# Dental Clinics: A Potential Health Center for Screening of Undiagnosed Type II Diabetes

**Farzeen Tanwir[1]\*, Bushra Ijaz[2] and Tauqeer Bibi[3]**

*[1]Professor, Bahria University Health Sciences Campus (BUHSC), Pakistan, McGill University, Canada*
*[2]Registrar, Department of Periodontology, Bahria University Health Sciences Campus (BUHSC), Pakistan*
*[3]Assistant Professor, Department of Periodontology, Bahria University Health Sciences Campus (BUHSC), Pakistan*

**\*Corresponding Author:** Farzeen Tanwir, Professor, Bahria University Health Sciences Campus (BUHSC), Pakistan and McGill University, Canada.

## Abstract

Oral diseases constitute a significant public health challenge due to their widespread occurrence and impact, particularly affecting vulnerable and marginalized communities. Developing countries are experiencing a shift in disease patterns, with a decline in infectious diseases and nutritional deficiencies, accompanied by a simultaneous rise in diabetes mellitus, cancer, cardiovascular diseases, and chronic non-communicable diseases (NCDs). This transition is evident in the Eastern Mediterranean Region as well. The acceleration of this transition is primarily attributed to the adoption of westernized lifestyles, alongside the growth of urbanization and economic development. There is an increasing prevalence of obesity and an excessive availability of food energy, surpassing actual requirements. Moreover, a rising trend of higher sugar consumption is observed in most states.

*Keywords: Dental Clinics; Potential Health Center; Diabetes Mellitus; World Health Organization (WHO)*

Diabetes mellitus is an emergent global health problem. It is widely spread in Asian communities like Hong Kong, Pakistan, and Singapore. These are among the countries with the higher diabetes prevalence in adult individuals. The World Health Organization (WHO) has projected a significant surge of 170% in diabetes cases within developing countries. This estimation translates to around 228 million individuals affected by diabetes, constituting approximately 75% of the global diabetic population. Notably, the most substantial escalation is anticipated in India, where, the diabetic population will rise from 19 million to 57 million. In parallel, Pakistan is expected to witness an increase from 4.3 million cases in 1995 to 14.5 million cases by 2025. Consequently, by the year 2025 [1], over three-fourths of all individuals with diabetes will be residing in developing nations. According to the report, subsequent to China and India, Pakistan holds the third position globally in diabetes prevalence as shown in figure 1. At present, there are 33 million individuals with diabetes in Pakistan, and health professionals' expresses concerns that the actual count of diabetic patients might have risen over the past few years [2,3].

In a recent survey conducted through questionnaires, 17% of the population in Karachi indicated that they have diabetes [4]. This aligns with the prevalence reported in previous World Health Organization (WHO) surveys regarding Diabetes mellitus. Pakistan's adult diabetes prevalence rate stands at 18%, in contrast to Sweden's rate of 2% among adults, and Saudi Arabia's higher rate of 25% (as per WHO data) [5].
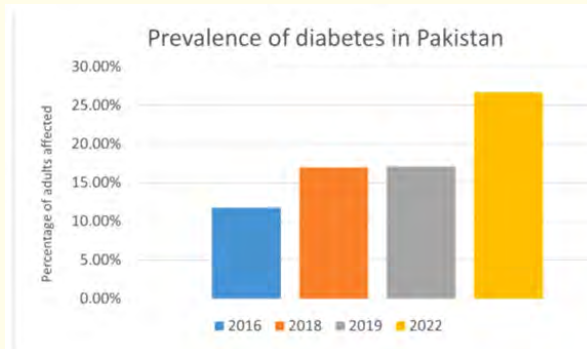
***Figure 1:** Prevalence of diabetes.*

In 2021, Pakistan exhibited the highest prevalence of diabetes, and by the age of 60, there was a mortality rate of 35.5% attributed to diabetes. Obesity is the most common risk factor of diabetes. In 1994, Shera., *et al.* conducted a survey in the rural town of Shikarpur, located in the Sindh Province of Pakistan, to estimate the frequency of Diabetes mellitus and its connection to obesity and age. According to their findings, the survey revealed Diabetes prevalence among women 11.7% and men 16.2%. This research identified a link between Diabetes and factors like central obesity, positive family history, and hypertension [6]. As per the National Diabetic Prevalence Survey in collaboration with the World Health Organization (WHO) conducted between 1994 and 1998, the prevalence of type-II diabetes was found to be 13.9% in rural Sindh and 16.5% in urban Sindh, Pakistan.

According to the research conducted in Pakistan regarding Oral health understanding and practices among diabetic patients, found a lack of awareness about the association between diabetes and oral complications [7]. Diabetes poses a significant load on healthcare systems. The strong correlation observed between various oral diseases and chronic conditions primarily arises from shared risk factors. One of the most common risk factors for Diabetes mellitus is periodontal disease.

Periodontitis can be considered as a complication of both types of diabetes, and the risk is further exacerbated by poor diabetic control. The progression of periodontitis is notably rapid in cases of poorly managed diabetes. Where as individuals with diabetes who effectively control their condition and maintain good oral health through self motivation care and frequent skilled checkup by expert exhibit a significantly reduced risk of periodontitis and subsequent tooth loss. Under specific combinations of risk factors, periodontitis can lead to substantial degradation of the bone supporting teeth, eventually causing loss of tooth. Poorly controlled diabetes is a notable risk factor for periodontitis, and the occurrence of gingivitis and periodontitis can sometimes serve as initial indicators of diabetes. Given the potential for severe periodontitis to lead to tooth loss, it's imperative that individuals with diabetes prioritize diligent oral hygiene and regular dental checkups to promptly identify any issues [8].

People whose diabetes are controlled and maintain good oral hygiene practices does not exhibit increased risk of periodontitis. However, the chances of developing periodontitis increases significantly, when the diabetes is uncontrolled and accompanied by smoking. Recent evidence highlights that the diabetes prevalence among individuals with periodontitis is significantly higher (twice as much) compared to those without periodontitis [9].

Inflammation plays a pivotal role in both the negatively synergistic effects on diabetes and periodontal diseases. Research suggests that the infectious and inflammation-heavy nature of periodontal disease can detrimentally impact the metabolic control of diabetes. From an

epidemiological standpoint, common oral symptoms reported by diabetic patients include inadequate oral hygiene, gum inflammation (gingivitis), oral candidiasis, calculus and pocket formation, dental caries, non-carious tooth surface loss, periapical abscess, taste impairment, burning mouth syndrome, rhomboid glossitis, denture stomatitis, angular cheilitis, reduced salivation, halitosis, and oro-antral fistula. This comprehensive list underscores how diabetes mellitus profoundly affects oral health [10]. Another study conducted by Sandberg in 2000 revealed that diabetics experiencing xerostomia (dry mouth) had more advanced periodontitis and carious lesions as compared to healthy individuals. Diabetic individuals also displayed a heightened need for periodontal treatment, caries prevention, and prosthetic correction [11] Khader's meta-analysis indicated that diabetic patient displayed poorer oral hygiene, evidenced by more severe periodontitis, calibrated by increased mean plaque index (PI), aggregate gingival index (GI), and increased clinical attachment loss. However, the extent of periodontal disease remained similar among diabetic and non-diabetic individuals [12].

The perception of self-efficacy among diabetics holds significance in the context of dental health education. Dental professionals can improve oral health by showcasing models of proper oral health behavior and through verbally convincing that involves encouragement and positive reinforcement. According to research conducted in Pakistan recently suggested a link between counseling by physicians and positive oral health practices among patients. Those counseled exhibited better oral hygiene practices, with 53.4% brushing twice or thrice in daily routine as compared to only 22.3% of those who were not counseled [7].

The recent surge in the incidence of diabetes cases poses a substantial public health challenge. Yet, evidence indicates that around one-third of diabetes cases remain undiagnosed. Detecting and managing affected individuals early is well-established in delaying the onset of most complications. An American study discovered that individuals having family history of high cholesterol levels, diabetes, hypertension, and clinical evidence of periodontal disease have a likelihood of 27 - 53% of having undiagnosed diabetes. According to the report, as the risk factors increases so does the likelihood of undiagnosed diabetes and chances increased further, when periodontal disease was accompanied with it. Moreover, a 45-year-old individual with a medical familial record of cardiac disease, hypercholesterolemia and diabetes bears a probability of 13 - 32% of having undiagnosed diabetes. When periodontal disease is added in, this likelihood almost doubles, ranging from 27% to 53% across different races/ethnic groups. Dentist should disclose the above mentioned risk signs of diabetes to the patient during history taking and oral examination.

## Conclusion

To conclude, these findings emphasize that dental office could play a pivotal role in identifying individuals who are unaware of their diabetic status [13]. Hence, in future research, it would be valuable to conduct screenings for undiagnosed diabetes, as suggested by Borrell., *et al*. These results underscore the potential for dental offices or clinics to function as healthcare centers for the identification of undisclosed cases. In essence, dental examinations could offer a valuable chance to recognize those individuals who are unaware of the glycemic control status in their bodies. Raising awareness among individuals about the importance of oral health in diabetes management could be a cost effective strategy to reduce the burden of disease in communities with high prevalence of diabetes.

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