Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

Knowledge, Attitude and Practice of School Teachers toward Oral Health of Children in Chennai

Vunnam Sri Sai Charan
Saveetha Dental College And Hospitals
Saveetha Institute Of Medical And Technical Sciences
Chennai, India
Email: sricharan.vunnum@gmail.com

Mebin George Mathew
Senior Lecturer
Department of Pedodontics
Saveetha Dental College And Hospitals
Saveetha Institute Of Medical And Technical Sciences
Chennai, India

Dr. Deepa Gurunathan
Professor and Head
Department of Pedodontics
Saveetha Dental College And Hospitals
Saveetha Institute Of Medical And Technical Sciences
Chennai, India

Corresponding author
Mebin George Mathew
Senior Lecturer
Department of Pedodontics
Saveetha Dental College And Hospitals
Saveetha Institute Of Medical And Technical Sciences
Chennai, India
E mail: mebingeorgem.sdc@saveetha.com

ABSTRACT

The aim of this study is to determine the knowledge, attitude and practice of school teachers towards the oral health of children in Chennai. The purpose of this study is to create awareness and determine the understanding of the school teachers regarding oral health of children in Chennai. This study was conducted based on a questionnaire which consists of 10 questions through a web-linked application called Google Form. A convenient sample size of 100 consecutive school teachers who currently working in Chennai participated in the study. As an

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

overall result, most of the participants have a positive attitude regarding information on the children's oral health. As a conclusion, school teacher's awareness on the oral health of children in Chennai are adequate but the knowledge had to be brushed up among them for a better understanding regarding this topic. Furthermore, they need to be trained on these grounds to help them be more disciplined and more consent with oral health issues.

KEYWORDS: school; teacher; oral; health; children

INTRODUCTION

School is an important platform for learning. It not only contributes to an individual's education but also to their health and health-related behavior.(Petersen 2009) In India, "healthy school concept" and "health-promoting school concept" have evolved to strengthen the opportunities for promoting oral health. The WHO has provided an "information series on school health" to advocate "health-promoting schools." They have also implemented strategies for oral health promotion in schools.(White et al. 2006)

Oral health and dental camps have become an integral part of school curriculum. Indian school textbooks had basic and adequate information on oral health.(Chhabra and Chhabra 2012) Literature review showed the wide perspective of school health education with different modes of education, different educators, reinforcements, and follow-up periods in different parts of the world.(Bagramian, Garcia-Godoy, and Volpe 2009; Moses et al. 2011) Research evaluating the effectiveness of various modes of oral health education (OHE) and its different combinations in improving the oral health status of children has been on the rise in the last decade.(Mehta and Kaur 2012)

Oral health status evaluation includes both objective and subjective parameter components. Kay and Locker in their systematic review concluded that the quality of evidence pertaining to the effectiveness of dental health education is poor.(Kay and Locker 1996) However, a systematic review by Priya et al. assessed the effectiveness of school dental health education in India and found it to be effective, irrespective of their follow-up periods.(Priya et al. 2019)

There is no comprehensive information available in this regard from a global perspective in recent times.(Wong et al. 2001) Hence, this systematic review was planned to assess the interventional studies on the effectiveness of school dental health education on the oral health-related knowledge, attitude, and practice behavior and oral health status of 6–12-year-old children, with a minimum follow-up period of 6 months.(Gill, Chestnutt, and Channing 2009; Harikiran et al. 2008)

During the school years, children spend most of their time with their teachers.(Kirkwood 1991) Similarly, the knowledge and skills needed to attain their future goals and nurture hidden potentials are acquired during this period. Shaping ways of life and personality development of

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

school children during elementary education is the key responsibility of school teachers and parents.(El-Qaderi and Taani 2004)

Students follow what teachers do and say. Teachers are considered as role models to transmit values of life.(Ramroop, Wright, and Naidu 2011) School teachers by virtue of their training can influence a large number of children, thereby playing a major role in the planning and implementation of oral health preventive programs. It is therefore important that their own oral health knowledge is good and their oral health behaviour conforms to expectation of the population.(Kakatkar et al. 2012)

The Ministry of Health and Family Welfare, Government of India, accepted in principle National Oral health Policy in the year 1995 to be included in national health policy. They launched the National Oral Health Care Programme which envisaged the implementation of oral health education, preventive and curative services.(Zhu et al. 2005) Against this background, the study was undertaken with the objective of assessing the knowledge, attitude and practice of school teachers towards oral health of school children.Our institution is passionate about high quality evidence based research and has excelled in various fields ((Jayaseelan Vijayashree Priyadharsini 2019; Pc, Marimuthu, and Devadoss 2018; Ramesh et al. 2018; Ramadurai et al. 2019; Sridharan et al. 2019; Ezhilarasan, Apoorva, and Ashok Vardhan 2019; Mathew et al. 2020; Samuel 2021; R et al. 2020; Chandrasekar et al. 2020; J. Vijayashree Priyadharsini, Smiline Girija, and Paramasivam 2018)

Therefore, this study is conducted to determine the knowledge, attitude and practice of school teachers towards the oral health of children in Chennai.

METHOD AND MATERIALS

A convenience sample size of 100 consecutive school teachers who are working in Chennai, currently. A cross-sectional observational online based study was conducted. Questionnaire was constructed on the Google Form website with demographic details and multi option questions. The questionnaire consists of 10 questions as shown in Table 1. A link containing these questionnaires was shared with all the participants and required them to answer the questions. All the responses were analysed and recorded.

QUESTIONS
Q1. Are you aware of the oral health of children in your school?
Q2. Do you know what is the main cause of dental caries in children?
Q3. What is the prevention of tooth caries?
Q4. What is the cause of gum diseases in children?

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

Q5. Do you know what is the prevention for gum bleeding?
Q6. What will be the frequency of brushing for children?
Q7. What is the correct brushing timing?
Q8. What is the frequency of brush changing?
Q9. What is the frequency of dental visits for a child?
Q10. Do you inspect the lunch boxes of your students?

Table 1 shows the questions asked in the questionnaire to school teachers

RESULTS

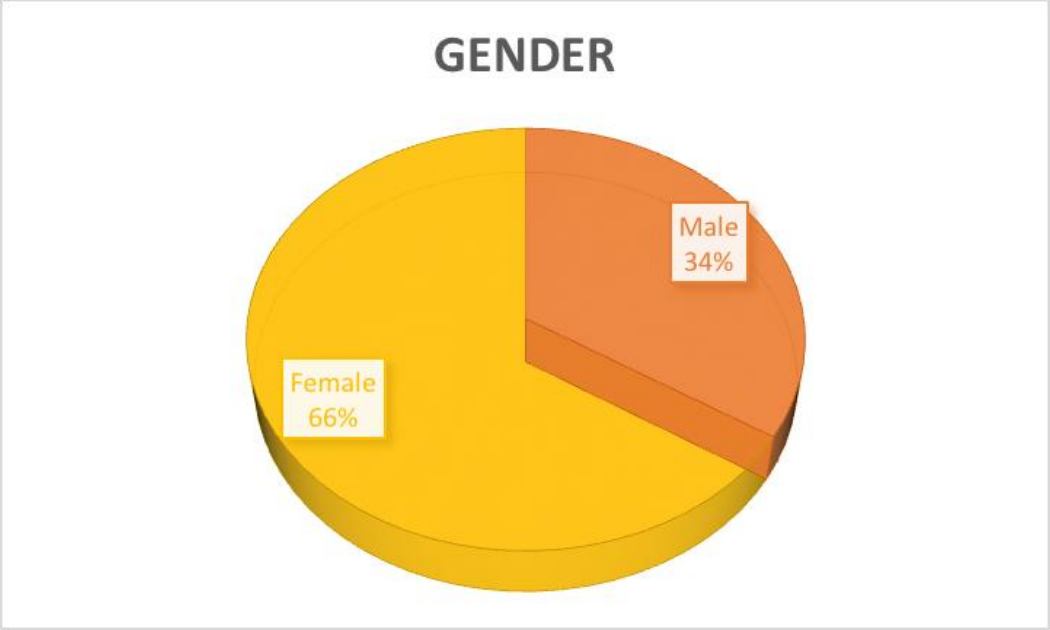

Figure 1 shows the gender distribution of school teachers who participated in this study

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

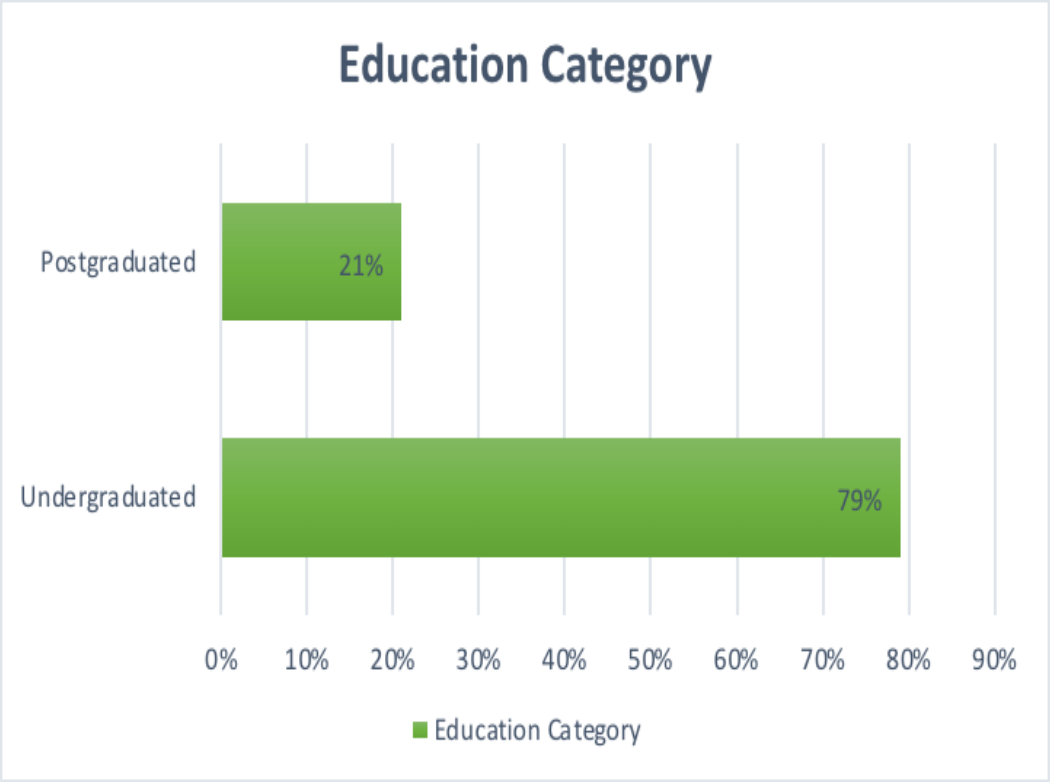

Figure 2 shows the education category of the participants

AGE RANGE	20-29 years old	**12%**
	30-39 years old	**43%**
	40-49 years old	**39%**
	50 years old and above	**6%**

Table 2 shows the age range of the school teachers who participated in this study

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

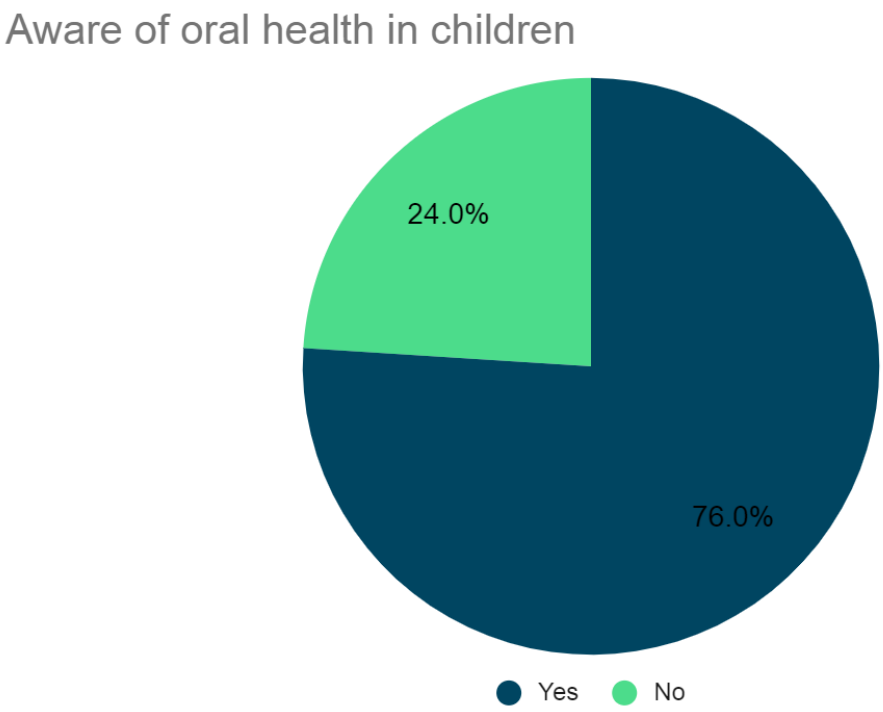

Figure 3 shows the percentage of school teachers that aware of oral health of children

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

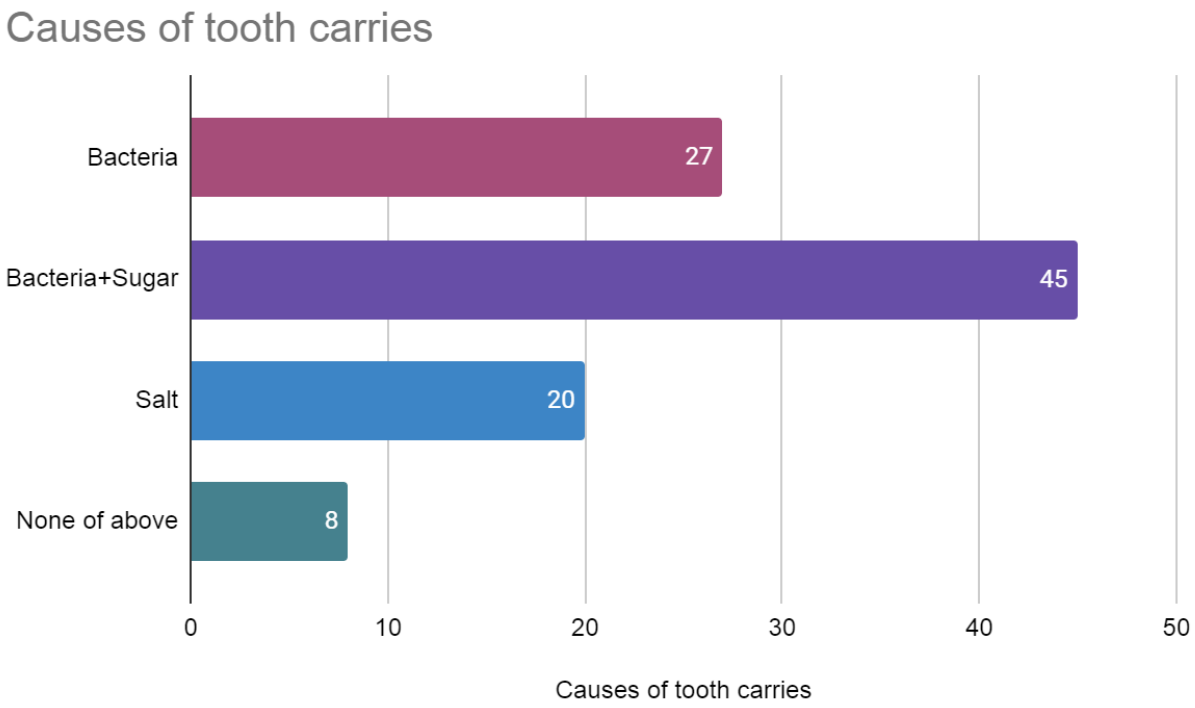

Figure 4 shows the percentage of response from participants regarding causative of dental caries

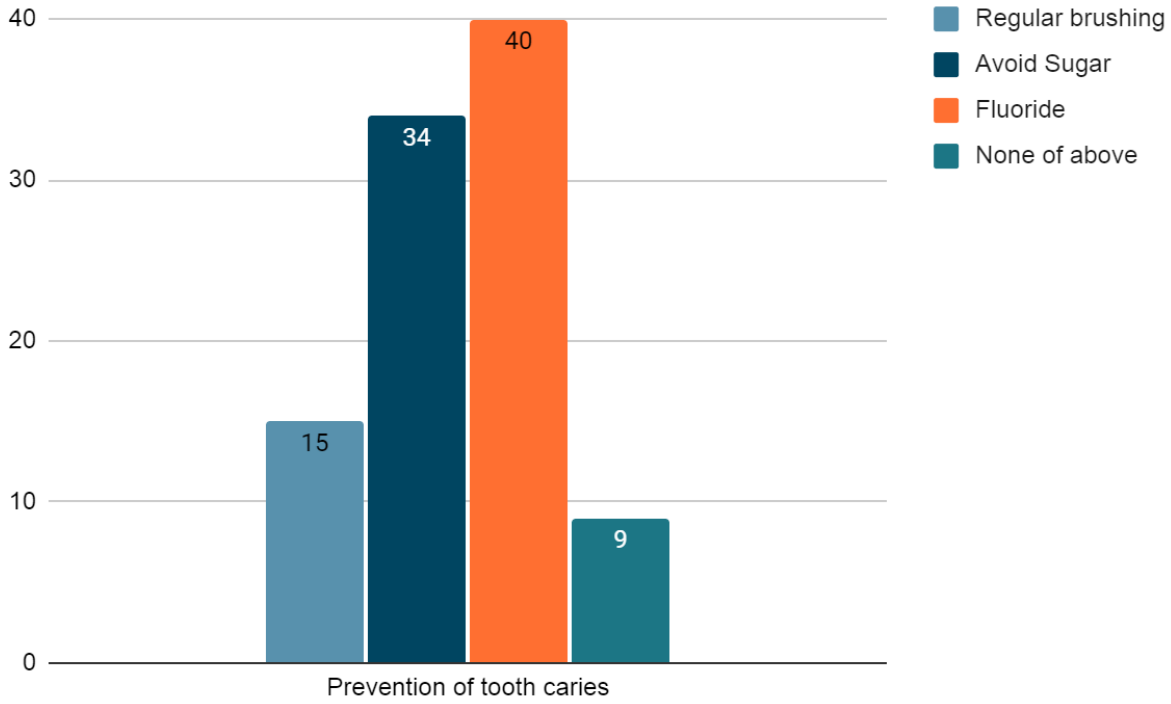

Figure 5 shows the response regarding prevention of tooth caries in children

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

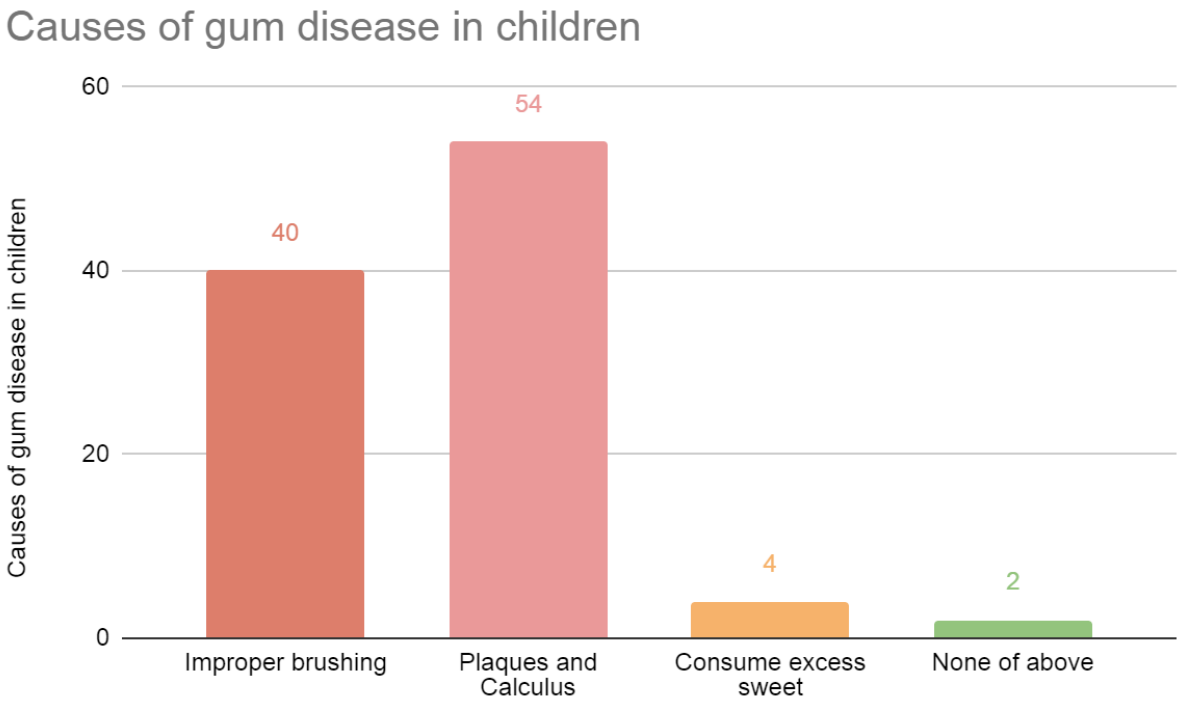

Figure 6 shows the percentage of answers regarding causes of gum disease in children

Frequency of brushing for children	
Once daily	30%
Twice daily	57%
Thrice daily	10%
More than 3 times daily	3%
Brushing timing	
Less than 1 minute	37%
1 minute	45%
2 minutes	10%
More than 2 minutes	8%
Frequency of brush changing	

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

Monthly	73%
3 months once	19%
6 months once	8%
Children's lunch box inspection	
Yes	89%
No	11%

Table 3 shows the response for remaining question asked to the participants

About 66% of the participants were female whereas 34% were males, as shown in figure 1. Figure 2 shows the demographic details of the education category of the participants, where 79% of them were undergraduates. Remainig 21% of them were postgraduates. Table 2 showed their age ranges. 12% of them were between 20-29 years old, 43% were 30-39 years old(majority), 39% of them were 40-49 years old, and remianig 6% were above 50 years old school teachers.

About 76% of the participants claimed that they are aware of the oral health of children. Remaining 24% of them were not aware of this topic, as shown in figure 3. Figure 4 explained about the causes of tooth caries in children which showed that about 45% of them chose bacteria and sugar. 27% of them choose only bacteria and 20% of them choose only salt. Remaining 8% of them chose none of the above options.

Figure 5 showed the response of participants regarding the question asked about prevention of tooth caries in children. 40% claimed the best prevention is by applying fluoride on children's oral cavities. Remaining 34%,15% and 9% choose the option to avoid sugar, regular brushing and none of above, respectively. Figure 6 showed the response regarding causes of gum disease in children. 54% of them choose the option plaques and calculus, 40% of them choose improper brushing technique, 4% of them choose to consume gum disease and 2% of them choose none of the above options.

Table 3 showed the remaining question and response of participants. 57% of the participants claimed that a child should brush twice daily, whereas some assumed as once daily(30%), thrice daily(10%) and more than 3 times daily(3%). When asked about the brushing timing, 45% of them claimed 1 minute for children, and others chose less than 1 minute(37%), 2 minutes(10%), more than 2 minutes(8%). Only 89% kept track of a child's lunch box, remaining 11% kept no tract on the lunch boxes of the children.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 2630 - 2643
Received 16 February 2021; Accepted 08 March 2021.

DISCUSSION

This study was similar to a study by Prathap et al.,(Pratap and Mahalakshmi 2013) where 82 % of the study population was females. The mean age of the teachers in our study is 47 years, while in other studies, the mean age is around 30years. We can stipulate then that the teachers in our study have more experience of around 10-15 years as compared to the few other studies conducted in our country. Around 45% of the subjects had knowledge of the cause of dental caries namely bacteria and sugar.

Around the same number also agreed that regular brushing could in fact reduce the incidence of gum disease. Although, this is in agreement with studies conducted by Nyandindi et al.,(Nyandindi et al. 1994) and Alhussain et al.,(AlHussain et al. 2017) it is not in agreement with a study by Lang et al.,(Lang, Woolfolk, and Faja 1989) in China. Around 59% of the school teachers felt that vitamin C supplementation is effective in reducing gum bleeding. While it is proven that deficiency of vitamin C results in scurvy leading to a bleeding tendency in the mouth, it is not the main cause of gum disease.

Around 9% of them did not have any idea regarding the causes of bleeding gums nor about its prevention. Poor knowledge of the gum disease among the school teachers is prevalent and thus has to be corrected by health education. Around 57% of the study population assumed that children need to brush their teeth twice daily. This is in agreement with a study done by Zhu et al(Zhu et al. 2005). However, the percentage of teachers brushing twice daily is higher in our study as compared to others. In agreement with studies by Vanka et al.(Vanka et al. 2012) 78% of teachers advise their children to clean their tongue and 87% to rinse their mouths after every meal.

Change of their toothbrush every 3 months is higher in our study as compared to a study by Ling Zhu. Change of the toothbrush is dictated by not only the number of months used by the individual, but also dictated by the fraying of the bristles. Fraying of the bristles reduces the efficiency of the tooth brush.

The awareness regarding dental problems being very poor relates to the percentage of the population visiting the dentist. It is the general belief of most teachers that children's teeth should regularly be checked by the dentist for not only treatment but also in the preventive aspect. Many deep pits and fissures can be filled prior to the development of dental caries. Also many malocclusions can be corrected by using appliances at the growth spurts. This attitude of the teachers will be helpful and instrumental in arranging regular visits by the dentist to the school as a part of camps organized by dental colleges and welfare societies.

Young children need to be constantly monitored in all aspects to shape and mould their character. The school teacher not only instills moral values to the children but can also give ideas

to the parents so as to improve their children's health. Health is a state of complete physical mental and social well-being and not merely the absence of disease or infirmity. Advice on monitoring their children's brushing and eating habits could be given during the regular parent teachers' association meetings. At these meetings, it is also stressed that the parents send healthy meals and snacks to the children at school.(Park 2005)

Many schools have an option of midday meals where they see to it that the nutritious food is provided. Inculcating good eating habits is essential as obesity, diabetes; hypertension is affecting individuals at a very young age. Commonly eating junk foods would not only be a risk factor for obesity but also for dental diseases. Thus it is the responsibility of both the teachers and the parents to monitor the children's diet. Teachers must inspect lunch boxes and make sure that parents send healthy food.(Sumit et al. 2013)

Around 40% teachers know that fluoride protects against tooth decay. Knowledge about fluoride could be shared with the parents where kids have a higher incidence of dental caries. It is the role of the dentist to do preventive deeds apart from the dental treatments he/she provides. Primary health care is the best way to provide health services to the community. The Ministry of Health and Family Welfare, Government of India accepted the principle "The National Oral Health Policy" in the year 1995. It plans to extend minimum oral health to the entire Indian population. The policy gave special emphasis to preschool children primary and secondary school children, expected and nursing mothers and for the increasing geriatric population. It has also emphasized oral health education and training of trainers. Oral health education chapters should be included in the school curriculum.(Lal, Paul, and Vashisht 2004)

Teachers training programme is a welcome proposal under the National Oral Health care Program and a guide book has been prepared in English and local languages. Regularly one hour can be devoted in each school for socially useful and productive work and that hour can be used for learning correct brushing techniques and other good habits. In that hour lectures can be taken by teachers themselves or a dentist may be called to promote oral health education.

CONCLUSION

Hygiene is embedded in Indian culture and it is the way of life. School children are ambassadors of health messages to their homes and can also act as change agents. In our study, the knowledge of the school teachers regarding oral health was fair. Their knowledge regarding gum disease and its treatment options were poor. However, their knowledge regarding preventing dental caries was good. Their attitude towards maintenance of oral hygiene was also not commendable. Oral Health education must be imparted to preschool and primary school teachers as a part of the National Oral Health care Program on a regular basis and further studies must be done to assess their awareness levels and make the necessary changes in further education modules.

REFERENCE

1. AlHussain, Al-Maha Mohammed, Dental interns Riyadh Colleges of Dentistry and Pharmacy, An-namuthajiya Campus, P. O. Box:, Riyadh, Kingdom of Saudi Arabia., Nouf Mohammed AlYemni, et al. 2017. "Relationship between Socioeconomic Status and Dental Caries among School Children in Riyadh City, Saudi Arabia." *Indian Journal of Dental Education*. https://doi.org/10.21088/ijde.0974.6099.10117.2.
2. Bagramian, Robert A., Franklin Garcia-Godoy, and Anthony R. Volpe. 2009. "The Global Increase in Dental Caries. A Pending Public Health Crisis." *American Journal of Dentistry* 22 (1): 3–8.
3. Chandrasekar, Raghavan, Shyamala Chandrasekhar, K. K. Shantha Sundari, and Poornima Ravi. 2020. "Development and Validation of a Formula for Objective Assessment of Cervical Vertebral Bone Age." *Progress in Orthodontics* 21 (1): 38.
4. Chhabra, N., and A. Chhabra. 2012. "Parental Knowledge, Attitudes and Cultural Beliefs Regarding Oral Health and Dental Care of Preschool." *European Archives of Paediatric Dentistry: Official Journal of the European Academy of Paediatric Dentistry* 13 (2): 76–82.
5. El-Qaderi, S. S., and D. Q. Taani. 2004. "Oral Health Knowledge and Dental Health Practices among Schoolchildren in Jerash district/Jordan." *International Journal of Dental Hygiene* 2 (2): 78–85.
6. Ezhilarasan, Devaraj, Velluru S. Apoorva, and Nandhigam Ashok Vardhan. 2019. "Syzygium Cumini Extract Induced Reactive Oxygen Species-Mediated Apoptosis in Human Oral Squamous Carcinoma Cells." *Journal of Oral Pathology & Medicine: Official Publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology* 48 (2): 115–21.
7. Gill, P., I. G. Chestnutt, and D. Channing. 2009. "Opportunities and Challenges to Promoting Oral Health in Primary Schools." *Community Dental Health* 26 (3): 188–92.
8. Harikiran, A. G., S. K. Pallavi, Sapna Hariprakash, Ashutosh, and K. S. Nagesh. 2008. "Oral Health-Related KAP among 11- to 12-Year-Old School Children in a Government-Aided Missionary School of Bangalore City." *Indian Journal of Dental Research: Official Publication of Indian Society for Dental Research* 19 (3): 236–42.
9. Kakatkar, Gauri, Ramesh Nagarajappa, Nagesh Bhat, Vikas Prasad, Archana Sharda, and Kailash Asawa. 2012. "Parental Beliefs about Children's Teething in Udaipur, India: A Preliminary Study." *Brazilian Oral Research* 26 (2): 151–57.
10. Kay, E. J., and D. Locker. 1996. "Is Dental Health Education Effective? A Systematic Review of Current Evidence." *Community Dentistry and Oral Epidemiology* 24 (4): 231–35.
11. Kirkwood, Betty. 1991. *Essentials of Medical Statistics*. Wiley.
12. Lal, Sunder, Dinesh Paul, and B. M. Vashisht. 2004. "National Oral Health Care Programme (NOHCP) Implementation Strategies." *Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine* 29

(1): 3.

13. Lang, Paul, Marilyn W. Woolfolk, and Barbara Wirth Faja. 1989. "Oral Health Knowledge and Attitudes of Elementary Schoolteachers in Michigan." *Journal of Public Health Dentistry*. https://doi.org/10.1111/j.1752-7325.1989.tb02020.x.
14. Mathew, Mebin George, S. R. Samuel, Ashu Jagdish Soni, and Korishettar Basavaraj Roopa. 2020. "Evaluation of Adhesion of Streptococcus Mutans, Plaque Accumulation on Zirconia and Stainless Steel Crowns, and Surrounding Gingival Inflammation in Primary Molars: Randomized Controlled Trial." *Clinical Oral Investigations*, 1–6.
15. Mehta, Abhishek, and Gurkiran Kaur. 2012. "Oral Health-Related Knowledge, Attitude, and Practices among 12-Year-Old Schoolchildren Studying in Rural Areas of Panchkula, India." *Indian Journal of Dental Research: Official Publication of Indian Society for Dental Research* 23 (2): 293.
16. Moses, Joyson, B. N. Rangeeth, Deepa Gurunathan, and Others. 2011. "Prevalence of Dental Caries, Socio-Economic Status and Treatment Needs among 5 to 15 Year Old School Going Children of Chidambaram." *Journal of Clinical and Diagnostic Research: JCDR* 5 (1): 146–51.
17. Nyandindi, U., T. Palin-Palokas, A. Milén, V. Robison, N. Kombe, and S. Mwakasagule. 1994. "Participation, Willingness and Abilities of School-Teachers in Oral Health Education in Tanzania." *Community Dental Health* 11 (2): 101–4.
18. Park, K. 2005. "Park's Textbook of Preventive and Social Medicine." *Preventive Medicine in Obstet, Paediatrics and Geriatrics*. https://ci.nii.ac.jp/naid/10021929774/.
19. Pc, J., T. Marimuthu, and P. Devadoss. 2018. "Prevalence and Measurement of Anterior Loop of the Mandibular Canal Using CBCT: A Cross Sectional Study." *Clinical Implant Dentistry and Related Research*. https://europepmc.org/article/med/29624863.
20. Petersen, Erik P. 2009. "Oral Health in the Developing World." *World Health Organization Global Oral Health Program Chronic Disease and Health Promotion. Geneva: Community Dentistry and Oral Epidemiology*. http://www.theglobalhealthcare.com/wp-content/uploads/2014/12/43_Oral_Health_in_the_Developing_World_FINAL.pdf.
21. Pratap, Vnr Kompalli, and Mallika Mahalakshmi. 2013. "Knowledge, Attitude and Practices of School Children and Teachers of Khammam towards Oral Hygiene," February. http://www.webmedcentral.com/article_view/4021.
22. Priya, P. R. Geetha, Sharath Asokan, R. G. Janani, and D. Kandaswamy. 2019. "Effectiveness of School Dental Health Education on the Oral Health Status and Knowledge of Children: A Systematic Review." *Indian Journal of Dental Research: Official Publication of Indian Society for Dental Research* 30 (3): 437.
23. Ramadurai, Neeraja, Deepa Gurunathan, A. Victor Samuel, Emg Subramanian, and Steven J. L. Rodrigues. 2019. "Effectiveness of 2% Articaine as an Anesthetic Agent in Children: Randomized Controlled Trial." *Clinical Oral Investigations* 23 (9): 3543–50.
24. Ramesh, Asha, Sheeja Varghese, Nadathur D. Jayakumar, and Sankari Malaiappan. 2018.

"Comparative Estimation of Sulfiredoxin Levels between Chronic Periodontitis and Healthy Patients - A Case-Control Study." *Journal of Periodontology* 89 (10): 1241–48.

25. Ramroop, V., D. Wright, and R. Naidu. 2011. "Dental Health Knowledge and Attitudes of Primary School Teachers toward Developing Dental Health Education." *The West Indian Medical Journal* 60 (5): 576–80.
26. R, Hannah, R. Hannah, Pratibha Ramani, Arvind Ramanathan, Jancy Merlin R, S. Gheena, Abilasha Ramasubramanian, and K. Monika. 2020. "CYP2 C9 Polymorphism among Patients with Oral Squamous Cell Carcinoma and Its Role in Altering the Metabolism of Benzo[a]pyrene." *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*. https://doi.org/10.1016/j.oooo.2020.06.021.
27. Samuel, Srinivasan Raj. 2021. "Can 5-Year-Olds Sensibly Self-Report the Impact of Developmental Enamel Defects on Their Quality of Life?" *International Journal of Paediatric Dentistry / the British Paedodontic Society [and] the International Association of Dentistry for Children* 31 (2): 285–86.
28. Sridharan, Gokul, Pratibha Ramani, Sangeeta Patankar, and Rajagopalan Vijayaraghavan. 2019. "Evaluation of Salivary Metabolomics in Oral Leukoplakia and Oral Squamous Cell Carcinoma." *Journal of Oral Pathology & Medicine: Official Publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology* 48 (4): 299–306.
29. Sumit, Kumar, Sandeep Kumar, Ashrita Saran, and Felita Sharal Dias. 2013. "Oral Health Care Delivery Systems in India: An Overview." *International Journal of Basic and Applied Medical Sciences* 3 (2): 171–78.
30. Vanka, Amit, Naveen S. Yadav, Vrinda Saxena, S. Sahana, G. Shanti, and G. C. Shivakumar. 2012. "Oral Health Acquaintance, Approach and Practices among Schoolteachers in Bhopal, Central India." *Journal of Orofacial Research*, 15–19.
31. Vijayashree Priyadharsini, Jayaseelan. 2019. "In Silico Validation of the Non-Antibiotic Drugs Acetaminophen and Ibuprofen as Antibacterial Agents against Red Complex Pathogens." *Journal of Periodontology* 90 (12): 1441–48.
32. Vijayashree Priyadharsini, J., A. S. Smiline Girija, and A. Paramasivam. 2018. "In Silico Analysis of Virulence Genes in an Emerging Dental Pathogen A. Baumannii and Related Species." *Archives of Oral Biology* 94 (October): 93–98.
33. White, D. A., B. L. Chadwick, N. M. Nuttall, I. G. Chestnutt, and J. G. Steele. 2006. "Oral Health Habits amongst Children in the United Kingdom in 2003." *British Dental Journal* 200 (9): 487–91.
34. Wong, M. C., E. C. Lo, E. Schwarz, and H. G. Zhang. 2001. "Oral Health Status and Oral Health Behaviors in Chinese Children." *Journal of Dental Research* 80 (5): 1459–65.
35. Zhu, Ling, Poul Erik Petersen, Hong-Ying Wang, Jin-You Bian, and Bo-Xue Zhang. 2005. "Oral Health Knowledge, Attitudes and Behaviour of Adults in China." *International Dental Journal* 55 (4): 231–41.