

Dental Caries Status and Barriers For Under Utilization Of Dental Care among 5-13 Year Old Children in the Town Of Vikarabad.India

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Abstract: Dental caries is rapid emerging oral health problem amongst children of India. It incidence varies from 31 to 89% in different states of India. The present study carried out with twin objective of evaluating dental caries in 5- 13-year-old children in one part of rural India and also to assess various barrier factors for under utilization of dental services among population. The caries prevalence was noticed 48.24% with mean 1.0010 ± 1.3498 and is significantly related to father's occupation, total family size. The caries prevalence was high among the children whose fathers were agriculturists and daily wage farm laborers and directly proportional to the size of the family. The main barrier factors for underutilization of dental services were, it is causal attitude of parents toward dental problems with the assumption that dental diseases are not life threatening and in convenient timing hours for dental treatment compared to treatment cost.

Key words: Dental caries, Children, Prevalence and Family.

I. Introduction

India is developing country facing many challenges in rendering oral health care to masses. As per censuses of 2001, a majority of Indian population i.e. 70-72% reside in rural areas, of which more than 40% are children [1,2]. By and large these children from rural areas tend to be more vulnerable to oral diseases due to various social, economic and demographic factors like lack of awareness, lack of transportation, limited access to professional dental care, lack of perceived need for dental care, language and cultural barriers. A number of epidemiological surveys conducted in Indian context indicate that caries is still prevalent and is major health problem. Therefore efforts are required to improve the oral health of school children. Time and again it has been proven that

schools can provide an ideal platform for the promotion of oral health. At the global level, approximately 80% of children attend primary schools and children spend considerable period of their lifetime in the school right from their childhood to adolescence. This period has a special importance in their growing age, as they are particularly receptive during this phase. It is very important to target oral health education to the children since the lifestyle and hygiene practices once established at an early age can go a long way in spending rest of the life in a healthy way. They should be empowered to take control of their own health early in their lives and encouraged to develop positive attitude towards preventive measures.

Oral health educational programmes implemented through schools have the additional advantage of imparting primordial and primary preventive instructions to all the children of all socio-economic status. Based on this background, the present cross sectional study was done to determine dental caries status in 5-13 year old school children in Vikarabad. Andhra Pradesh, INDIA and also assess the access to dental care. This consists of a close-ended questionnaire, which is in English, and local languages to evaluate various barrier factors in the utilization of dental services, which was filled by the child, care givers.

Aims Of The Present Study:

- Establish the base line data of dental caries status among 5-13 year old children in the town of Vikarabad. INDIA.
- To assess barriers influencing dental care utilization among the population

Objectives Of The Present Study:

- Assess dental caries prevalence in children using the DMFT/dft recording index.
- assess the access related factors influencing dental health care utilization. To through a self formatted questionnaire.

Methodology:

Study Area: The present study was conducted in dental institute by name Sri Sai College of Dental Surgery in the Department of Pedodontics and Preventive dentistry. The dental institute is located in Vikarabad. Andhra Pradesh. INDIA.

Study Population:

The study population comprised of 2,025 children from 5 years to 13 years of age, all children hailed from both private and government schools in Vikarabad.

Study Design:

This is a cross-sectional study. The dmft/DMFT recording is done by single calibrated examiner using mouth mirror and CPI probe according to criteria dentition status outlined in the basic oral health surveys 1997 [2]. The examination recorded tooth status recorded tooth status as falling into one of the categories: untreated cavities, missing, restored sealants, non-restorable / extraction and secondary caries in a dmft/DMFT index [annexure 1]. A self designed closed ended questionnaire which was in both Telugu and Urdu, both local languages' given to each child and they were asked to get it filled by their respective parents and bring it on the next day Examiner collected the forms nextday [annexure 2].

Sampling Procedure:

A multistage stratified random sampling procedure was employed. Selection of schools: A list of schools located in all the villages in VikarabadMandal was obtained from the district educational department officer. The samples were divided in to 9 groups based on their age and each age group consisted of 225 children. A total of 15 schools were randomly selected from 15 selected villages' all over Vikarabadmandal.

Approval From The Authorities:

Permission to conduct the study was obtained from all the concerned authorities viz.

1. Ethical committee of the Institution [ANNEXURE -3]
2. Mandal Education Officer, Vikarabad, INDIA [ANNEXURE-4]

Instruments And Material:

- 1) Plane mouth mirrors.
- 2) Community Periodontal Index probes.
- 3) Tweezers.
- 4) Head light/torch
- 5) Kidney trays.
- 6) Gauze and cotton rolls.
- 7) Gloves and mouth mask
- 8) Chittle's forceps
- 9) KorsolexBoherbad

Infection Control:

Instruments were sterilized in the department in the autoclave before every visit to the school. Spot sterilization was done during the study using chemical sterilizing solution – Korsolex (teraldehyde – 7.0 grams, 6-Dihydroxy 2, 5- Dioxahexane and polymethyl urea derivatives – 17.6grams) was diluted with 9 parts of clean tap water into which the instruments were immersed for a minimum of 30 minutes and then washed and rinsed well before being reused. Disposable masks and gloves were used for the examination.

Examination Method:

The examination was carried in the school premises. The examination was carried out in the natural light using mouth mirror and CPI probe. The recording clerk recorded the scores as the examiner examined the subjects.

Statistical Analysis:

The data collected was compiled, tabulated and subjected to statistical analysis using Statistical Package for Social Sciences (SPSS version 14). The quantitative data was summarized using means and standard deviations and qualitative data was summarized using frequencies, percentages and ranges.

Results Observations From Tables And Graphs:

The prevalence of dental caries epidemic estimated to be affecting 48.24 % of the population of the geographical area of Vikarabad, India.

Table 1: Table 1 depicts the caries prevalence of children. Out of 2025 children, 1048 are without caries (51.80%) and 977 were experienced caries (48.20%). The total mean dmft/DMFT is 1.0010+₋1.3498 and the prevalence rate is 48.24%.

Table 2 And Graph 1: Describes the Comparative evaluation of the relationship between profession of the parents and prevalence of dental caries. The relationship between profession of the parents and caries prevalence of children was found to be statistically significant in ANOVA test with the p value <0.001.

Table 3 And Graph 2: Describes Relationship between parental income and prevalence of dental caries in children. The relationship between parental income and prevalence of caries was found to be non significant in ANOVA test with the value of 0.465.

Table 4 And Graph 3: Describes the relationship between number of family members in a family and prevalence of caries. The relationship between family member's structure and the caries prevalence is found to be significant in ANOVA test with the value of 0.003, with p <0.05.

Table 5 And Graph 4: Describes the relationship between numbers of working hours of parents to prevalence of dental caries. The relationship between the number of working hours of the parents to the prevalence of dental caries in children was found to be non significant in ANOVA test with the p < 0.3.

Table 6 And Graph 5: Describes the relationship between nearest hospital available in to prevalence of dental caries. The relationship between nearest hospital available to parents and the prevalence of dental caries is found to be statistically significant in ANOVA test with the p value < 0.001.

Table 7 And Graph 6: Describes the relationship between distances to the hospital in kilometers to the prevalence of the caries. The relationship between distance to the hospital in kilometers and the caries prevalence in children is found statistically non significant in ANOVA test with the value of 0.15.

Table 8 And Graph 7: Describes the relationship between convenient modes of transport to the hospital to the prevalence of dental caries. The relationship between the convenient mode of transport and prevalence of dental caries is found to non-significant in ANOVA test with the value of p < 0.528.

Table 9 and Graph 8: Describes the relationship between convenient timing hours for treatment and prevalence of dental caries. The relationship between the convenient timing hours and prevalence of dental caries is found statistically non-significant using ANOVA test with the value of p < 0.46.

Table 10 And Graph 9: Describes the relationship between barriers to underutilization of dental services to the prevalence of dental caries. The relationship between the barriers for underutilization and prevalence of dental caries is found to significant using ANOVA test with the value of p < 0.001.

Table 11: Correlation analysis between different factors with profession of the father, annual income, total family members, working hours of parents, nearest hospital available to population, distance to nearest hospital, convenient timing hours and convenient mode of transport to the dental caries experience (dmf index scores) by Spearman's rank correlation coefficient method. The statically significant correlations found between mean dmft and profession of the father, nearest hospital available and main barrier for underutilization with significant values of 0.0020, 0.0002 and 0.0059 respectively.

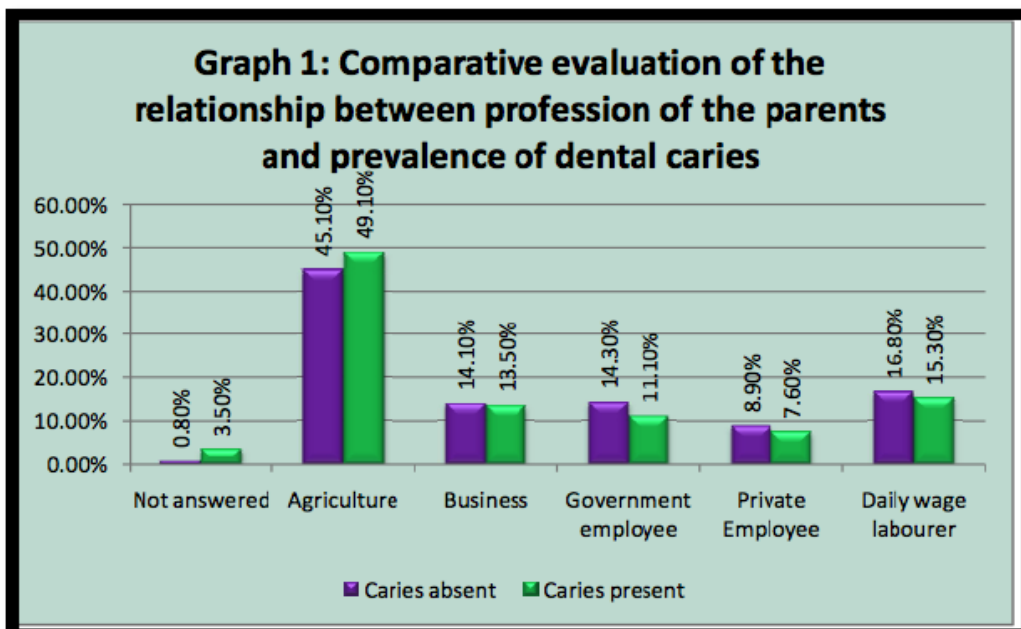
Table 12: Multiple logistic regression analysis is done to evaluate with the mean dmft and association with different factors like annual income, profession of the father, total family members in the family, nearest hospital available to subjects, working hours of parents and convenient mode of transportation and statistically significant relationship is found between nearest hospital and mean dmft in children with the significant value of 0.0180.

TABLE 1- Prevalence of dental caries.

Dental caries	No of respondents	% of respondents
Without caries	1048	51.80
With caries	977	48.20
Total	2025	100.00
Mean dmf	1.0010	
SD dmf	1.3498	
Prevalence	48.24%	

TABLE 2 –Comparative evaluation of the relationship between profession of the parents and prevalence of dental caries.

Profession of the parents	Number of children	Caries free children (%)	Caries experienced children (%)	P value
Did not answer	42	8 (19.0)	34(80.9)	< 0.001 *
Agriculture (1)	952	473 (49.6)	479(50.3)	
Business (2)	280	148(52.8)	132(47.1)	
Government (3) employee	258	150(58.1)	108(69.7)	
Private employee (4)	167	93(55.6)	74(44.3)	
Daily wage labourer (5)	325	176(54.1)	149(45.8)	



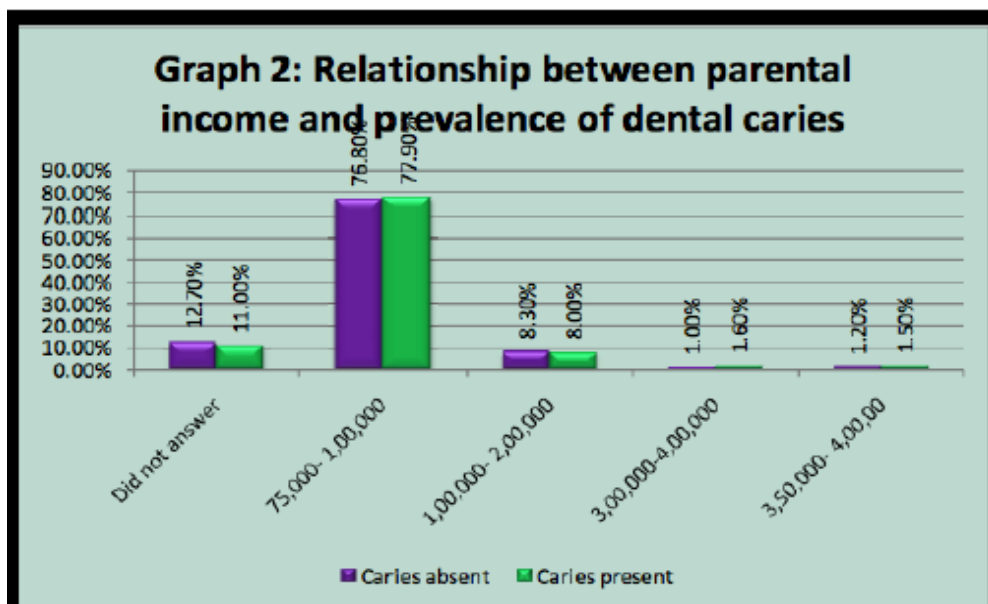


Table 3: Comparative evaluation of the relationship between parental annual income and prevalence of dental caries.

ANNUAL INCOME OF THE PARENTS	NUMBER OF CHILDREN	CARIES FREE CHILDREN (%)	CARIES EXPERIENCED CHILDREN (%)	P-VALUE
DID NOT ANSWER	240	133(55.4)	107 (44.5)	0.456
75,000- 1,00,000 RUPEES	1566	805 (50.4)	761 (48.5)	
1,00,000- 2,00,000 RUPEES	165	87(52.7)	78(47.2)	
2,00,000-3,00,000 RUPEES	26	10 (38.4)	16(61.5)	
3,00,000-4,00,000 RUPEES	28	13 (46.4)	15(53.5)	

Table 4- comparative evaluation of the relationship between family members and the prevalence of dental caries:

Members in the family	Number of children	Caries free children	Caries experienced children	P – value
Did not answer	19	5 (26.3)	14(73.6)	0.003*
2-3 (1)	254	177(69.6)	137(53.9)	
3-4 (2)	672	331(49.2)	341(50.7)	
4-5 (3)	1019	535(52.5)	484(47.4)	

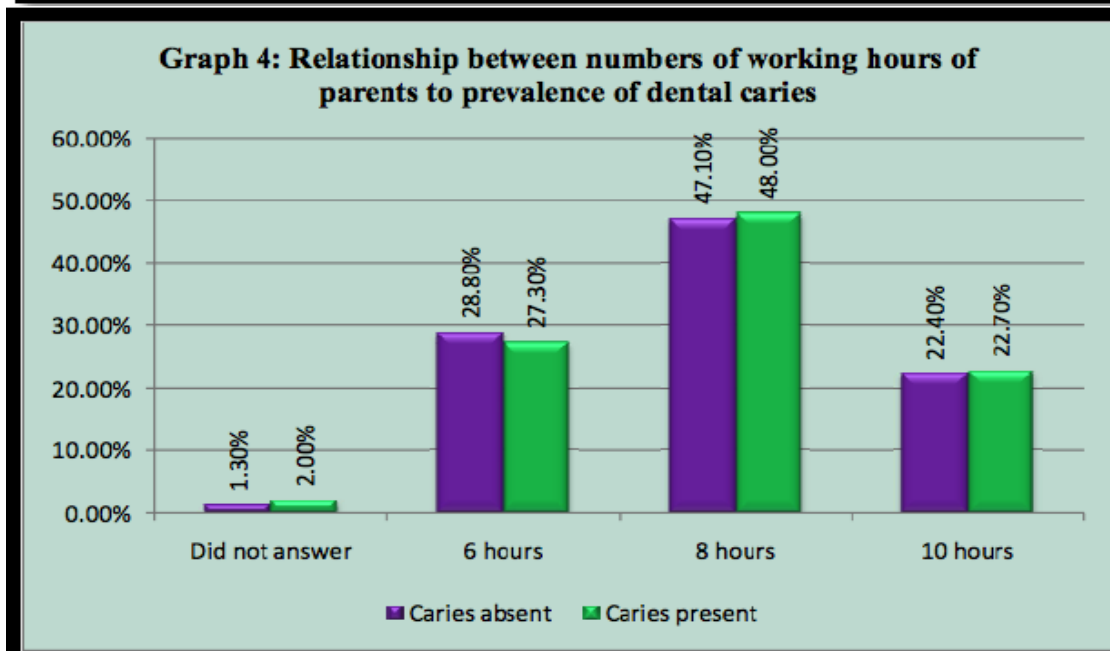
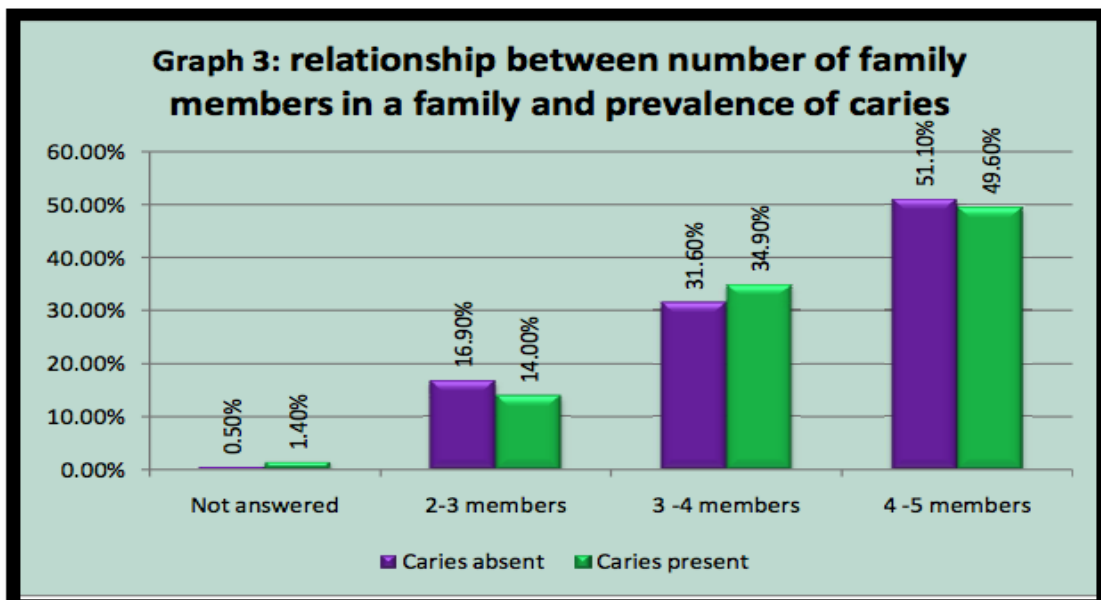


TABLE 5 : Comparative evaluation of the relationship between numbers of working hours of parents to prevalence of dental caries.

Number of working hours	Number of children	Caries free children (%)	Caries experienced children (%)	P VALUE
Did not answer	34	14(41.4)	20(58.8)	0.3
6 hours	568	302(53.1)	266(46.8)	
8 hours	962	493(51.2)	468(48.6)	
10 hours	460	235 (51.0)	222 (48.2)	

Table 6: Comparative evaluation of relationship between nearest hospital available in to prevalence of dental caries.

Nearest hospital	Number of patients	Caries free children	Caries experienced children	P value
Did not answer	90	32(35.5)	58(64.4)	<0.001*
Government hospital (1)	531	244(45.9)	287(54.0)	
Private hospital (2)	442	236(53.3)	206(46.6)	
Private college (3)	292	165(56.5)	127(43.4)	
Medical doctor (4)	63	42(66.6)	21(33.3)	
Dental doctor (5)	316	174(55.0)	142(44.9)	
Do not know (6)	290	155(53.4)	135(46.5)	

Table 7: Comparati ve evaluation of the relati onshi p between distances to the hos pital in kilometers to the prevalence of the caries.

Distance to the nearest hospital	Number of patients	Caries free children	Caries experienced children	P – value
Did not answer	132	29(21.96)	33(25.0)	0.15
10-20kms (1)	1588	806(50.75)	782(49.24)	
20-30kms (2)	217	123(56.68)	94(43.31)	
30- 40kms (3)	157	90(57.32)	67(42.67)	

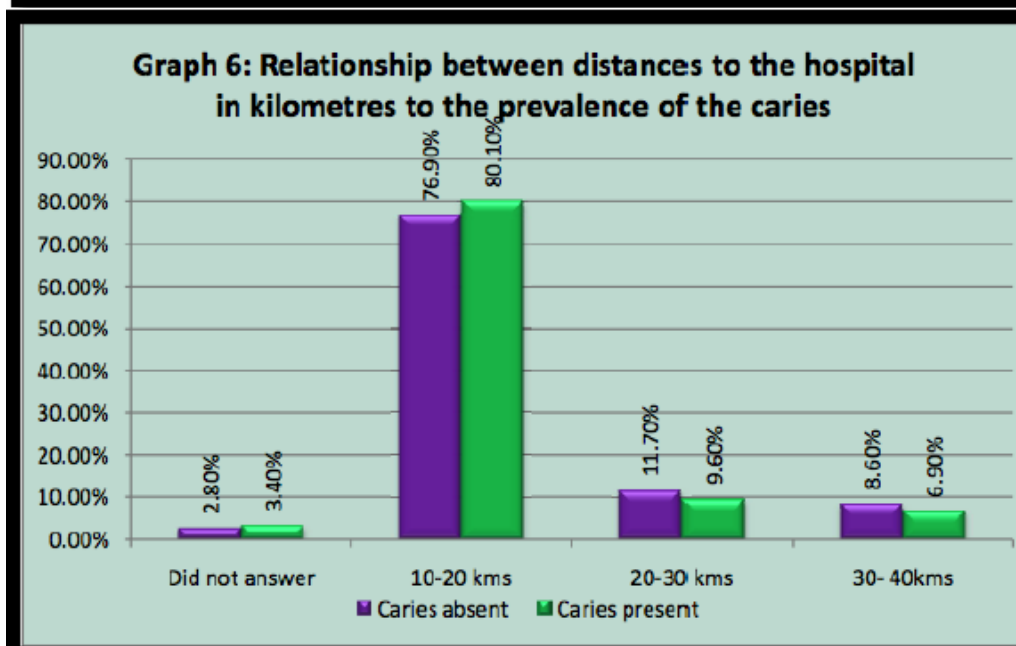


Table 8– comparative evaluation of the relationship between convenient modes of transport to prevalence of dental caries.

Mode of transport to nearest hospital	Number of children	Caries free children	Caries experienced children	p-value
Did not answer	21	13(61.9)	8(38.0)	0.528
APSRTC BUS (1)	764	380(49.7)	384(50.2)	
Private bus (2)	161	92(57.1)	69(42.8)	
Auto (3)	812	425(52.3)	387(47.6)	
Personnel vehicle (4)	193	101(52.3)	92(47.6)	
On foot (5)	71	36(50.7)	35(49.2)	

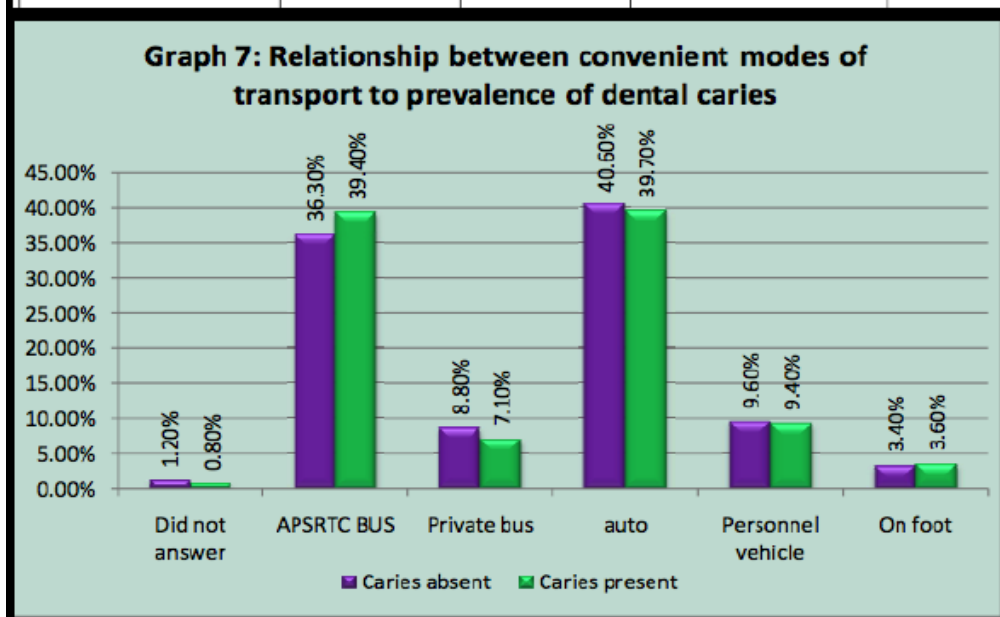


Table 9 - comparative evaluation of the relationship between convenient timing hours for treatment to the prevalence of dental caries .

Convenient timing hours	Number of children	Caries free children	Caries experienced children	p-value
Did not answer	64	36(3.4)	28(2.9)	0.05*
Morning hours (1)	1066	558(53.2)	508(52.0)	
Afternoon hours (2)	376	187(17.8)	189(19.4)	
Evening hours (3)	500	254(24.2)	246(25.2)	

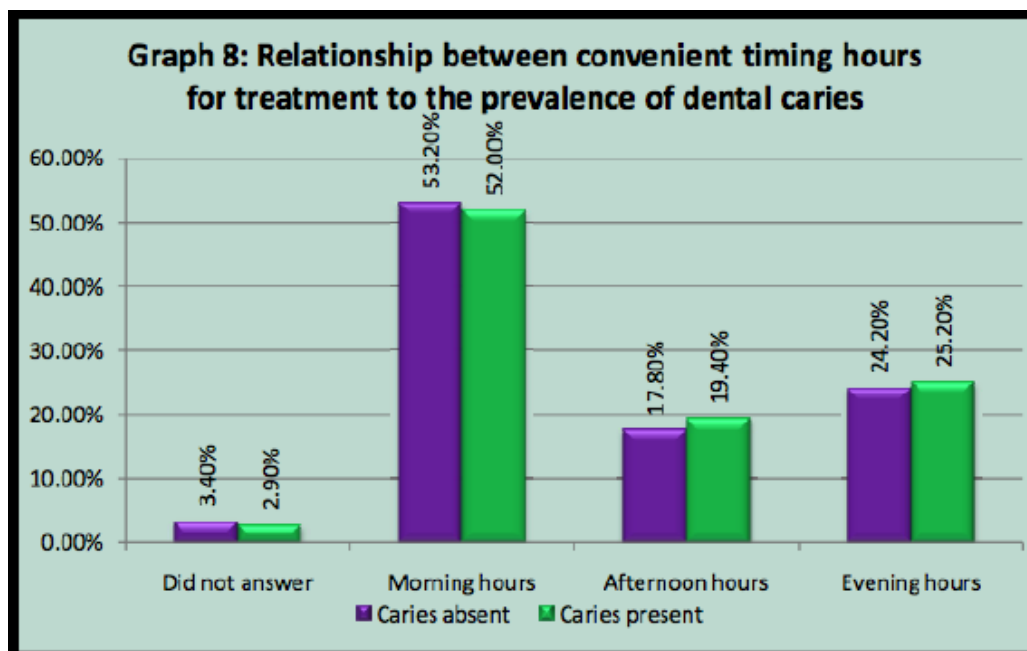


Table 10– Comparative evaluation of the relationship between underutilization of dental services to the prevalence of dental caries.

Barriers for under utilization	Number of children	Caries free children	Caries experienced children	P - value
Did not answer	81	29(35.8)	52 (62.9)	<0.001*
Dental diseases are not life threatening attitude (1)	434	209(48.1)	225(51.8)	
Could not afford financially (2)	679	349(58.0)	330(48.6)	
Timings are not convenient (3)	716	417(58.2)	299(41.7)	
No proper mode of transport (4)	77	32(41.5)	45(58.4)	
Not happy with the doctor (5)	37	12(32.4)	25(67.5)	

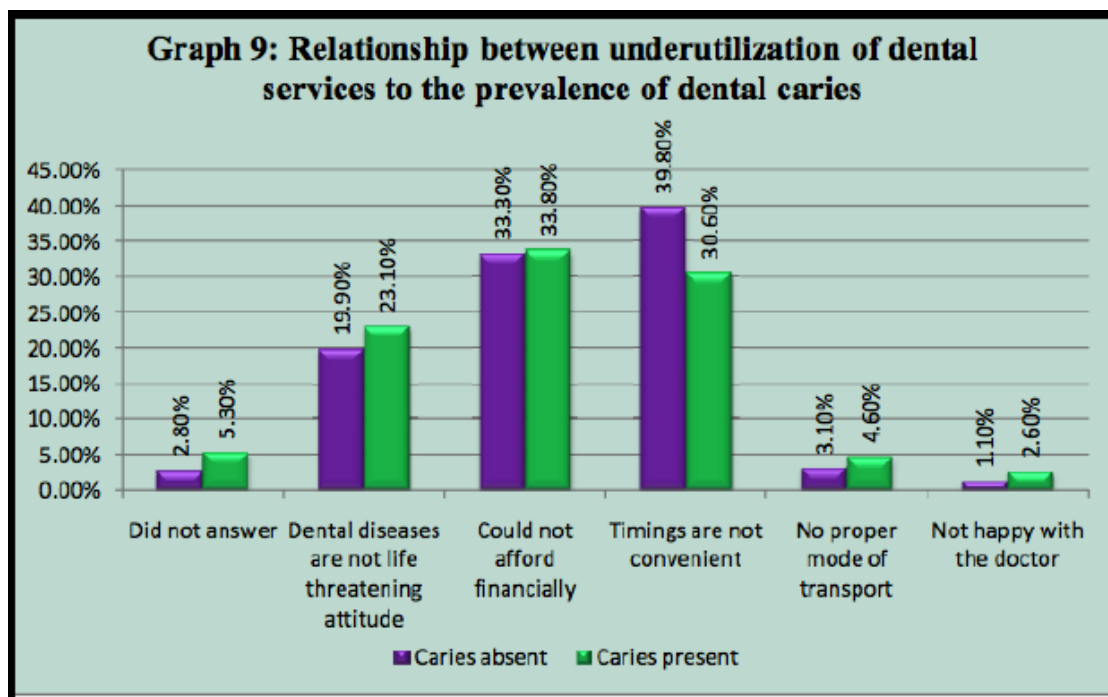


Table 11- Correlation analysis between different factors (Q1 to Q9) with dental caries experience (dmf index scores) by Spearman's rank correlation coefficient method.

Factors	Spearman's rank correlation coefficient	t-value	p-level
Q1	-0.0685	-3.0875	0.0020*
Q2	0.0341	1.5345	0.1251
Q3	-0.0104	-0.4673	0.6403
Q4	0.0089	0.4007	0.6887
Q5	-0.0818	-3.6894	0.0002*
Q6	-0.0409	-1.8396	0.0660
Q7	-0.0217	-0.9760	0.3292
Q8	0.0229	1.0313	0.3025
Q9	-0.0612	-2.7580	0.0059*

Table 12- multiple logistic regression analysis of dental caries (with and without dental caries) by different factors:

Variables	Estimates (Coefficients)	Std. Err. of estimates	Z-value	P-value	95% confidence interval	
_cons	0.1545	0.2401	0.6400	0.5200	-0.3162	0.6252
Q1	0.1036	0.1046	0.9900	0.3220	-0.1014	0.3085
Q2	0.0646	0.0764	0.8500	0.3980	-0.0852	0.2143
Q3	-0.0445	0.0568	-0.7800	0.4330	-0.1557	0.0667
Q4	-0.0424	0.0620	-0.6800	0.4940	-0.1639	0.0791
Q5	-0.2081	0.0877	-2.3700	0.0180*	-0.3799	-0.0362
Q6	-0.0137	0.1071	-0.1300	0.8980	-0.2236	0.1961
Q7	-0.0067	0.0376	-0.1800	0.8600	-0.0804	0.0671
Q8	0.0245	0.0509	0.4800	0.6300	-0.0753	0.1243
Q9	0.1153	0.0913	1.2600	0.2070	-0.0637	0.2942
Likelihood chi-square = 16.1832, p= 0.0633						

II. Discussion:

Need Of The Study:

An accurate assessment of existing health problems in a society is important for public health planning. According to WHO reports caries prevalence among school-age children is 60–90%. Centers for Disease Control and Prevention (CDC) in August 2005 reveal high prevalence of dental caries in children, 27% in preschoolers, 42% in school- age children. Dental caries prevalence is 1.8 times greater for children of poverty than for those with incomes twice the poverty level [3]. In Indian scenario, dental caries still remains major cause of pain and morbidity as 80-85% of population continue to suffer from this disease and average number of missing, decayed, filled teeth per person is about 4 in rural areas and 5 in urban areas with almost no dental restorative help available in rural and deprived areas [4].

Criteria For Using School Based Survey:

Children below 16 years of age constitute over 40% of India’s population. According to WHO Geneva report in 2003, children who suffer from poor oral health have 12 times more restricted activity days, including missing schools. Annually 50 million hours are lost from school due to oral diseases [3]. School based environment explicitly supports student’s physical, emotional and social wellbeing in addition to their academic achievement. For these reasons, implementing oral health education and services in the school environment will contribute familiarization to not only students but also to parent’s thus providing an ideal platform for promoting oral health awareness [5].

Criteria For Using Questionnaire Based Survey:

The second objective of the present community based study aimed at assessing various factors affecting parental attitude in utilizing dental treatment facilities through a closed ended questionnaire.

1. Information related to socioeconomic status of the population by following questions

Profession of the father.

Annual income of the family.

Total members of the family.

2. Information related to Geographic area

Nearest hospital available to the population.

Distance to nearest hospital.

The convenient mode of transportation to the nearest hospital.

3. Information related to barriers to access to dental care is evaluated by

Convenient timing hours for dental treatment Total working hours per day.

Socioeconomic status (SES) is the social standing of an individual or group in terms of their income, education, and occupation [6]. Marcia Angell has observed that income, education, and occupation are powerful yet mysterious determinants of health. They do not have a direct effect but serve as proxies for other determinants [7]. According to Milgrom et al 1998, there is a clear socioeconomic disparity in the distribution of oral health problems, with children in the low-income group almost twice as likely as children in the high-income group to have unmet dental needs and the reason for the persistent problems is not only due to inadequate access to dental care but also for preventive services [8]. Number of studies conducted by various authors in India proved the relationship between socioeconomic status and prevalence of dental caries [9,10,11].

A study conducted by Sogi.G.M in Davengere proved that low prevalence of dental caries was found among high and middle socioeconomic status people while low socioeconomic status group recorded a highest mean decayed tooth [12]. Education is the most basic SES component as it provides knowledge and life skills that allow better-educated persons to gain more ready access to information and resources to promote health. The study done epidemiological Study of Dental Caries Department of Pediatrics, Dr. R.N. Cooper Municipal General Hospital, and The Prevalence of dental caries was low in children of literate parents particularly literate mothers (caries prevalence was 27.49% with both parents literate and 31.82% with only mother literate when compared to 43.08% with illiterate parents) [13].

The present study found significant relationship between occupation of the parent and prevalence of caries with $p < 0.001$. Namal.N and Vihit.H.E found when the father being non professional compared to professional increased the chance of risk of caries by 2.156 levels and father being civil servant increased the factor by 2.005 times in their children [14].

According to J.N. Mansbridge children from large families tend to receive less education and health care than children from small families due to less attention individual person in the family [15]. In the present study the prevalence of dental caries and family structure is significantly related with the p value < 0.003 as with increase in the family members the increase in the dental caries in the children noticed.

A study conducted by Mariam Yousef Al-Amr et al evaluates dental caries prevalence and total members in family, maternal education. Increased caries found in children with number of siblings more than 4 and the level of mother's education at intermediate school or less [16].

Primosch RE suggested that differences in the caries experience for children from various family structures might be the result of the families' socioeconomic status and its influence upon the child's dietary habits [17]. Both social class and parent's education had a statistically significant influence on the caries prevalence. The main factors, which presented with significant association with increased dmft scores, were lack of tooth brushing, more number of family members and the low level of mother's education. Keeping in mind that the present study location is in a rural area, we tried to evaluate the hypothetical relationship between family structure, the nearest available health centers and distance to them, working hours of the parents and general attitude towards the health problems as they act as confounding factors for etiology of any taken

disease including dental diseases.

Number of non-financial barriers such as geographical distance and lack of knowledge and awareness, delay or prevent poor from seeking health care. The distance factor has been identified as key in the utilization of health services in rural areas of developing countries like India. A study conducted by Paul and Rumsey (2002) in India to evaluate the impact of accessibility on maternal health in different road density zones. The topography with its associations of road networks connection played substantial role in the process of maternal health care utilization and distance to the nearest health center, lack of transportation, and perceived quality of services are all thought to be associated with the use of modern health care and seeking assistance from trained medical personnel [18]. From the present study, it was found that government hospital is the nearest hospital available within 10-20 kilometer distances. The present study also proves government hospital is the nearest health care facility available to the population. The possible explanation is that in a rural set up like Vikarabad, only emergency services are available round the clock and dental care facilities are not available after day timings. Even though distance and transport facilities are not found to be major barriers for treatment in this study, dental care is not being utilized by the population due to the attitude that dental diseases are not life threatening. The present study proved a statistically significant relationship between the prevalence of dental caries and convenient timing hours for treatment with the $p < 0.001$ and lack of time is one the prime reason in accessing dental health care facilities.

The possible explanation could be 47% of the subjects in this study belong to agricultural background and their work schedules might not permit them to utilize dental health care facilities as most of hospitals especially at rural areas in India work only on day timings. The similar results were found in a study in which even though the subjects were happy with the kind of treatment offered to them but it is the lack of time is the main reason for in accessing dental services.

III. Conclusion

The main barrier factors in the present study population are, it is attitude of the parents that dental diseases are not life threatening compared to medical problems resulting in underutilization of dental services and also not inconvenient timings hours for dental treatment as most of dental institutes work only between 9 am to 4 pm in India, making it difficult to agriculturists and daily wage laborers utilize dental services. The low caries prevalence in this study (48.24%) is low compared to state rural (57.2%) caries prevalence. The possible explanation is the vikarabad is located 60 kilometers away from Hyderabad, which is a capital of state in India. So increased urbanization resulted in increased socio economic status of population and making dental treatment quite affordable. The main limitations of the present study are that only dental caries for assessment is done and other dental problems in children such as gum diseases and orthodontic problems and their relation to treatment care utilizations were not explored. The next limitation is that only school going children were included in the study ignoring non school going children keeping in view higher rate of illiteracy among children in this primarily rural farming population. In spite of these limitations the outcome this study gives brief insight into, the dental health care utilization in and around geographical area of Vikarabad and barriers affecting dental health utilization.

List Of Abb Reviations:

1. **DMFT INDEX**-decayed, missing and filled and treated teeth of permanent teeth.
2. **dft index**- decayed, and filled and treated teeth of deciduous teeth.
3. **WHO**- world health organization.
4. **CDC**- centers for disease control.
5. **SD** – Standard Deviation.
6. **ANOVA** – Analysis of Variance.
7. **Post HOC test**- post Hock analysis.
8. **N**- Number of subjects.
9. **P**- Level of significance.
10. **%**- Percentages.

Annexure -1: The dental caries recording form

Annexure 2: Questionarie Form To Evalaute Access Releted Factors For Dental Care

Annexure 3: Permission letter from ethical committee of the institute to conduct dental caries prevalence study in dental institution. Vikarabad. INDIA.

Annexure -4, Permission letter from district educational department to conduct survey in school children in Vikarabad. India.

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