

Original Article

ORAL HEALTH STATUS, TOBACCO USE PATTERNS, AND BARRIERS TO ORAL HYGIENE PRACTICES AMONG INSTITUTIONALIZED ORPHANAGE ADOLESCENTS IN PATNA, BIHAR: A CROSS-SECTIONAL ASSESSMENT

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Abstract:

Background: Adolescents living in institutional care may have limited access to preventive dental services, irregular supervision for daily hygiene practices, and increased vulnerability to risk behaviours such as tobacco use. These factors can adversely affect oral health and overall quality of life.

Objective: To assess oral health status, tobacco use patterns, and barriers to oral hygiene practices among institutionalized orphanage adolescents in Patna, Bihar.

Methods: A cross-sectional study was conducted among 200 orphanage adolescents aged 12–18 years. Data were collected using a structured questionnaire to record sociodemographic details, oral hygiene practices, tobacco use behaviour, and perceived barriers to maintaining oral hygiene. Clinical examination was performed to record dental caries experience using DMFT index and oral hygiene status using OHI-S. Associations between tobacco use, oral hygiene practices, and oral health outcomes were analyzed using chi-square test and independent t-test, with significance set at $p < 0.05$.


Results: The mean age of participants was 15.2 ± 1.8 years, with males constituting 62%. Current tobacco use was observed in 28%, predominantly smokeless tobacco (18%). Mean DMFT was 2.14 ± 1.62 , and 65.5% had at least one decayed tooth. Poor oral hygiene ($OHI-S \geq 3$) was noted in 42% participants. Tobacco users showed significantly higher DMFT (2.78 ± 1.71) compared to non-users (1.89 ± 1.54 , $p=0.001$). The most common barriers to oral hygiene were lack of motivation (46%), unavailability of toothpaste/toothbrush (38%), and forgetfulness (34%).

Conclusion: Institutionalized adolescents in Patna showed a notable burden of dental caries and suboptimal oral hygiene, along with considerable tobacco use. Addressing supply-related barriers, strengthening supervised oral hygiene routines, and integrating tobacco prevention programs within orphanages may improve oral health outcomes.

Key words- Tobacco use, Oral health, Oral hygiene practices, Orphans, Barriers

INTRODUCTION

Oral health is an essential component of general health and well-being, contributing to normal eating, speaking, social confidence, and academic participation. Poor oral health during adolescence can lead to pain, infection, school absenteeism, and reduced quality of life. Adolescence is also a critical period when lifestyle habits become established, including oral hygiene practices and substance use behaviours. Tobacco use initiated during adolescence is strongly associated with long-term dependence and is a major risk factor for oral diseases such as periodontal disease, tooth staining, halitosis, delayed wound healing, and oral cancer.

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Adolescents residing in orphanages represent a vulnerable group due to limited parental support, reduced emotional security, and constrained access to healthcare. Institutional settings may not always provide adequate oral health resources or consistent supervision for daily brushing habits. Additionally, stress, peer influence, and limited recreational outlets may increase the risk of tobacco initiation among institutionalized adolescents. In India, tobacco is commonly used in both smoked and smokeless forms such as cigarettes, bidis, gutkha, khaini, and paan with tobacco, and these are easily accessible and inexpensive.

Evidence suggests that children living in institutional care often experience a higher burden of dental caries and periodontal problems compared to those living in family settings, primarily due to inadequate awareness, limited preventive dental care, irregular oral hygiene practices, and poor dietary habits. Along with this, barriers such as lack of toothbrush/paste availability, lack of motivation, forgetfulness, and limited knowledge about oral health further worsen oral hygiene behaviour.

Despite these concerns, there is limited setting-specific data focusing on institutionalized orphanage adolescents in Bihar. Understanding their oral health status, tobacco use patterns, and practical barriers can guide targeted preventive strategies. Therefore, this study was conducted to assess oral health status, tobacco use behaviour, and barriers to oral hygiene practices among orphanage adolescents in Patna, Bihar.

MATERIALS AND METHODS

This cross-sectional study was carried out among institutionalized adolescents residing in registered orphanages in Patna city, Bihar. The study was conducted over a period of six months after obtaining ethical clearance from the Institutional Ethics Committee and formal permission from the orphanage authorities. Written informed consent was obtained from the institutional guardians/authorities, and assent was taken from all participating adolescents before enrollment.

A total of 200 adolescents aged 12–18 years were included in the study. Participants were selected using a cluster-based approach, where orphanages were first identified and listed, and then eligible adolescents were recruited proportionately from each selected orphanage. Adolescents who had been residing in the orphanage for at least six months were included to ensure that their lifestyle and hygiene routines reflected institutional living conditions. Adolescents with serious systemic illness, those undergoing orthodontic treatment that interfered with clinical scoring, or those unwilling to participate were excluded.

Data collection involved two components: a questionnaire survey and a clinical oral examination. A pretested structured questionnaire was administered in the local language (Hindi) by the investigator. The questionnaire recorded participant age, sex, duration of stay in the orphanage, educational status, oral hygiene practices (frequency of brushing, use of toothpaste, mouth rinse use), dietary habits (frequency of sugary snacks and carbonated beverages), and tobacco use behaviour. Tobacco use was assessed in terms of ever use, current use (use within the last 30 days), type of tobacco used (smoked or smokeless), age of initiation, and reasons for initiation. In addition, participants were asked about barriers preventing them from maintaining good oral hygiene. Common barriers included lack of toothbrush/paste availability, lack of motivation, forgetfulness, lack of time, peer influence, and lack of knowledge.

Following the questionnaire survey, a clinical oral examination was conducted in a well-lit room within the orphanage premises using sterile mouth mirrors and probes under standard infection control precautions. Dental caries was assessed using the Decayed, Missing, and Filled Teeth (DMFT) index. Oral hygiene status was evaluated using the Simplified Oral Hygiene Index (OHI-S), which records debris and calculus scores. Any oral

mucosal lesions such as ulcers, leukoplakia-like patches, or tobacco-related changes were also documented.

All clinical findings were recorded in a structured proforma. Data were entered into Microsoft Excel and analyzed using SPSS software. Descriptive statistics were expressed as frequencies, percentages, means, and standard deviations. Associations between tobacco use and oral health outcomes (DMFT and OHI-S) were tested using chi-square test and independent t-test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Out of 200 participants, 124 (62%) were males and 76 (38%) were females. The mean age of the participants was 15.2 ± 1.8 years. The majority of adolescents (58%) belonged to the age group of 15–17 years. The mean duration of stay in the orphanage was 4.1 ± 2.3 years.

Oral hygiene practices

Most participants reported brushing once daily (132, 66%), while 52 (26%) reported brushing twice daily. A small proportion (16, 8%) reported irregular brushing habits (less than once daily). Toothpaste use was reported by 182 (91%), whereas 18 (9%) used tooth powder or other traditional cleaning aids. Only 12 (6%) reported using mouthwash occasionally, and interdental cleaning practices were rare (5%).

Tobacco use patterns

Ever tobacco use was reported by 72 participants (36%). Current tobacco use (use within the past 30 days) was found in 56 participants (28%). Among current users, 36 (18%) used smokeless tobacco products such as gutkha or khaini, 14 (7%) smoked cigarettes/bidis, and 6 (3%) reported mixed use. The mean age of tobacco initiation was 14.1 ± 1.2 years. The most commonly reported reasons for tobacco initiation were peer influence (48%), stress relief (28%), curiosity (15%), and imitation of older adolescents (9%).

Oral health status (DMFT and OHI-S)

The mean DMFT score among participants was 2.14 ± 1.62 . A total of 131 participants (65.5%) had at least one decayed tooth. Filled teeth were low, suggesting limited access to restorative care. The mean OHI-S score was 2.86 ± 1.04 . Good oral hygiene was observed in 36 (18%), fair hygiene in 80 (40%), and poor hygiene in 84 (42%) participants.

Comparison between tobacco users and non-users

Current tobacco users had significantly higher mean DMFT scores (2.78 ± 1.71) compared to non-users (1.89 ± 1.54) and this difference was statistically significant ($p = 0.001$). Poor oral hygiene was also more common among tobacco users (62.5%) than non-users (34.7%) ($p < 0.001$).

Barriers to oral hygiene practices

The most common barriers reported were:

- Lack of motivation / “not feeling it is important” – 92 (46%)
- Unavailability of toothbrush or toothpaste – 76 (38%)
- Forgetfulness – 68 (34%)
- Lack of time due to school routine – 44 (22%)
- Peer influence / teasing – 36 (18%)
- Lack of awareness about dental diseases – 30 (15%)

Oral mucosal findings

On examination, oral mucosal changes were seen in 14 participants (7%), including recurrent aphthous ulcers (4%), tobacco-related mucosal irritation (2%), and leukoplakia-like patches requiring referral (1%).

DISCUSSION

The present study highlights a significant burden of oral health problems and tobacco use among institutionalized orphanage adolescents in Patna. The mean age of participants was in mid-adolescence; a period commonly associated with risk-taking behaviours and experimentation. Male predominance was observed, similar to patterns reported in adolescent tobacco use studies where males often show higher prevalence due to social acceptability and peer influences.

Oral hygiene practices were suboptimal, with two-thirds brushing only once daily and very few using additional oral hygiene aids such as mouthwash or interdental cleaning. This reflects the limited emphasis on preventive oral hygiene in institutional settings and suggests a need for structured supervised brushing programs.

The prevalence of current tobacco use (28%) is concerning, especially the dominance of smokeless tobacco products. Smokeless tobacco is often inexpensive, readily available, and easier to conceal than smoking, making it attractive for adolescents. Peer influence emerged as the major factor for initiation, emphasizing the need for peer-led counselling and behavioural interventions.

Dental caries experience was high, with more than 65% of adolescents having decayed teeth. The low number of filled teeth indicates poor access to restorative dental services and a high unmet treatment need. Oral hygiene status also showed that nearly half of participants had poor hygiene, which can increase the risk of gingival inflammation and periodontal disease. A key finding was the significantly worse oral health among tobacco users, with higher DMFT scores and poorer OHI-S scores. This supports the established evidence that tobacco negatively affects oral health through plaque accumulation, altered immune response, and increased periodontal risk. Tobacco use also often clusters with neglect of daily hygiene practices.

Barriers to oral hygiene were mainly behavioural and resource-based. Lack of motivation and supply constraints were the most frequent, showing that improving access to toothbrushes and toothpaste alone may not be sufficient unless accompanied by motivation-building strategies. Structured routines, caregiver involvement, and periodic reinforcement sessions can improve compliance.

The presence of mucosal lesions in a small percentage of participants, including tobacco-related irritation and leukoplakia-like lesions, highlights the importance of early screening and referral services in high-risk adolescent groups.

Overall, this study indicates that orphanage adolescents represent a vulnerable population with significant oral health needs. Integrating oral health promotion with tobacco prevention programs in orphanages can offer long-term benefits.

CONCLUSION

This cross-sectional assessment among 200 institutionalized orphanage adolescents in Patna, Bihar showed a considerable burden of dental caries, poor oral hygiene practices, and a high prevalence of tobacco use, particularly smokeless forms. Tobacco users had significantly worse oral health outcomes compared to non-users. Major barriers to oral hygiene included lack of motivation, limited availability of oral hygiene supplies, and forgetfulness. Regular dental screening, supervised brushing programs, ensured supply provision, and targeted tobacco prevention and cessation interventions are strongly recommended for orphanage settings.

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