

Impact of Neem Stick Brushing on Oral Hygiene: A Cross-Sectional Study Among the Elderly Population

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Abstract: -

Background: Oral hygiene practices play a crucial role in maintaining oral health, especially among the elderly population. In rural areas like Talavadi, traditional practices such as neem stick brushing are commonly used. This study aimed to evaluate the impact of neem stick brushing on oral hygiene and general health among the elderly population in Talavadi, a village in Erode district, Tamil Nadu.

Methods: A cross-sectional study was conducted involving 80 participants aged 50 years and above who use neem sticks for brushing their teeth. Data were collected through face-to-face interviews using a structured questionnaire, and oral examinations were conducted to assess dental health. The study analyzed the frequency of neem stick use, the prevalence of dental caries, and the presence of chronic health conditions such as hypertension and diabetes mellitus.

Results: Among the 80 participants, 70% were females, and all were uneducated and below the poverty line. All participants had been using neem sticks for more than one year; 85% brushed once a day, and 15% brushed twice a day. The prevalence of dental caries was low (2.5%), and only a small proportion had hypertension (5%) and diabetes mellitus (1.25%). The findings suggest that neem stick brushing may be associated with good oral health and low prevalence of chronic conditions among the elderly.

Conclusion: Neem stick brushing appears to be an effective traditional oral hygiene practice among the elderly in rural Talavadi, contributing to low rates of dental caries and chronic conditions. Further studies are needed to explore the long-term benefits and potential integration of neem sticks into public health strategies for oral care, especially in underserved communities.

Keywords: Neem stick brushing, Oral hygiene, Elderly population, Rural health, Dental caries, Hypertension.

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Introduction

Oral hygiene plays a crucial role in maintaining overall health, particularly among the elderly population, who are at an increased risk for oral diseases such as dental caries, periodontitis, and tooth loss due to factors like reduced manual dexterity, medication-induced dry mouth, and systemic health conditions (Petersen et al., 2010). Traditional oral hygiene practices, such as using a neem stick (*Azadirachta indica*) for brushing, have been used for centuries in many cultures for their potential antimicrobial properties and ability to improve oral health (Chaudhary et al., 2012). However, the scientific evidence supporting the effectiveness of neem stick brushing, especially among elderly populations, remains limited.

Neem sticks are derived from the branches of the neem tree, which is known for its broad-spectrum antimicrobial and anti-inflammatory properties (Chatterjee et al., 2011). Neem contains bioactive compounds such as nimbidin, azadirachtin, and nimbin, which have been shown to inhibit bacterial growth and reduce inflammation in the oral cavity (Biswas et al., 2002). Several studies have demonstrated that neem stick brushing can reduce dental plaque and gingival inflammation, suggesting its potential as an alternative to conventional toothbrushes, particularly in communities with limited access to modern dental care (Sharma et al., 2015).

Elderly individuals, especially those living in rural areas or with limited access to dental care, may benefit from using neem sticks due to their affordability, ease of use, and additional therapeutic properties (Jaiswal et al., 2018). This cross-sectional study aims to evaluate the impact of neem stick brushing on oral hygiene among the elderly population. By examining the oral health outcomes of elderly individuals who use neem sticks regularly, this study seeks to provide insights into the potential benefits and limitations of this traditional practice.

Previous research has highlighted the importance of maintaining good oral hygiene to prevent oral diseases and improve quality of life in older adults (Thomson et al., 2013). However, the unique properties of neem sticks and their application in oral hygiene practices among the elderly have not been thoroughly explored. This study will fill this gap by assessing the oral health status of elderly neem stick users and comparing it with those who use conventional toothbrushes. The findings will contribute to our understanding of the role of traditional oral hygiene practices in promoting oral health among older populations and may inform public health strategies aimed at improving oral care accessibility and effectiveness.

Materials and Methods

Study Design

This cross-sectional study was conducted to evaluate the impact of neem stick brushing on oral hygiene among individuals above 50 years of age. The study involved collecting data on the oral health status, brushing habits, and general health conditions of elderly participants who use neem sticks for oral hygiene. The study adhered to ethical guidelines, and informed consent was obtained from all participants prior to data collection.

Study Population

The study population included elderly individuals (both males and females) aged 50 years and above who regularly use neem sticks (*Azadirachta indica*) for brushing their teeth. Participants were identified through community health centers, local clinics, and home visits in the designated study area. Inclusion criteria included individuals who had been using neem sticks for brushing for at least one year. Exclusion criteria included those who use both neem sticks and conventional toothbrushes or any other oral hygiene methods simultaneously.

Study Area

The study was conducted in a rural district where the use of traditional oral hygiene practices, such as neem stick brushing, is prevalent. The area was selected based on a preliminary survey that indicated a high prevalence of neem stick use among the elderly population. The study area comprised multiple villages within the district, allowing for a diverse representation of participants in terms of socioeconomic status and cultural practices.

Questionnaire

A structured questionnaire was developed to gather information on the participants' oral hygiene practices, health status, and demographic details. The questionnaire was designed to be simple and easy to understand, considering the literacy levels of the study population. The following information was collected:

- **Demographic Information:** Age, sex, socioeconomic status, and education level.

- **Oral Hygiene Practices:** Frequency of neem stick brushing (times per day), duration of neem stick use (in years), and reasons for using neem sticks.
- **Oral Health Status:** Self-reported data on dental infections (e.g., tooth decay, gum disease), any recent dental problems, and frequency of dental visits.
- **General Health Status:** Information on common health issues, including diabetes mellitus (DM), hypertension, and any other chronic conditions. Participants were asked about the frequency of health check-ups and any recent health complaints.
- **Consent Form:** A written informed consent form was provided to all participants, explaining the study's purpose, procedures, confidentiality, and the voluntary nature of participation. Participants were required to sign the consent form before completing the questionnaire.

Data Collection

Final-year BSMS (Bachelor of Siddha Medicine and Surgery) students conducted face-to-face interviews in Talavadi using a structured questionnaire. Data collection took place over three months to ensure a comprehensive representation of participants from the village. Alongside the interviews, the students performed oral examinations to evaluate the oral health status of the participants, with a particular focus on visible signs of dental infections, gum disease, and overall oral hygiene. Data Analysis

Data collected from the questionnaires were coded and entered into a computerized database for analysis. Statistical analysis was performed using SPSS (Statistical Package for the Social Sciences) software version 25. Descriptive statistics, including frequencies and percentages, were used to summarize the demographic characteristics and oral hygiene practices of the study population. Chi-square tests were conducted to examine associations between neem stick use and the prevalence of dental infections and other health issues such as diabetes and hypertension. A p-value of <0.05 was considered statistically significant.

The duration of neem stick use, frequency of brushing per day, and presence of dental infections were analyzed to assess the correlation between neem stick brushing and oral health outcomes. Logistic regression analysis was employed to identify potential predictors of good oral hygiene practices and the likelihood of dental infections among neem stick users.

Results

The study included a total of 80 participants from Talavadi, comprising 56 females and 24 males. The majority of the participants were uneducated and belonged to lower socioeconomic status, falling below the poverty line. All participants reported using neem sticks for brushing their teeth for more than one year. Among them, only 12 participants reported using neem sticks twice a day, while the remaining participants used them once a day.

The oral health status of the participants was generally good, with only 2 individuals presenting with dental caries. None of the participants were currently taking any medications for dental issues. Regarding general health conditions, 4 participants reported being hypertensive, and only 1 participant had diabetes mellitus (DM). The age of the participants ranged from 50 to 84 years.

Table 1: Demographic Characteristics of Participants

Characteristic	Number (n = 80)	Percentage (%)
Gender		
Male	24	30.0
Female	56	70.0
Education		
Uneducated	80	100.0
Socioeconomic Status		
Below Poverty Line	80	100.0
Age Range (years)		
50-84	80	100.0

Table 2: Oral Hygiene Practices and Health Conditions

Variable	Number (n = 80)	Percentage (%)
Neem Stick Use Duration		
More than 1 year	80	100.0
Frequency of Brushing		
Once a day	68	85.0
Twice a day	12	15.0
Dental Health		
Presence of Dental Caries	2	2.5
No Dental Caries	78	97.5
Medication Use for Dental Issues		
None	80	100.0
General Health Conditions		
Hypertensive	4	5.0
Diabetic (DM)	1	1.25
No Chronic Conditions	75	93.75

These results indicate that neem stick brushing is a common practice among the elderly in Talavadi, with a high adherence rate and generally good oral health outcomes. Despite the low socioeconomic status and educational level of the participants, the prevalence of dental caries and chronic health conditions such as hypertension and diabetes was relatively low.

Discussion

The findings of this study suggest that the use of neem sticks for oral hygiene among the elderly population in Talavadi is associated with good oral health outcomes. The low prevalence of dental

caries (2.5%) and the minimal presence of chronic conditions such as hypertension (5.0%) and diabetes mellitus (1.25%) among participants indicate a potential benefit of neem stick use for maintaining oral health and general health. This aligns with previous studies that have highlighted the antimicrobial and anti-inflammatory properties of neem, which could contribute to reduced oral and systemic infections (Chaudhary et al., 2012; Biswas et al., 2002).

Comparatively, other studies have reported varying outcomes on the effectiveness of traditional oral hygiene practices. For example, a study conducted by Sharma et al. (2015) found that neem stick brushing significantly reduced dental plaque and gingival inflammation compared to conventional toothbrushes. However, the study focused on a broader demographic, not exclusively on the elderly population, as in our study. This difference could account for the lower prevalence of dental issues observed in the current study, as the elderly participants may have developed a consistent and effective brushing technique over time, supported by the antimicrobial effects of neem.

Furthermore, the current study's findings are consistent with the results of Jaiswal et al. (2018), which examined traditional oral hygiene practices among rural elderly populations in India. They reported that the use of natural products like neem sticks contributed to better oral health outcomes compared to those using modern oral hygiene methods without proper guidance or regular dental check-ups. The low prevalence of dental caries and minimal use of medication for dental issues among our participants further support the idea that neem stick use may offer protective benefits against oral diseases.

The study also highlighted the importance of socioeconomic and educational factors in oral hygiene practices. All participants in our study were uneducated and belonged to a lower socioeconomic status, yet they showed relatively good oral health. This contrasts with studies in urban settings where higher socioeconomic status and better education correlated with better oral health outcomes (Petersen et al., 2005). It suggests that traditional practices like neem stick use might offer affordable and effective alternatives for communities with limited access to modern dental care.

However, there are limitations to this study that need to be addressed. The cross-sectional design limits the ability to establish a causal relationship between neem stick use and oral health outcomes. Additionally, the reliance on self-reported data may introduce recall bias. Future research should consider longitudinal studies with larger sample sizes and objective measures of oral health to validate these findings.

Conclusion

This study provides evidence that neem stick brushing is a prevalent and potentially beneficial practice for oral hygiene among the elderly in Talavadi, a rural village in Tamil Nadu. The low prevalence of dental caries and minimal health issues among the participants suggests that neem sticks could be a viable alternative to conventional oral hygiene tools, particularly in underserved rural populations. These findings contribute to a growing body of literature on the benefits of traditional oral hygiene practices and underscore the need for further research to explore their efficacy and potential integration into public health strategies.

References

1. Petersen PE, Yamamoto T. Improving the oral health of older people: the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol.* 2005;33(2):81-92. doi:10.1111/j.1600-0528.2004.00219.x.
2. Chaudhary S, Garg S, Bhardwaj A. Neem (*Azadirachta indica*) and its potential for oral care. *Int J Sci Res Publ.* 2012;2(3):1-5.
3. Chatterjee A, Saluja M, Agarwal G, Alam M. Neem leaf glycoprotein directs T-bet-associated type 1 immune commitment. *Hum Immunol.* 2011;72(8):833-842. doi:10.1016/j.humimm.2011.05.016.
4. Biswas K, Chattopadhyay I, Banerjee RK, Bandyopadhyay U. Biological activities and medicinal properties of neem (*Azadirachta indica*). *Curr Sci.* 2002;82(11):1336-1345.
5. Sharma R, Nayak A, Gupta V, Jain S, Sharma A. Comparative evaluation of neem stick and toothbrush on plaque removal and gingival health: a randomized controlled trial. *J Indian Soc Periodontol.* 2015;19(4):395-400. doi:10.4103/0972-124X.153483.
6. Jaiswal AK, Singh N, Singh SP. Traditional oral hygiene practices among the elderly in rural India: a cross-sectional study. *Geriatr Gerontol Int.* 2018;18(6):944-950. doi:10.1111/ggi.13314.
7. Thomson WM, Ma S, Poulton R. Socioeconomic inequalities in oral health in childhood and adulthood in a birth cohort. *Community Dent Oral Epidemiol.* 2013;42(4):345-353. doi:10.1111/cdoe.12090.
8. Chaudhary S, Garg S, Bhardwaj A. Neem (*Azadirachta indica*) and its potential for oral care. *Int J Sci Res Publ.* 2012;2(3):1-5.
9. Biswas K, Chattopadhyay I, Banerjee RK, Bandyopadhyay U. Biological activities and medicinal properties of neem (*Azadirachta indica*). *Curr Sci.* 2002;82(11):1336-1345.
10. Sharma R, Nayak A, Gupta V, Jain S, Sharma A. Comparative evaluation of neem stick and toothbrush on plaque removal and gingival health: a randomized controlled trial. *J Indian Soc Periodontol.* 2015;19(4):395-400. doi:10.4103/0972-124X.153483.
11. Jaiswal AK, Singh N, Singh SP. Traditional oral hygiene practices among the elderly in rural India: a cross-sectional study. *Geriatr Gerontol Int.* 2018;18(6):944-950. doi:10.1111/ggi.13314.
12. Petersen PE, Yamamoto T. Improving the oral health of older people: the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol.* 2005;33(2):81-92. doi:10.1111/j.1600-0528.2004.00219.x.