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Assessing the Impact of Community-Based Oral Health Education and Preventive Programs on Awareness and Treatment Compliance in Underserved Populations

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Abstract

Underserved populations face substantial barriers to oral health awareness and treatment adherence. This experimental study evaluates the effectiveness of community-based oral health education and preventive programs on improving awareness and treatment compliance among underserved communities. A quasi-experimental design was implemented, including 240 participants divided equally into intervention and control groups. The intervention included structured community workshops, demonstrations, and preventive checkups over a three-month period. Awareness and treatment compliance were assessed using validated structured questionnaires and clinical follow-ups. Pre- and post-intervention scores revealed a statistically significant increase in awareness in the intervention group (mean ± SD: 6.8 ± 1.3 pre, 9.1 ± 1.2 post; $p < 0.001$) and improved compliance rates (54.2% to 82.5%; $p < 0.001$). No significant change was observed in the control group. Demographic analysis showed the greatest impact among females and participants aged 30–45 years. These findings demonstrate the substantial positive impact of localized, culturally tailored oral health interventions. This study fills a critical gap by focusing on compliance in addition to awareness and demonstrates a scalable approach to

mitigating disparities in oral healthcare. Future research should evaluate long-term retention and community engagement strategies.

Keywords: Oral Health Education, Treatment Compliance, Underserved Communities

Introduction

Oral health represents a foundational aspect of general well-being, influencing systemic health, psychosocial functioning, and quality of life. Despite advancements in dentistry and preventive strategies, underserved populations continue to exhibit high prevalence of untreated dental caries, periodontal diseases, and oral infections. These populations, often constrained by limited resources, lack access not only to dental treatment but also to information regarding basic oral hygiene practices. Socioeconomic disadvantage, low health literacy, and cultural barriers collectively compromise their oral health status, making it critical to design interventions that are community-centered, accessible, and education-focused. Community-based oral health programs represent a potentially transformative solution by embedding preventive strategies directly into the social structures of underserved populations.1-3

While oral health education has traditionally been delivered through school systems and clinical consultations, these modes are often inaccessible to marginalized communities. As a result, a growing body of research has explored the efficacy of community-centered education models that utilize health workers, local volunteers, and peer educators. These programs aim not only to raise awareness but also to influence long-term behavioral change, such as consistent tooth brushing, reduced sugar intake, and routine dental visits. However, the effectiveness of these models in translating knowledge into treatment compliance remains inadequately studied, particularly in low-resource settings. Compliance, being a multifactorial behavior, is influenced not just by knowledge, but also by trust, accessibility, and perceived value of care.4-7

Recent global health strategies have emphasized the integration of oral health into broader primary healthcare frameworks. This shift encourages a focus on education, preventive care, and empowerment rather than reactive treatments. However, successful implementation depends heavily on contextual adaptation. Factors such as language, cultural beliefs about oral diseases, and the role of traditional remedies must be incorporated into program design. Moreover, oral

health messages need reinforcement through repeated exposure and social modeling. The role of community-based oral health workers becomes central in this context, functioning not just as information transmitters but as influencers and behavioral catalysts.8-10

A major challenge in current literature is the limited evidence linking awareness improvements with measurable changes in treatment compliance. Studies have shown increased oral health knowledge following educational sessions, yet few have explored whether this awareness translates into clinic visits, adherence to treatment plans, or sustained hygiene practices. This disconnect presents a crucial research gap. It is essential to evaluate not just whether knowledge is gained, but whether it alters oral health behaviors, particularly in populations where barriers to care are both structural and perceptual. Furthermore, intervention sustainability and community ownership remain critical, as one-time sessions often yield short-lived outcomes.

The present study addresses these gaps by implementing a structured, community-based oral health education and prevention program in underserved populations. The intervention incorporates both didactic and interactive methods, such as visual demonstrations, oral hygiene kits, and free preventive dental checkups, tailored to cultural and literacy contexts. By assessing both awareness levels and treatment compliance before and after the intervention, and comparing them with a control group, this study provides a comprehensive evaluation of program impact. Additionally, subgroup analyses by age and gender identify differential effects across demographics, offering insights for targeted policy development.

This research offers critical evidence supporting the need for community-integrated models in oral healthcare delivery. Beyond establishing statistical significance, it demonstrates real-world applicability by embedding interventions in familiar community settings. In doing so, it seeks to advance the global oral health agenda by advocating for scalable, culturally sensitive approaches that bridge the gap between awareness and actionable treatment behavior. The implications of this study extend beyond dentistry, contributing to the broader discourse on health equity, empowerment, and sustainable community engagement in public health.

Methodology

A quasi-experimental study design was used at Islam Dental College, Sialkot to assess the impact of a structured community-based oral health education and prevention program on awareness and treatment compliance among underserved populations in two demographically similar communities. Sample size was calculated using Epi Info software version 7.2, assuming a 95% confidence level, 80% power, a 20% expected increase in awareness post-intervention, and accounting for a 10% non-response rate, resulting in 240 participants equally divided into intervention (n=120) and control (n=120) groups. Participants aged 18–60 years were recruited through purposive sampling from local health centers. Inclusion criteria involved residents with no formal dental education exposure and willingness to attend all sessions; exclusion criteria included prior participation in any dental awareness program within the last six months or ongoing treatment for systemic illnesses that could interfere with oral health outcomes. The intervention comprised three monthly interactive sessions using posters, models, group discussions, and distribution of oral hygiene kits, followed by preventive screenings. Verbal consent was obtained from all participants after explaining the study purpose in their native language. Baseline and follow-up data were collected using a validated oral health awareness questionnaire and treatment compliance checklist administered by trained dental volunteers. Ethical clearance was obtained from the institutional review board. Data were analyzed using SPSS version 26. Independent t-tests and chi-square tests were used, with $p < 0.05$ considered statistically significant.

Results

Table 1: Demographic Characteristics of Participants (n=240)

Variable	Intervention Group (n=120)	Control Group (n=120)	p-value
Mean Age (years)	36.2 ± 9.5	35.8 ± 8.9	0.72
Female (%)	68 (56.7%)	65 (54.2%)	0.68
Low-income status (%)	98 (81.7%)	100 (83.3%)	0.75
Illiterate (%)	34 (28.3%)	36 (30.0%)	0.79

Both groups were demographically comparable, ensuring baseline equivalence.

Table 2: Changes in Oral Health Awareness Scores (Mean ± SD)

Time Point	Intervention Group	Control Group	p-value (between groups)
Baseline	6.8 ± 1.3	6.9 ± 1.4	0.62
Post-Intervention	9.1 ± 1.2	7.0 ± 1.3	<0.001*

Significant improvement in awareness scores was observed in the intervention group post-education ($p < 0.001$).

Table 3: Treatment Compliance Before and After Intervention

Compliance Measure	Intervention (n=120)	Control (n=120)	p-value
Baseline Compliance (%)	54.2%	55.0%	0.88
Post-Intervention Compliance (%)	82.5%	56.7%	<0.001*

The intervention group showed a statistically significant improvement in treatment compliance compared to controls.

Discussion

The findings from this study strongly support the implementation of community-based oral health education and preventive programs as effective tools in enhancing both awareness and treatment compliance among underserved populations. The statistically significant improvement in awareness scores in the intervention group demonstrates the ability of structured community-based education to influence knowledge acquisition, especially when delivered using culturally sensitive materials and methods. Importantly, the observed 28.3% increase in treatment compliance reflects a successful translation of knowledge into behavior change, which has often been lacking in similar initiatives.11-14

This work contributes new insights by emphasizing the impact of education on compliance—a factor that has traditionally been underexplored. Treatment adherence, especially in low-resource settings, is frequently hindered by mistrust, limited understanding of oral diseases, and financial concerns. By integrating preventive checkups and hygiene tools into the intervention, participants not only learned but also experienced improved access, reducing barriers that often dissuade treatment continuation.15-17

Notably, the intervention was more effective among women and individuals aged 30–45, suggesting that tailoring programs to subgroups may enhance impact. Women in underserved communities often serve as health decision-makers, and empowering them with oral health knowledge creates a ripple effect. The age-related responsiveness may reflect greater concern for long-term well-being or family health responsibilities, which should be factored into future program designs.18-20

The effectiveness of verbal education, especially in populations with low literacy levels, underscores the value of visual demonstrations and interactive sessions. This aligns with contemporary health promotion models that emphasize engagement and practical demonstration over passive information delivery. These approaches create memory retention and foster peer-led reinforcement, making them especially suitable for low-literacy settings.

Importantly, the use of trained dental volunteers embedded within the community ensured cultural resonance and trust. This strategy appears pivotal in overcoming resistance and stigma associated with formal healthcare systems. Trust-building mechanisms are particularly vital in promoting compliance and deserve further exploration in long-term program models.

The success of this intervention also highlights the critical role of prevention in public health. Providing preventive services alongside education addresses both immediate health needs and long-term behavioral shifts. The dual approach ensures that individuals are not merely aware but are given the opportunity and means to act on that awareness, enhancing program effectiveness.

Finally, while the study's short-term outcomes are promising, sustainability remains a key concern. Longitudinal assessments are needed to evaluate whether compliance and awareness persist beyond three months. Future research should explore strategies for continuous community engagement, including periodic reinforcement sessions, community champions, and integration into local health systems. These findings provide a strong evidence base for policy formulation and scale-up of similar interventions.

Conclusion

Community-based oral health education and preventive programs significantly improved awareness and treatment compliance in underserved populations. This study bridges a critical gap by demonstrating that knowledge enhancement can translate into measurable behavioral change. Future interventions should focus on sustained community engagement and subgroup targeting to maintain long-term oral health improvements.

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