The Study of Demographic and Background Variables Effects on Decayed, Missing and Filled Teeth and Gingivitis Indicators Among Primary School Male Students

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Abstract

Background: Oral health is an important healthcare aspect and one of the main challenges in many societies, for its extensive and profound implications.

Objectives: This study aimed to investigate the effects of demographic and background variables on decayed, missing and filled teeth (DMFT) and gingivitis indicators, among primary school male students.

Materials and Methods: This is a cross-sectional study, which was conducted with the participation of 1104 primary school male students, using census method, in Paveh city, Iran, in 2014. The data were collected via students' examination and interview, using a structured questionnaire. Two hierarchical linear and logistic regression analyses were applied in two steps, using the Enter method. Variables found to be associated with DMFT and gingivitis, in the univariate analysis, were included in multivariate regression model. The P values for entry and removal variables, in the stepwise regression model, were 0.05 and 0.15, respectively. Data were analysed using the SPSS 17.0 software and all $P \leq 0.05$ were considered significant.

Results: The obtained results showed that the average DMFT was 7.91 ± 3.78 and one third of the students had symptoms of gingival inflammation, whereas only five percent of them did not have any symptoms of decaying. The survey of demographic and background variables on DMFT and gingivitis indicators, in adjusted form, indicated that educational grade, parents' educational level, birth rank, father's job, daily brushing and dentistry periodic examination have a significant relationship with the assessed indicators ($P < 0.05$).

Conclusions: This study indicated that there are major indicators affecting oral health status and it was believed that current study results and suggestions can pave the way for health care planners and policymakers.

Keywords: Oral Health, DMFT Index, Gingivitis

1. Background

Dental decay is the most prevalent infectious disease worldwide that emerges with various rates and severity among individuals and societies, based on the presences of risk factors (1). The disease is caused by removal of the inorganic compounds of the outer tooth layers, the protective layer of enamel and dentin, and consequently, the destruction of organic parts and involvement of the root (2).

The teeth have a basic role in our life and health, since they are essential in eating, speaking, aesthetics and so-cial relationship (3). Regarding this fact, dental decay has numerous negative effects on one's quality of life and leads to physiological, functional and biological side-effects, followed by the economic, social and psychological destructive consequences. The overall impact of these side-effects is studied and analyzed, as an indicator entitled dental impact of daily living (4, 5).

The decay of teeth occurs because of the cumulative effects of destructive social, economical, biomedical and behavioral factors, lifelong, where behavioral fac-

tors, including dental protection methods, such as brushing and its style, using dental floss and mouth wash, periodic examination by dentist and having healthy nutrition, have the most considerable impact (6, 7). In addition, various studies have shown a significant relationship between oral health status and social level, parents' education, birth rank, family dimensions etc. (8, 9).

The world health organization (WHO) and the international federation of dentistry (FDI), through the collaborative efforts of various countries, have a special focus on oral health and have set targets to improve it in all societies, aiming a reduction of the decayed, missing and filled teeth (DMFT) indicator in 12-year-old children, to become ≤ 1, by 2020 and to increase the caries free (CF) indicator by 50% in 5 - 6-year-old children, with ongoing studies in different ages, sex and social groups (10).

The previous studies have indicated that oral health in children, especially in primary school ages, is extremely important for the reason that they are in critical age of dental transition, from primary to permanent teeth. The importance of primary teeth is related to their status and, therefore, before the age 12, they have an imperative role in children nutrition and growth (2, 11).

Regarding the vulnerability of children in primary school ages and importance of identification of the most effective factors in occurrence of teeth decay for health planning and interventions, as well as the lack of any related survey in the current study environment, this article aims to study the effects of demographic and background variables on DMFT and gingivitis indicator, among primary school male students, in Paveh, Iran, during 2014. Moreover, the main cause of conducting this study is that the previous reports have identified an effective factor on oral health indicators, without elimination of other factors effects Nevertheless, in this study, the effects of factors on oral health indicators were assessed with elimination of other factors' effects using multivariate regression. In addition, the previous studies often assessed the effective factors on DMFT indicators and neglected the assessment of the effective factors on gingivitis, as an important indicator in oral health status assessment.

2. Objectives

The aim of this study investigate the effects of demographic and background variables on DMFT and gingivitis indicators, among primary school male students, with the long-term target of improving oral health and growth.

3. Materials and Methods

This is a cross-sectional design study, including all 1104 primary school male students, in Paveh city, Iran, during 2014, using the census method. The inclusion criteria ap-

proved subjects having educational and health records in the investigated area and students' willingness to take part in the study. Students were excluded if they did not wish to participate in the study.

The data collection tool was a questionnaire with two sections: demographic and background variables, and examination results. The content validity of the questionnaire was confirmed using content validity index (CVI) and the content validity ratio (CVR) tests, based on the opinion of 10 experts. In order to calculate CVI, three standards of relevance, clarity and simplicity were used on a four-point Likert scale. Therefore, the CVI of each question was calculated by dividing the number of agreeing experts who select the "complete or high relevancy", "complete or high clarity", "complete or high simplicity" answers (persons with ranks three and four) by the total number of the experts (separately for each of the three standards). In order to determine CVR, the experts were asked to examine each question based on the three-point scale ("it is necessary", "it is useful and unnecessary" and "it is unnecessary") (12, 13). Subsequently, the answers were calculated, based on the following formula:

$$\text{(1)} \qquad \text{CVR} = \frac{nE - \frac{N}{2}}{\frac{N}{2}}$$

In the above formula, nE is the number of experts that have rated for the "it is necessary" alternative and N is the total number of experts.

The CVI was 0.92 and the CVR was 0.87, indicating a high level of expert agreement validity. In the data collection phase, required data for measuring DMFT and gingivitis indicators were gathered via students' examination. Also, essential data related to demographic and background variables, including parents' education, father's job, family dimension, birth rank, routinely diary consumption, regular teeth brushing and periodic examination by dentist, which indicate significant effects on dental decay in the previous studies, were collected using interview with students (14, 15).

For calculating DMFT indicator, the number of DMFT was summed. The symptoms and signs of decayed teeth, including pain, color change, fracture, perforation or teeth sensitivity to pressure, heat and cold, were assessed. To survey the gingivitis indicator, the students were assessed for gingival symptoms, such as unusual color, texture inflammation, gingival cyst and any outward abnormality (14, 15). Frequencies and percentages were used to describe qualitative demographic information of participants and mean (standard deviation) was used to report continuous variables.

Two hierarchical linear and logistic regression analyses were applied in two steps, using the Enter method to find factors associated with DMFT and gingivitis status of student. Variables found to be associated with DMFT and

gingivitis, in the univariate analysis, were included in multivariate regression model.

The P-values for entry and removal variables in the step-wise regression model were 0.05 and 0.15, respectively. Data were analysed using the SPSS 17 statistical package (SPSS Inc., Chicago, IL, USA). The $P \leq 0.05$ were considered as statistically significant.

Ethical principles considered in this study included the complete freedom of all participants to accept or refuse to participate in the study, respecting the privacy of participants and ensuring the participants that the use of their data and information was exclusively in line with the study goals. In addition, this study was approved by ethics committee of Tabriz university of medical sciences, Tabriz, Iran.

4. Results

The study participants were similarly distributed in various grades, although their numbers in grade 1 and 5 were greater than the others. The educational level of students' parents was mainly high school diploma and the families commonly had two or three children. The responders were, generally, the first or second child of the family and their fathers' job dispensed normally between its related groups. The responders claimed that they consumed dairy products less than once a day and most of them were not brushing their teeth routinely; furthermore, most of the assessed students were not annually referring to the dentist for periodic examination, or getting informed, or other preventive actions (Table 1).

Although the diary food group is a fundamental need in growth ages and teeth health, it was consumed as 0.90 ± 0.80) unit per day, in assessed students. The mean of teeth brushing times is 0.55 ± 0.63 times per day; in addition, the students had a 0.33 ± 0.57 annually time referal to dentistry. The DMFT rate was 7.91 ± 3.78, where the number of decayed teeth has maximum impact on it. The assessed students have 4.71 ± 2.72 decayed teeth, 1.70 ± 2.04 missing teeth and 1.50 ± 1.95 filled teeth, averagely.

The findings of oral health status survey also show that < 5% of the participants do not have any decayed teeth and half of them have missing and filled teeth. More than 50% of assessed students have DMFT from 6 to 10 and one third of them have symptoms of gingivitis (Table 2).

The survey of the effects of the demographic and background variables on DMFT in unadjusted form (univariate analysis) indicated that all of the assessed variables have significant relationship with this indicator, whereas the survey of variable effects on DMFT, in adjusted form (multivariate analysis), indicated that all of assessed variables, except the number of family children and diary consumption, have significant relationship with this indicator, which is described below (Table 3).

Table 1. The Demographic and Background Variables of Participants

Variable/Category	Values[a]
Educational grade	
Grade 1	178 (16.1)
Grade 2	218 (19.7)
Grade 3	164 (14.9)
Grade 4	168 (15.2)
Grade 5	227 (20.6)
Grade 6	149 (13.5)
Father's education	
Illiterate	132 (12)
Under diploma	332 (30.1)
Diploma	411 (37.2)
Academic undergraduate	180 (16.3)
Academic postgraduate	49 (4.4)
Mother's education	
Illiterate	216 (19.6)
Under diploma	328 (38.8)
Diploma	314 (30.9)
Academic undergraduate	108 (9.8)
Academic postgraduate	11 (1)
Number of children	
One	161 (14.6)
Two	485 (43.9)
Three	339 (30.7)
Four	94 (8.5)
Five	25 (2.3)
Birth rank	
First	332 (30.1)
Second	512 (46.4)
Third	221 (20)
Fourth	39 (3.5)
Father's job	
Employee	341 (30.9)
Worker	314 (28.4)
Self-employed	379 (34.3)
Unemployed	70 (6.3)
Dairy consumption (daily)	
No consumption	374 (33.9)
One time	504 (45.7)
Two times	186 (16.8)
Three times	40 (3.6)
Brushing (daily)	
No brushing	575 (52.1)
One time	447 (40.5)
Two times	82 (7.4)
Periodic teeth assessment (in 6 months)	
No assessment	804 (72.8)
One time	238 (21.6)
Two times	62 (5.6)

[a]Data are presented as frequency (%).

The effect of educational level on DMFT in grade 1 is significantly lower than for other grades and the increasing trend from grade 1 to grade 3 and decreasing trend in upper grades is evident, constantly. The survey of the effect of father's education on DMFT demonstrates that students with illiterate fathers have two DMFT units more than students whose fathers have academic postgraduate education. In addition, students with illiterate mothers have 0.8 and 2 DMFT units more than students whose mothers are under diploma and academic undergraduate education mothers, respectively. However, they have 2 DMFT units less than those with mothers with academic postgraduate education.

The obtained results show that students who are the first child of family have 0.8 and 1.5 DMFT units more than students who are second and fourth child of family, respectively. Moreover, the students with employee fathers have 0.7 DMFT units less than students with worker fathers.

The survey of statistical relationship between oral health preventive actions and DMFT indicator rate demonstrates that students, who have one daily teeth brushing and once a year refer to dentistry for periodic examination, have significantly 2.9 and 3.4 DMFT units less than students who do not have daily teeth brushing and periodic oral health examination by dentist, respectively.

The survey of the effects of demographic and background variable on gingivitis, in unadjusted form (univariate analysis), indicated that all surveyed variables have a significant relationship with this indicator. However, the survey of variable effects on gingivitis, in adjusted form (multivariate analysis), indicated that all of assessed variables, except for the number of family children and diary consumption, have a significant relationship with this indicator, which is described below (Table 4). The survey of the relationship between educational grade variable and gingivitis reveals that risk of gingivitis in grade 1 students is 68% lower than that of grade 5 students.

The assessment of the relationship of father's education with gingivitis shows that risk of gingivitis, in students with illiterate fathers, is significantly lower than that of students with literate fathers in all groups. But students with illiterate mothers have 96, 99 and 98 percent lower gingivitis risk than students with mothers who have under diploma, diploma and academic undergraduate educational level respectively.

The results also show that students who are the first child of family have 77% and 97% higher gingivitis risk than students who are the second or third child of family, respectively. In addition, the students who have worker fathers have 5.2 times more gingivitis risk than students with employee fathers.

The survey of the effect of teeth brushing on gingivitis indicator reveals that students who brush twice daily have a 91% lower gingivitis risk than students who do not have daily brushing. In addition, the students who do not refer to dentistry clinics for periodic oral health examination have 92% and 95% lower gingivitis risk than students who refer to dentist once and twice respectively.

Table 2. The Status of Oral Health Indicators in Assessed Students

Indicator/Categories	Values[a]
Decayed teeth	
Without decayed teeth	49 (4.4)
1 to 4 decayed teeth	559 (50.6)
5 to 8 decayed teeth	415 (37.6)
9 to 12 decayed teeth	64 (5.8)
Higher than 12 decayed teeth	17 (1.5)
Missing teeth	
Without missed teeth	497 (45)
1 to 2 missed teeth	308 (27.9)
3 to 4 missed teeth	167 (15.1)
Higher than 4 missed teeth	132 (12)
Filled teeth	
Without filled teeth	580 (52.5)
1 to 2 filled teeth	227 (20.6)
2 to 4 filled teeth	181 (16.4)
Higher than 4 filled teeth	116 (10.5)
DMFT	
1 to 5	245 (23.2)
6 to 10	532 (50.4)
11 to 15	246 (23.3)
16 to 20	23 (2.2)
Higher than 20	9 (0.9)
Gingivitis	392 (35.5)
CF	49 (4.4)

Abbreviations: CF, Carries free; DMFT, Decayed, missing and filled teeth.
[a]Data are presented as frequency (%).

Table 3. The Relationship Between Demographic and Background Variables and DMFT (Using Linear Regression)

Variables/Categories	Number	Unadjusted				Adjusted			
		B[a]	SE	Beta	P	B[a]	SE	Beta	P
Educational grade									
Grade 1	178	Ref.	NA	NA	NA	NA	NA	NA	NA
Grade 2	218	4.45	0.32	0.47	<.001	4.5	0.30	0.47	<.001
Grade 3	164	6.55	0.34	0.61	<.001	5.5	0.33	0.52	<.001
Grade 4	168	4.43	0.34	0.42	<.001	3.5	0.33	0.33	<.001
Grade 5	227	3.17	0.32	0.34	<.001	2.3	0.31	0.25	<.001
Grade 6	149	1.91	0.35	0.17	<.001	1.5	0.34	0.14	<.001
Father education									
Illiterate	132	Ref.	NA	NA	NA	NA	NA	NA	NA
Under diploma	332	0.30	0.39	0.03	.433	-0.06	0.34	-0.01	.855
Diploma	411	0.29	0.38	0.04	.435	0.15	0.33	0.02	.650
Academic undergraduate	180	-0.59	0.43	-0.06	.168	-0.60	0.38	-0.05	.115
Academic postgraduate	49	1.51	0.63	0.08	.017	-1.94	0.56	0.10	.001
Mother education									
Illiterate	216	Ref.	NA	NA	NA	NA	NA	NA	NA
Under diploma	428	-0.46	0.31	-0.06	.136	-0.76	0.27	-0.09	.005
Diploma	314	0.08	0.32	0.01	.799	0.09	0.29	0.01	.757
Academic undergraduate	108	-2.5	0.43	0.19	<.001	-2.08	0.38	-0.16	<.001
Academic postgraduate	11	1.7	1.15	0.04	.136	2.08	0.99	0.05	.035
Number of children									
One	161	Ref.	NA	NA	NA	NA	NA	NA	NA
Two	485	-0.78	0.34	-0.10	.021	0.16	0.33	0.02	.557
Three	339	0.21	0.35	0.02	.544	0.57	0.43	0.07	.179
Four	94	-0.67	0.48	-0.05	.162	-0.12	-0.57	-0.01	.833
Five	25	-4.17	0.80	-0.16	.015	-2.15	0.91	-0.08	.190
Birth rank									
First	332	Ref.	NA	NA	NA	NA	NA	NA	NA
Second	512	-0.47	0.26	0.06	.068	-0.80	0.29	-0.10	.006
Third	221	0.69	0.32	0.07	.032	0.28	0.43	0.03	.512
Fourth	39	-3.81	0.62	-0.18	<.001	-1.45	0.76	-0.07	.057
Father job									
Employee	341	Ref.	NA	NA	NA	NA	NA	NA	NA
Worker	314	0.78	0.29	0.09	.008	0.74	0.26	0.09	.005
Self-employed	379	0.63	0.28	0.08	.024	0.32	0.26	0.04	.216
Unemployed	70	1.29	0.49	0.08	.009	0.56	0.42	0.03	.189
Dairy consumption (daily)									
No consumption	374	Ref.	NA	NA	NA	NA	NA	NA	NA
One time	504	0.77	0.30	0.07	.042	0.77	0.30	0.07	.124
Two times	186	0.20	0.61	0.01	.736	0.20	0.61	0.01	.736
Three times	40	NA	NA	NA	NA	NA	NA	NA	NA
Brushing (daily)									
No brushing	575	Ref.	NA	NA	NA	NA	NA	NA	NA
One time	447	-2.89	0.42	-0.20	<.001	-2.89	0.42	-0.20	<.001
Two times	82	NA	NA	NA	NA	NA	NA	NA	NA
Periodic teeth assessment									
No assessment	804	Ref.	NA	NA	NA	NA	NA	NA	NA
One time	238	-3.35	0.48	-0.20	<.001	-3.35	0.48	-0.20	<.001
Two times	62	NA	NA	NA	NA	NA	NA	NA	NA

Abbreviation: NA, not available; SE, Standard error.
[a]The B represent the regression coefficients which defined in statistics books.

Table 4. The Relationship Between Demographic and Background Variables and Gingivitis (Using Logistic Regression)

Variables/Categories	Number	Unadjusted				Adjusted			
Educational Grade		Odds Ratio	Lower	Upper	P	Odds Ratio	Lower	Upper	P
Grade 1	178	Ref.	NA	NA	NA	NA	NA	NA	NA
Grade 2	218	0.69	0.45	1.07	.099	1.20	0.60	2.40	.600
Grade 3	164	1.82	1.18	2.82	.007	1.16	0.57	2.34	.676
Grade 4	168	1.27	0.82	1.97	.280	1.14	0.60	2.17	.683
Grade 5	227	0.73	0.48	1.12	.158	0.32	0.17	0.62	<.001
Grade 6	149	1.40	0.89	2.20	.138	1.89	0.94	3.80	.073
Father education									
Illiterate	132	Ref.	NA	NA	NA	NA	NA	NA	NA
Under diploma	332	1.30	0.83	2.03	.245	6.49	3.05	13.81	<.001
Diploma	411	1.88	1.22	2.89	.004	15.91	7.23	34.99	<.001
Academic undergraduate	180	1.26	0.77	2.08	.347	16.06	6.68	38.61	<.001
Academic postgraduate	49	1.69	0.84	3.37	.137	21.62	6.55	71.37	<.001
Mother education									
Illiterate	216	Ref.	NA	NA	NA	NA	NA	NA	NA
Under diploma	428	0.08	0.05	0.12	<.001	0.04	0.02	0.07	<.001
Diploma	314	0.07	0.04	0.10	<.001	0.01	0.01	0.03	<.001
Academic undergraduate	108	0.07	0.04	0.01	<.001	0.02	0.01	0.05	<.001
Academic postgraduate	11	0.00	0.00	NA	.999	0.00	0.00	NA	.998
Number of children									
One	161	Ref.	NA	NA	NA	NA	NA	NA	NA
Two	485	0.66	0.49	0.65	.025	2.12	1.07	4.18	.304
Three	339	0.74	0.59	1.08	.122	3.10	1.24	4.18	.160
Four	94	0.42	0.24	0.74	.003	0.33	0.06	1.67	1.181
Five	25	0.00	0.00	NA	.999	0.00	0.00	NA	.998
Birth rank									
First	332	Ref.	NA	NA	NA	NA	NA	NA	NA
Second	512	0.35	0.26	0.46	<.001	0.23	0.12	0.43	<.001
Third	221	0.36	0.25	0.52	<.001	0.33	0.09	0.54	.001
Fourth	39	0.57	0.29	1.13	.110	1.05	0.14	7.81	.958
Father job									
Employee	341	Ref.	NA	NA	NA	NA	NA	NA	NA
Worker	314	2.39	1.74	3.28	<.001	5.20	2.91	2.28	<.001
Self-employed	379	0.71	0.51	0.98	.041	1.18	0.66	2.08	.573
Unemployed	70	0.16	1.46	0.86	.2477	0.96	1.05	0.14	.7809
Dairy consumption (daily)									
No consumption	374	Ref.	NA	NA	NA	NA	NA	NA	NA
One time	504	1.52	4.15	2.01	.032	4.81	2.84	8.15	.651
Two Times	186	0.56	0.37	0.85	.076	1.66	0.83	3.33	.148
Three Times	40	1.37	0.70	2.68	.348	8.18	3.07	2.82	.243
Brushing (daily)									
No brushing	575	Ref.							
One time	447	0.92	0.71	1.18	.508	1.18	0.79	1.76	.402
Two Times	82	0.22	0.11	0.44	<.001	0.09	0.03	0.27	<.001
Periodic teeth assessment									
No assessment	804	Ref.	NA	NA	NA	NA	NA	NA	NA
One time	238	0.09	0.06	0.16	<.001	0.08	0.04	0.15	<.001
Two Times	62	0.15	0.07	0.33	<.001	0.05	0.01	0.16	<.001

Abbreviation: NA, not available.

5. Discussion

This study was conducted to survey the effects of demographic and background variables on DMFT and gingivitis indicators, among primary school male students in Paveh city, Iran, in 2014. The study findings showed that, while a person needs 3 units of milk and its products, daily consumption of dairy food group in surveyed students is less than once a day, on average. In addition, any person must brush their teeth after eating food and before night sleeping and refer to dentistry every 6 months for examination of oral health status; however, the surveyed students averagely have less than half time brushing in a day and one third time reference to dentistry, annually. It therefore becomes certain that all of these shortcomings led to more oral and general health problems.

In this survey, the DMFT indicator was calculated as 7.91 ± 3.78, where the high number of decayed teeth has most of its effect on this indicator. The high rate of decayed teeth is a symbol of serious problems, such as overlook of students and their parents to oral health and importance of teeth function, especially in primary teeth, majestic deficiency in public education, related to oral health, improperness of Oral Health Plan (a joint plan between Iranian Ministry of Health and Ministry of Education to betterment oral health status of primary health students) and economic problems of families.

The other studies indicated that the rate of DMFT in 6 - 9-year-old children of Mexico, in 2001, was 0.77 (16), in 12-year-old children of Brazil in 2005, was 1.7 (17), in 3 - 5-year-old children of Tehran, in 2003, was 2.45 (18), in grade 3 students of Gonabad, in 2009, was 4.90 (2) and in 12-year-old children of Ardakan in 2001 was 1.45 (19). It is obvious that the surveyed students in current study have worse status than other surveyed children in other studies and their oral health status in not satisfactory.

About one third of participants have symptoms of gingivitis. Moreover, only less than 5% of assessed students have no decay in their teeth and this rate is extremely lower than in other studies, e.g. this rate in 4 - 5-year-old children, in Jordan, is 33% (20), and in Ardakan, is 41% (19).

The survey of effects of demographic and background variable on DMFT, in adjusted form, indicated that all of the assessed variables, except for the number of family children and diary consumption, have a significant relationship with this indicator. The effect of educational level on DMFT in grade 1 is significantly lower than for other grades and shows an increasing trend from grade 1 to grade 3, while a decreasing trend in upper grades is evident, constantly. The reason of this trend can be the gradual decay of teeth, because teeth decay requires a time of 3 to 5 years. At the beginning of primary school period, the teeth are healthier and through time, the destruction and loss of teeth become more important and teeth decay can be increased up to third grade. However, after grade 3, the replacement of primary and permanent teeth accelerate and this factor can lead to decrease in DMFT indicator rate. Another reason for improving the oral health of children after grade 3 can be associated to the gradual growth of knowledge, attitude and skills of child in the field of personal hygiene, particularly in relation to oral health. A study that was done in Mexico showed a similar trend (16). Also, Qandehari Motlaq et al. who surveyed 3 - 5 year-old Tehranian children, confirmed the increasing trend of DMFT with rising age (18).

The survey of the effect of father education on DMFT indicator demonstrates that students with illiterate fathers have about two DMFT units more compared to students whose fathers have academic postgraduate education. Moreover, students with illiterate mothers have higher DMFT than students with mothers who have under diploma and academic undergraduate education respectively, while their DMFT indicator is lower than in students whose mothers have academic postgraduate education. All of these results indicate that parents' educational level, particularly the mother's education has a significant impact on students' oral health status. However, the effects of lack of parents' education on DMFT, in several groups, can be related to the lack of simultaneous growth in parents' education levels and their health literacy, especially in oral health knowledge and ability.

The obtained results show that students who are the first child of the family have higher DMFT than students who are the second and fourth child of the family. The possible reason of this result can be associated with lack of parents' understanding of importance of proper nutrition and oral health and the way of observing them for their first child.

Moreover, the students who have employee fathers have lower DMFT than students with worker fathers, and this can be due to differences in income and health literacy levels of employee and worker fathers. It is clear that because of high price of dentistry services and lack of coverage of these services by health insurance in Iran the low and middle-income people could not received them. Also, we can claim that worker fathers have lower general and health literacy and have lower understanding related to oral health importance, therefore, they do not understand the necessity and importance of primary and permanent teeth health, in their children.

Investigating the statistical relationship between oral health preventive actions and DMFT indicator rate demonstrates that students who have once a day teeth brushing and once a year refer to dentistry for periodic examination, have significantly lower DMFT than students who do not have daily teeth brushing and periodic annual oral health examination by dentist. This fact reflects that the focus on preventive activities in oral health is vital and could not improve oral health status via complex and expensive dental treatment, effectively.

Investigating effects of demographic and background variable on gingivitis, in the adjusted form indicated

that all of assessed variables, except for the number of children of family and diary consumption, have significant relationship with this indicator. The survey of relationship between educational grade variable and gingivitis reveals that risk of gingivitis in grade 1 students is significantly lower than that of grade 5 students. The reason of this finding could be the gradual decay of teeth in higher grades and the impact of the teeth decay on gingivitis rate.

Investigating the relationship of father education and gingivitis shows that rate of gingivitis in students with illiterate fathers is significantly lower than that of the students with literate fathers, in all groups. The reason may be that the health literacy of literate fathers is not developed according to their general education and knowledge. Another reason can be related to increase in working load and responsibilities of fathers with increase in their level of education and decrease in free time to pay attention and address their children's health affairs.

Nevertheless, the students with illiterate mothers have lower gingivitis risk than students with under diploma, diploma and academic undergraduate mothers. It is a fact that the mothers, for reasons, such as having more free time, spend more time with their children and are more sensitive to the health of their children, have greater impact on their children's education, especially in the field of health, comparing with fathers. Therefore, it is clear that a higher level of mother's education and health literacy can have a major impact on children's health.

The results also show that students who are the first child of family have significantly higher gingivitis risk than students who are the second or third child of family. The possible reasons can be associated with lack of parents understanding of proper nutrition and oral health importance and how to observe them for their first child and association between DMFT and gingivitis rate.

In addition, the students who have worker father have 5.2 times more gingivitis risk than students with employee father. The reason of this result can be the high price of dentistry services and lack of coverage of these services by health insurance in Iran and, consequently, failure of low and middle-income people to receive them, S\since the health of the gums and soft tissues of the mouth is directly related to dental health and DMFT.

Investigating the effect of teeth brushing on gingivitis indicator reveals that students who have twice a day brushing have significantly lower gingivitis risk than students who do not have daily brushing. Furthermore, the students who do not refer to dentistry for periodic oral health examination have lower gingivitis risk than students who once or twice refer to dentist. Of course, these findings emphasize the great importance, efficiency, and effectiveness of prevention rather than treatment activities in the field of oral health.

The various national and international studies approve the effect of different variables, such as age and educational grade (16, 18), parents'- specially mother's literacy level (18), father's job (21), family income (6), birth rank (22), teeth brushing and referring to dentistry (23), social and economical situation (24, 25) on children's oral health status and their results have notable conformity with results of the current study.

The researchers have suggestions based on study results, including delivering broad practical instructions in oral health to students and their parents in terms of oral health, brushing and periodic examination of oral health, and suitable brushing methods. Also, special attention should be paid to low income students, who are children of workers and unemployed fathers, by expanding the insurance coverage in oral health therapeutic services.

Because of the importance of oral health and its shocking condition in Iran that weigh up by current and previous study the researchers also give several suggestions that similar studies should be performed in various areas of our country, especially in primary schools, for using their findings and offers for health planning and policy making. Besides, the similar studies in other age, sex, and geological groups can be helpful for promoting community health.

This study has several limitations, including difficulty in the data collection process, because of its large sample size, lack of similar studies in Iran, especially in primary school children for comparison, lack of studies that survey gingivitis to compare with current findings, and lack of studies which do regression modeling to assess relationship between demographic and background variables on oral health indicators.

Furthermore, the research team is criticizing DMFT and its calculation because it gets similar value for decayed, missed and filled teeth. We believe that missed teeth must have the most and filled teeth must have the least value in DMFT calculation, because filled teeth were improved and, usually, have normal lifetime. However, missed teeth were completely lost. The decayed teeth must have moderate value, because is not lost yet and can survive with suitable and on time treatment. Thereafter, the filled teeth must be divided in two groups, including amended filled teeth and root-removed teeth and both should be given different values since the amended teeth can survive normally. Unfortunately, root removed teeth have 5 - 10 years lifetime.

This study indicated that the assessed population has numerous problems in oral health and there are apparent shortages in effective factors, especially in health literacy, oral health skills, preventive services, and financing of dentistry therapeutic services. It is certain that these facts point out to improvement opportunities and can be useful to health planers and policy makers, in Iran.

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Footnotes

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