

# Psychosocial Factors in Oral Health Care and Dental Caries: The Missing Link

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## ABSTRACT

**Aims and objective:** Social support (functional measure) and social network (structural measure) have found to influence the health behavior and oral health. As evidence suggests that the source of social support also varies with age, we were interested in finding the major source of support in adolescents and how different levels of support influenced their oral health care and dental caries patterns.

**Materials and methods:** A cross-sectional study was conducted on adolescent school students of Hyderabad whose social support and network, oral health behaviors, and dental caries (using DMFT index) were assessed. The social support was measured using "The Multidimensional Scale of Perceived Social Support". Kruskal–Wallis test was used to compare the caries and oral health behavior patterns in students with varying support levels using SPSS 24.

**Results:** Family was the major source of support (35.2%), followed by friends (32.7%), and significant others (32.1%). Students were categorized into "high", "medium", and "low" groups on the basis of the level of "social support" and the size of "social network of friends" and "social network of family". Caries was greater in students having a "lower" network of friends than those with a "higher" network. ( $p = 0.013$ ). Brushing frequency was better in the "lower" and "medium" social support groups and "higher" social network of friends groups.

**Conclusion:** Better oral health behaviors and minimal caries were found among students with a better social support and social network. This signifies the importance of such support in the students and the need to target the relevant sources at each age to bring down caries in them.

**Keywords:** Caries, Oral health, Psychosocial factors, School children, Social network, Social support.

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## INTRODUCTION

Dental caries (an infectious microbiologic disease of the calcified tissues of the teeth, characterized by demineralization of the inorganic portion and destruction of the organic substance of the tooth) has known to be the most common chronic disease of childhood<sup>1,2</sup> and can have a huge impact on the child's daily activities like eating, studying, and sleeping.<sup>3,4</sup> Despite the behavioral processes shaped by social and psychological factors having demonstrated their impact on the oral health,<sup>5–7</sup> most research has focused only on the epidemiological factors in caries causation—the agent, host, and environment. An important social contributor to health is the social support, defined as the resources provided by other persons.<sup>8</sup> It has shown to influence both the general and the oral health of a person.<sup>9,10</sup> Perceived social support (the perception of a person about the help he would receive when in need) has proven to be an important predictor for psychological well-being than received social support (the actual support in the form of emotional or tangible affirmation received by a person).<sup>11</sup> The source of support also varies with age. It could be parents in childhood, friends in adolescence, and spouse or children in old age, thus making it important to understand the source as well. The other psychosocial factor is the social network that is defined as the set of people with whom one maintains social contact.<sup>12</sup> Studies on social support in other countries have shown to influence oral health in adolescents,<sup>13,14</sup> periodontal status,<sup>15</sup> and oral health-related quality of life<sup>16</sup> in adults.

In addition to having an impact on the health of a person, psychosocial factors have also shown to improve health-promoting behavior like toothbrushing<sup>17,18</sup> and self-care-related dental visits.<sup>19</sup> To the best of our knowledge, there is no evidence on how these associations unfold in the Indian context, especially in adolescents.

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Hence, given the high caries prevalence in Indian children,<sup>20,21</sup> and lacunae in the literature about the influence of social factors, we were interested in assessing the major source of support and aimed at examining how caries patterns and oral health behaviors varied with different levels of support.

## MATERIALS AND METHODS

### Study Design, Population, and Setting

We conducted a cross-sectional study that was systematically spread over 5 months. Adolescents aged 12–14 years, studying in both private and government schools, willing to participate and who could read English or Telugu were included.

A pilot study was initially conducted to check the feasibility, and the sample size of 970 was calculated from that considering 95% confidence intervals, 35% caries prevalence, and 3% error. However, 1015 participants were included to overcome any missing data. After

obtaining the list of all private and government schools from the District Education Officer, students were recruited in three stages following a proportionate random sampling. Schools, classes, and students were the primary, secondary, and tertiary units of selection, respectively. Informed consent was obtained both from the children and from their parents through letters addressed to them. Prior ethical clearance was obtained from the institutional review board.

### Questionnaire Used and Variables Assessed

A self-administered structured questionnaire in English and Telugu was used to measure demographic details, psychosocial factors, and oral health behaviors. The face and content validity were established, and internal consistency was found to be good (Cronbach's  $\alpha = 0.78$ ).

Age, gender, religion, and the type of school were the demographic details assessed. Psychosocial factors included the social support and social network. The Multidimensional Scale of Perceived Social Support, developed by Zimet et al., was used for social support that consisted of 12 questions measuring the support from friends, family, and significant others. This scale was psychometrically validated in the South Asian population by Tonsing et al.<sup>22</sup> and is superior to the other scales in addressing the subjective assessment of social support; inclusion of "significant others" making it flexible to be used in any population; ease in understanding; brevity; and psychometrically sound properties. Social network was assessed using two questions about the number of family members and friends available to support them in need. Oral health behaviors assessed were brushing frequency and time since last visit. Dental caries was recorded using the DMFT index.

### Statistical Analysis

The collected data were statistically analyzed using SPSS 24. Descriptive data to depict the distribution of all the variables were computed. Kruskal–Wallis was used to test how dental caries and the oral health care behaviors varied among the three groups under the social support and social network—high, medium, and low, followed by a *post hoc* test.

## RESULTS

The aim was to identify the major source of support and to examine how caries and oral health behavior varied with different levels of support in adolescent school children. Table 1 represents the distribution of all the variables measured in the study. Boys accounted for 45% and girls 55% of the sample. Among them, 74%, 18%, 7%, and 1% of the students belonged to the Hindu, Muslim, Christian, and the other religions, respectively. There was almost an equal distribution of the students in the government (50.3%) and the private (49.7%) schools.

Students were grouped on the basis of the level of support into 3 categories—high, medium, and low support groups. Among the three sources, support received from family (35.2%) was greater than friends (32.7%) and significant others (32.1%), and social support in the sample was moderate with a mean score of 4.1. Most of them had a higher network of family members and friends, when they were grouped into high, medium, and low network groups.

Brushing frequency was once daily in a majority of them, and there was never a past dental visit for almost 70% of the samples. It was observed that an overwhelming 80% did not have a single carious tooth, whereas most of the remaining students had more than one carious tooth, and the mean D score was 0.57.

**Table 1:** Descriptive data

Variables		N (%)
Age	12 yrs	171 (16.8)
	13 yrs	400 (39.5)
	14 yrs	444 (43.7)
Gender	Males	457 (45)
	Females	558 (55)
Religion	Hindus	747 (73.6)
	Muslims	188 (18.5)
	Christians	66 (6.5)
	Others	14 (1.4)
School	Private	511 (50.3)
	Government	504 (49.7)
<i>Psychosocial factors</i>		
Social support	Family	4.31 (35.2)
	Friends	4.03 (32.7)
	Significant others	3.96 (32.1)
Social support	High	223 (21)
	Medium	523 (52)
	Low	269 (27)
Social network (family)	High	570 (56.1)
	Medium	213 (21)
	Low	232 (22.9)
Social network (friends)	High	499 (49.2)
	Medium	259 (25.5)
	Low	257 (25.3)
Dental caries	=0	732 (72)
	≥1	283 (28)
Brushing frequency	≥3 times/day	17 (1.7)
	Twice a day	308 (30.3)
	Once a day	679 (66.9)
	Do not brush	11 (1.1)
Last dental visit	<1 year	126 (12.4)
	1–2 years	90 (8.9)
	3 or more days	97 (9.6)
	Never	702 (69.2)

**Table 2:** Variation of caries and oral health behaviors with the social variables

Variable	Dental caries	Brushing frequency	Time since past dental visit
Social support	0.99	10.27 <sup>a</sup>	1.17
Social network (family)	0.14	1.86	1.39
Social network (friends)	6.09 <sup>a</sup>	6.17 <sup>a</sup>	4.19

Analyzed through Kruskal–Wallis test; <sup>a</sup>H statistic significant at  $p < 0.05$

Table 2 is a depiction of variation of caries and oral health behaviors across the three groups of psychosocial factors with all significant *post hoc* comparisons represented in Table 3. A significant difference in caries was found only among the three "social network-friends" groups, followed by a *post hoc* showing the significant difference between the low and high groups (caries in low network > high network;  $p = 0.013$ ), even after Bonferroni correction.

**Table 3:** Post hoc pairwise comparison of all the significant associations

Comparison variables	Groups compared	Z statistic	p-Value
Social support * brushing frequency	Low * Medium	-0.37	0.70
	Low * High	-2.33	0.019 <sup>a</sup>
	Medium * High	-2.89	0.00 <sup>b</sup>
Social network (friends) * dental caries	Low * Medium	-1.38	0.16
	Low * High	-2.47	0.013 <sup>b</sup>
	Medium * High	-0.81	0.41
Social network (friends) * brushing frequency	Low * Medium	-1.30	0.19
	Low * High	-0.98	0.32
	Medium * High	-2.47	0.013 <sup>b</sup>

<sup>a</sup>Significant at  $p < 0.05$ ; <sup>b</sup>Significant at  $p < 0.017$  after Bonferroni correction

The brushing frequency was found to be significantly higher in the low ( $p = 0.019$ ) and the medium ( $p = 0.004$ ) “social support” groups in comparison to the high support group. The medium “social network-friends” group showed a significantly lower brushing frequency than the high “social network-friends” group ( $p = 0.013$ ).

## DISCUSSION

The study found that the level of social support in the sample was moderate, with family being the major source of support. Most of them had a higher social network of both friends and family members. A study by Tonsing among South Asians also found moderate scores for support, signifying similar social ties and integration between the two samples belonging to the same continent.<sup>22</sup>

The network of family and friends being high in most of the students is suggestive of the importance of family and values in these young children. It was hypothesized by Chu et al. in their meta-analysis on the relationships between social support and well-being in children and adolescents that there might be a possibility for family relationships being subjected to conflicts in the later periods of life but school relationships are always stable, hence school children usually maintain a good network of friends.<sup>23</sup>

The mean D for this sample was 0.57, analogous to the study results of Sukhbogi et al. on 12–15-year-old school children in Hyderabad,<sup>24</sup> owing to their similar study setting. The number of decayed teeth was higher in the lower “social network-friends” group than the high network group. One of the major etiological factors in caries causation is saliva, quantity of which is reduced in a state of stress. This is seen due to its influence on the unstimulated salivary flow rate.<sup>25</sup> Having a good network of people combats stress due to the cooperation received out of social integration and thereby prevents its effect on caries. Thorsteinsson also suggested, in the phase of mounting stress, students seek support from friends, to alleviate psychological distress; hence, those having better network are more likely to be contended and associate themselves with healthy oral habits resulting in lesser carious teeth.<sup>26</sup>

The brushing frequency was significantly better in the low and medium “social support” groups, which probably could have been due to the brushing patterns of their parents whom they tend to follow, also supported through the finding of family being the major source of support in our study. Qui et al. also found children’s oral health behaviors to be related to the caregiver’s

(mostly mother or father) oral health behavior in a study done in Guangzhou.<sup>27</sup>

The finding of students in the medium “social network-friends” group manifesting lesser brushing frequency as compared to those with higher “social network-friends” is in line with a study by Fontanini that recommended oral health behaviors in adolescents being strongly related to social influence. Possible reasons could be the influence of the social factors on cognitive and emotional states, such as self-esteem and social competence, causing an improved motivation and persuasion for self-care in people with better contacts.<sup>28,29</sup> Additional evidence comes from Baelum according to whom, societal processes are capable of influencing proximal risk factors of oral diseases like modifying lifestyle or shaping the health-related behaviours.<sup>30</sup>

Though “time since last dental visit” failed to vary with different levels of social support and social network in the present study, studies have shown fewer family members and friends being associated with lower odds of timely or self-care-related dental visits.

Despite the study being the first of its kind in the Indian population, there are a few limitations. First, the cross-sectional study design prevented us from making causal relations between the caries and social factors. Second, the possibility of information bias about the duration since the last dental visit by the students. Given the above, we found that social support and social network were partially linked to caries and the oral health behaviors, but would recommend future longitudinal studies on similar lines accounting to the above limitations, for a better interpretation of the results.

## CONCLUSION

In the present study, better oral health behavioral patterns and minimal caries were found among those with a greater social support and network. These results could be generalized to the entire Indian population despite the country being a blend of distinct cultures, because there is unity amid the vast cultural diversity. The external validation of these results to the other parts of the world remains questionable. However, we would strongly advocate on the need to continuously monitor the oral health and identify the different sources of support among the school students. This would help in targeting the most relevant source at each stage and counsel the students about the importance of relations and their influence on oral health.

## REFERENCES

1. Newacheck PW, Hughes DC, Hung YY, et al. The unmet health needs of America’s children. *Pediatrics* 2000;105(4 Pt 2):989–997.
2. Petersen PE, Bourgeois D, Ogawa H, et al. The global burden of oral diseases and risks to oral health. *Bull World Health Organ* 2005;83(9):661–669.
3. Selwitz RH, Ismail AI, Pitts NB. Dental caries. *Lancet* 2007;369(9555):51–59. DOI: 10.1016/S0140-6736(07)60031-2.
4. Casamassimo PS, Thikkurissy S, Edelstein BL, et al. Beyond the dmft: the human and economic cost of early childhood caries. *J Am Dent Assoc* 2009;140(6):650–657. DOI: 10.14219/jada.archive.2009.0250.
5. Prendergast M, Beal J, Williams S. The relationship between deprivation, ethnicity and dental health in 5-year-old children in Leeds, UK. *Community Dent Health* 1997;14(1):18–21.
6. Watt R, Sheiham A. Inequalities in oral health: a review of the evidence and recommendations for action. *Br Dent J* 1999;187(1): 6–12. DOI: 10.1038/sj.bdj.4800191.



7. Locker D. Deprivation and oral health: a review. *Community Dent Oral Epidemiol* 2000;28(3):161–169. DOI: 10.1034/j.1600-0528.2000.280301.x.
8. Cohen S, Syme SL. Issues in the study and adaptation of social support. In: Cohen S, Syme SL, editors. *Social Support and Health*. London: Academic Press; 1985. pp. 3–22.
9. Watt RG, Heilmann A, Sabbah W, et al. Social relationships and health related behaviors among older US adults. *BMC Public Health* 2014;14(1):53. DOI: 10.1186/1471-2458-14-533.
10. Umberson D, Crosnoe R, Reczek C. Social relationships and health behaviour across the life course. *Ann Rev Sociol* 2010;36:139–157. DOI: 10.1146/annurev-soc-070308-120011.
11. Aranda MP, Castaneda I, Lee PJ, et al. Stress, social support, and coping as predictors of depressive symptoms: gender differences among Mexican Americans. *Social Work Research* 2001;25(1):37–49. DOI: 10.1093/swr/25.1.37.
12. Bowling A. Measuring social networks and social support. In: Bowling A, editor. *Measuring Health: A Review of Quality of Life Measurements Scales*, 2nd ed. Buckingham: Open University; 1997. pp. 91–109.
13. Bernabé E, Stansfeld SA, Marceles W. Roles of different sources of social support on caries experience and caries increment in adolescents of East London. *Caries Res* 2011;45(4):400–407. DOI: 10.1159/000330370.
14. Fontanini H, Marshman Z, Vettore M. Social support and social network as intermediary social determinants of dental caries in adolescents. *Community Dent Oral Epidemiol* 2015;43(2):172–182. DOI: 10.1111/cdoe.12139.
15. Nicolau B, Netuveli G, Kim JW, et al. A life-course approach to assess psychosocial factors and periodontal disease. *J Clin Periodontol* 2007;34(10):844–850. DOI: 10.1111/j.1600-051X.2007.01123.x.
16. Sanders AE, Spencer AJ. Childhood circumstances, psychosocial factors and the social impact of adult oral health. *Community Dent Oral Epidemiol* 2005;33(5):370–377. DOI: 10.1111/j.1600-0528.2005.00237.x.
17. McLennan J, Kotelchuck M, Hyunsan C. Prevalence, persistence, and correlates of depressive symptoms in a national sample of mothers of toddlers. *J Am Acad Child Adolesc Psychiatry* 2001;40(11):1316–1323. DOI: 10.1097/00004583-200111000-00012.
18. Chung EK, McCollum KF, Elo IT, et al. Maternal depressive symptoms and infant health practices among low-income women. *Pediatrics* 2004;113(6):e523–e539. DOI: 10.1542/peds.113.6.e523.
19. Nahouraii H, Wasserman M, Bender DE, et al. Social support and dental utilization among children of Latina immigrants. *J Health Care Poor Underserved* 2008;19(2):428–441. DOI: 10.1353/hpu.0.0017.
20. Reddy KS, Reddy S, Ravindhar P, et al. Prevalence of dental caries among 6–12 years school children of Mahbubnagar District, Telangana State, India: a cross-sectional study. *Indian J Dent Sciences* 2017;9(1):1–7. DOI: 10.4103/0976-4003.201641.
21. Mehta A. Trends in dental caries in Indian children for the past 25 years. *Indian J Dent Res* 2018;29(3):323–328. DOI: 10.4103/ijdr.IJDR\_615\_17.
22. Tonsing K, Zimet GD, Samson T. Assessing social support among South Asians: the multidimensional scale of perceived social support. *Asian J Psychiatr* 2012;5(2):164–168. DOI: 10.1016/j.ajp.2012.02.012.
23. Chu PS, Saucier DA, Hafner E. Meta-analysis of the relationships between social support and well-being in children and adolescents. *J Soc Clin Psychol* 2010;29(6):624–645. DOI: 10.1521/jscp.2010.29.6.624.
24. Sukhabogi JR, Parthasarathi P, Anjum S, et al. Dental fluorosis and dental caries prevalence among 12–15-year-old school children in Nalgonda district, Andhra Pradesh, India. *Ann Med Health Sci Res* 2014;4(Suppl 3):245–252.
25. Gholami N, Sabzvari BH, Razzaghi A, et al. Effect of stress, anxiety and depression on unstimulated salivary flow rate and xerostomia. *J Dent Res Dent Clin Dent Prospects* 2017;11(4):247–252. DOI: 10.15171/joddd.2017.043.
26. Thorsteinsson EB, Brown RF. Mediators and moderators of the stressor-fatigue relationship in nonclinical samples. *J Psychosom Res* 2008;66(1):21–29. DOI: 10.1016/j.jpsychores.2008.06.010.
27. Qui RM, Tao Y, Zhou Y, et al. The relationship between children's oral health related behaviours and their caregiver's social support. *BMC Oral Health* 2016;16(1):86. DOI: 10.1186/s12903-016-0270-4.
28. Berkman LF, Glass T, Brisette I, Seeman TE. From social integration to health: Durkheim in the new millennium. *Soc Sci Med* 2000;51(6):843–857. DOI: 10.1016/S0277-9536(00)00065-4.
29. Kawachi I, Berkman LF. Social ties and mental health. *J Urban Health* 2001;78(3):458–467. DOI: 10.1093/jurban/78.3.458.
30. Baelum V. Dentistry and population approaches for preventing dental diseases. *J Dent* 2011;39(2):S9–S19. DOI: 10.1016/j.jdent.2011.10.015.