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Awareness of Orthodontic Treatment in School Children of Karnataka State – A Survey

Dr. Roopa Siddegowda[1], Dr. Rani. M.S [2]
[1](Orthodontics, Vokkaligara Sangha Dental College & Hospital /Rajiv Gandhi University, India)
[2](Orthodontics, Vokkaligara Sangha Dental College & Hospital /Rajiv Gandhi University, India)

Abstract : *Aims: To assess the awareness of Orthodontic treatment among school children in Karnataka. Settings and Design: School settings and Descriptive cross-sectional survey. Methods and Material: A cross-sectional epidemiological survey was conducted in all the 30 districts of Karnataka. School children in the age group of 10-16 years were the target population. Population proportionate technique was employed for the sample size estimation. A total sample of 9505 was randomly selected from 102 schools all over Karnataka. A pre-structured questionnaire was used to record the awareness of children towards orthodontic treatment. Statistical analysis used: One way Anova, Scheffe's post hoc-test.*
Results: *Our study showed an average awareness of orthodontic treatment in Karnataka school children.*
Conclusions: *The awareness was influenced by the literacy rate as districts with higher literacy showed higher awareness of children towards orthodontic treatment and districts with lower literacy rate showed lesser awareness of children towards orthodontic treatment.*
Keywords *- Awareness , Karnataka, Literacy, Orthodontic treatment , School children.*

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I. INTRODUCTION

Awareness is the state or quality of being aware of something. Health is multi-factorial and multi-dimensional; Influenced by factors such as genetics, lifestyle, environment, socio-economic status and others [1]. Oral health is a comfortable and functional dentition that allows individuals to continue their social role [2]. Oral health knowledge is considered to be an essential pre-requisite for health-related behavior [3]. School children are considered important target group for various health education activities with the underlying objective of inculcating healthy lifestyle practices to last a lifetime. There is a paucity of data about the awareness of orthodontic treatment among school children in the Indian context. Therefore the rationale for this study was to assess the awareness of children towards orthodontic treatment.

1.1 OBJECTIVE OF THE STUDY

To assess the awareness of Orthodontic treatment among school children in Karnataka.

1.2 Subjects and Methods

A cross-sectional epidemiological survey was conducted in the State of Karnataka, with prior permission from the Ministry of Higher Primary and Secondary Education Board of Karnataka. The survey was carried out in selected schools in all the district head quarters. Children in the age group of 10-16 years were included in the study and constituted the study population. Population proportionate technique was employed for sample size estimation. According to the population census 2011, the total population in Karnataka is 6,11,30,704, out of which 10-16 years old children constitute 29% (According to National Family Health Survey-2, India [1998-99], child population in the age group of 10-16 years was taken as a reference). With 95% confidence level, the estimated sample size was 9505. In the first stage of sampling, three categories of schools, namely, Government schools, Aided schools, and Private schools in each district were selected from a list of schools provided by the Karnataka Higher Primary and Secondary Education Board by lottery method. In the second stage, 102 schools all over Karnataka were surveyed during the year 2011-2012. All children in the age group of 10-16 years, from the selected schools in each district all over Karnataka and children who obtained written informed consent from parents to participate in the study were included. Exclusion criteria used were-history of previous orthodontic treatment, rampant caries, multiple missing teeth, mutilated malocclusion and other craniofacial anomalies like cleft lip and palate, facial hemiatropy, cleidocranial dysplasia etc.

Ethical clearance to conduct the survey was obtained from the Vokkaligara Sangha Dental College and Hospital Review and Ethical Committee. Prior permission to conduct the survey was taken from the concerned school authorities.

A pre-structured questionnaire consisting of 15 questions with multiple answers were given to the children after the clinical examination to assess their knowledge and attitude [awareness] towards Orthodontic treatment. The responses of the children to the questions were recorded on a 3 point Likert scale [a. yes, b. no, c. don't know].

The Dental Health check up was done for the remaining children and an oral health lecture was given to all the children in the school to create awareness about Dental health and Orthodontic treatment. In some schools, tooth paste and tooth brush were distributed to the children.

1.3, Results

Results will be discussed under the following subheadings

Awareness of Dentist/ Orthodontist

One-way ANOVA reveals a significant difference among the mean scores of awareness about Dentist and Orthodontist among the children included in the study. F value of 7.052 was found to be significant at .000 levels. Scheffe's post hoc-test indicates that the children from Udupi (2.54), Chitradurga (2.62) and Madikeri (2.63) have the highest awareness and Children from Raichur (1.98) and Chikkaballapur (1.89) have the least awareness. Children from rest of the districts showed almost a similar mean awareness about Dentist and Orthodontist.

Knowledge about Irregular Teeth

One-way ANOVA reveals a significant difference among the mean scores of knowledge about irregular teeth among the children included in the study. F value of 22.239 was found to be significant at .000 levels. Scheffe's post hoc-test indicates that the children from Tumkur (3.59), Bangalore rural (3.66) and Mandya (3.67) have the highest awareness. Children from Bidar (2.57) and Raichur (2.41) have the least awareness. Children from rest of the districts showed almost a similar knowledge about the irregular teeth.

Knowledge about Orthodontic Treatment

One-way ANOVA reveals a significant difference among the mean scores of knowledge about orthodontic treatment among the children included in the study. F value of 8.087 was found to be significant at .000 levels. Scheffe's post hoc-test indicates that the children from Karwar (1.52) and Mandya (1.50) have the highest awareness. Children from Raichur (0.84) and Chikkaballapur (0.90) have the least awareness. Children from rest of the districts showed almost a similar knowledge about orthodontic treatment.

Awareness of Braces Treatment

One-way ANOVA reveals a significant difference among the mean scores of braces treatment among the children included in the study. F value of 8.198 was found to be significant at .000 levels. Scheffe's post hoc-test indicates that the children from Kolar (2.06) and Mandya (1.95) have the highest awareness. Children from Bellary (1.98) and Davangere (1.45) have the least awareness. Children from rest of the districts showed almost a similar mean awareness about braces treatment.

1.4, Discussion

Malocclusion is still not considered to be a dental problem because more priority is given to treatment of dental caries and periodontal diseases due to pain experienced by them. Most malocclusion cases are still not treated properly due to ignorance of patients, parents, inadequacy of resources, lack of knowledge about malocclusion and other influencing factors like literacy rate and socio-economic status. The level of dental health knowledge, positive dental health attitude, and dental health behavior are interlinked and associated with the level of education and income as demonstrated by studies in the past [4,5,6,7,8,9]. Attitudes and perceptions towards dental appearance differ among populations and among individuals [10].

The state of Karnataka is witnessing a steady increase in the literacy rate which ranks 17th in India. It has gone up from 66.64 % to 75.60 % i.e. a 9% increase in the last decade with male literates exceeding the female literates. The literacy rate is higher in Dakshina Karnataka, Bangalore and Udupi districts with 88.62%, 88.48 % and 86.29 % respectively, which could be one of the possible reasons for higher awareness about Dentists and Orthodontists in these districts. The literacy rate is lower in Yadgir, Raichur and Chamarajanagar with 52.36%, 60.46 % and 61.12 % respectively, which could be one of the possible reasons for lower awareness about Dentists and Orthodontists in these districts. The female literacy rate is lesser in Raichur and Yadgir districts and the female literacy rate is higher in Bangalore, Dakshina Karnataka and Udupi. In districts with lesser awareness and literacy rates, the exposure of these children to awareness about health related problems especially dental health and malocclusion seems to be low.

A study by Bhavneet Kaur [11] revealed a low level of dental awareness in parents of pre-school children in the Indian context. LI Jing et al [12] in his study stated that the orthodontic awareness level was unsatisfactory and the correlation between the awareness level and malocclusion problems was poor.

In general, knowledge about irregular teeth in children may be attributed to many reasons. In our study, knowledge about irregular teeth was noticed in children of most of the districts. This may be because they would

have noticed the irregular teeth in others with its consequences. It has been suggested that the public's assessment of dental irregularity and perception of psychological and sociological implications of malocclusion become more critical when orthodontic services are readily available.[12]

The knowledge about orthodontic treatment in our study was observed to be less, as children would not have often seen people wearing braces or they might just have some idea about the orthodontic treatment but not about the duration and the cost of the treatment.

The awareness of braces treatment was average in the children of most of the districts. The children would not have felt the need to wear braces or have not been asked by anyone to do so. Considering all these aspects, children have a lesser awareness about Dental health and the Orthodontic treatment. The socio-economic situation also plays a major role as the parents' financial situation determines the need for treatment of malocclusion and at times irregularity of teeth is also not considered abnormal.

II. CONCLUSION

Through this survey, we have recorded the prevalence of malocclusion, awareness and of the children regarding the orthodontic treatment. Our primary concern is to educate the children as they are considered to be an important target group to provide proper guidance for maintaining oral health. These educated children can in turn take home the message about oral health, mal-alignment of teeth, consequences of the malocclusion and their treatment. The outcome of the survey will be useful to the Community, Dental professionals and to NGO's to provide treatment to the needs and to further increase the awareness about orthodontic treatment in the school going children of Karnataka state.

Table-1 Gender distribution of the sample

Gender	No of children
Male	4966
Female	4539
Total	9505

Table 2: Questionnaire format to record Awareness of children towards orthodontic treatment

1. Are you aware of a dentist?
2. Have you visited a dentist before?
3. Have you heard of an Orthodontist?
4. Are you aware that they align your teeth?
5. Have you noticed people having irregular teeth?
6. Do you believe teeth should be properly aligned for a better facial appearance?
7. Do you know crooked teeth have ill effects?
8. Have you seen people wearing braces?
9. Have you ever felt the need to wear braces?
10. Has anyone advised you to get your teeth aligned?
11. Are you aware that few teeth may have to be removed for aligning irregular teeth?
12. Does thumb-sucking have an effect on the front teeth alignment?
13. Did you know taking braces treatment at the earlier age would improve facial appearance?
14. Do you know the duration for braces treatment is longer than other dental procedures?
15. Do you know that orthodontic treatment is costly?

Table 3: Questionnaire format to analyze the Awareness of children towards orthodontic treatment

Awareness about Dentist/ Orthodontist	1. Are you aware of a dentist? 2. Have you visited a dentist before? 3. Have you heard of an Orthodontist? 4. Are you aware that they align your teeth?	**a. Yes, b. No, c. Don't know**
Knowledge about irregular teeth	5. Have you noticed people having irregular teeth? 6. Do you believe teeth should be properly aligned for a better facial appearance? 7. Do you know crooked teeth have ill effects? 11. Are you aware that few teeth may have to be removed for aligning irregular teeth? 12. Does thumb-sucking has an effect on the front teeth alignment?	**a. Yes, b. No, c. Don't know**

Knowledge about Orthodontic treatment	13. Did you know taking braces treatment at an earlier age would improve facial appearance? 14. Do you know the duration for braces treatment is longer than other dental procedures? 15. Do you know that orthodontic treatment is costly?	**a. Yes, b. No, c. Don't know**
Awareness about braces/ Orthodontic treatment	8. Have you seen people wearing braces? 9. Have you ever felt the need to wear braces? 10. Has anyone advised you to get your teeth aligned?	**a. Yes, b. No, c. Don't know**

Table 4: Mean score [M]and standard deviation [SD] of the awareness questionnaire in all the districts of Karnataka.

*Note: F-Fisher's Value; P-Probability; HS-Highly significant; dfs= 29, 9475. Means with different superscripts

Districts	**Awareness of orthodontic treatment**									
	Awareness of Dentist/ Orthodontist		**Knowledge about Irregular teeth**		**Knowledge about Ortho treatment**		**Awareness of Braces treatment**		**Total**	
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Bagalkot	2.39^{abc}	1.10	2.89^{abcdefgh}	1.51	1.35^{abc}	1.15	1.65^{abc}	0.93	8.28	3.23
Bangalore Rural	2.35^{abc}	1.15	3.66^{h}	1.27	1.25^{abc}	0.99	1.82^{abc}	0.87	9.08	3.01
Bangalore urban	2.24^{abc}	1.04	3.40^{cdefgh}	1.32	1.09^{abc}	1.03	1.71^{abc}	0.87	8.43	2.85
Belgaum	2.12^{abc}	0.98	2.65^{abc}	1.37	1.10^{abc}	1.06	1.50^{ab}	0.88	7.37	2.97
Bellary	2.11^{abc}	1.00	2.80^{abcdefg}	1.31	1.08^{abc}	0.95	1.42^{a}	0.82	7.40	2.58
Bidar	2.11^{abc}	1.09	2.57^{ab}	1.52	1.34^{abc}	1.16	1.67^{abc}	1.00	7.69	3.47
Bijapur	2.44^{abc}	1.13	2.78^{abcdef}	1.38	1.11^{abc}	1.08	1.55^{abc}	0.91	7.89	3.09
Chamaraja Nagar	2.16^{abc}	1.10	3.28^{bcdefgh}	1.29	1.16^{abc}	1.08	1.88^{abc}	0.95	8.48	3.13
Chikballapur	1.89^{a}	0.91	2.82^{abcdefg}	1.37	0.90^{ab}	0.92	1.72^{abc}	0.89	7.33	2.77
Chikmagalur	2.41^{abc}	1.09	3.30^{bcdefgh}	1.33	1.41^{abc}	0.95	1.57^{abc}	0.85	8.68	2.90
Chitradurga	2.62^{C}	1.03	3.50^{bcdefgh}	1.22	1.47^{bc}	1.04	1.55^{abc}	0.94	9.15	2.78
Davangere	2.23^{abc}	1.06	3.11^{fgh}	1.43	1.28^{abc}	1.16	1.45^{ab}	0.87	8.08	3.07
Dharwad	2.28^{abc}	1.08	3.14^{abcdefgh}	1.34	1.19^{abc}	1.02	1.52^{ab}	0.85	8.13	2.70
Gadag	2.41^{abc}	1.09	2.70^{abcd}	1.45	1.33^{abc}	1.11	1.52^{ab}	0.91	7.96	2.95
Gulburga	2.33^{abc}	1.12	2.84^{abcdefg}	1.45	1.28^{abc}	1.19	1.57^{abc}	0.99	8.02	3.42
Hassan	2.39^{abc}	1.06	3.50^{efgh}	1.25	1.46^{abc}	1.07	1.58^{abc}	0.82	8.93	2.68
Haveri	2.46^{abc}	1.14	3.23^{bcdefgh}	1.29	1.43^{abc}	1.09	1.62^{abc}	0.94	8.74	3.01
Karwar	2.36^{abc}	1.04	2.71^{abcde}	1.24	1.52^{c}	0.99	1.61^{abc}	0.86	8.20	2.52
Kolar	2.30^{abc}	0.99	3.50^{defgh}	1.36	1.37^{abc}	1.09	2.06^{C}	0.90	9.23	3.14
Koppal	2.28^{abc}	1.10	3.22^{bcdefgh}	1.22	1.37^{abc}	1.09	1.66^{abc}	0.80	8.53	2.89
Madikeri	2.63^{C}	1.21	3.11^{abcdefgh}	1.20	1.03^{abc}	0.85	1.83^{abc}	0.93	8.61	2.90
Mandya	2.41^{abc}	1.03	3.67^{h}	1.18	1.50^{bc}	1.05	1.95^{bc}	0.87	9.53	2.77
Mangalore	2.23^{abc}	1.00	2.91^{abcdefgh}	1.34	1.00^{abc}	0.91	1.57^{abc}	0.88	7.71	2.52
Mysore	2.10^{abc}	1.04	3.34^{bcdefgh}	1.33	1.27^{abc}	1.01	1.75^{abc}	0.89	8.46	2.84
Raichur	1.98^{ab}	1.00	2.41^{a}	1.42	0.84^{a}	1.00	1.50^{ab}	0.86	6.73	3.06
Ramanagar	2.33^{abc}	0.93	3.54^{fgh}	1.33	1.27^{abc}	1.00	1.91^{abc}	0.86	9.05	2.72
Shimoga	2.20^{abc}	0.98	3.10^{abcdefgh}	1.28	1.37^{abc}	1.06	1.57^{abc}	0.89	8.23	2.78
Tumkur	2.03^{abc}	0.98	3.59^{gh}	1.24	1.14^{abc}	0.97	1.54^{abc}	0.90	8.28	2.59
Udupi	2.54^{bc}	1.12	3.32^{bcdefgh}	1.28	1.30^{abc}	1.01	1.61^{abc}	0.92	8.77	2.86
Yadgir	2.34^{abc}	1.21	2.88^{abcdefgh}	1.45	1.22^{abc}	1.14	1.69^{abc}	0.92	8.13	3.44
Total	2.25^{abc}	1.06	3.12	1.38	1.21^{abc}	1.06	1.64^{abc}	0.90	8.22	2.97
F value	**7.052**		**22.239**		**8.087**		**8.198**		**14.044**	
P value	**.000 (HS)**		**.000 (HS)**		**.000 (HS)**		**.000 (HS)**		**.000 (HS)**	

are significantly different from each other as indicated by Scheffe's Post hoc test (Alpha=.05).

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