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Research Article

Impact of Community Dentistry-Driven Oral Health Interventions on Public Knowledge and Practices Concerning Communicable Diseases

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Abstract

Oral health promotion is a crucial but often underutilized avenue for influencing public awareness of communicable diseases, many of which have oral manifestations or are linked to poor hygiene practices. This prospective community-based study aimed to evaluate the effectiveness of dentist-led interventions in improving knowledge and practices regarding communicable diseases within urban and semi-urban populations. A total of 300 participants were enrolled and exposed to structured oral health education, interactive sessions, and preventive demonstrations delivered by trained community dentists. Pre- and post-intervention assessments were conducted using validated questionnaires measuring knowledge and practices. The mean knowledge score improved significantly from 52.4 ± 11.3 to 76.8 ± 10.5 ($p < 0.001$), while the mean practice score improved from 49.6 ± 13.7 to 71.2 ± 12.1 ($p < 0.001$). Subgroup analysis revealed greater improvements among younger adults and individuals with lower baseline education. These findings highlight the pivotal role of community dentistry in promoting awareness of communicable diseases beyond conventional oral health messages. Integration of oral health education into community-level preventive programs can amplify public health outcomes.

Keywords: Community dentistry, oral health interventions, communicable diseases, health promotion, public knowledge

Introduction

Communicable diseases continue to pose a significant global health burden, especially in low- and middle-income countries where prevention strategies often encounter structural and behavioral barriers. Despite substantial biomedical advances in vaccines, antimicrobials, and diagnostic technologies, public knowledge and everyday practices remain foundational determinants of disease transmission and control. In this context, dentistry—particularly at the community level—offers an underexplored yet strategically important platform for disseminating preventive health information. Oral health professionals routinely engage with diverse populations and are uniquely positioned to integrate communicable disease education into their interactions.1-4

The rationale for utilizing community dentistry in communicable disease prevention is rooted in several converging realities. First, many communicable diseases present with oral signs or have direct links to oral hygiene. Viral illnesses such as hepatitis B, HIV, and even emerging threats like monkeypox can exhibit early manifestations in the oral cavity. Additionally, bacterial infections like tuberculosis and syphilis can present with lesions, highlighting the oral cavity as both a diagnostic window and a potential site of transmission. Second, dental practices and oral hygiene behaviors—such as sharing toothbrushes, improper sterilization of instruments, or neglect of oral hygiene—can inadvertently facilitate transmission of pathogens.5-8

The community dentistry model shifts oral health practice from an individual-centered paradigm toward population-level engagement. Rather than restricting interventions to dental clinics, this model prioritizes outreach into schools, workplaces, and community centers, thereby addressing underserved and vulnerable groups. Educational interventions delivered by dentists can influence not only oral hygiene practices but also general health literacy. Importantly, the dentist's credibility as a healthcare provider can increase receptivity among populations traditionally resistant to other health campaigns.9-10

Over the past decade, integrated health education programs have demonstrated measurable benefits in modifying risk behaviors associated with communicable diseases. However, few initiatives have explicitly leveraged the oral health sector to extend this impact. Evidence suggests that people often underestimate the systemic implications of oral hygiene, perceiving dentistry as

separate from general medicine. Correcting this misconception can enhance both oral and systemic disease prevention.

Recent years, particularly after the COVID-19 pandemic, have underscored the importance of infection control measures, hand hygiene, and mask usage, many of which parallel oral health interventions. This overlap creates an opportunity for dental professionals to reinforce cross-cutting preventive practices. Furthermore, the pandemic amplified public sensitivity to health education delivered outside traditional medical contexts, legitimizing community dentistry as a conduit for broader health promotion.

The focus on knowledge and practices is deliberate. Knowledge provides the cognitive basis for behavioral change, while practices represent tangible adoption of preventive measures. The gap between awareness and practice has been well documented across global health literature. By embedding oral health interventions into community-based programs, this gap can be narrowed through repetitive engagement, hands-on demonstrations, and reinforcement strategies.

The current study addresses a critical research gap by systematically evaluating the measurable impact of community dentistry-driven interventions on public knowledge and practices concerning communicable diseases. Unlike general health campaigns, this study positions oral health professionals as active agents of community health education. Through a prospective cohort design, pre- and post-intervention assessments provide robust evidence of the effectiveness of this approach. The findings are expected to inform policy, refine health promotion strategies, and support the integration of oral health with broader communicable disease control frameworks.

Methodology

This prospective community-based intervention study was conducted at Department of Community and Preventive Dentistry, Islam Dental College, Sialkot. Ethical approval was obtained from the institutional review board, and informed consent was secured from all participants.

Sample size calculation: Using Epi Info version 7.2, a sample size of 260 was estimated to detect a 20% improvement in knowledge scores with 95% confidence and 80% power. To account for attrition, 300 participants were recruited.

Inclusion criteria: Adults aged 18–60 years, residing in the selected communities for at least 6 months, and willing to participate.
Exclusion criteria: Individuals with prior participation in health education programs in the last 6 months, healthcare professionals, or those with cognitive impairments.

Intervention: Trained community dentists conducted structured sessions consisting of oral health education, demonstrations of hygienic practices, discussions on transmission pathways of communicable diseases, and preventive strategies such as handwashing, mask use, and safe oral hygiene habits. Materials included posters, flip charts, and interactive Q&A sessions.

Assessment: A validated questionnaire with 20 knowledge items and 15 practice items was administered pre- and post-intervention. Scores were standardized on a 0–100 scale.

Statistical analysis: Data were analyzed using SPSS v25. Paired t-tests compared pre- and post-intervention scores. Subgroup analyses were conducted by age, gender, and education level. $p < 0.05$ was considered statistically significant.

Results

Table 1: Demographic Profile of Participants

Variable	**n (%)**
Total participants	300 (100%)
Mean age (years)	34.8 ± 10.2
Gender (Male/Female)	142 (47.3%) / 158 (52.7%)
Education (≤Secondary/College+)	176 (58.7%) / 124 (41.3%)
Residence (Urban/Semi-urban)	168 (56%) / 132 (44%)

Explanation: The cohort represented a balanced distribution across gender, education, and residence, suitable for community-level generalization.

Table 2: Pre- and Post-Intervention Knowledge and Practice Scores

Domain	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	p-value
Knowledge	52.4 ± 11.3	76.8 ± 10.5	<0.001
Practices	49.6 ± 13.7	71.2 ± 12.1	<0.001

Explanation: Both knowledge and practice scores improved significantly after the intervention.

Table 3: Subgroup Improvements in Knowledge Scores

Subgroup	Mean Improvement (%)	p-value
Age <35 years	27.1	<0.001
Age ≥35 years	20.4	0.002
Secondary education or less	28.5	<0.001
College education+	18.7	0.004

Explanation: Younger participants and those with lower baseline education levels showed greater improvements, indicating high receptivity to dentist-led interventions.

Discussion

This study provides strong evidence that community dentistry-driven interventions significantly improve both knowledge and practices concerning communicable diseases. The magnitude of change observed highlights the untapped potential of oral health professionals in public health education.1-3 Knowledge scores improved by nearly 25 percentage points, demonstrating that information delivered in accessible formats by trusted providers can reshape community understanding of communicable disease prevention. Practices improved similarly, underscoring the translation of awareness into tangible behavior change. 11-15 The greater improvements among younger participants suggest that early adulthood is a critical period for adopting preventive behaviors. This resonates with broader behavioral science findings that younger populations are

more adaptable to health education.16-17 The higher gains among participants with lower educational backgrounds underscore the importance of tailored, accessible interventions. Community dentists can bridge the gap by simplifying technical knowledge into actionable guidance. 18-20 Importantly, the findings expand the role of dentistry beyond oral hygiene. By situating oral health professionals as communicable disease educators, a new dimension of interprofessional collaboration in public health is introduced. The scalability of this model is promising. With modest resources, dentist-led interventions can be integrated into national preventive health frameworks, especially in resource-limited settings where communicable diseases remain endemic. Future research should explore long-term retention of knowledge, sustainability of improved practices, and potential impacts on disease incidence. Nonetheless, the present study establishes a foundational case for incorporating dentistry into the frontline of communicable disease education.

Conclusion

Community dentistry-driven interventions significantly enhance public knowledge and practices related to communicable diseases. Oral health professionals can serve as effective agents of general health promotion beyond their conventional roles. Integrating such initiatives into community health frameworks can accelerate progress toward disease prevention goals.

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