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Oral Health Disparities and Their Impact on Daily Performance Among Migrant Construction Workers in Chennai: A Cross-Sectional Study

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Abstract **Background:** Migrant construction labourers often face challenging working conditions, low income and inadequate access to healthcare, including dental services. These factors contribute to significant oral health issues that impair daily activities such as eating, speaking and social interactions. This study aims to assess the Oral Impact on Daily Performance (OIDP) among migrant construction workers in Chennai, identify associated covariates and recommend targeted interventions. **Methodology:** A cross-sectional study was conducted among 108 migrant construction labourers in Chennai using a structured questionnaire to assess oral health status and OIDP. The questionnaire collected demographic data, oral hygiene practices and self-reported oral health issues. The OIDP scale evaluated the impact of oral problems on daily tasks like eating, speaking and sleeping. ANOVA and Student's T-test were used to examine associations between OIDP and covariates such as age, gender, education and occupation. Special focus was placed on socioeconomic factors and healthcare access. **Results:** The study found no significant correlation between the Oral Hygiene Index-Simplified (OHI-S) and OIDP scores ($p = 0.237$). However, higher Decayed, Missing and Filled Teeth (DMFT) scores, tooth loss and periodontitis significantly correlated with increased OIDP scores. Workers without dental decay had a mean OIDP score of 0.907, while those with severe decay (DMFT $\geq$9) scored 8.355 ($p = 0.000$). Workers with 7-9 missing teeth had the highest mean OIDP score of 18.389 ($p = 0.000$). Periodontitis also showed a significant association ($p = 0.009$). **Conclusion:** Migrant construction workers in Chennai face serious oral health issues that impact their daily performance. Socioeconomic barriers and limited healthcare access play a key role. Policymakers must address these challenges by introducing affordable dental care programs, awareness campaigns and integrating oral healthcare into primary healthcare services to improve their quality of life.

Key Words Oral Impact on Daily Performance (OIDP), Migrant Health Disparities, Dental Healthcare Access, Socioeconomic Barriers, Preventive Dental Care

INTRODUCTION

Oral health plays a vital role in an individual's overall well-being, quality of life and ability to perform daily activities. Among vulnerable populations, such as migrant construction labourers, oral health concerns are particularly significant due to their disadvantaged socio-economic position and poor access to healthcare services [1]. Despite being a growing workforce in Chennai, a rapidly urbanizing city, the oral health status of migrant construction workers has remained under explored. This demographic faces unique challenges stemming from their occupational hazards, socioeconomic instability and inadequate healthcare access, which heighten their risk of developing oral health issues [2]. Migrant construction labourers are exposed to various occupational and environmental risks that can compromise their oral health. These risks include harsh working conditions with exposure to dust, chemicals and extreme weather, contributing to oral diseases such as dental caries and periodontal problems [3]. Additionally, limited access to clean water and balanced nutrition, coupled with poor hygiene practices, further exacerbate oral health concerns. Stress due to job insecurity, long working hours and financial

instability further deteriorates their oral health status [4]. Their transient lifestyle compounds these issues by limiting access to preventive dental care, fostering a cycle of untreated conditions and increased risk of severe oral health problems [5].

Previous studies have identified a high prevalence of dental caries, periodontal disease and tooth loss among marginalized and migrant populations in India, which have been linked to social determinants such as education level, income disparities and healthcare barriers [6]. While existing literature emphasizes the prevalence of these conditions, there is limited focus on how these oral health issues specifically impact daily performance and productivity in vulnerable populations such as migrant construction workers.

This study aims to address this gap by assessing the Oral Impact on Daily Performance (OIDP) among migrant construction labourers in Chennai. It seeks to explore the influence of socio-demographic variables, occupational risks, lifestyle habits and healthcare access on OIDP scores. Additionally, this research intends to inform policymakers by proposing practical interventions such as improved dental care accessibility, awareness programs and preventive strategies to mitigate the oral health disparities faced by this marginalized population [7]. By identifying these key factors, this study aims to contribute to the development of effective public health strategies and targeted interventions that enhance the oral health and quality of life of migrant construction workers in Chennai.

MATERIALS AND METHODS

Study Design

A cross-sectional study design was employed to assess the Oral Impact on Daily Performance (OIDP) and its associated covariates among migrant construction workers in Chennai. The cross-sectional approach was chosen to provide a snapshot of oral health status and its impact on daily performance, suitable for assessing multiple variables simultaneously.

Study Area

The study was conducted at various building construction sites in Chennai, a rapidly urbanizing metropolitan region with a high influx of migrant labourers.

Study Population

The study population comprised migrant construction workers residing in Chennai. To ensure the inclusion of participants most vulnerable to oral health risks, the study targeted both skilled and semi-skilled daily wage workers employed at construction sites.

Sample Size

The sample size was calculated based on previous studies assessing oral health outcomes in similar populations to achieve adequate statistical power. A total of 108 participants were enrolled, comprising 93 males and 14 females. The limited female representation reflects the predominantly male workforce in the construction sector.

Inclusion Criteria

Participants included were:

- Skilled and semi-skilled daily wage workers
- Labourers who had been working at the same construction site for a minimum of two years to ensure stable occupational exposure and lifestyle patterns

Exclusion Criteria

- Individuals who had previously participated in similar studies to prevent data duplication
- Permanent residents of the area were considered for outcome observation but excluded from the analytical data to maintain focus on the migrant population

Survey Instrument

Data collection was conducted using a structured questionnaire incorporating the validated OIDP Scale and pre-tested oral health indices. The questionnaire covered demographic details, oral hygiene practices and self-reported oral health issues to enhance data reliability.

Outcome Variables

- **Demographic Details:** Age, Gender, Education and Occupation
- **Covariates:** Oral Hygiene Index-Simplified (OHI-S), Gingivitis, Decayed, Missing and Filled Teeth (DMFT), Number of Missing Teeth and Periodontitis

Bias Control Measures

To minimize reporting bias, participants received clear instructions and data collectors were trained to ensure consistent administration of the questionnaire and indices. Moreover, random checks were conducted to verify data accuracy and ensure uniformity.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee and all participants provided informed consent prior to participation. Confidentiality and anonymity of participants were strictly maintained throughout the study process.

RESULTS

The study sample included 108 participants, with 93 males (86.1%) and 15 females (13.9%), reflecting the male-dominated nature of the construction workforce. The age distribution indicated that the majority (60.2%, n = 65) were aged 18-25 years, followed by 26-35 years (23.1%, n = 25),

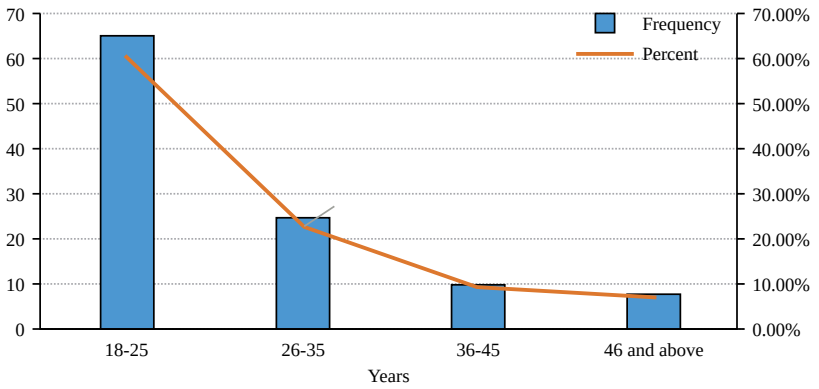

Figure 1: Age distribution of the population

Table 1: OIDP scores among individuals with varied oral health status

Variable	Mean OIDP score	Std. deviation	F	Sig.
OHI-S				
Good	1.742	1.548	1.485	0.237
Fair	2.886	4.387		
Poor	4.533	5.163		
Gingivitis				
No	3.671	4.597	0.840	0.364
Yes	3.356	4.525		
DMFT				
No decay	0.9069	1.533	11.189	0.000
1-4	1.262	1.036		
5-8	4.803	4.591		
9 and above	8.355	5.758		
No. of missing teeth				
No missing teeth	1.336	1.582	40.411	0.000
1-3 missing teeth	4.774	3.267		
4-6 missing teeth	13.885	4.545		
7-9 missing teeth	18.389	5.420		
Periodontitis				
No	3.585	5.627	7.322	0.009
Yes	3.265	2.756		

36-45 years (9.3%, n = 10) and 46 years and above (7.4%, n = 8). This age profile aligns with the active working-age population in the construction industry (Figure 1).

Analysis revealed that while participants with poor oral hygiene had higher mean OIDP scores (4.533) compared to those with good oral hygiene (1.742), the difference was not statistically significant (p = 0.237). This suggests that oral hygiene alone may not substantially impact daily performance in this sample. Workers with gingivitis reported slightly higher OIDP scores (3.671) compared to those without gingivitis (3.356); however, this difference was also statistically insignificant (p = 0.364), indicating that gingivitis alone may have minimal impact on daily activities (Table 1).

Conversely, a strong and significant association was observed between DMFT scores and OIDP outcomes (p = 0.000). Participants with no dental decay had a low OIDP score (0.9069), while those with severe dental decay (DMFT ≥9) reported a markedly higher OIDP score of 8.355. This result emphasizes that untreated dental decay significantly impairs daily performance.

Similarly, tooth loss was found to have a significant impact on OIDP scores (p = 0.000). Workers with no missing teeth had a mean OIDP score of 1.336, while those with 7-9 missing teeth had the highest OIDP score of 18.389. This result strongly highlights the detrimental effect of tooth loss on daily functioning.

Periodontitis was also significantly associated with OIDP scores (p = 0.009). Although the mean OIDP score was slightly lower for those with periodontitis (3.265) compared to those without it (3.585), the significant association suggests that periodontitis still negatively influences daily life activities, albeit less severely than dental decay and tooth loss.

The significant impact of poor oral health on daily performance has been consistently observed in various studies, underscoring that oral health issues can severely impair an individual's ability to function effectively in both personal and professional life [8,9]. The present study's findings align with this broader pattern, particularly among vulnerable groups such as migrant construction labourers. The age distribution in this study, dominated by young adults, reflects the typical workforce profile in the construction industry. Likewise, the male-majority sample aligns with trends seen in the predominantly male-dominated construction sector [10].

The results align with previous studies highlighting the vulnerability of low-income, migrant labourers to poor oral health outcomes due to limited healthcare access, poor oral hygiene practices and inadequate awareness of preventive care. Similar patterns have been observed among migrant agricultural workers across India, including regions such as Mumbai and Hyderabad, where untreated dental caries and periodontal disease severely impacted their ability to eat, speak and work efficiently [11,12].

Unlike most earlier studies that focused predominantly on the prevalence of oral diseases, this study offers valuable insights by specifically examining the Oral Impact on Daily Performance (OIDP). Similar to findings from research on migrant factory workers in China, this study emphasizes that

oral health problems not only cause physical discomfort but also significantly influence essential daily functions such as chewing, speaking and even psychological well-being [13]. The psychological impact, including embarrassment and social stigma linked to poor oral health, was evident among participants, limiting their social interactions and reducing their self-confidence [14,15].

Tobacco use emerged as a significant contributor to poor oral health outcomes in this study, reflecting broader public health concerns among migrant labourers in Chennai. The widespread use of tobacco products such as chewing tobacco and smoking further exacerbated oral health problems, contributing to conditions like gum disease, dental caries and oral cancer [16]. Migrant workers' challenging socio-economic conditions, including long working hours, financial instability and limited healthcare access, further increased their vulnerability to these oral health issues. The correlation between tobacco use and low education levels, limited health awareness and minimal preventive care measures emphasizes the need for targeted interventions, such as tobacco cessation programs, enhanced oral health education and improved dental care accessibility for this population [17,18].

Interestingly, despite migrant populations in high-income countries such as the United States and European nations also facing financial and cultural barriers to dental care, their OIDP scores tend to be lower than those reported in this study [11,19]. This discrepancy may be attributed to better access to emergency dental services, higher health literacy and broader preventive care measures in developed healthcare systems [20]. For example, migrant workers in countries with established public or subsidized dental care services often experience fewer severe impacts on daily functioning compared to those in Chennai's underserved environments [4].

The association between socioeconomic status and oral health outcomes further highlights the broader global pattern of disparities. Studies in Bangladesh demonstrated that rural-to-urban migrants with low incomes faced significant barriers to accessing dental care, resulting in higher OIDP scores [21]. Similarly, research among Brazilian migrant populations emphasized that income and educational disparities were key determinants of poor oral health and its resulting impact on daily life [22]. These findings reinforce the conclusion that economically disadvantaged individuals often prioritize immediate survival needs such as food and housing over essential dental care, mirroring the challenges faced by the migrant construction workers in this study [22,23].

Addressing oral health issues among migrant labourers requires a comprehensive, multi-dimensional approach. Key strategies should include improving lifestyle habits, expanding access to dental healthcare and developing culturally sensitive interventions that cater to the unique needs of this population. Drawing on insights from global best practices, policymakers in Chennai can implement effective strategies such as subsidized dental care, mobile dental clinics and workplace-based awareness programs to mitigate the significant oral health disparities faced by migrant construction labourers. Such interventions are essential to improving their overall well-being, social integration and productivity in the long term [18,24].

CONCLUSION

This study highlights the significant impact of oral health issues on the daily performance of migrant construction labourers in Chennai, emphasizing the strong association of untreated dental decay, missing teeth and periodontitis with impaired daily functioning. While oral hygiene and gingivitis showed minimal influence, the findings underscore the need for comprehensive oral healthcare strategies tailored to this vulnerable population. The notably high OIDP scores reflect structural inequalities such as socioeconomic barriers, limited healthcare access and poor preventive care awareness, aligning with global evidence on oral health disparities in marginalized populations. To address these challenges, policymakers must implement multi-level strategies that include preventive dental care, affordable treatment programs and awareness campaigns. Culturally sensitive interventions, such as mobile dental clinics at construction sites, expanded outreach programs and integrated oral health education within public health initiatives, are crucial to improving healthcare access. By addressing these structural barriers and providing practical, community-based solutions, significant improvements in the oral health, well-being and overall quality of life of migrant construction workers can be achieved. This study reinforces the urgent need for targeted oral healthcare programs, policy reforms and innovative public health strategies to reduce oral health inequalities in underserved populations.

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Conflict of Interest

The authors hereby declare that there are no conflicts of interest related to this study.

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