Epidemiology of dental caries among adolescents in Tamil Nadu, India.

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SUMMARY

Objective: Economic and dietary changes in the Indian state of Tamil Nadu have led to compromised oral health status of the adolescent population. Adequate epidemiological data are not available to address the prevention or treatment needs in this region of India. The study aim was to measure the prevalence and severity of dental caries among adolescents of Tamil Nadu, a southern state of India.

Methods: The aim was addressed by a quantitative cross-sectional study by measuring the Decayed, Missing and Filled teeth index (DMFT) using the WHO oral health survey method in 974 adolescent school students (12-15 year-olds) from both rural and urban areas of Tamil Nadu, India.

Results: The oral health survey indicated that prevalence of dental caries among adolescents in rural and urban areas of Tamil Nadu was 61.4% with an average DMFT score of 2.03. Multiple regression analyses indicated factors such as gender, mother's education, type of school and caste as significant predictors of dental caries.

Conclusion: Females, Scheduled Caste and Tribes attending public schools in rural areas were identified as the more vulnerable populations to be affected by dental caries. Oral health policies should be targeted to these adolescent populations in the Tamil Nadu region.

INTRODUCTION

The prevalence of dental caries is increasing in developing countries, such as India, because of economic growth and changes in dietary habits. In India, community based dental caries prevention has only recently became a priority. The 2002-2003 National Oral Health Survey conducted by the Dental Council of India indicated a dental decay prevalence of 49.8% and mean DMFT (Decayed, Missing and Filled teeth) of 2.5 among 12-year-olds and 3.4 in 15-year-olds [1]. The World Health Organisation and Government of India conducted a more recent multi-centric study (2007) comparing oral health care needs in different states of India, but the state of Tamil Nadu was not included in that study [2]. The distribution of both private and Government dental university hospitals which provide free or inexpensive dental treatments are clustered in the urban areas. In addition, under the 'rural healthcare scheme', 22% of primary health centres are providing emergency treatments, scaling, filling, and extraction free to all age groups by a qualified dentist [3]. Oral health services are not provided in 78% of primary health centres located in rural areas where 65% of the total Tamil Nadu population live [4].

There have been numerous studies conducted in different districts of Tamil Nadu [5-7] but baseline data for both the rural and urban adolescent population were not adequately reported, nor were the data available to understand the distribution of dental caries among different caste categories for the adolescent population. Currently, the Tamil Nadu State Government is in the process of developing and strengthening oral health strategies which includes the addition of dental services to the primary health care centres in Tamil Nadu. Hence, if this population based approach to improving the oral health status of Tamil Nadu is to be evidence informed there is an urgent need to collect baseline and benchmarking data for this purpose.

The primary aim of this study was to determine the prevalence and severity of dental caries among the Tamil Nadu adolescent population to help inform the implementation of effective intervention and oral health prevention strategies. A secondary aim was to determine the differences in dental caries severity and prevalence among different socio-demographic variables such as gender, parent's education and caste/community groups where very little information is available in the literature.

METHODOLOGY

The aim was addressed by a quantitative cross-sectional study by measuring the Decayed, Missing and Filled teeth (DMFT) using the WHO oral health survey method. The adolescent sample (aged 12-15 years) was recruited from private and public schools in urban and rural areas of Tamil Nadu. The current study was aimed at measuring prevalence and severity of dental caries in an adolescent population. In the present Indian education system, students aged 16 years and above sit for the public common exams and it was anticipated that accessing students aged 16 years and above would be logistically difficult. Students with mixed dentition were excluded from the survey which resulted in sample of adolescents aged 12-15 years. A two stage stratified random sampling procedure was adopted for the current study. The schools were stratified by area (rural and urban) and, within a given area; the number of schools were selected by simple random sampling determined by the number of schools in the selected area. The rural participants were recruited from the Thanjavur districts and urban participants from Chennai city.

The participants from the urban population were recruited by selecting five zones from 15 zones in Chennai city. The wards within each zone were randomly selected and then private and public schools in each ward were listed and randomly selected schools were approached for permission to recruit participants. In the Thanjavur district, the schools in three revenue divisions namely: Thanjavur, Kumbakonam and Pattukottai were listed and schools in the urban agglomeration were not included in the list. Eight schools randomly selected in the rural areas agreed to participate in the survey, but only four of the eight randomly selected schools in Chennai district agreed to participate in the dental survey.

All participants belonging to Standards VII, VIII, and IX from the selected schools were invited to participate in the survey and provided with consent and information sheets. Every student invited to participate in the survey consented to participate, that is there were no refusals, hence the participation rate was 100%. If after consenting, they did not meet the inclusion criteria then their data were subsequently removed. About 54 survey forms from 12 and 13 year olds who had mixed dentition were removed.

As it was anticipated that the majority of adolescents would not have had a dental examination while living in rural Tamil Nadu, it was therefore considered a fair, ethical, and equitable practice to examine every student in the selected class. In the current study, 91% of participants reported that they had never been to a dentist nor had any oral health examination previously.

The procedure used in the multi-centric oral health survey [2] for the selection of classrooms within each school was also followed in the current study. If there was only one section for that age group,

that class was included in the survey. If more than one section was in the required age group, a random selection method was used to further select the section to be examined.

Sample size was determined using the formula ($n=Z^2P\ (1-P)/d^2$), where the level of confidence (Z), expected prevalence (p) and precision (d) were inputted into the formula. The conventional level of confidence (Z= 1.96) was chosen to present results in 95% confidence interval (CI). The estimated prevalence rate was not known and 0.5 was used for the calculation as a conservative estimate because it produced the largest sample needed for the study. To obtain a narrow confidence interval (good precision), (d) was decided as 0.05. The estimated sample size was 392 and was rounded up to 400. Hence, it was decided to recruit 400 participants from rural and urban areas separately.

Each statistical tests (such as *t* test, normal curve test, Chi-Square test, ANOVA and multiple regression tests) has its own population effect size (ES). It was proposed to undertake a regression analysis and therefore the sample required for a multiple regression analysis was calculated based on Cohen's table [8]. In the current research, there were seven independent variables. According to Cohen's table, the sample size needed for the test with seven variables was 726 (Effect Size=0.02; Power= 0.80; Significance criterion α=0.05) but the final sample included 974 participants that were examined in the survey. The decision for ethical and practical reasons for including all students from selected classes in the survey resulted in oversampling and increasing the power of the study. The unexpected lack of refusals to participate had the same effect.

The oral examination was performed by following the procedures recommended in *Oral Health Surveys, Basic Methods 4th edition-World Health Organisation* [9]. The WHO oral health assessment form modified by WHO-HQ [10] for *Multi-Centric Oral Health Survey* was used for the oral health survey. The modifications were undertaken in consultation with Professor Poul Erik Peterson, World Health Organisation, Geneva. This manual was a simplified version of *WHO Oral Health Surveys, Basic Methods.* The components in the modified oral health assessment form were: survey identification; extra oral examination; dentition status and dental caries; periodontal status and loss of attachment; oral mucosa and enamel fluorosis. A self-administered questionnaire was distributed to participants prior to the oral helath examination to collect socio-demographic data such as gender, age, father's and mother's education, and community caste. There was some missing data on community caste but this information was received from the teacher.

The DMFT index was used to calculate the prevalence and severity of dental caries. Dental caries in permanent teeth were recorded as present when a lesion was identified in a pit and fissure; on a smooth surface; noticeably softened floor; tooth with temporary filling; tooth with permanent filling and also detectable caries; and root stumps left and caries to be ascertained as emerged from the crown. Oral health examinations were conducted solely by the researcher to maintain consistency in the oral examinations. Two dental house surgeons were recruited to assist the researcher in organising

and recording data during the survey. The oral examination was conducted following appropriate WHO guidelines.

The data were analysed using Statistical Package for Social Sciences (SPSS version 20). First, descriptive analyses were undertaken to determine the prevalence and severity of dental caries and later bivariate and multivariable analyses were conducted to understand the effects of different socio-demographic variables on the prevalence and severity of dental caries.

The research was conducted in full accordance with the *World Medical Association Declaration of Helsinki*. Ethical approvals for the study were received from the Human Ethics Committee, University of Canterbury, New Zealand and from the Institutional Review Board, Sree Balaji Dental University, Tamil Nadu. The project required approval to access students from the school management, head teachers, and parents. A written informed consent was obtained from the parents and the adolescent participants separately before undertaking the oral health examination.

RESULTS

In total, 974 participants aged 12-15 years were recruited from six private and six public schools in two districts of Tamil Nadu.

Results indicated the sample population was representative of the Tamil Nadu population for the categories of caste and parent's education [4]. The male population and 14 year olds were slightly overrepresented. Tamil Nadu education statistics indicates there are more boys than girls both at primary and upper primary levels which explains the over representation of male participants in the sample. Participants who had mixed dentition were mostly among the 12 and 13 year-olds which was an exclusion criterion in the study. A higher school drop-out ratio among the 15-year-olds, especially females, caused over-representation of 14-year-olds and males in the study.

The prevalence and severity of dental caries were calculated and analysed separately to understand the effect of socio-demographic variables on dental caries.

Prevalence of dental decay is measured in adolescents who have dental caries with a DMFT value of more than 0. Results indicated 61.4% (n=598) of adolescents were affected by dental caries, that is one out of three adolescents did not have any caries which included decayed teeth, missing teeth due to decay and filled teeth. Frequency analysis indicated the prevalence of dental caries was higher for adolescents who were: 14 years of age, their father's and mother's education was below 8th standard, females and those who belonged to the community group Scheduled Caste and Scheduled Tribes. The

Pearson Chi-Square analysis indicated a strong statistically significant correlation between all socio-demographic variables and the prevalence of dental caries. The age of the participants was not associated with the prevalence of dental caries (See Table 1).

A binary logistic multiple regression analysis (Table 2) was performed to understand the predictors of dental caries among different socio-demographic variables by creating a dichotomous binary variable based on who had (DMFT>1) and who did not have (DMFT=0) dental caries experience. The results (Table 2) indicated that the caste and the type of schools were the major predictors of prevalence of dental caries. The odds ratio suggested that the Most Backward Caste (1.081 times) and Scheduled Caste/Tribes (1.793 times) participants were most likely to be affected by dental caries when compared to Backward Caste. The public school participants were 1.696 times more likely to get dental caries compared to private school participants.

The severity of decay is measured by mean DMFT value (scored between 0 and 32), with the higher the value, the higher the severity of disease. The mean DMFT score for the total sample was 2.03 with a standard deviation of 2.30 and median of 1. The total number of teeth affected by dental caries was 1980 in the total sample and 98.6% of affected teeth were decayed and needed further treatment to protect the teeth. Only 21 out of 1980 teeth were filled. In the total sample, 91% of participants reported that they have never been to a dentist.

The independent *t*-test (Table 3) was used to measure the association of DMFT scores with gender (male-female), type of school (private-public) and location of school (urban-rural). The association for categories with greater than two variables namely: age, father's education, mother's education and caste were measured using the ANOVA test. The categories such as female, 15 year olds, participants who reported as not having a father or mother, scheduled caste or tribes, participants studying in a rural school and public schools had more severe dental caries compared to other categories within each variable. The bivariate analyses indicated that the differences in the DMFT scores between the different categories of socio-demographic variables were statistically significant (Table 3).

Multiple linear regression analysis (Table 4) was performed with preliminary analyses carried out using linear regression with each variable in turn. These all showed a significant relationship for all predictor variables. Hence, all predictor variables were included in the model at the same time rather than using a stepwise regression method. A second reduced model analysis (Table 4) was performed by forcing only those predictor variables which resulted in a significant beta coefficient in the first model. The predictor variables used in the final reduced model were mother's education, caste and gender.

The resulting R-square value was 0.066 which was expected to be lower for the developed model due to reduced variability for the dependent variable (DMFT Score). Even though the DMFT score could fall between 0-32, the range in the current study was 0-9 which reduced the variability of

dependent variable. Field and Miles [11] indicated that in a regression model with little variability and low R-square value there would still be a meaningful result, if the F value is significant. The F ratio for the developed model is highly significant ($F=8.036$; $p<0.001$), the highly significant p value indicates a real relationship between the predictors and the dependent variable. This result indicates that the DMFT scores decrease with an increase in mother's highest level of education but by comparison belonging to the Scheduled Caste/Tribes and Most Backward Caste increases severity of dental caries. Gender was identified as a predictor of dental caries severity with a significant and negative beta coefficient value for the males, which denotes that being male decreases the chances of getting more severe dental caries compared to being female.

DISCUSSION

Results indicate that prevalence of dental caries was 61.4% and the mean DMFT was 2.03. Compared to developed countries the prevalence and severity of dental caries is higher [12-15] which is most likely due to a lack of oral health services and water fluoridation in the state of Tamil Nadu, India. The DMFT reported in the current study was compared with DMFT average of six regions of WHO reported in da Silveira Moreira's study[15] . The mean DMFT score reported in the current study was higher than four regions (West Pacific, East Mediterranean, Europe and South East Asia) and less than DMFT reported for American and European countries. Compared to other South-East Asian countries, the severity is higher in the current study [16]. At present, India is growing in a similar way that developed countries did in 1970, in terms of economic growth, and increasing dental caries prevalence is a negative outcome of this economic growth. The Indian government recognizing this is seeking to promote oral health services to address the issue.

When the current study results are compared to the multi-centric study for 15 year olds [2], the current study's result is higher compared to six sites, namely Arunachal Pradesh, Delhi, Maharashtra, Rajasthan, Orissa and Utter Pradesh and lower than that reported for Puducherry. This could be due to the highly westernised diet resulting from the French influence in this area. A comparative analysis of DMFT average reported in other recent studies conducted in different parts of India [2, 17], including Tamil Nadu, with the findings from the current study is presented in Figure 1. Figure 1 indicates that the DMFT score reported for each state has increased after the 2007 Multi-centric study, indicating oral health status is deteriorating overall. The DMFT reported in the current study (2.04) is second only to Maharashtra in 2012 (2.66). An increase in the mean DMFT score is observed throughout India and this is likely because of the urbanisation of India and a lack of awareness about how to prevent oral health diseases while adopting an increasingly westernised diet.

Compared to other states of India, the prevalence of dental caries is higher in Tamil Nadu. The current study sample has the lowest reported prevalence rate among those reported by other authors

for the Tamil Nadu region but in those studies, participants were drawn from a younger age. Participants who had only permanent teeth were recruited for the current study and newly erupted permanent teeth are less affected by decay than deciduous teeth which have been exposed to the oral environment for a longer time. A recent study conducted by Moses et al. [18] reported a prevalence rate (63.83%) closest to the current study and of note is that it is the only recent study that included 15-year-olds from the Tamil Nadu region.

The effect of gender, parental literacy, community, location and the type of the school on the prevalence and severity of dental caries are discussed below.

The dental caries prevalence and DMFT score were both higher for female participants compared to their male counterparts and the results were statistically significant. These results were comparable with the findings reported in the studies conducted in both rural and urban areas of India [6, 19]. Females in rural areas were more affected when compared to their urban counterparts. This might be due to less access to nutritious food for females in rural areas when compared to males and urban females because sons are considered more important for the family compared to daughters. This cultural belief is more common among the families in rural areas when compared to urban areas. A nutritional study conducted among adolescent girls in rural areas indicated that thinness and stunted growth are more common in girls and as were the related nutritional disorders such as anaemia, dental caries and angular stomatitis [20]. In the current study available data was not sufficient for further interpretation and explanation of gender disparity related to cultural beliefs and behaviours. More in-depth nutritional and parental attitude based data will be needed to examine this phenomenon.

A strong negative correlation was identified between the parental level of education and dental caries prevalence rate and DMFT scores. This result also indicated that a mother's education level is far more important than the father's educational level for an adolescent's oral health. This might indicate that a mother is more likely to educate a child about oral health hygiene practices than is a father, and this effect is mediated by the mother's educational attainment and associated health literacy. This result is highly significant because the drop-out ratio for female students increases after upper primary school and the Gross Enrolment Ratio in higher secondary school and at university level is very low for women when compared to men. A common cultural belief is that formal education is not as important for women because of the expectation they ought to become mothers.

The dental caries in rural participants (64.3%; DMFT value 2.22) was higher than urban participants (58.09%; DMFT value 1.84) with these differences being statistically significant. The prevalence and severity of dental caries was expected to be different between rural and urban areas due to differences in social class, population density and availability of oral health services. Comparing these differences provides important information to influence health policy, planning and decision making. This result is consistent with the multi-centric Indian study results [6]. Research relating to India and the wider

international context [21], has consistently reported higher dental caries prevalence and severity in rural populations [14, 22]. A higher literacy rate among parents in Chennai, compared to the rural areas, combined with greater access to oral health services were the most likely explanations for the lower reported prevalence and severity of dental caries in the urban areas.

A statistically significant difference was reported in prevalence and severity of dental caries between private schools (54.61%: DMFT 2.19) and public schools (68.81%; DMFT 2.64). One of the major reasons behind the difference in prevalence percentage between private and public school participants is the underlying difference in socio-economic status between these schools. Another possible reason is 60% of the sample participants were from the Scheduled Caste and Tribes community studying in public schools and this caste category was also shown to be an important predictor of prevalence of dental caries.

The caste had a strong impact on dental caries in the adolescent population. The Indian Government divides various caste categories into Forward Caste (FC), other Backward Castes (BC), Most Backward Castes (MBC), Scheduled Castes (SC) and Scheduled Tribes (ST). The Scheduled castes (SC/ST) populations were the official definition given to various caste categories that are historically disadvantaged in the Indian community. In the current study, Scheduled Caste and Scheduled Tribes were grouped together due to very few participants in the Scheduled Tribes category. The prevalence of dental caries in Forward Caste adolescents was the lowest of all categories (51.7%) and prevalence was highest for Scheduled Caste and Tribes community (71.8%) which is considerably higher than other castes. The Most Backward Caste and Scheduled Caste were 1.08 and 1.79 times, respectively, more likely to get dental caries. The result implies that the Scheduled Caste and Tribes community are vulnerable populations. Out of 273 Scheduled Caste and Tribes participants in the study sample, about 71.8% had dental caries that is 1/3 of total affected sample population. This result was confirmed in the logistic multiple regression analysis and Scheduled Caste/Tribes category was shown as a significant predictor of both prevalence and severity of dental caries when controlling for other socio-demographic variables. Lack of education and poor economic status for many years have placed these populations' oral health under scrutiny. There are various policies in India to enhance Scheduled Caste' or Tribes' health, education, social and economic status, but there are no policies that focus in particular on the Scheduled Caste and Scheduled Tribes population in regard to oral health.

Although the study was carefully designed and accomplished its aims, there were a couple of unavoidable limitations. The urban participants were recruited from four schools rather than the proposed sample of eight schools because of issues in gaining permission from some of the schools. Recruiting participants from the sample of eight schools, as proposed, would have covered the majority of suburbs in Chennai city and would have provided a truly representative sample of the total adolescent population in Chennai. Future research should receive permission from Tamil Nadu

Education Department with a list of schools randomly selected, who could then be advised of the study. This process would increase the chances of securing support from the schools, particularly those in urban areas.

The majority of participants who reported that they did not know their parents' level of education also had more dental caries. It was assumed that these parents are illiterate and that the participants did not want to report this sensitive information. Future studies should be more carefully designed to better collect parental educational status because there is a high correlation between parents' educational attainment and adolescents' oral health literacy/oral health status.

CONCLUSION

This research has identified two groups in Tamil Nadu as vulnerable populations that are likely to be most affected by dental caries; those who attend public schools in rural areas and who are either females (child and adolescent), and/or children/adolescents who are a member of a Scheduled Caste or Scheduled Tribes community. The oral health policies targeting the Scheduled Caste and Scheduled Tribes population, which includes 25% of total Indian population, would make a huge positive impact in the community because 33% of the affected population in the current study were from these communities.

Future studies are required to better understand the existence of the reported gender disparity and its effect on nutritional based oral health issues among females in rural parts of Tamil Nadu. The relationship between caste and dental caries has rarely been studied and future dental caries epidemiological studies conducted in India should consider caste as an important predictor. This would help policy makers to identify at risk groups and provide better access to oral health services for lower caste populations throughout India. Decreasing the school drop-out ratio for females, improving the overall literacy rate and increasing university enrolment could also promote improved oral health outcomes in Tamil Nadu. Economists and Sociologists in India have not made a connection between women's education and child health. The strong relationship between a mother's education and her child's health should be better understood by policy makers and the current policies on decreasing female dropout ratio could be strengthened.

The study results imply that future oral health policies in Tamil Nadu should concentrate more on females living in rural areas and attending public schools and the Scheduled Caste/ Tribes population living in both rural and urban areas of Tamil Nadu to improve oral health outcomes in these communities.

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408 **Table 1: Prevalence percentage and mean DMFT for different Socio-demographic variables**

Category	Frequency	Prevalence of Dental Caries in Adolescents (%)		DMFT score	
		n (%)	X^2 (p)	Mean	SD
Total Sample	974 (100)			2.03	2.30
Gender					
Male	542 (55.6)	317 (58.5)	4.364	1.76	2.12
Female	432 (44.4)	281 (65.0)	(0.037)*	2.39	2.50
Age					
12 years	23 (2.4)	12 (52.2)	1.802 (0.615)	1.57	1.93
13 years	224 (23.0)	133 (59.4)		1.75	2.08
14 years	529 (54.3)	333 (62.9)		2.12	2.31
15 years	198 (20.3)	120 (61.9)		2.22	2.61
Father's/Male Guardian's highest level of education					
8th standard or below	258 (26.5)	173 (67.1)	19.383 (0.002)**	2.31	2.35
10th standard	228 (23.4)	150 (65.8)		2.14	2.28
12th standard	108 (11.1)	67 (62.0)		2.13	2.43
University	274 (28.1)	139 (50.7)		1.50	2.01
No Father/guardian	32 (3.3)	22 (68.8)		3.16	3.15
Don't know	74 (7.6)	47 (63.5)		2.18	2.47
Mother's/Female Guardian's highest level of education					
8th standard or below	336 (34.5)	227 (67.6)	26.512 (0.00)***	2.40	2.43
10th standard	181 (18.6)	117 (64.6)		2.03	2.33
12th standard	129 (13.2)	71 (55.0)		1.74	2.07
University	210 (21.6)	102 (48.6)		1.39	1.95
No Mother/Guardian	15 (1.5)	12 (80.0)		3.13	2.61
Don't Know	103 (10.6)	69 (67.0)		2.44	2.56
Community					
Forward Caste	60 (6.2)	31 (51.7)	19.887 (0.00)***	1.70	2.21
Backward Caste	443 (45.5)	249 (56.2)		1.65	2.06
Most Backward	198 (20.3)	122 (61.6)		2.19	2.52
Scheduled Caste & Tribes	273 (28.0)	196 (71.8)		2.64	2.46
Location of school					
Rural School	516 (53.0)	332 (64.3)	4.015 (0.026)*	1.70	2.39
Urban School	458 (47.0)	266 (58.0)		1.65	2.24
Type of school					
Private School	509 (52.3)	278 (54.6)	20.675 (0.000)***	2.19	2.13
Public School	465 (47.7)	320 (68.8)		2.64	2.47

409 Key: *$p < .05$; **$p < .01$. ***p<0.001

Table 2: Multiple variable Binary Logistic Regression analysis for Prevalence of dental caries

	B	S.E.	Wald	Sig.	e^B	95% C.I. for EXP (B)	
						Lower	Upper
Type of School (Public -1; Private-0)	.35	.17	4.06	.044*	1.42	1.01	2.00
Caste			10.24	.017*			
BC	Reference Category						
FC	.12	.29	.18	.67	.944	.64	2.02
MBC	.08	.18	.21	.65	1.08	.76	1.56
SC/ST	.54	.17	9.8	.002**	1.71	1.22	2.40
Constant	-.71	1.36	.28	.59	.48		

Note: Controls are Father's and Mother's education, Location of school, Age and Gender (omitted from the table due to non-significant Beta value). e^B = exponentiated *B*. For caste variable, Backward caste is the reference category. The type of school was coded 1 for Public school and 0 for private school

*$p < .05$. **$p < .01$.

419 **Table 3: Bivariate analysis between DMFT scores and different socio-demographic variables**

***t*-test**								
Category	**DMFT score**		**Leven's Test for equality of variance**		***t*-test for equality of means**			
	Mean	Standard deviation	F	p	Equal variance assumed		Equal variance not assumed	
					t	p	t	p
Gender								
Male	1.76	2.12	26.65	.000*	-		-4.189	0.000*
Female	2.39	2.50						
Geographic location of school								
Rural School	1.70	2.39	2.71	0.10	2.52	0.01*	-	
Urban School	1.65	2.24						
Type of school								
Private School	2.19	2.13	15.71	0.000*	-		-4.875	0.000*
Public School	2.64	2.47						

ANOVA test					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Age					
Between Groups	40.06	4	10.05	1.863	.115
Within Groups	5208.29	969	5.37		
Father's highest level of Education					
Between Groups	144.95	5	28.98	5.499	.000*
Within Groups	5103.41	968	5.27		
Mother's highest level of Education					
Between Groups	177.32	5	35.46	6.770	.000*
Within Groups	5071.03	968	5.23		
Community					
Between Groups	178.36	3	59.45	11.375	.000*
Within Groups	5069.98	970	5.22		
Total	5248.35	973			

420 **Table 4: Multiple Variable Linear Regression analysis for DMFT scores**

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	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.341	.178		13.154	.000
Gender (F=0;M=1)	-.553	.147	-.118	-3.777	**.000****
Mother's Education					
8th Standard	Reference Category				
10th standard	-.275	.209	-.046	-1.313	.189
12th standard	-.556	.235	-.081	-2.367	**.018***
College	-.880	.210	-.156	-4.196	**.000****
No mother	.436	.599	.023	.728	.467
Don't know	-.054	.255	-.007	-.213	.831
Community					
Forward Caste	.335	.323	.035	1.036	.300
Backward Caste	Reference Category				
Most Backward Caste	.386	.196	.067	1.969	**.049***
Scheduled Caste/Tribes	.792	.177	.153	4.468	**.000****

a. Dependent Variable: DMFT

b. Predictors: (Constant), Mother's Education, gender and caste

**$p < 0.05$. ***p<0.001

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424 **FIGURE LEGEND**

425 **Figure 1 DMFT average in the current study and other recent studies in India**