover, the DMFT/dmft index is still regarded as a valid approach for assessing dental caries and is the main index used for collecting epidemiological data in many countries (76). Besides, the World Health Organization (WHO) recommends to use DMFT/dmft index for assessing the prevalence of dental caries in various populations to support the possibility of international comparisons (12).

Receiving socially acceptable responses regarding variables such as parent's occupation and education level and also positive supervision on children’s tooth brushing was another possible reason that could influence the statistical results and caries experience in school children could not be predicted by socioeconomic characteristics of their parents (77, 78). Although we had tried to control this limitation by checking the schools record books which are kept for each student and their parents’ occupation in all primary schools. Page 15 lines 23-25 and page 16 lines 1-22.

Conclusion:

The conclusions should clearly answer the objectives.

Response: We have deleted these clauses “According to the findings of this study, a high rate of developing dental caries and a high percentage of dental plaque were seen in children aged 7-12 year in Hamadan. Nowadays, although using oral health aids such as toothbrush, toothpaste, and mouthwash is more frequent than the past, no remarkable improvement of dental caries has been observed due to lack of paying serious attention to practical education and unsatisfactory learning outcomes. Despite increased number of education centers, dental departments, health care centers, and dentists working across the country, oral health and oral disease prevention
services have not yet been promoted and instead dental treatment services have been mainly developed further. Therefore, in addition to the necessity of access to corrective treatments for children aged 7-12 years, prevention programs and basic strategies should be implemented to improve dental caries-associated behaviors at both individual and community scale. Some of these strategies are as follows: Educating and informing children under 12 years and the groups influencing them such as parents especially mothers, elementary school teachers, health care centers' staff, and providers of health services (especially treatment team) (26), delivering preventive services (e.g. fluoride varnish and fissure sealant) to prevent dental caries and gum disease and taking measures to accentuate the benefits of these services or reduce barriers ahead of welcoming such services by target groups such that they receive these services at economical and logical costs, because when preventive services are integrated into the comprehensive prevention program and delivered alongside a six-month program of oral health and topical application of fluoride, dental caries decrease by 87.5% (51), convincing the community decision makers to codify and enforce oral health promotion laws and regulations that can lead to funding, providing necessary equipment and facilities, supplying human force, and codifying oral health-related policies and laws, and indirectly making arrangements to welcome measures to prevent dental caries (26,51).” from the Interpretation of the Conclusion and the sentences now reads as follows:

This study provided accurate epidemiological information on oral health status of 7 to 12 year olds in order to further assist caries prevention and maintenance of oral health interventions. The percentage of children with dental plaque and one or more caries lesions was too high considering the currently ongoing national oral health preventive campaign. The recorded DMFT and PI indexes, in comparison with other countries, illustrate poor oral health, low oral hygiene, and consequently ineffective oral health preventive actions in Hamadan, as well as a need to invest in modern preventive and therapeutic methods.