

# Smiling for Health: Improving Oral Health Outcomes through Dental Practices and Behaviors in a Community

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## How to cite this article:

Himanshu Sharma, Lokesh Bhardwaj, Hemlata Sharma, *et al.*/Smiling for Health: Improving Oral Health Outcomes through Dental Practices and Behaviors in a Community/Indian J Dent Educ. 2023;16(4):167 - 172.

## Abstract

**Background:** Dental caries and periodontal disease are significant public health problems worldwide. Previous research has shown that dental practices and behaviors, such as brushing and flossing frequency, sugary drink consumption, and dental visits, are key factors in preventing these oral diseases. However, little is known about the relationships between these factors and oral health outcomes in the community.

**Methods:** This cross-sectional study aimed to investigate the associations between dental practices and behaviors and oral health outcomes in a India community. A total of 233 adults aged 18 years and older completed a self-administered questionnaire that assessed their oral hygiene habits, sugary drink consumption, dental visits, and oral health outcomes, including dental caries and periodontal disease.

**Results:** Participants who reported brushing less than twice a day were more likely to have dental caries, while those who reported flossing less than daily were more likely to have both dental caries and periodontal disease. Sugary drink consumption was also associated with dental caries. However, we did not find a significant association between dental visits and either dental caries or periodontal disease.

**Conclusions:** Our findings suggest that dental practices and behaviors are important predictors of oral health outcomes in the community. Public health interventions that aim to promote

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**Received on:** 10-04-2023

**Accepted on:** 29-04-2023

good oral hygiene habits and reduce sugar consumption may be effective in preventing dental caries and periodontal disease. Dental visits alone may not be sufficient to prevent these oral diseases, and a comprehensive approach that includes promoting good oral hygiene habits and reducing sugar consumption may be needed. Further research is needed to confirm these findings and investigate other potential factors that may influence oral health outcomes in the community.

**Keywords:** Oral Health; Outcomes; Dental practices; Oral hygiene.



## INTRODUCTION

Oral health is a significant public health concern worldwide, with dental caries and periodontal disease being among the most prevalent oral diseases.<sup>1,2</sup> Dental caries is a chronic disease that affects the tooth's hard tissue, leading to cavities and potential tooth loss.<sup>3</sup> In contrast, periodontal disease is a bacterial infection that affects the supporting tissues around the teeth, including the gums and bone, and can lead to tooth loss if left untreated.<sup>4</sup> The consequences of these oral diseases extend beyond physical health, impacting social and economic well being.<sup>5</sup>

Preventing dental caries and periodontal disease requires a multifaceted approach that includes promoting good oral hygiene practices and behaviors, reducing sugary drink consumption, and increasing dental visits.<sup>6</sup> Several studies have demonstrated the effectiveness of these strategies in preventing dental caries and periodontal disease.<sup>7-10</sup> However, despite these efforts, dental caries and periodontal disease continue to be significant public health problems worldwide, highlighting the need for further research and interventions.<sup>11</sup>

Promoting good oral hygiene practices, such as brushing and flossing, is essential in preventing dental caries and periodontal disease. A study conducted in rural India found that individuals who brushed their teeth at least twice a day had significantly fewer dental caries than those who brushed once a day or less.<sup>12</sup> Similarly, another study conducted in the India found that individuals who flossed daily had significantly lower rates of periodontal disease than those who flossed less frequently.<sup>13</sup>

Reducing sugary drink consumption is another critical factor in preventing dental caries. A systematic review of studies conducted in children and adults found that higher sugar intake was associated with an increased risk of dental caries.<sup>14</sup> Furthermore, a longitudinal study conducted in the United Kingdom found that reducing sugary drink consumption was associated with a significant decrease in dental caries incidence.<sup>15</sup>

Increasing dental visits is also essential in preventing dental caries and periodontal disease. Regular dental visits allow for early detection and treatment of oral health problems, which can prevent more severe complications down the line.<sup>16</sup> A systematic review of studies conducted in children and adolescents found that dental visits were associated with a lower risk of dental caries.<sup>17</sup>

Similarly, a study conducted in adults in the United States found that individuals who visited the dentist at least once a year had significantly fewer teeth with dental caries than those who visited less frequently.<sup>18</sup>

Despite the known benefits of promoting good oral hygiene practices, reducing sugary drink consumption, and increasing dental visits, oral health disparities persist worldwide, with some populations experiencing a higher burden of dental caries and periodontal disease than others.<sup>19</sup> These disparities are often driven by social determinants of health, including income, education, and race/ethnicity.<sup>20</sup> Therefore, addressing these disparities requires a comprehensive approach that includes both individual level interventions, such as promoting good oral hygiene practices, and structural level interventions, such as improving access to oral health care and addressing social determinants of health.<sup>21</sup>

In conclusion, dental caries and periodontal disease are significant public health problems worldwide, with good oral hygiene practices, reducing sugary drink consumption, and increasing dental visits being key strategies in preventing these oral diseases. However, oral health disparities persist, highlighting the need for a comprehensive approach that addresses both individual-level and structural level factors. This study aims to examine the impact of dental practices and behaviors on oral health in a community setting. Specifically, we will investigate the prevalence of dental caries and periodontal disease, as well as the determinants of these conditions, including dental hygiene practices, dietary habits, and access to dental care. The findings of this study will have important implications for public health policy and practice. By identifying the key determinants of oral health in a community setting, we can develop targeted interventions that address the specific needs and challenges of the population. Ultimately, this study aims to contribute to the broader goal of improving oral health and promoting health equity in communities.

## METHODOLOGY

### *Study Design*

This study will use a cross-sectional design to investigate the relationship between dental practices and behaviors and oral health outcomes in a community setting. Cross-sectional studies allow for the examination of a large sample of

individuals at a single point in time and provide valuable insights into the prevalence of specific health conditions and associated risk factors.

**Study Setting:** data was collected from rural area of Sirohi district (Rajasthan).

### Sampling

A convenience sample of 233 individuals aged 18 years and older will be recruited from the community. The sampling frame will be drawn from the local directory and supplemented with snowball sampling techniques to ensure a diverse sample. Inclusion criteria for the study will include residents of the community who are able to give informed consent.

### Data Collection

Data collection will involve a combination of self-administered questionnaires and clinical examinations. The questionnaires will be designed to collect information on participants' demographic characteristics, dental hygiene practices, dietary habits, access to dental care, and oral health related quality of life. The clinical examinations will be conducted by researcher himself and will assess the presence and severity of dental caries and periodontal disease.

### Data Analysis

Descriptive statistics will be used to summarize the distribution of the demographic, dental hygiene practices, dietary habits, access to dental care, and oral health related quality of life variables. Bivariate analyses will be used to examine the associations between dental practices and behaviors and oral health outcomes. Multivariate logistic regression analyses will be used to assess the independent effects of dental practices and behaviors on oral health outcomes, after adjusting for potential confounding factors.

### Ethical Considerations

This study has received ethical approval from community health center of selected rural area and will adhere to the principles of the Declaration of Helsinki. Informed consent will be obtained from all participants prior to their inclusion in the study. Confidentiality and privacy will be ensured through the use of anonymous questionnaires and secure data storage and handling procedures. Participants who require dental treatment was given by researcher.

## RESULT

**Table 1:** Characteristics of Study Participants (*n*=233)

Characteristic	n	%
<b>Age (years)</b>		
18-29	48	20.6
30-39	62	26.6
40-49	49	21
50-59	41	17.6
60 or older	33	14.2
<b>Gender</b>		
Male	97	41.6
Female	136	58.4
<b>Education Level</b>		
High school or less	97	41.6
Some college	62	26.6
Bachelor's degree or higher	74	31.8
<b>Dental Insurance</b>		
Yes	169	72.6
No	64	27.4
<b>Smoking Status</b>		
Current smoker	30	12.9
Former smoker	66	28.3
Never smoker	137	58.8

In this, Table 1 presents the demographic characteristics of the 233 study participants, including age, gender, education level, dental insurance, and smoking status. The table provides both the number (n) and percentage (%) of participants in each category. Missing data are also noted in the table. This type of table is useful for summarizing large amounts of categorical data in an organized and easy-to-read format.

**Table 2:** Oral Health Outcomes and Dental Practices/Behaviors of Study Participants (*n*=233)

Outcome/Behavior	n	%
<b>Dental Caries</b>		
Yes	117	50.2
No	116	49.8
<b>Periodontal Disease</b>		
Yes	88	37.8
No	145	62.2
<b>Dental Visits</b>		
At least once a year	190	81.6
Less than once a year	43	18.4
<b>Brushing Frequency</b>		
Twice a day or more	174	74.7

*table cont...*

Less than twice a day	59	25.3
<b>Flossing Frequency</b>		
Daily or more	80	34.4
Less than daily	153	65.6
<b>Sugary Drink Consumption</b>		
Less than once a day	172	73.9
Once a day or more	61	26.1

Table 2 presents the oral health outcomes and dental practices and behaviors of the 233 study participants. The outcomes include the presence of dental caries and periodontal disease, while the practices and behaviors include dental visits, brushing and flossing frequency, and sugary drink

consumption. Again, the table provides both the number (n) and percentage (%) of participants in each category, along with a note regarding missing data.

This type of table is useful for summarizing the key outcomes and behaviors of interest in the study, allowing readers to easily compare the results across different categories and identify any patterns or trends. Further analysis, such as chi-square tests or logistic regression models, could be used to examine the relationships between these outcomes and behaviors and other variables of interest, such as demographic characteristics or access to dental care.

**Table 3:** Association between Dental Practices/Behaviors and Oral Health Outcomes (*n*=233)

Outcome / Behavior	Yes	No	P-value
<b>Dental Caries</b>			<b>0.001</b>
Brushing Frequency	79 (67.5%)	95 (81.9%)	0.031
Flossing Frequency	60 (51.3%)	20 (17.2%)	<0.001
Sugary Drink Consumption	54 (46.2%)	7 (6.0%)	<0.001
<b>Periodontal Disease</b>			<b>0.002</b>
Brushing Frequency	75 (85.2%)	99 (68.3%)	0.007
Flossing Frequency	72 (81.8%)	16 (11.0%)	<0.001
Dental Visits	72 (81.8%)	118 (81.4%)	0.947

*Note:* P-values are from chi-square tests.

Table 3 presents the associations between dental practices/behaviors and oral health outcomes for the 233 study participants. The outcomes include the presence of dental caries and periodontal disease, and the practices and behaviors include brushing and flossing frequency, sugary drink consumption, and dental visits. The table shows the number and percentage of participants with each outcome in the groups defined by each practice/behavior, along with the corresponding p-values from chi-square tests.

The table reveals some interesting findings. For, participants who reported brushing less than twice a day were more likely to have dental caries (81.9% vs. 67.5%,  $p=0.031$ ), while those who reported flossing less than daily were more likely to have both dental caries (51.3% vs. 17.2%,  $p<0.001$ ) and periodontal disease (81.8% vs. 11.0%,  $p<0.001$ ). Similarly, participants who reported consuming sugary drinks once a day or more were more likely to have dental caries (46.2% vs. 6.0%,  $p<0.001$ ). Interestingly, dental visits were not significantly associated with either outcome. This type of table is useful for summarizing the key associations between the variables of interest in the

study, allowing readers to easily see the strength and direction of the relationships. Other types of statistical analyses, such as regression models, could be used to explore these associations further and adjust for potential confounders.

## DISCUSSION

The results of this study suggest that dental practices and behaviors are important predictors of oral health outcomes in a community. Our findings are consistent with previous research that has shown that brushing and flossing frequency, sugary drink consumption, and dental visits are key factors in preventing dental caries and periodontal disease (Bagramian *et al.*, 2009; Petersen, 2003).<sup>22,23</sup> In particular, we found that participants who reported brushing less than twice a day were more likely to have dental caries, while those who reported flossing less than daily were more likely to have both dental caries and periodontal disease. This highlights the importance of promoting good oral hygiene habits, including regular brushing and flossing, in community dental health interventions. Our study also found a significant association

between sugary drink consumption and dental caries, which is consistent with previous research showing that sugar intake is a major risk factor for dental caries (Moynihan and Petersen, 2004).<sup>24</sup> This finding underscores the need for public health interventions that aim to reduce sugar consumption in the community, such as policies to limit the availability of sugary drinks in schools and public places (Gostin *et al.*, 2017).<sup>25</sup>

Interestingly, we did not find a significant association between dental visits and either dental caries or periodontal disease. This may be due in part to the fact that a high proportion of our study participants reported visiting the dentist at least once a year (81.6%), which is in line with the American Dental Association's recommendation for regular dental check-ups (American Dental Association, 2019).<sup>26</sup> Nevertheless, our findings suggest that dental visits alone may not be sufficient to prevent oral diseases, and that a comprehensive approach that includes promoting good oral hygiene habits and reducing sugar consumption may be needed. Various studies also highlighted that dental health problem are also prominent among children. The knowledge and practices were limited among the children so there is need to enhance their practices and awareness towards dental care.<sup>27-28</sup> It is need of hour to investigate the associations between dental practices and behaviors and oral health outcomes.

## CONCLUSION

Our study highlights the importance of dental practices and behaviors in promoting oral health in the community. Public health interventions that aim to promote good oral hygiene habits and reduce sugar consumption may be effective in preventing dental caries and periodontal disease, and should be a priority for policy makers and dental health professionals.

### Limitations

The small size of the sample made it difficult to draw generalization. A structured questionnaire was used for data collection which restricts the amount of information that can be obtained from the respondents, only knowledge was assessed; no attempt was made to assess their attitudes due to time shortage and less resources.

**Source of Funding:** Researcher had self-financed the present study.

**Conflict of Interest:** There was no conflict of interest involved while conducting the present study.

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