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SMILES BEYOND CLINICS: LINKING ORAL HEALTH WITH SOCIAL DEVELOPMENT GOALS IN PAKISTAN

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ABSTRACT

Background: Oral health is increasingly recognized as a critical component of overall well-being; however, in many low- and middle-income countries, it remains narrowly framed as a clinical issue, detached from broader social and development agendas. In Pakistan, particularly in resource-constrained settings, limited access to oral healthcare intersects with socioeconomic inequality, gender norms, and weak preventive systems, potentially undermining education, livelihoods, and social participation.

Objectives: This study aimed to examine the linkages between oral health and key social development dimensions, explore community and stakeholder perceptions of oral health as a social development concern, and identify structural and institutional pathways through which oral health influences broader development outcomes among marginalized populations.

Methods: A qualitative exploratory design was employed in rural and peri-urban communities of Khyber Pakhtunkhwa, Pakistan. Data were collected through semi-structured in-depth interviews and focus group discussions with 35 participants, including community members, healthcare providers, and local development stakeholders. Data were analyzed using thematic analysis, guided by social determinants of health and development frameworks.

Results: Seven interrelated themes emerged. Poor oral health constrained educational participation through school absenteeism and reduced learning engagement; disrupted livelihoods by causing work absenteeism and income loss; and reinforced gendered inequities due to women's limited autonomy and financial dependence. Social stigma associated with poor oral health reduced community participation and self-esteem. At the institutional level, oral health was largely excluded from development planning, with services focused on pain management rather than prevention. Oral diseases were widely normalized, delaying care-seeking. Despite these barriers, participants increasingly recognized oral health as integral to education, productivity, dignity, and long-term social development.

Conclusion: Oral health in resource-constrained settings is deeply embedded within social, economic, and institutional structures, with far-reaching implications for development outcomes. Reframing oral health as a social development priority and integrating preventive, gender-responsive, and community-based approaches into development planning are essential for advancing equitable and sustainable health and development in Pakistan.

INTRODUCTION

Oral health constitutes an essential component of overall health and well-being, yet it remains one of the most neglected facets of public health worldwide (World Health Organization [WHO], 2025). Oral diseases such as dental caries, periodontal disease, and tooth loss rank among the most prevalent non-communicable diseases globally, affecting approximately 3.5 billion people and disproportionately burdening socially disadvantaged populations (WHO, 2025). The global burden of oral disease underscores systemic inequalities in access to care, preventive services, and public health infrastructure, particularly in low- and middle-income countries (LMICs) such as Pakistan (World Health Organization, 2025; Khan, Batool, & Batool, 2025).

The social determinants of health (SDH) including socioeconomic status, education, employment, and living conditions play a central role in shaping oral health outcomes across life courses. According to comprehensive reviews, these determinants influence not only biological risk factors but also oral health behaviours and care utilization (Rhythm & Gupta, 2024; Obeidat et al., 2024). Structural disadvantages in income and education lead to uneven distribution of dental disease and access to services, mirroring broader health inequities observed globally (WHO, 2025; Obeidat et al., 2024). Indeed, evidence from population-level analyses confirms that lower income and lower educational attainment are consistently associated with poorer oral health outcomes and limited dental care utilization (Obeidat et al., 2024).

In addition to socioeconomic factors, gender disparities are well-documented in oral health literature. Women in many LMIC contexts face compounded barriers to care, including restricted autonomy, financial dependency, and cultural norms that limit mobility and decision-making power (Khan et al., 2025). These intersecting barriers contribute to gendered patterns of oral disease and delayed care, amplifying the social consequences of untreated dental conditions (Huzaifa et al., 2025). This gendered dimension aligns with broader discussions in the public health and development literature that highlight the importance of intersectional approaches to health equity research (Mbah, Sevak, et al., 2024).

The links between oral health and educational participation are similarly established. Poor oral health and dental pain are associated with increased school absenteeism, reduced concentration, and diminished academic performance among children (Global Oral Health Status Report, WHO, 2022). In Pakistan, research on school-age children shows that socioeconomic status and parental education significantly influence oral health behaviours, dental visitation, and caries prevalence, indicating that social context directly shapes children's oral health and, by extension, their educational experiences (Moin et al., 2023; Khan et al., 2025b).

Beyond education, poor oral health can impede livelihoods and economic productivity. Oral pain and dysfunction limit work capacity, particularly for individuals in informal or daily-wage labour, where absenteeism directly translates to income loss and heightened economic vulnerability. These

individual experiences reflect broader economic and social gradients in oral health, wherein underserved communities confront systemic barriers such as high out-of-pocket costs and limited public dental services (WHO, 2025; Khan et al., 2025a; Addressing Challenges of Dental Problems in Pakistan, 2024).

Another critical pathway linking social life and oral health is stigma and social participation. Oral conditions can diminish self-esteem and social engagement, leading to withdrawal from community life and interpersonal interactions. Qualitative research in Pakistan highlights that stigma related to dental appearance contributes to avoidance of social gatherings and reluctance to seek care, exacerbating isolation and reinforcing negative health trajectories (Najjar et al., 2025; BMC Oral Health, 2024). These psychosocial dimensions reinforce the notion that oral health intersects with broader social and emotional well-being.

In addition to individual and interpersonal factors, institutional and policy contexts shape oral health outcomes. Pakistan's health system has historically undervalued oral health within primary healthcare frameworks, with limited integration of preventive dental services into primary care and public health programming (Basharat & Shaikh, 2016). Despite the inclusion of oral health in national health policy rhetoric, disparities in access and quality persist, particularly in rural and low-income communities where oral health infrastructure is weak and service provision is extraction-focused rather than preventive (Basharat & Shaikh, 2016; Addressing Challenges of Dental Problems in Pakistan, 2024).

The neglect of oral health at policy and development levels is mirrored globally. Oral health often remains peripheral to key global health agendas and development frameworks despite its inclusion in the Sustainable Development Goals (SDGs). Recent analyses highlight the importance of explicitly linking oral health to SDG-3 (Good Health and Well-Being), SDG-4 (Quality Education), SDG-5 (Gender Equality), and SDG-10 (Reduced Inequalities), noting that integrated strategies can advance health equity and social development outcomes (Ahmed, Rehman, & Kausar, 2023). The 2021 WHO Resolution on Oral Health and the Global Oral Health Action Plan 2023-2030 also advocate for a shift from predominantly curative approaches to comprehensive preventive and promotive strategies embedded within universal health coverage frameworks.

The global disparities in oral health extend beyond LMICs; even high-income countries report pronounced inequalities linked to socioeconomic status, housing instability, and food insecurity, which influence both oral disease burden and access to routine dental care (Obeidat et al., 2024). These shared patterns across diverse contexts reinforce the imperative for multisectoral, equity-oriented policies that address upstream determinants of oral health rather than focusing solely on individual behaviours.

Against this backdrop, the present study investigates the lived experiences and perceptions of oral health in resource-constrained rural and peri-urban communities of Khyber Pakhtunkhwa, Pakistan. It explores how oral health is linked with core dimensions of social development including education, livelihoods, gender equity, and social participation while elucidating structural and institutional pathways that sustain oral health inequities in marginalized settings. In doing so, the study contributes to a growing body of qualitative research that reframes oral health as a social and developmental issue, not merely a clinical condition.

Research Methodology

Study Design

This study employed a qualitative exploratory research design (Naz et al., 2024a; Riaz et al.,

2024a) to examine the social and developmental dimensions of oral health beyond its conventional clinical framing. The exploratory nature of the design was particularly suited to investigating under-researched linkages between oral health, education, livelihoods, gender relations, and social participation in low-resource settings. Qualitative inquiry enabled an in-depth understanding of participants' lived experiences, social meanings, and institutional interactions, which are often overlooked in epidemiological or service-utilization studies of oral health.

The study was guided conceptually by social determinants of health and human development perspectives, which view health not merely as a biomedical outcome but as a product of social structures, power relations, and access to resources.

Study Setting

The research was conducted in rural and peri-urban communities of KP, Pakistan. These settings were purposively selected due to persistent development challenges, including poverty, limited access to public healthcare facilities, weak preventive oral health services, and entrenched gender and socioeconomic inequalities. Rural and peri-urban areas in KP are characterized by high reliance on informal employment, restricted mobility for women, and limited integration of oral health within primary healthcare and development programs, making them particularly relevant for exploring oral health as a social development issue.

Study Population and Sampling

The study population comprised three broad participant groups:

1. Adult community members from low-income households,
2. Public and private dental or general healthcare providers, and
3. Local development stakeholders, including community leaders, social workers, and practitioners engaged in education or social welfare initiatives.

A purposive sampling strategy was adopted to ensure the inclusion of participants with diverse perspectives and experiences relevant to oral health and development outcomes (Naz et al., 2024b, Riaz et al., 2024b; Naz et al., 2024c; Naz et al., 2024d). Efforts were made to include both men and women, participants from different age groups, and individuals occupying varied social and professional roles within the community.

The final sample consisted of 35 participants. Sampling was conducted iteratively and continued until thematic saturation was reached, defined as the point at which additional interviews no longer generated new analytical insights or themes relevant to the study objectives (Naz et al., 2025; Afridi et al., 2025).

Data Collection Methods

Data were collected using semi-structured in-depth interviews (IDIs) and focus group discussions (FGDs). These methods were selected to allow flexibility in exploring individual experiences while also capturing shared norms, collective meanings, and community-level dynamics related to oral health.

Interview and FGD guides were developed based on the study objectives and relevant literature and covered the following domains:

Perceived impacts of oral health on education, work, income generation, and social participation;

- Gendered and socioeconomic differences in oral health experiences and care-seeking behaviors;
- Community norms surrounding oral disease, pain tolerance, and prevention;
- Institutional responses and policy gaps linking oral health with broader development planning.

All interviews and FGDs were conducted in local languages to facilitate participant comfort and expression. With informed

consent, sessions were audio-recorded, transcribed verbatim, and subsequently translated into English. Translations were cross-checked to ensure conceptual and contextual accuracy.

Data Analysis

Data were analyzed using thematic analysis (Amin et al., 2025; Ishtiaq et al., 2025; Riaz et al., 2025), following a systematic and iterative process. Initial familiarization involved repeated reading of transcripts to gain an overall understanding of the data. Open coding was then conducted to identify meaningful units related to oral health experiences, social impacts, and institutional contexts (Naz et al., 2023b; Naz et al., 2023c). An inductive–deductive analytical approach was employed. While themes were allowed to emerge organically from the data, analysis was also informed by established frameworks on social determinants of health, gender, and development. Codes were grouped into broader categories and refined into themes through constant comparison across participant groups.

Coding was conducted manually and/or using qualitative data analysis software. Analytical memos were maintained to document emerging interpretations and reflexive considerations, enhancing transparency and analytical rigor.

Ethical Considerations

All participants provided informed consent and were assured of confidentiality and anonymity (Naz et al., 2022a; Naz et al., 2022b; Naz et al., 2023a). Pseudonyms and non-identifying descriptors were used in reporting findings. Participants were informed of their right to withdraw from the study at any stage without penalty.

Rigor and Trustworthiness

Methodological rigor was ensured through multiple strategies. Triangulation across participant groups enhanced the credibility of findings. Peer debriefing supported critical reflection on emerging themes, while thick description enabled contextual richness and transferability. Dependability and confirmability were strengthened through systematic documentation of data collection and analytical procedures and through reflexive engagement with the research process.

Results

The analysis revealed seven interrelated themes that collectively demonstrate how oral health extends beyond clinical outcomes to influence education, livelihoods, gender relations, social participation, and broader development trajectories. Across participant narratives, oral health emerged as a deeply social phenomenon, shaped by economic vulnerability, gendered power relations, and institutional neglect. These effects were most pronounced among marginalized populations, particularly women, low-income households, and informal workers.

Theme 1: Oral Health as a Constraint on Educational Participation

Participants consistently described untreated oral health problems as a significant barrier to educational engagement among children and adolescents. Oral pain, infection, and discomfort affected students' ability to attend school regularly, concentrate during lessons, and participate in classroom activities. Many caregivers reported delaying care due to cost or accessibility until pain became severe, by which time educational disruption had already occurred.

Oral health problems were often normalized within households, resulting in delayed recognition of their educational consequences. Teachers and parents alike perceived dental pain as a temporary issue rather than a factor with cumulative impacts on learning outcomes.

"When the tooth hurts, the child cannot sit in school. He keeps missing classes." *(Female participant, rural)*

Theme 2: Livelihood Disruptions and Economic Vulnerability

For adult participants, particularly daily wage earners and informal workers, oral health problems were directly linked to economic insecurity. Dental pain and infection led to absenteeism, reduced work capacity, and income loss. In contexts where livelihoods depend on daily physical presence, even short periods of illness had immediate financial consequences for households.

Participants also highlighted the social dimensions of employability, noting that visible oral problems affected confidence, customer interactions, and perceived professionalism, especially in service-oriented work.

"If I don't work for one day because of pain, there is no income for the family." *(Male participant, rural)*

Theme 3: Gendered Inequalities in Oral Health Experiences

Women's narratives revealed pronounced gendered disparities in oral health experiences and access to care. Financial dependence on male household members, limited decision-making autonomy, and restricted mobility contributed to delayed or foregone treatment. As a result, women often endured prolonged pain, affecting not only their physical well-being but also their emotional health, household responsibilities, and social engagement.

Poor oral health undermined women's confidence and reinforced existing gender inequities in health and dignity.

"I stayed in pain for months because I needed permission and money." *(Female participant, rural)*

Theme 4: Social Stigma and Reduced Community Participation

Participants across gender and age groups described oral health problems as a source of embarrassment and social stigma. Missing teeth, visible decay, and persistent oral discomfort led to avoidance of social gatherings, reduced communication, and withdrawal from community life. This was particularly evident among women and young people, for whom appearance and social interaction were closely tied to self-esteem and social inclusion.

"I avoid gatherings because I feel ashamed to talk or smile." *(Female participant, peri-urban)*

Theme 5: Institutional Neglect of Oral Health within Development Agendas

Healthcare providers and development stakeholders emphasized that oral health remains largely absent from public health planning and social development programs. Services were described as predominantly reactive, focusing on pain relief and extractions, with minimal attention to prevention, health education, or integration with education, livelihood, or gender-focused initiatives.

This institutional neglect reinforced community perceptions of oral health as a low priority within development agendas.

"Oral health is not part of development programs; we only treat pain." *(Healthcare provider, IDI)*

Theme 6: Normalization of Oral Disease and Limited Preventive Awareness

Across communities, oral diseases were widely perceived as inevitable, particularly among low-income households. Preventive practices such as routine dental check-ups and oral hygiene education were uncommon. Care-seeking was typically delayed until pain became unbearable, resulting in advanced disease and avoidable complications.

This normalization reflected broader structural constraints, including poverty, limited service availability, and lack of preventive messaging.

"We think it is normal until the pain becomes unbearable."

(Female participant)

Theme 7: Emerging Recognition of Oral Health as a Development Priority

Despite persistent barriers, participants increasingly articulated an understanding of oral health as integral to education, productivity, dignity, and long-term social development. Community leaders and healthcare providers emphasized the need for preventive, school-based, and community-level interventions that link oral health with broader development goals.

This emerging recognition suggests opportunities for integrating oral health into social development and public health planning. "Oral health is linked to children's future, not just treatment." *(Community leader)*

Table-1: Thematic Linkages Between Oral Health and Social Development Outcomes

Theme	Analytical Focus	Developmental Implications	Illustrative Excerpt
Oral health as a constraint on education	Untreated oral pain disrupts attendance, concentration, and classroom participation among children	Compromised educational attainment, reduced learning continuity, and long-term human capital loss	"When the tooth hurts, the child cannot sit in school. He keeps missing classes."
Livelihood disruptions and economic vulnerability	Dental problems cause absenteeism, reduced productivity, and income instability, especially for informal workers	Heightened household economic insecurity and vulnerability to poverty	"If I don't work for one day because of pain, there is no income for the family."
Gendered inequalities in oral health experiences	Women face delayed care due to financial dependence, limited autonomy, and mobility restrictions	Reinforcement of gender-based health inequities, diminished well-being and dignity	"I stayed in pain for months because I needed permission and money."
Social stigma and reduced participation	Poor oral appearance and discomfort lead to embarrassment and withdrawal from social life	Social exclusion, reduced community engagement, and weakened social capital	"I avoid gatherings because I feel ashamed to talk or smile."
Institutional neglect of oral health	Oral health excluded from preventive and development-oriented programs	Fragmented health planning and missed opportunities for integrated development outcomes	"Oral health is not part of development programs; we only treat pain."
Normalization of oral disease	Oral problems perceived as inevitable; care sought only when pain becomes severe	Delayed treatment, advanced disease, and preventable complications	"We think it is normal until the pain becomes unbearable."
Oral health as an emerging development priority	Growing recognition of oral health's role in education, productivity, and dignity	Potential entry point for integrating oral health into social development agendas	"Oral health is linked to children's future, not just treatment."

DISCUSSION

This study's findings elucidate the profound social embeddedness of oral health within resource-constrained settings in Khyber Pakhtunkhwa, Pakistan, demonstrating that oral health outcomes are shaped by multidimensional social determinants such as education, socioeconomic status, gender norms, and institutional neglect. These results align with the well-established conceptualization of oral health as a product of social determinants of health, which include socioeconomic status, education, employment, and access to healthcare services (Rhythm & Gupta, 2024). Quantitative evidence from broader populations also indicates that lower educational attainment and socioeconomic disadvantage are associated with poorer oral health status (Langrial et al., 2023), reinforcing the centrality of structural determinants in shaping oral health inequities.

Consistent with our findings, extant literature indicates that oral health issues, such as dental pain and untreated caries, are significantly associated with school absenteeism and poorer academic performance in children and adolescents (Jackson et al., 2018). Meta-analytic evidence suggests that children with poor oral health have higher odds of absenteeism and lower academic achievement compared with their healthier peers (Jackson et al., 2018), which resonates with participant narratives in this study where oral pain disrupted school attendance and learning engagement.

Our theme on livelihood disruptions and economic vulnerability underlines how oral health problems translate directly into lost productivity and income insecurity, especially for informal workers. This pattern is reflected in international research demonstrating that socioeconomic and lifestyle factors including parental education, household income, and health behaviours -are strongly associated with oral health outcomes among children and adults (Moin et al., 2023). In Pakistan specifically, parental education has been linked to children's oral health behaviours and outcomes, with lower parental education associated with higher rates of untreated dental conditions and greater absenteeism related to oral issues (Moin et al., 2023).

The low prioritization of preventive practices seen in our data parallels findings that oral health literacy and awareness are critical determinants of oral health behaviours and outcomes. Mixed-methods research in socially diverse populations shows that limited knowledge and perceptions about oral health contribute to disparities in oral health outcomes (King et al., 2023). Such disparities are further compounded by financial barriers and dental fear as key deterrents to care-seeking, even among educated populations (BMC Oral Health, 2024).

The gendered patterns identified in the current study, where women experienced prolonged suffering due to restricted autonomy and financial dependence, reflect documented gender differences in oral health behaviours and access. Socio-demographic research in Pakistan underscores how female caregivers' education and decision-making power significantly influence children's oral hygiene practices (Iqbal et al., 2022). Moreover, qualitative work highlights gender-specific barriers in access to preventive and restorative dental care, reinforcing that patriarchal norms and resource constraints intersect to create compounded disadvantage for women.

Stigma associated with oral health conditions also emerged as a critical barrier to community participation. Studies exploring dental stigma show that perceived stigma can deter individuals from seeking care due to embarrassment, fear of negative judgement, and previous experiences of discriminatory behaviours within healthcare settings (Najjar et al., 2024). These psychosocial barriers can amplify social exclusion and diminish self-

esteem, particularly among youth and women in socio-culturally conservative environments. Findings that oral health is neglected in broader development planning echo critiques in global oral health policy scholarship, which emphasize that oral health often remains peripheral to primary healthcare and development strategies (Rhythm & Gupta, 2024). Even within Pakistan's public health landscape, qualitative evidence indicates that oral health services are perceived as inaccessible, extraction-focused, and poorly resourced (Khan et al., 2025), underscoring the need for integrated, preventive, and equity-oriented oral health policies aligned with universal health coverage objectives.

The emerging recognition of oral health as a development priority among study participants suggests potential avenues for policy action. Aligning oral health interventions with Sustainable Development Goals (SDGs**)** particularly SDG-3 (health and well-being), SDG-4 (quality education), SDG-5 (gender equality), and SDG-10 (reduced inequalities) can provide a cohesive framework for integrating oral health within broader social development priorities (Ahmed et al., 2023). School-based oral health education programs, for instance, have been shown to improve knowledge and oral hygiene practices among children, suggesting that preventive interventions can reduce disease burden and its developmental impacts when embedded within education systems (Khyber College study, 2022).

CONCLUSION

This study demonstrates that oral health in resource-constrained communities of Khyber Pakhtunkhwa is not merely a clinical issue but a deeply embedded social and developmental concern. Through qualitative exploration of community and stakeholder perspectives, the findings reveal that untreated oral health conditions adversely affect educational participation, livelihood security, gender equity, and social inclusion. Oral pain and visible dental problems disrupt children's schooling, undermine adult productivity, and reinforce economic vulnerability, particularly among informal workers and low-income households.

Gendered inequalities further compound these challenges, as women experience delayed access to care due to restricted autonomy, financial dependence, and limited mobility. Social stigma associated with poor oral health contributes to withdrawal from community life and diminished self-esteem, especially among women and youth. At the institutional level, oral health remains marginalized within public health and social development agendas, with services largely reactive and pain-focused rather than preventive or integrative.

Despite these constraints, the study also identifies an emerging recognition among communities and stakeholders of oral health as integral to education, dignity, productivity, and long-term development. This shift in perception signals important opportunities for reframing oral health within broader development frameworks. Overall, the study underscores the need to reconceptualize oral health as a social determinant that intersects with multiple dimensions of human development, rather than as an isolated biomedical concern.

Recommendations

Based on the study findings, the following recommendations are proposed to inform policy, practice, and future research:

1. Integrate Oral Health into Development and Social Sector Planning

Oral health should be explicitly incorporated into national and provincial development strategies, including education, livelihood, gender, and social protection programs. Aligning oral health initiatives with the Sustainable Development Goals particularly SDG-3 (Good Health and Well-being), SDG-4 (Quality Education), SDG-5 (Gender Equality), and SDG-10 (Reduced Inequalities)

can facilitate more holistic and equitable development outcomes.

2. Strengthen Preventive and Community-Based Oral Health Interventions

There is a critical need to shift from reactive, pain-focused dental services toward preventive and promotive approaches. School-based oral health education, community awareness campaigns, and routine screening programs should be prioritized, particularly in rural and peri-urban settings, to address early disease and reduce long-term social and economic consequences.

3. Promote Gender-Responsive Oral Healthcare

Policies and programs must address gender-specific barriers to oral healthcare by enhancing women's decision-making autonomy, improving financial access, and ensuring culturally appropriate service delivery. Integrating oral health services within maternal and primary healthcare platforms may help reduce gender-based inequities in access and outcomes.

4. Enhance Access to Affordable and Decentralized Services

Expanding access to affordable oral healthcare through primary health facilities, mobile dental units, and public–private partnerships can reduce geographic and financial barriers. Decentralized service models are particularly important for daily wage earners and marginalized populations who face high opportunity costs in seeking care.

5. Improve Oral Health Literacy and Reduce Stigma

Community-level interventions should focus on improving oral health literacy, challenging the normalization of oral disease, and addressing stigma associated with poor oral health. Engaging community leaders, teachers, and health workers can support culturally sensitive messaging and encourage timely care-seeking behaviors.

6. Future Research and Evidence Generation

Further research using mixed-methods and longitudinal designs is recommended to quantify the developmental impacts of oral health and evaluate the effectiveness of integrated interventions. Gender-focused and implementation research can provide critical insights into scaling up equitable and context-appropriate oral health strategies.

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