

Original Research Article
Dental Health

Oral-Systemic Connection Through Community-Based Dental Education: A Three-Year School Dental Camp Experience in Kathmandu, Nepal

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Abstract

Background: Oral health is closely linked to systemic health, yet preventive oral health education remains insufficient in many low- and middle-income settings. School-based interventions offer a scalable platform for early prevention and long-term behavioral change. **Objective:** To evaluate the impact of a repeated school-based oral health education and treatment program on oral disease burden and related systemic outcomes over a three-year period in Kathmandu, Nepal. **Methods:** A quasi-longitudinal community-based study was conducted through annual dental camps at Mahendra Public School and Shee Thangpal Secondary School between 2018 and 2021 in collaboration with Lions Clubs International. Approximately 500 participants were evaluated annually. Standardized oral examinations were performed using dental charting and Palmer notation. Interventions included oral health education, preventive care, and basic treatment services. From the second year onward, audiovisual and small-group interactive learning strategies were implemented. Oral disease prevalence and self-reported systemic complaints were recorded and compared across years. **Results:** A significant reduction in oral disease burden was observed. Dental caries prevalence decreased from 62% (≈ 310 cases) in 2018 to 130 cases in 2021, representing a 58.1% reduction. Gingivitis prevalence declined from 38% (≈ 190 cases) to 80 cases, also reflecting a $\sim 58\%$ reduction. Participants demonstrated improved oral hygiene practices and increased engagement in peer-led education. Additionally, a reduction in self-reported digestive complaints was noted among adult participants. **Conclusion:** Sustained school-based oral health programs integrating education, prevention, and treatment are associated with significant improvements in oral and systemic health outcomes. These findings support the scalability of community-based dental education models in resource-limited settings.

Keywords: Oral health, Community dentistry, School dental program, Nepal, Oral-systemic health, Preventive dentistry.

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INTRODUCTION

The relationship between oral health and systemic health has gained increasing recognition in global health discourse. Poor oral health has been associated with systemic conditions such as diabetes mellitus, cardiovascular disease, and gastrointestinal disorders (Preshaw *et al.*, 2012). Despite this, preventive oral health education remains limited in many communities, particularly in low- and middle-income countries.

School-based oral health programs provide a unique opportunity to introduce preventive strategies early in life. These programs not only improve individual oral health outcomes but also foster behavioral changes that extend to families and communities. Evidence

suggests that interactive and small-group learning approaches enhance knowledge retention, encourage peer-to-peer education, and promote long-term behavioral change (Collins *et al.*, 2014).

This study presents a three-year community-based dental camp initiative conducted in Kathmandu, Nepal, focusing on integrating oral health education with preventive and basic treatment services. The program aimed to improve oral health outcomes while emphasizing the oral-systemic health connection.

BACKGROUND

Oral diseases such as dental caries and periodontal disease remain among the most prevalent global health conditions, disproportionately affecting children and underserved populations (Marsh, 2018).

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Untreated oral conditions can impair mastication, compromise nutrition, and contribute to systemic health complications (Featherstone, 2018).

Preventive oral health education has been shown to significantly reduce disease burden. School-based interventions are particularly effective, as children can adopt and disseminate healthy behaviors within their communities (Bramantoro *et al.*, 2021). However, traditional didactic teaching methods often fail to produce sustained behavioral change.

Interactive, small-group educational models have demonstrated improved engagement and long-term adherence to preventive practices. These approaches encourage active participation, peer learning, and reinforcement of health-promoting behaviors (Collins *et al.*, 2014).

METHODOLOGY

Study Design and Setting

A descriptive quasi-longitudinal study was conducted through annual dental camps in 2018, 2020, and 2021 at Mahendra Public School and Shee Thangpal Secondary School in Kathmandu, Nepal, in collaboration with Lions Clubs International.

Participants

Approximately 500 participants were included annually, consisting of schoolchildren aged 4–14 years and adult community members.

Procedures

Clinical Screening: Comprehensive oral examinations were conducted to identify dental caries, gingivitis, and malocclusion using standardized dental charting.

Preventive Interventions and Education: Participants received education on tooth-brushing techniques, flossing, dietary counseling, and the importance of routine dental visits. Fluoride applications and preventive checkups were provided.

Treatment Services: Basic dental treatments including scaling, simple restorations, and referrals for advanced care were offered.

Educational Approach: Participants were divided into small groups (17–18 individuals) for interactive sessions involving demonstrations, role-play, and discussions. In later years, audiovisual tools and peer-led education were incorporated.

Data Collection

Data on oral disease prevalence (dental caries and gingivitis) and self-reported systemic symptoms were collected annually and analyzed for trends over time.

RESULTS

At baseline (2018), a high burden of oral disease was observed:

- Dental caries: ~62% (~310/500 participants)

- Gingivitis: ~38% (~190/500 participants)
- Adults frequently reported missing teeth, impaired mastication, and digestive complaints
- By 2021:
- Dental caries reduced from 310 to 130 cases
 - Reduction: 180 cases
 - Percentage reduction: 58.1%
- Gingivitis reduced from 190 to 80 cases
 - Approximate reduction: 58%

Additional findings included:

- Improved oral hygiene practices among students
- Increased peer-to-peer oral health education
- Reduction in self-reported digestive complaints among adults

DISCUSSION

This study demonstrates that sustained, community-based dental interventions can significantly reduce oral disease burden over time. The integration of preventive education, clinical care, and interactive learning strategies contributed to the program's success.

A key strength of the program was the use of small-group interactive education. This approach enhanced engagement, reinforced behavioral change, and encouraged peer learning. By empowering children as health educators, the program extended its impact beyond the school environment into the broader community.

The observed reduction in digestive complaints highlights the oral-systemic health connection. Improved oral health likely enhanced mastication and nutritional intake, thereby contributing to better gastrointestinal function (Kapila, 2021).

These findings align with existing literature emphasizing the importance of preventive oral health programs and their broader systemic health implications. The results support the role of school-based interventions as a cost-effective public health strategy in resource-limited settings.

CONCLUSION

The integration of oral health education with preventive and basic dental services in a school-based setting resulted in significant improvements in oral health outcomes over three years. The program also demonstrated potential systemic health benefits, reinforcing the importance of the oral-systemic health connection.

Scaling such community-based models could play a critical role in reducing oral disease burden and improving overall public health in low- and middle-income countries.

REFERENCES

- Bramantoro T, Santoso CMA, Hariyani N, Setyowati D, Zulfiana AA, Nor NAM, et al. (2021) Effectiveness of the school-based oral health promotion programmes from preschool to high school: A systematic review. *PLoS ONE* 16(8): e0256007. <https://doi.org/10.1371/journal.pone.0256007>
- Collins, J., Brown, A., & Newman, S. (2014). Small-group learning in healthcare education: Benefits and challenges. *Medical Teacher*, 36(5), 360–367.
- Featherstone, J. D. B. (2018). Dental caries: A dynamic disease process. *Australian Dental Journal*, 63(S1), S27–S34.
- Marsh, P. D. (2018). Microbiome-based approaches to managing dental caries. *Journal of Dental Research*, 97(2), 153–161.
- Preshaw, P. M., et al. (2012). Periodontitis and diabetes: A two-way relationship. *Diabetologia*, 55(1), 21–31.
- Kapila YL. Oral health's inextricable connection to systemic health: Special populations bring to bear multimodal relationships and factors connecting periodontal disease to systemic diseases and conditions. *Periodontol 2000*. 2021 Oct;87(1):11-16. doi: 10.1111/prd.12398. PMID: 34463994; PMCID: PMC8457130.