HBRP PUBLICATION

Research and Reviews: Neonatal and Pediatric Nursing
Volume 1 Issue 1

Strengthening Dental Health through School Health Program: A Call for Prevention of Dental Caries among Indian School children

Hepsi Bai Joseph[1], Angel Priya[2], Ancy I. R.[3], Aswani S.L.[3], Maheswari M.[3], Murugeswari P.[3], Nanthini S.[3], Narmatha A.[3], Nathiya J.[3], Stalin D.[3]

[1]Assistant Professor, College of Nursing, All India Institute of Medical Sciences, Bhubaneswar, Odisha, India

[2]Professor & Principal, The Salvation Army Catherine Booth College of Nursing, Nagercoil, Tamil Nadu, India

[3]BSc (N) 4th year students, The Salvation Army Catherine Booth College of Nursing, Nagercoil, Tamil Nadu, India

****Corresponding Author***

***E-Mail Id**: nurs_hepsi@aiimsbhubaneswar.edu.in*

ABSTRACT

Oral health is essential for general health and well-being throughout the lifespan and is a mark of overall health status. Research and other advances in oral health have led to safe and effective means of maintaining oral health and preventing dental caries. To determine the effectiveness of structured teaching program on prevention of dental caries among school children. An experimental study was conducted among school children, in a selected school at Kanyakumari District. Sixty school children selected using simple random technique for their knowledge on prevention of dental caries was assessed using pretested and validated tool. The pre-test knowledge was 23% adequate and 27% adequate among experimental and control group respectively. There was a statistically significant difference in mean score of post-test among experimental and control group15.4±3.3 and 9.4±2.7 respectively, (p<0.001). There was a statistically significant association between pre-test level of knowledge and selected socio demographic variables age (0.019), academic year (0.019) and mother's occupation (0.00004) number of siblings (0.00003). The study has great implication for school health nurses, Anganwadi workers on educating children on dental hygiene and prevention of dental caries which can improvise the dental hygiene practices, helps to have young generation free form dental caries. The school education department in the state and central can initiate policies and proper evaluation system at various level to promote dental health.

Keywords: *Prevention of dental caries, structured teaching programme, school children*

INTRODUCTION

Oral health is essential for general health and well-being throughout the lifespan and is a mark of overall health status. According to WHO, the incidence of dental health problems in India among children is 1,300,000[1]. According to National Oral Health Survey report, caries prevalence in India was 51.9%, 53.8% and 63.1% at age of 5, 12 and 15 years respectively [2]. Dental caries, is the most common chronic childhood disease. In origin, dental caries causes demineralization and destruction of the hard tissues of the teeth. It is a result of production of acid by bacterial fermentation of food debris accumulated on the tooth surface [3].

The oral health of children under 12 years is the objectives of several epidemiological studies conducted around the world. According to World Health Organization the importance given to this age group is due to the fact that in this age children leave primary school.

Thus, in many countries, it is the last age at which data can be easily obtained through a reliable sample of the school system. Moreover, it is possible that at this age all the permanent teeth except third molars have already erupted. Thus, the age of 12 was determined as the age of global monitoring of caries for international comparisons and monitoring of disease trends [1,4].

Evaluation of the oral health status of children revealed, dental caries is the most prevalent disease affecting permanent teeth, more than primary teeth and more in corporation than in private schools, there by correlating with the socio-economic status. It may be concluded that the greatest need of dental health education is at an early age including proper instruction of oral hygiene practices and school based preventive programs, which would help in improving preventive dental behaviour and attitude which is beneficial for life time [1].

Studies had found school children had fairly adequate oral hygiene habits (58%) and oral health knowledge (48%). Inadequate oral health knowledge was twice as likely to have caries as with adequate knowledge [5]. Healthy, clean, strong and good teeth are like a valuable possession. Therefore, attention should be paid to the dental care. Oral hygiene is an important aspect of personal health of an individual. Oral hygiene is essential for prevention of dental disease mainly dental caries and periodontal disease [6]. Hence the current study was conducted among children attending school between 8 to 13 years of age in a selected school with an objective of to assess the oral hygiene practice and to determine the effectiveness of structured teaching program on prevention of dental caries among school children.

METHODS

The present study adopted quantitative approach with experimental design using simple random sampling technique. The setting adopted for the study was Government primary school at Kanyakumari district. Sample selected for the present study were school children in the age group of 8-13 years studying from 3rd to 8th standard. A total of 60 school children 30 in control group and 30 in experimental group participated in the study.

The setting of the study was selected conveniently and subjects were selected using simple random (lottery method) technique from 3rd to 8th standard. All the student's names were listed and through lottery method 30 students were selected in experimental group and remaining (30) students were selected as control group. The present study included students who can able to read and write Tamil and excluded children who were not willing to participate in the study and absent during the time of data collection.

The materials used were socio-demographic proforma of school children, to assess the dental hygiene practice a structured self-report questionnaire was used and knowledge questionnaire on dental hygiene and prevention of dental caries. The structured knowledge questionnaire consists of 20 multiple choice questions with three options. Each correct answer carried one-mark and wrong answer carried zero mark. Total score was 20(100%). Score more than 10 indicate adequate knowledge less than 10

indicates inadequate knowledge. Pre tested tools were given to both groups. At the end of pre-test knowledge assessment, a structured teaching session was carried for experimental group. After a period of 2 weeks gap post-test knowledge was assessed for both groups using same tool.

Test-retest method was used to measure the reliability (r=0.84). Ethical permission was obtained from institutional research committee (The Salvation Army Catherine Booth CON- TSACBCON/Group5/2018) and assent was obtained from parents. Consent was obtained from their parents. Collected data was coded and entered into SPSS-18. Descriptive statistics including mean, standard deviation, frequency and percentage was used. Inferential statistics including paired 't' test (to compare the knowledge score), chi-square test (to determine the association) was used.

RESULTS

Nearly three fourth (73%) of the subjects were among the age group of 8-10 years, more than half (60%) of the subjects were male, nearly three fourth (73%) were studying 3rd to 5th standard, more than half (60%) of the subjects were Christians, more than three fourth (75%) of the subjects were residing in rural area. More than three fourth (88%) of the subject's father was unskilled workers, more than half (60%) of the subject's mother was unskilled workers.

More than quadrant (47%) of the subjects had one sibling, more than half (55%) of the subjects sibling had dental caries, more than half (67%) of subjects stated dental hygiene is essential for general health, less than quadrant (38%) of subjects received health information on prevention of dental caries before.

Regarding the practice on dental hygiene among the 60 children, a large majority (87%) of them used tooth brush as cleaning method, majority 87% of subjects used tooth paste as cleaning aid, more than three fourth (87%) of the subjects used fluoride tooth paste, majority (87%) of subjects used half-length paste over tooth paste, nearly half (48%) of the subjects cleaned tooth 1 time in a day, more than half (57%) of the subjects were cleaned tooth in morning, more than half (52%) of the subjects were cleaning tooth for less than 3 minutes, more than one fourth (42%) of the subjects brushed tooth circular technique, nearly three fourth (70%) of the subjects changed their tooth brush once in 3 months.

There was statistically significant difference in mean score of pre-test among experimental and control group 7.9±0.1 and 6.6±2.9, ($p=0.001$)**, (Table 1)** and statistically significant difference found in mean score of post-test among experimental and control group15.4±3.3 and 9.4±2.7 (p=0.00001), **(Table 2).** In the pre-test knowledge of the experimental group, (33%) and (67%) had adequate and inadequate knowledge respectively.

And the post-test knowledge of the experimental group (97%) and (33%) had adequate and inadequate knowledge respectively **(Figure 1).** There was a statistically significant association between pre-test level of knowledge and selected socio demographic variables age (0.019), academic year (0.019), mother's occupation (0.00004) number of siblings (0.00003) **(Table 3).**

Table 1: Comparison between pre-test knowledge score of experimental and control group.

S. No	Groups	Mean	Standard Deviation	T-Value	p-Value
1.	Experimental group	7.9	0.1		
2.	Control group	6.6	2.9	2.95*	0.001**

*p<0.01 level of significance

Table 2: *Comparison of post-test knowledge score between experimental and control group.*

S. No	Groups	Mean	Standard Deviation	T-Value	p-Value
1.	Experimental group	15.4	3.3	7.75 **	0.00001**
2.	Control group	9.4	2.7		

**p<0.0001 level of significance

Table 3: *Association between knowledge on prevention of dental caries and selected socio demographic variables. (n=60)*

Socio demographic variables	Adequate		Inadequate		Chi-square value	Df	p- value
	F	%	F	%			
1. Age (in years)							
a) 8-10	3	5	28	47	5.432	1	0.019*
b) 11-13	10	16	19	32			
2.Gender							
a) Male	9	15	28	47	0.053	1	0.817
b) Female	5	8	18	30			
3.Academic grade							
3rd-5th class	3	5	28	47	5.432	1	0.019*
6th-8th class	10	16	19	32			
4.Religion							
a) Hindu	7	12	17	28			
b) Christian	7	12	27	45	1.24	3	0.537
c)Muslim	1	2		2			
5**.Residence**							
a) Rural	12	20	18	30			
b) Urban	17	28	13	22	1.66	1	0.196
6.**Father`s job**							
a) Skilled	2	3	4	7			
b) Unskilled	12	20	40	67			
c) Professional	0	0	0	0	0.66	3	0.609
d) Unemployed	1	2	1	2			
7.**Mother`s occupation**							
a) Skilled	7	12	23	38			
b) Unskilled	5	8	11	18	19.95	3	0.00004**
c)Professional	0	0	0	0			
d)Unemployed	13	22	1	2			
8.**Siblings**							
a)1	14	23	10	17			
b)2	2	3	25	42	15.99	3	0.00003**
c)>3	2	3	7	12			
9. Received information regarding prevention of dental caries before							
a)Yes							
b)No	21	70	24	80			
	9	30	6	20	0.8	1	0.37

*p<0.05, **p<0.001 level of significance

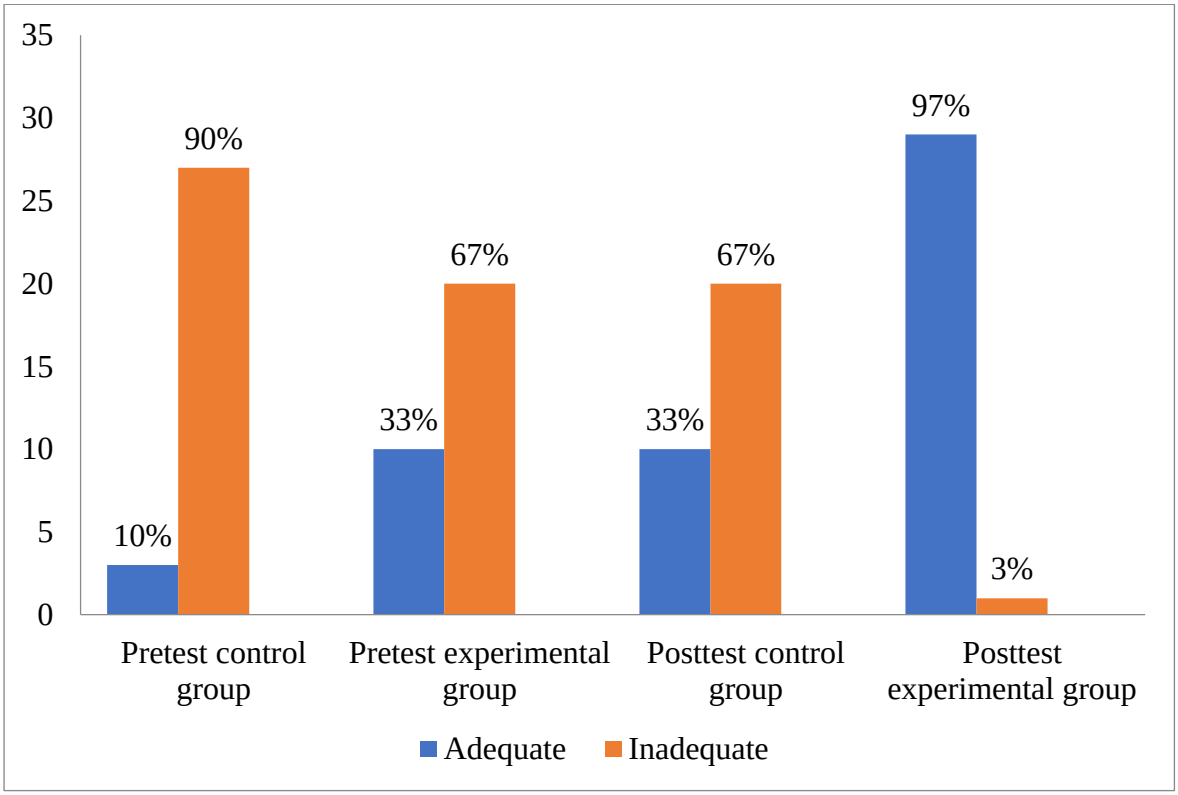

Fig 1: *Frequency and percentage distribution of pre and post-test level of knowledge level among the subjects*

DISCUSSION

The pretest level of knowledge regarding prevention of dental caries, found only 27% of the subjects had adequate knowledge and 73% had inadequate knowledge in pretest. This is consistent with findings of study by Khan SY found, where majority of school children (21%) had adequate knowledge and 79% had inadequate knowledge regarding the prevention of dental carries[7] and study from Tamil Nadu India found inadequate oral hygiene habits (74%) and 26% had adequate knowledge regarding the prevention of dental carries [8].

Consistent to it a study from Saudi found 48% had adequate knowledge, and 52% had inadequate knowledge regarding on prevention of dental caries among school children [9]. Another study found it was found that 31% school children had 31% adequate knowledge, and 69% had inadequate knowledge regarding on prevention of dental caries [10]. A study from UAE found school children had (58%) inadequate knowledge, and (42%) had adequate knowledge regarding on prevention of dental caries [11].

These findings across various nations indicate that there is a discrepancy in health-related knowledge among school children that arise to strong need of health education related to dental hygiene and prevention of dental caries among school children. This can be strengthened by proper recruitment of school health nurse in both the private and government schools and transparent evaluation of system of education in school health services. Furthermore, in addition to education, referral services could be rendered for those children in need and necessary care

to be provided in school for chronic and sick children. Healthy life style practice initiated from young age can further prevent lifestyle diseases in adult stage.

This was supported by the posttest findings of the present study that 81% of the subjects had adequate knowledge and 19% had inadequate knowledge on prevention of dental caries. Similar findings found after educational program in various studies [12,13]. There was statistically significant difference in mean score of pre-test among experimental and control group 7.9±0.1and 6.6±2.9($p_<$0.01). There was a statistically significant difference in mean score of post-test among experimental and control group15.4±3.3 and 9.4±2.7(0.0001). Poor dental hygienic practices were evident among the school children in the present study in frequency of brushing the tooth, technique of brushing and time taken for brushing the tooth.

The school health program was initiated by Government of India under Ayushman Bharat Scheme aiming to strengthen health promotion and disease prevention intervention for school children [14,15]. Through Anganwadi centers, the Anganwadi workers and in the school by the school health nurses can execute the program effectively and efficiently by educating and monitoring the children's health including dental health [16]. But the impact of these interventions only could be learnt by evaluation of such program which has to be done vigilantly to improvise its quality services at periphery.

The authors would like to appreciate children's active participation and the intervention had effectiveness by enhancing their knowledge. Practice on prevention of dental caries was unable to assess among the children due to time constraints of the study.

CONCLUSION

Besides having the national school health program in hand, it is also the responsibility of every stakeholder from the health and education department to measure its impact and effectiveness by proper planning, implementation and evaluation from center to periphery level. Periodic dental check-up also helps to identify the issues related to dental health and initiate early intervention against the dental issues.

Acknowledgement: All the children participated in the study and school authorities
Conflict of interest: None stated
Source(s) of Support: Nil

REFERENCES

1. Pandey, P., Nandkeoliar, T., Tikku, A. P., Singh, D., & Singh, M. K. (2021). Prevalence of dental caries in the Indian population: A systematic review and meta-analysis. *Journal of International Society of Preventive & Community Dentistry*, *11*(3), 256.
2. Batra, P., Saini, P., & Yadav, V. (2020). Oral health concerns in India. *Journal of oral biology and craniofacial research*, *10*(2), 171-174.
3. Pitts, N. B., Zero, D. T., Marsh, P. D., Ekstrand, K., Weintraub, J. A., Ramos-Gomez, F., ... & Ismail, A. (2017). Dental caries. *Nature reviews Disease primers*, *3*(1), 1-16.
4. Miglani, S. (2020). Burden of dental caries in India: Current scenario and future strategies. *International journal of clinical pediatric dentistry*, *13*(2), 155.
5. Salunke, S., Shah, V., Ostbye, T., Gandhi, A., Phalgune, D., Ogundare, M. O., & Sable, V. (2019). Prevalence of dental caries, oral health awareness and treatment-seeking behavior of elderly population in rural

Maharashtra. *Indian Journal of Dental Research*, *30*(3), 332.

6. Janakiram, C., Antony, B., Joseph, J., & Ramanarayanan, V. (2018). Prevalence of Dental Caries in India among the WHO Index Age Groups: A Meta-Analysis. *Journal of Clinical & Diagnostic Research*, *12*(8).
7. Khan, S. Y. (2019). Knowledge, attitude and awareness to dental caries among Indian children and adolescents: A case-control study. *Pesquisa Brasileira em Odontopediatria e Clínica Integrada*, *19*.
8. Kumari, S., Samson, R., Devi, S., & Wilson, S. (2019). A Study to Assess the Effectiveness of Planned Teaching Programme on Knowledge regarding Dental Caries among School Students in Rural Areas of Anichakuppam, Puducherry. *Asian Journal of Nursing Education and Research*, *9*(4), 545-548.
9. Sabbagh, H. J., Alghamdi, D. S., Almutairi, W. M., Alshahrani, S. A., & Alghamdi, A. S. (2019). Knowledge and practices for early childhood caries prevention among parents of the children visiting king abdulaziz university pediatric dental clinics, Kingdom of Saudi Arabia. *J Contemp Dent*, *2*(9), 53-8.
10. Reang, T., & Bhattacharjya, H. (2014). Mother's knowledge and practice regarding oral hygiene and challenges in the prevention of dental caries of under-five children in an urban resettlement colony. *Int J Med Sci Public Health*, *3*(1), 76-80.
11. Bamba, S., Chachra, S., & Duhan, H. (2019). A Questionnaire-based Study to Assess the Level of Awareness among Parents about Preventive Measures and its Relationship with Dental Health Status of 6–12 Years Old Children in Panchkula, Haryana, India. *Journal of South Asian Association of Pediatric Dentistry*, *2*(1), 11.
12. Bramantoro, T., Santoso, C. M. A., Hariyani, N., Setyowati, D., Zulfiana, A. A., Nor, N. A. M., ... & Irmalia, W. R. (2021). Effectiveness of the school-based oral health promotion programmes from preschool to high school: A systematic review. *PloS one*, *16*(8), e0256007.
13. Stein, C., Santos, N. M. L., Hilgert, J. B., & Hugo, F. N. (2018). Effectiveness of oral health education on oral hygiene and dental caries in schoolchildren: Systematic review and meta- analysis. *Community dentistry and oral epidemiology*, *46*(1), 30-37.
14. Lahariya, C. (2018). 'Ayushman Bharat'program and universal health coverage in India. *Indian pediatrics*, *55*(6), 495-506.
15. Grover, S., Pahuja, M., Pradhan, S., Akif, M., & Shukla, K. (2020). Rural Oral Health: Challenges and Pit Falls: Time to Recover And Rebuild the Pathway: A Review Article. *EXECUTIVE EDITOR*, *11*(6), 893.
16. Panda, P. K. (2019). Ayushman Bharat: Challenges and Way Forward. *Future of FinTech: Innovative Business Model for Financial Inclusion*, 89.