SSM - Health Systems 4 (2025) 100079

Contents lists available at ScienceDirect

SSM - Health Systems

journal homepage: www.sciencedirect.com/journal/ssm-health-systems

https://www.sciencedirect.com/science/article/pii/S2949856225000315

Where do traditional healers fit in the dentist-centred oral health system? An ethnography inquiry among the indigenous communities in Gudalur, South India

Rajeev B R [a,b,*], Mahesh Madhav Mathpati [c], Mahantu Yalsangi [c], Ravi Narayan [a]

[a] Society for Community Health Awareness Research and Action, No. 359, 1st Main, 1st Block, Koramangala, Bengaluru, Karnataka 560 034, India
[b] Institute of Public Health Bengaluru, 3009, II-A Main, 17th Cross, Krishna Rajendra Road, Banshankari Stage 2, Karnataka 560070, India
[c] Association for Health Welfare in the Nilgiris, Post Box No.20, Gudalur, The Nilgiris District, Tamil Nadu 643 212, India

ARTICLE INFO

Keywords:
Dental pluralism
Local health traditions
Indigenous health
Oral health
Socio-ecological framework

ABSTRACT

Background: Adivasi (Indigenous) communities in Gudalur, Tamil Nadu, India, face significant challenges in accessing equitable oral health care, influenced by cultural and socio-political factors. This study examines the role of traditional herbal medicine healers in delivering oral health services within these communities.
Methods: Guided by the Socio-Ecological Framework, the data were collected between April 2015 and July 2018, employing ethnography tools such as participant observation, focus group discussions, and semi-structured interviews. A total of twenty-four healers took part, offering insights into how Adivasi healers perceive and treat oral health issues. The study also incorporated perspectives from community members, dentists, and doctors to provide a broader understanding of oral healthcare within the community.
Results: Adivasi healers identified overlapping oral health symptoms and provided local care that fills gaps in the formal health system. Challenges such as resource limitations and competition with Western biomedicine affect the continuity of their practices. Oral health among Adivasis is deeply intertwined with cultural and structural determinants, exacerbated by marginalisation within the mainstream public healthcare system.
Conclusion: Local health traditions, particularly those practised by Adivasi healers, play a crucial role in primary oral health care where formal dental services are inadequate. Addressing oral health disparities requires a shift towards inclusive, community-oriented health systems that recognise and integrate local healing practices.

Introduction

Adivasi communities in Gudalur, South India, face formidable barriers to accessing essential oral health care, shaped by a complex interplay of cultural, geographical, and socioeconomic factors. These communities often rely on traditional healers alongside or in preference to state-supported Western biomedicine at public or private healthcare facilities due to issues of accessibility (Bochi, 2015; Gandhi et al., 2017). Bochi argued that informal dental practice was translocal and interstitially practised in the open borders between Syria and Lebanon, signalling neoliberal governance where this informal dentistry complemented the public health system.

India's healthcare landscape is characterised by a rich diversity of traditional health systems, encompassing both codified classical forms like Ayurveda and non-codified systems such as locally practised folk medicine (Mishra et al., 2018; Shankar, 2001) Despite the presence of diverse health practices, there remains a paucity of research on dental pluralism and the integration of traditional healing practices with Western biomedicine for oral health (Agbor and Naidoo, 2016). Globally, studies emphasise the complementary role of traditional healers in addressing primary oral health care needs, advocating for their incorporation into mainstream health systems (Agbor and Naidoo, 2011; Foláyan et al., 2024). The Adivasi communities of Gudalur, predominantly inhabiting remote and forested areas, exhibit distinctive cultural practices and face socio-economic challenges that influence their health-seeking behaviours. Traditional healers from the Adivasi community play a pivotal role in addressing various health concerns, including oral health, through indigenous knowledge systems passed

* Corresponding author at: Institute of Public Health Bengaluru, 3009, II-A Main, 17th Cross, Krishna Rajendra Road, Banashankari Stage 2, Karnataka 560070, India.
E-mail address: rajeevbr@iphindia.org (R. B R).

https://doi.org/10.1016/j.ssmhs.2025.100079
Received 14 August 2024; Received in revised form 4 April 2025; Accepted 17 April 2025
Available online 22 April 2025

down through generations. These healers are deeply embedded within the social fabric of Adivasi life, wielding significant influence over health decisions and practices (Payyappallimana and Hariramamurthi, 2012).

India's traditional health systems encompass a broad spectrum, ranging from *Ayurveda, Siddha,* and *Yoga* to indigenous folk medicine practices that are accessible and widely utilised within local communities. The Local Health Traditions (LHT) built on *Lokaparampara* or folk medicine tradition form an integral part of healthcare delivery in rural and remote areas where formal medical services are scarce or inaccessible (Shankar, 2001). Studies have highlighted the complementary nature of traditional healers in providing primary care services, often addressing conditions that are underserved by the healthcare system (Gureje et al., 2015; James et al., 2018). However, challenges persist in bridging the gap between traditional and Western medical practices, impacting the holistic management of health issues (Lampiao, Chisaka and Clements, 2019). Initiatives that integrate traditional healing practices with modern healthcare systems have shown promise in addressing these challenges, advocating for a more inclusive and culturally sensitive approach to health promotion and treatment (Patwardhan et al., 2023).

The overall oral health profile of India reflects significant disparities, with high prevalence rates of dental caries among children and adults, particularly in rural and underserved communities (Christensen et al., 2003; James et al., 2023; Pandey et al., 2021). Infrastructural challenges, inadequate healthcare facilities, and disparities in access to oral health services have hampered the government's efforts to improve oral health outcomes (Dasson Bajaj et al., 2023). Indigenous populations, comprising 8.6 % of India's population and recognised as Scheduled Tribes, experience notably poor health outcomes due to socio-economic marginalisation and limited healthcare access (Ministry of Tribal Affairs, 2014). Dental caries and periodontal diseases are highly prevalent, particularly among disadvantaged populations residing in tribal areas where access to oral healthcare remains limited (Kumar et al., 2009, 2016). Adivasi communities, facing geographical isolation and socio-economic marginalisation, bear a disproportionate burden of oral health issues, exacerbated by dietary habits, limited preventive care, and cultural beliefs influencing health behaviours (Kumaraguru et al., 2023). For example, Valsan and colleagues reported heightened oral health issues exacerbated by limited access to primary care facilities and resources among the *Panniyas,* one of the Adivasi communities in the Gudalur region (Valsan et al., 2016). India's oral health challenges are multifaceted, with disparities evident across different demographic and geographic segments.

Despite the recognised prevalence of oral health issues within these communities, there is a notable gap in research on how these conditions are managed through indigenous knowledge systems. Oral health is frequently neglected in public health initiatives, yet it plays a crucial role in overall well-being and quality of life (Janakiram et al., 2017). Banking on existing resources, such as traditional healers, to address oral health issues in resource-constrained situations may provide insight that could improve the effectiveness of health interventions in these communities. Therefore, this study explored how traditional healers in the Adivasi community in Gudalur perceive and manage oral health issues and how their practices interact with Western biomedicine. This study contributes to the existing body of knowledge by examining the tricky dynamics of oral health beliefs, practices, and healthcare delivery among Adivasi communities in Gudalur. This inquiry seeks to inform policy and practice towards more equitable and culturally responsive oral health interventions by focusing on the role of traditional healers and their integration within the Western biomedically dominated health system. Understanding and leveraging traditional healing practices could potentially enhance healthcare access and outcomes for marginalised populations, thereby fostering a more inclusive healthcare system in India.

Methodology

Study setting

This article presents findings from fieldwork conducted intermittently between April to November 2015, May to November 2016, and May to July 2018. Gudalur is located in the Nilgiris district of Tamil Nadu, South India, at the tri-junction of the Karnataka, Kerala, and Tamil Nadu states. It is part of the Nilgiris Biosphere Reserve in the Western Ghats. The region is home to diverse Adivasi communities, including *Mullukurumba, Bettakurumba, Panniya,* and *Kaattunayaka,* each with distinct cultural identities and practices classified as vulnerable tribal groups (Ministry of Tribal Affairs, no date). The study was supported and conducted with the help of a local civil society organisation[1] involved in the Adivasi development.

Methods- theoretical framework: socio-ecological perspective

The Socio-Ecological framework was chosen for this study as it recognises that health behaviours and outcomes are shaped by interactions between multiple levels of influence, including individual, interpersonal, community, and systemic factors (Centers for Disease Control and Prevention, 2007). This framework not only informed the research design but also structured the data collection and analysis processes, ensuring a comprehensive understanding of oral health practices among Adivasi communities (Table 1). By systematically incorporating these levels into both data collection and analysis, the socio-ecological framework provided a structured yet flexible lens through which to examine oral health practices. This approach ensured that findings were not only descriptive but also contextually grounded within the broader socio-political and cultural realities of the Adivasi communities.

Sampling and participants

Traditional healers in Gudalur encompassed a diverse group within the community, including women, men, and elders, with practical knowledge of medicinal plants and healing rituals. Adivasi healers were invited for interviews from a pool of thirty identified through community mapping. The mapping process involved consultations with village elders, local health workers, and community representatives to ensure a broad and representative selection of healers across different communities.

A total of twenty-three healers were interviewed, comprising nine women and fifteen men from the *Panniya, Mullukurumba, Bettakurumba*, and *Kaattunayaka* communities (Table 2). The inclusion criteria for participation included self-identification as a traditional healer actively practising in the community, recognition by community members as a healer, and willingness to share knowledge and experiences. Unwilling participants and those who were unavailable for repeated interactions were excluded.

One non-Adivasi healer was also included in the study. This was unintentional and aligned with the broader objective of understanding the landscape of traditional oral healthcare practices in the region. While the study primarily focused on Adivasi healers, the presence of non-Adivasi traditional practitioners in the area is a reality that influences healthcare-seeking behaviours within the community.

[1] *The Adivasi Munnetra Sangam (AMS) is a local organisation established for the welfare of Adivasi communities in Gudalur. It functions as a collective platform addressing critical social determinants of health, education, and livelihood. The institutions operating under AMS, such as ACCORD, ASHWINI Hospital, and Vidyodaya School, work closely with the community, ensuring that interventions are locally relevant and culturally appropriate. ASHWINI Hospital runs a community health programme with biomedically trained nurses and community health workers called health animators.*

Table 1
Socioecological framework adapted for data collection and analysis.

Sl No	Level	Research tools	Ares of inquiry	Thematic codes
1	Individual	In-depth interviews with healers and community members	Past experiences shaping individual behaviours, personal beliefs, hygiene routines, and the use of traditional medicinal practices for oral health	Individual perceptions and practices
2	Interpersonal	Focus group discussions and participant observations	Social networks and relationships influence on oral health behaviours, Examination of peer influence, shared knowledge, and the transfer of traditional healing practices	Future and continuity of the tradition and differences with Western Biomedicine
3	Community	Collaboration with the local organisation, community mapping exercises, field notes	Cultural traditions, access to healthcare resources, and the role of local health systems were explored	Community-driven healthcare and the cultural significance of healing practices
4	Systemic	Observations and interviews with dentists, medical doctors, school teachers, and health workers	Systemic barriers such as limited access to formal dental care and challenges in integrating traditional healing into mainstream healthcare services	Structural constraints, policy gaps, and opportunities for integration

Table 2
Details of the healers.

Sl No	Adivasi Community	No of healers interviewed
1	*Panniya*	6
2	*Mullukurumba*	2
3	*Bettakurumba*	7
4	*Kaattunayaka*	8
5	Non-Adivasi healer	1
	Total	**24**

Including a non-Adivasi healer allowed for a comparative perspective on how healing practices intersect, differ, or integrate with Adivasi traditions. To mitigate any potential bias, the data analysis process carefully categorised findings based on the background of the healers, ensuring that the inclusion of the non-Adivasi healer did not skew the interpretation of Adivasi-specific practices. Additionally, the responses from this participant were contextualised to highlight any distinctions while preserving the integrity of the study's primary focus on Adivasi knowledge systems.

Approaching and gaining the healers' trust required significant time and effort. Local Adivasi coordinators from the local organisation facilitated introductions and helped build rapport. This process involved multiple visits and various levels of engagement within the Adivasi villages, known locally as *Paadi*.

Data collection

Data was collected in the Tamil and Malayalam languages, both of which were familiar to the authors and participants. Tamil is the state language of Tamil Nadu and Malayalam is the state language in the neighbouring Kerala state. Interviews were audio-recorded and later transcribed and translated into English by the first author and a volunteer who was proficient in both languages from the local organisation. Data triangulation was used to strengthen the credibility of the findings and was verified through multiple sources, including interviews, field notes, and observations from community interactions. Discussions with local coordinators helped validate interpretations, ensuring that the themes reflected the perspectives of the Adivasi healers and were not solely researcher-driven.

Ethical clearance was obtained from the SOCHARA Institution, Scientific and Ethical Committee, Bangalore, India. Before the data collection began, the first author presented the research proposal to the Adivasi community member representatives at the local organisation and sought their permission to conduct the study. A participatory approach reinforced ethical rigour and respect for community autonomy. Recognising potential power imbalances between researchers and participants, multiple steps were taken to foster a respectful and collaborative research environment. The research team prioritised long-term engagement over one-time data collection by participating in community activities, attending monthly meetings, and regularly updating the community on the study's progress. To ensure participants felt safe and empowered to share their experiences, interviews were conducted in familiar settings chosen by the healers, such as their homes or community spaces. Conversations were flexible, allowing participants to shape the discussion rather than following a rigid interview guide.

Data analysis

Thematic analysis was used to identify emerging themes and patterns within the data, aligning with the study's objectives to understand cultural beliefs, practices, and perceptions of oral health among Adivasi communities. The analysis was guided by the socio-ecological framework, allowing for an exploration of factors influencing oral health across multiple levels. The transcripts were reviewed for accuracy before analysis, followed by familiarising with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report (Braun and Clarke, 2006). Coding was both inductive and deductive, allowing for themes to emerge from the data while also being informed by the study's research questions. Additionally, the research team remained reflexive about their positionality, ensuring that findings were meaningfully shared with the community. An iterative approach was employed to refine the themes, incorporating feedback from the healers and community representatives. Feedback sessions and member-checking were conducted to validate preliminary findings and ensure the accuracy and relevance of interpretations from the community's perspective. Regular discussions were held both informally and formally during the monthly meetings at the local organisation, where preliminary themes were shared, and their relevance and accuracy were assessed. This process ensured that the findings resonated with participants' lived experiences and minimised potential misinterpretations.

Community engagement and validation

The study prioritised community engagement through continuous interactions with the healers, Adivasi leaders, and other community members. The first author executed outreach programs for the Adivasi school children, including transect walks around the village and forest boundaries to revitalise the interest in the Adivasi health traditions.The most significant outcome of this participatory action research was the documentation of the Adivasi community's traditional medicinal

knowledge. One of the healers expressed concern about the eroding collective memory of traditional ecological knowledge and a need to document it in one interaction. The research team discussed this in the monthly meeting, stressing the urgent need to safeguard knowledge, particularly against the threat of intellectual property rights violations. Through ongoing discussions with community members, a funded project was initiated to conduct an ethnobotanical survey with the help of three Adivasi youth volunteers and the first author. This effort aimed to systematically document traditional knowledge and register the data with the State Biodiversity Board, ensuring protection against commercially motivated activities such as unauthorised patenting. An important tangible outcome of this engagement was the development of a bilingual field guidebook documenting one hundred and twenty-three medicinal plants and their uses. The guidebook was designed as an accessible reference for older and younger generations. Community members welcomed this resource, which is at the pre-print stage, expressing that it reinforced intergenerational knowledge transfer and strengthened efforts to sustain traditional healing practices. Future evaluations will assess its broader impact on knowledge retention and local health practices.

The first author was invited to the Technical Committee meeting in May 2018 for the Voluntary Certification Scheme for Traditional Community Healthcare Providers, co-organised by the Quality Council of India and the Foundation for Revitalisation of Local Health Traditions, where findings from this study were discussed. The second author later contributed to the execution of this program in 2022 for the Adivasi healers in the Nilgiris district. The fourth author has actively advocated for integrating LHT into national and state health policies in India.[2]

Positionalities

As researchers at the intersection of health and Indigenous knowledge systems, we navigated insider and outsider dynamics in engaging with the Gudalur Adivasi community. While our public health backgrounds provided an understanding of healthcare systems and policy frameworks, our positionalities as non-Adivasi researchers introduced complexities in access, trust-building, and knowledge exchange. Gatekeeping was a key challenge, requiring ongoing negotiations with community elders, local organisations, and healers. The mediation of the AMS was invaluable, yet it also underscored power imbalances inherent in research relationships, prompting reflexivity in our approach.

A central tension in this study was the contrast between normative and perceived needs regarding oral health and traditional medicine. The present public health paradigm prioritises biomedical interventions, while Adivasi perspectives place greater emphasis on immediate socioeconomic concerns, with traditional healing continuing to play a vital role despite being marginalised in dominant health discourses. Rather than imposing a deficit model, we adopted a critical anthropological approach, recognising indigenous health practices as legitimate, dynamic systems of knowledge.

This study was not just about inquiring into traditional medicine but about co-producing knowledge in alignment with community priorities. The healers' concerns about intellectual property rights led to an Adivasi-led documentation initiative, reflecting a commitment to protecting traditional knowledge from commercialisation. Recognising our positionality required continuous self-reflection on how our disciplinary training and institutional affiliations shaped the research process. By centring community voices and fostering dialogue, we aimed to conduct research that was both methodologically rigorous and ethically responsible.

[2] https://www.sochara.org/what_we_do/integration_of_medical_and_health_systems/

Results

This study examined the complex landscape of oral health practices within Adivasi communities in Gudalur, South India, framed within the traditional healing paradigm known as *Pacchamarundhu*, or Herbal Medicine. The findings provide a comprehensive view of how healers perceived their roles, the methods they employed, and the challenges they faced amidst societal changes and modern influences. In exploring the practice of *Pacchamarundhu* within Adivasi communities, it became evident that health behaviours and outcomes are deeply intertwined with multifaceted influences ranging from individual beliefs to broader systemic challenges.

Individual level: healers' perspectives and healing methods

Healers' perspective of their position in society

Healers among the Adivasi communities were referred to as *avar marundhu kuduppaar* or *marundhu seivar* (literal meaning- they give medicines or prepare medicine), reflecting their role as providers of herbal remedies. This position entailed not only treating diseases but also commanding respect and obedience in their communities. The term *avar*, a gender-neutral honorific, stressed the cultural reverence towards these healers, who were also known as *Vaidyar* in certain contexts. Their status transcended familial and community boundaries, extending to interactions with non-Adivasi groups like the *Chettis*, who also recognised and respected the Adivasi healing expertise.

Mechanisms of knowledge acquisition

The acquisition of healing knowledge among Adivasi healers followed a traditional apprenticeship model, typically within the family unit across generations. This oral tradition, devoid of written records, emphasised experiential learning under the guidance of older family members. The transmission of knowledge from *paattan-paattan* (generation to generation) ensured the continuity of healing practices.

Healing methods

Central to the practice of *Pacchamarundhu* was a personalised and holistic approach to healing. Healers emphasised a deep connection with their patients, often treating them within the confines. The treatment process was characterised by mutual understanding and trust. An elderly *Panniya* male healer highlighted the iterative nature of the treatment, involving multiple attempts with herbal remedies until successful outcomes were achieved. The exchange of services was typically non-monetary, reflecting a communal ethos where patients offered whatever they could afford as a gesture of reciprocity.

> "If it does not heal, come for the second time. And if it does not heal by then, I will ask them to see another person…there are chances that they will get well, and some people no matter who gives, there will not be any healing." (E02PHT11)

Interpersonal level: rituals, prayers, and community interactions

Interpersonally, community interactions further shaped healing practices, with healers holding esteemed positions that extended beyond medical roles to encompass spiritual and emotional support. They were sought after for performing rituals and ceremonies during significant life events such as the annual harvest festival *Puttheri*, weddings and other occasions, bridging cultural practices between the Adivasi communities and neighbouring groups. This interplay between healers and their communities strengthened social cohesion and reinforced the cultural identity tied to traditional healing practices.

Elements of preaching and rituals

Rituals and prayers constituted the integral components of the healing process among Adivasi healers. These rituals varied among the

different Adivasi communities, reflecting personal spiritual beliefs and community traditions. Rituals involved prayers to the Adivasi deities at home or the sacred groves before gathering medicinal plants, highlighting the spiritual dimensions intertwined with healthcare delivery. While some healers performed rituals before gathering herbs or administering treatments, others silently integrated prayers into the healing process. This spiritual dimension emphasised the holistic approach to health and well-being embedded within Adivasi cultural practices, where healing was perceived as a harmonious interaction between life's physical, spiritual, and social dimensions. A 29-year-old male *Bettakurumba* healer had a different take on prayers, highlighting the fluid nature of the rituals:

> "I do not offer any particular prayers, but I think of god and pray in my mind that this medicine should work. I do not do anything openly like offering prayers to Kavu (Sacred Grove[3]), but I just pray in my mind". (Y02BHK13)

Differences with western biomedicine

A distinct contrast existed between Adivasi healing practices and Western biomedicine, particularly concerning treatment efficacy and approach. Healers advocated for the long-term benefits of herbal remedies, contrasting with perceptions that Western medicine offered short-term relief. Despite this, there was a growing concern among healers about the increasing dependence on hospital-based treatments, even for minor ailments that were traditionally managed within the community. This shift reflected broader socio-cultural beliefs regarding health care and treatment options, highlighting the ongoing negotiation between traditional healing practices and modern biomedical interventions. A middle-aged woman healer from the *Mullukurumba* community complained:

> "In our community, people are aware that they should go to the hospital. Herbal medicine is also essential. But now for everything people go to the hospital. We have many herbal medicines. First, they have to use this and then go for that" (M01MHP15)

Future and continuity of the tradition

The future viability of *Pacchamarundhu* faced multifaceted challenges in the contemporary landscape. Healers reported that fewer young individuals expressed interest in apprenticing as healers because of migration to urban places for employment opportunities, and the modern schooling system, among a multitude of reasons. This reluctance of youth to engage in this traditional knowledge transfer posed a significant threat to the sustainability of *Pacchamarundhu* in the face of modernisation and changing societal dynamics. A notable decline in youth apprenticeships threatened the intergenerational transfer of healing knowledge, compounded by environmental changes restricting access to medicinal plants. Healers expressed apprehension about the sustainability of their traditions amidst increasing modernisation, legislative measures, and policy interventions that limited their access to traditional healing grounds. The encroachment on forest lands, marked by fencing and wildlife conservation efforts, further exacerbated the disconnect between healers and vital medicinal resources, which were some of the reasons quoted by an elderly Panniya healer during a focus group discussion:

> "We do not grow the herbs. When we need medicine, we get it from the forest. We have to go without being seen (by the forest department officials). Now it is difficult". (E02PHD22)

[3] Sacred Grove is a collection of trees in the forest or the community surroundings that has a religious importance within the Adivasi culture.

Community level: priority, oral health conditions and cultural practices

At the community level, oral health conditions reflect both traditional practices and evolving socio-cultural situations. All the participants agreed that oral health was not a priority among the Adivasis in the face of bigger challenges such as emergency health issues (snake bite), chronic conditions (Sickle cell anaemia, tuberculosis, cardiovascular diseases and other metabolic disorders), livelihood, chronic alcoholism, domestic violence, education, housing among others. Most often, the participants expressed that oral health issues can wait, while others cannot, resulting in the progression of oral diseases. For example, a 50-year-old female health worker (M01HA3) working at the Adivasi hospital's community health program explained that, oftentimes, patients with a toothache came to her seeking analgesics. When she explained to the patients about the dental procedure, including follow-up, they would quote pressing issues that demanded their presence and also complained that they could not take time off work for the numerous follow-ups involved in the dental treatments. A 35-year-old female dentist who worked at the Adivasi hospital explained her strategy for treating oral conditions that require invasive interventions. She would admit the patients as inpatients mainly to prevent patient attrition because of the multiple visits involved in dental treatments. She claimed, "*Patients do not return if they have to visit three to four times in case of root canal treatment*'". *(Y01DEG3)*

Oral hygiene practices such as brushing teeth with homemade charcoal and salt exemplified traditional approaches passed down over generations. While modern influences like toothpaste have been integrated into daily routines over recent decades, cultural practices such as chewing betel quid remained prevalent among adults, illustrating the enduring cultural significance of oral health practices within Adivasi communities. The increase in oral health issues draws attention to the community-level impact of dietary habits and lifestyle choices. A middle-aged male *Kaattunayaka* healer *(M02KHC3)* observed an increase in oral cancer cases linked to habits such as betel quid chewing and tobacco chewing, highlighting community-wide health challenges that intersect with cultural practices and dietary behaviours.

The study provided nuanced insights into prevalent oral health conditions among Adivasi communities, emphasising local terminology and perceptions of oral anatomy. Common ailments such as toothache, dental caries, and oral cancer were explored in-depth, shedding light on community-specific understandings and management practices within their cultural context.

Toothache and dental caries

Toothache was one of the most prevalent complaints that the Adivasi healers attended to. Healers attributed toothache to various causes, including dental caries, which they described as a black discolouration or decay affecting tooth structure. The treatment of toothache typically involves herbal remedies such as the use of *Kurumolagu* (*Piper nigrum* L.), *Nelli Pattam* (bark of *Phyllanthus embilica L.*), and *Lavangam* (*Syzygium aromaticum* (L.) Merr. & L.M.Perry), known for their analgesic properties. Healers stressed the importance of these herbal treatments in alleviating pain and promoting oral health within the community through the use of easily available local herbal aids.

Oral hygiene practices

The study elucidated traditional oral hygiene practices among Adivasi communities, contrasting them with contemporary practices influenced by modernisation. Daily oral care routine typically involved cleaning teeth with homemade toothpowder, historically made from charcoal prepared from the firewood of trees such as *Nilagiri* (*Eucalyptus* L'Hér.) and *Thega* (*Tectona grandis L.f.*). This practice, once ubiquitous, has gradually given way to commercially available toothpaste like Colgate, which was introduced in the region over the past few decades. A 25-year-old school teacher at the Adivasi school pointed towards the community's evolving oral hygiene practices, influenced by changing

attitudes towards dental care and increasing access to commercial oral care products.

> "Earlier, there was no toothpowder or Colgate. Only in the last 30 years, our Adivasi people have started using Colgate. Most people now do not use charcoal". (Y02PSG3)

Cultural practices: betel quid and tobacco use

Chewing *Vetthalai Pak* (betel quid) was a notable practice among many Adivasi individuals, influencing both oral health and social customs. Betel quid, a mixture of betel leaf, areca nut, slaked lime, and sometimes tobacco, holds ritualistic importance and was commonly chewed by adults and the elderly. This practice was believed to freshen breath and ward off hunger, reflecting the interplay between cultural beliefs, oral health implications, and community identity among Adivasi groups.

Challenges in oral health management

Healers identified several challenges in managing oral health within their communities, including limited access to herbs as well as modern dental care facilities. Healers reported an increasing prevalence of dental caries, particularly among children, attributed to dietary changes characterised by higher sugar consumption and inadequate oral hygiene practices. In one of the focus group discussions, healers supported a balanced approach to oral health management, integrating traditional herbal remedies with modern preventive measures to mitigate oral health disparities effectively.

Oral cancer and other serious conditions

This study also highlights the prevalence of oral cancer among Adivasi individuals, presenting significant challenges in diagnosis and treatment within rural contexts. Healers observed the rise in oral cancer cases and attributed it to adverse habits such as betel quid chewing and tobacco use. Healers stressed the community's perception of oral cancer as a debilitating condition that affects nutrition and overall well-being. *A* 43-year-old male *Panniya* healer pointed to the need for early detection and holistic management approaches to address oral cancer effectively within the community.

> "It begins as Vaayi Punnu (ulcer) and grows to become cancer. They complain of difficulty to eat. The reason for its occurrence is chewing a lot of Vettalai Pak, smoking cigarettes and beedi" (M02PHP12)

Attitudes towards teeth extraction and other treatments

The study explored the community's attitudes towards dental extraction, underlining the cultural beliefs and perceptions that influence oral health-seeking behaviours. Healers reported a historical reluctance among community members to undergo dental extractions, fearing potential complications and spiritual implications. An elderly healer recalled evolving perceptions towards oral health care that have led to increased acceptance of dental treatments, driven by concerns about the progression of dental caries and overall oral health improvement.

> "No one was ready to take the tooth out. When it becomes rotten, it will fall on its own. Scared to take it out. Now they have started doing (going to the dentist) it and feel if they do not take out the bad one, it will spread" (E02BHT17)

Implications for community health and well-being

The findings reiterate the broader implications of oral health inequalities among Adivasi communities, highlighting the intersection of cultural practices, socio-economic factors, and access to health care services. The focus group discussions also revealed the need for culturally sensitive health interventions that recognise the value of traditional healing practices while integrating modern biomedical approaches to enhance overall community health outcomes. The results direct attention towards the importance of collaborative efforts between healthcare providers, policymakers, and community stakeholders to address oral health inequalities effectively and sustainably.

Systemic level: challenges and sustainability

Systemically, *Pacchamarundhu* faces challenges that threaten its sustainability. Environmental policies restricting access to medicinal herbs in forests and encroachments by commercial plantations pose significant barriers to herbal medicine practices. The intergenerational transmission of healing knowledge is further jeopardised as younger generations gravitate towards modern lifestyles, diminishing interest in traditional healing professions. The interface between Adivasi healthcare practices and Western biomedicine revealed systemic tensions. While some healers acknowledged the benefits of biomedical treatments for certain ailments, there is a broader apprehension towards overreliance on hospital-based care, advocating for the integration of herbal and modern healthcare systems to meet community health needs effectively.

Discussion

This discussion synthesises key themes that emerged from the study, including the coexistence of traditional healing practices and professional biomedical interventions, challenges in oral health management, and implications for community health and well-being. The study's findings and discussions align closely with the socio-ecological framework, providing a comprehensive exploration of the multifaceted factors influencing oral health among the Gudalur Adivasis.

Fig. 1 illustrates how multiple factors shape oral health in the Gudalur Adivasi community using the socio-ecological model. At the individual level, beliefs and traditional healing practices influence health behaviours, though modern changes like increased sugar consumption and tobacco use are altering oral health patterns. Interpersonally, trust in traditional healers remains strong, yet declining youth interest in these traditions impacts healer-patient dynamics. At the community level, changing social norms, urbanisation, and restrictions on accessing medicinal plants challenge the sustainability of traditional healing. Oral health often ranks lower in priority compared to livelihood and food security. Organisational barriers, such as limited policy recognition and restrictive forest laws, hinder the integration of Adivasi healing into formal healthcare systems. At the systemic level, a dominant dentist-centred model marginalises traditional healers, coupled with oral health being deprioritised within public health agendas. This framework highlights the need for culturally responsive health policies that bridge gaps between traditional and biomedical systems. By recognising Adivasi healing as a legitimate healthcare system, policymakers can develop inclusive interventions that improve oral health equity while respecting indigenous knowledge.

This study highlights the role of Adivasi healers in addressing oral health needs within their communities, particularly in the absence of adequate formal dental care. Similar to findings from Indigenous health studies worldwide, traditional healing practices serve as a critical interstitial system that fills healthcare gaps (World Health Organization, 2013). In India, policies such as the National AYUSH Mission aim to integrate traditional systems of medicine into public healthcare, yet oral health remains an overlooked area (Ministry of AYUSH, 2022). Research in South American and African contexts has demonstrated that traditional medicine plays a key role in primary healthcare delivery, particularly in remote and underserved areas (Eder and Garcia Pu, 2003; Abdullahi, 2011). This study reinforces these findings by showing that Adivasi healers provide localised, culturally relevant oral health solutions despite systemic neglect.

The oral health delivery system in India follows the inverse square law (Directorate General of Health Services and Ministry of Health and

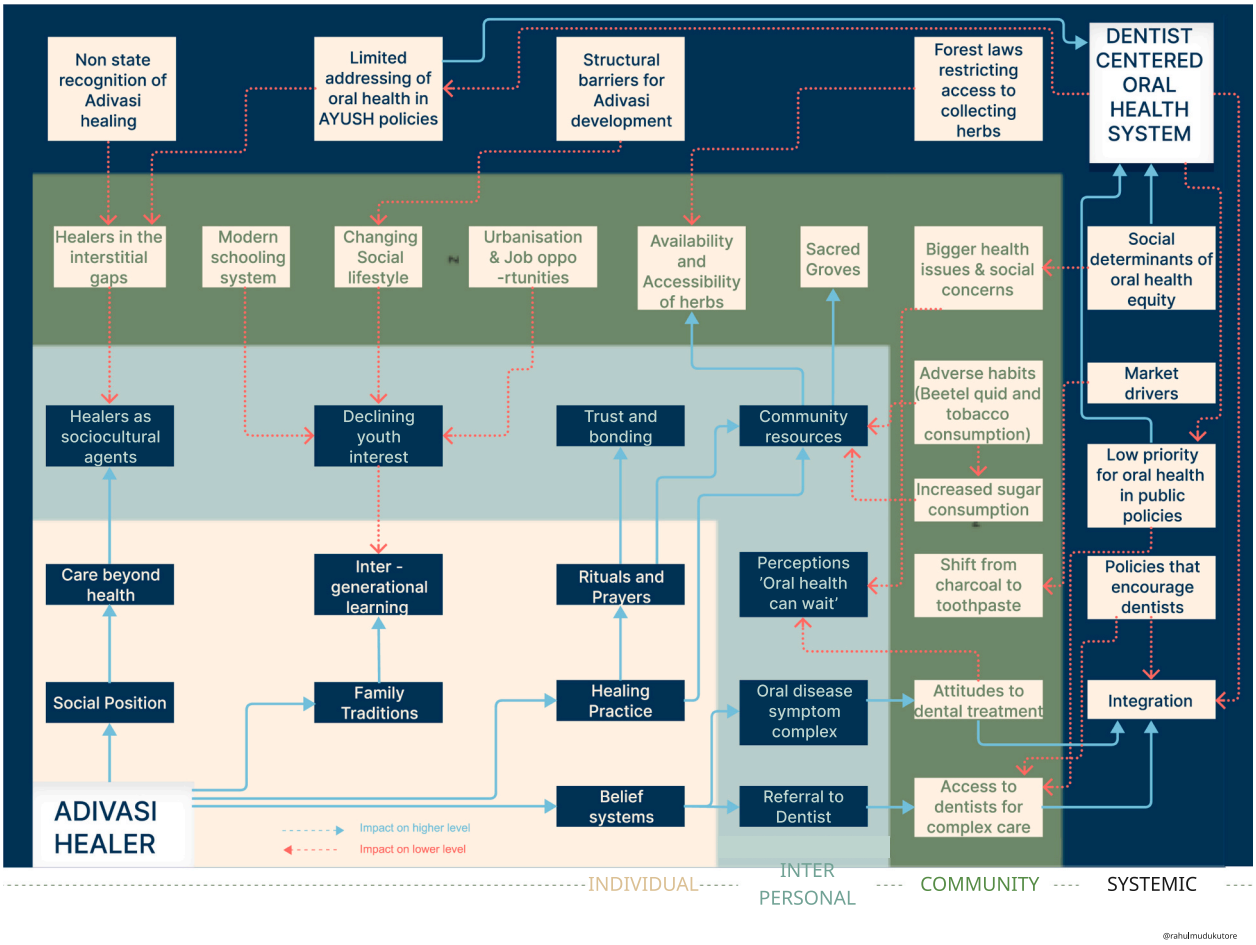

Fig. 1. Oral health and traditional healing in the Gudalur adivasi community seen through the Socio-Ecological perspective.

Family Welfare, 2001; Oberoi et al., 2017). The health system operates on a biomedical model, which causes cross-cultural conflicts that may interfere with accessibility, availability, and acceptability. Of the 2,94, 102 registered dentists in India, 10,350 dentists work at public hospitals (Directorate General of Health Services and Ministry of Health and Family Welfare, 2001). There is no recent data available on the number of dentists working in rural areas. Similarly, there is no data on the healers who treat oral diseases in India. The Dentist-Population ratio is 1:10,271, and roughly 60 % of the Indian population is served by Dentists (Vundavalli, 2020). Traditional healers and professional dentists co-exist in their own space with little or no interaction on the professional front. With an acute shortage of professional dentists, healers play a lateral role in filling the gaps in the health delivery system (Bochi, 2015). Delivering oral healthcare in such a context becomes increasingly challenging and necessitates strong political prioritisation.

Such a dentist-centred health system is structured around specialised clinical interventions, often prioritising curative over preventive care and relying on expensive infrastructure, such as dental clinics and hospitals, that are largely concentrated in urban areas. This model, reinforced by policies favouring Western biomedicine, has systematically marginalised traditional healing methods by excluding them from regulatory frameworks, funding mechanisms, and mainstream public health initiatives (Nambiar and Mishra, 2019). Among the Gudalur Adivasis, traditional oral healthcare remains integral, yet healers recounted that it is often dismissed as unscientific or informal. This marginalisation is not merely a result of biomedical superiority but reflects deeper structural inequities that devalue Indigenous knowledge systems (Mishra and Nambiar, 2018).

Traditional healers are pivotal in providing primary oral health care within Adivasi communities. The beliefs and illness behaviour related to oral health problems were studied in the *Orang Asli* Indigenous group in Malaysia. The role of the traditional healer, *Tok Halaq,* in prevention and health promotion was crucial (Saub and Jaafar, 2001). Similarly, this study revealed the healer's integral position in addressing common oral health issues, such as toothache and dental caries, through herbal remedies and culturally embedded practices. The verbatim accounts from healers stressed their role not only as providers of medicinal treatments but also as custodians of cultural knowledge and community well-being. Despite their efficacy in managing certain oral health conditions, healers operate at the periphery of the formal healthcare system, grappling with legitimacy issues and a dwindling interest among younger generations to continue these practices (Subedi, 2023).

Previous studies on Indigenous health systems emphasise that traditional healing persists not only due to limited healthcare access but also because of cultural and historical factors that shape trust in biomedical institutions (Verbunt et al., 2021). In Gudalur, Adivasi healers are valued for their deep knowledge of medicinal plants, their accessibility, and their holistic approach to health, which aligns with Indigenous worldviews (Kleinman, 1984). Similar findings have been observed among the Māori in New Zealand and Indigenous communities in Canada, where local healing traditions continue despite the presence of formal health services (Durie, 2004; Nguyen et al., 2020).

The integration of traditional healing practices with professional biomedical interventions exposed a nuanced approach to oral health care in the study area, similar to the observations from Cameroon (Agbor and Naidoo, 2011). Healers offered initial treatments using medicinal plants and other remedies; there is a recognised need for advanced biomedical interventions, particularly for complex cases

requiring surgical or invasive procedures. The case example of the non-Adivasi healer (M01NH15) accompanying a relative to the Adivasi hospital for severe tooth pain supported this integration, where healers often refer patients to dentists for specialised care beyond their capabilities.

This study also contributes to discussions on 'local biology', where oral health disparities are shaped by both biological and sociocultural environments (Lock and Nguyen, 2010). The interaction of diet, economic insecurity, and inadequate access to clean water exacerbates oral health inequalities (Watt and Sheiham, 2012). The neglect of oral health within broader public health priorities has been noted in global health literature, reinforcing the need for culturally appropriate interventions that integrate social determinants into oral health strategies (Petersen and Kwan, 2011).

The study identified several challenges in managing oral health among Adivasi communities, including limited access to professional dental services, dental phobia among patients, and socioeconomic barriers. Despite efforts by the local Adivasi hospital to provide financial support through community health insurance for dental treatments, awareness of both financial support and oral hygiene remained low, and fear of dental procedures persisted. These factors contributed to delayed treatment-seeking behaviours and exacerbated oral health inequalities within the community.

Cultural perceptions significantly influence health behaviours and treatment-seeking patterns among indigenous communities (Cáceres et al., 2023), this holds good for the oral health among the Gudalur Adivasi communities too. Practices such as betel quid chewing, prevalent among adults, contribute to poor oral hygiene and increase the risk of oral cancer and other oral diseases. While a section of the community relied on natural remedies like *Neem* (*Azadirachta indica* A.Juss.) twigs for oral hygiene, pointing to the cultural preferences, there was also an incidental adoption of modern oral hygiene practices using toothbrushes and toothpaste. The way forward is to recognise adverse and healthy practices, whether traditional or modern and adopt a culturally sensitive approach that respects and integrates LHT while promoting oral health education and awareness.

The findings have significant implications for community health and policy interventions aimed at reducing oral health inequalities. The coexistence of traditional healing practices and professional dentistry presents opportunities for collaborative healthcare models that leverage both systems' strengths (Jama et al., 2024). Strengthening the capacity of traditional healers through training and accreditation could enhance their role as primary healthcare providers, particularly in remote and underserved areas where access to professional dental services is limited (WHO Regional Office for Africa, 2000; Anjorin and Hassan Wada, 2022; Mack, 2024). In this context, an accreditation drive for healers in the Gudalur region was conducted in 2022, legitimising their role within the broader healthcare landscape (Quality Council of India, 2022). This policy initiative not only recognised the contributions of traditional healers but also protected them from being labelled as quacks.

Policy initiatives should prioritise culturally informed health interventions that bridge the gap between traditional healing practices and biomedical approaches (Priya and Shwetha, 2010; World Health Organisation, 2024). A community health approach to solving this public health issue, where the community's beliefs, practices, and needs are taken into consideration while formulating policies, will help to move away from the dentist-centred oral healthcare delivery system (National Academies of Sciences et al., 2021; Rigg et al., 2018). Additionally, investing in infrastructure and training for local healers can improve their capacity to deliver effective and safe oral health care within their communities (Krah et al., 2018).

This study acknowledges several limitations, including the focus on a specific geographical area, which may limit the generalisability of findings to other Indigenous communities. Future research should focus on exploring the variations in oral health practices across different Indigenous communities and regions in India and elsewhere, considering socio-cultural contexts and environmental factors influencing health outcomes. Additionally, policy research investigating the structural factors determining oral health is also required.

Conclusion

This ethnographic study highlights how Adivasi healers provide locally relevant oral healthcare in the absence of adequate state-provided services. The findings indicate that oral health is often not prioritised by the Gudalur Adivasis due to pressing economic and social challenges. The effectiveness of traditional healing practices depends on factors such as community trust in healers, access to medicinal resources, and the existing oral health infrastructure. There is a need for a culturally sensitive oral health approach that acknowledges local biology, dietary habits, and environmental conditions contributing to oral health disparities. Improving oral health outcomes in remote Adivasi communities requires integrating local healing traditions into public health initiatives. Healers play a key role in promoting preventive oral health measures and providing emergency pain relief. Additionally, addressing broader social determinants such as access to clean water, food security, and better housing should be prioritised to create an inclusive, community-centred oral healthcare system.

CRediT authorship contribution statement

Mathpati Mahesh Madhav: Writing – review & editing, Supervision, Methodology, Conceptualization. **B R Rajeev:** Writing – original draft, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Narayan Ravi:** Writing – review & editing, Supervision. **Yalsangi Mahantu:** Writing – review & editing, Supervision, Methodology.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used Grammarly and ChatGPT to improve grammar and readability. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The research team wish to thank the Adiavsi healers and other Adivasi community members of Gudalur, the staff of SOCHARA, Bangalore and the Adivasi Munnetra Sangam at Gudalur who facilitated this project, Giovanni Bochi and Shilpa Shika Das (Institute of Public Health Bengaluru) for providing insightful comments while drafting the paper, the two anonymous reviewers as well as Aswathy R (Institute of Public Health, Bengaluru) for proofreading. The preparation of the manuscript, including the time dedicated to its development, was supported by Rajeev B R's DBT Wellcome Trust India Alliance Early Career Fellowship (IA/CPHE/23/1/507016).

References

Abdullahi, A.A., 2011. Trends and challenges of traditional medicine in Africa (Available at:). ', Afr. J. Tradit. Complement. Altern. Med. AJTCAM 8 (5), 115–123. https://doi.org/10.4314/ajtcam.v8i5S.5.

Agbor, A.M., Naidoo, S., 2011. Knowledge and practice of traditional healers in oral health in the Bui Division, Cameroon (Available at:). J. Ethnobiol. Ethnomed. 7 (1), 6. https://doi.org/10.1186/1746-4269-7-6.

Agbor, A.M., Naidoo, S., 2016. A review of the role of African traditional medicine in the management of oral diseases (Available at:). Afr. J. Tradit., Complement. Altern. Med. 13 (2), 133–142. https://doi.org/10.4314/ajtcam.v13i2.16.

Anjorin, O., Hassan Wada, Y., 2022. Impact of traditional healers in the provision of mental health services in Nigeria (Available at:). Ann. Med. Surg. 82, 104755. https://doi.org/10.1016/j.amsu.2022.104755.

Bochi, G., 2015. Pluralism in OH care Lebanon Bochi 2015 (Available at). Med. Anthropol. Q. 29 (1), 80–96. https://doi.org/10.1111/maq.12066.

Braun, V., Clarke, V., 2006. Using thematic analysis in psychology. Qual. Res. Psychol. 3 (2), 77–101.

Cáceres, Á.L., Ramesh, R.M., Newmai, P., Kikon, R., Deckert, A., 2023. Perceptions, health seeking behavior and utilization of maternal and newborn health services among an indigenous tribal community in Northeast India—a community-based mixed methods study (Available at:). Front. Public Health 11, 1139334. https://doi.org/10.3389/fpubh.2023.1139334.

Centers for Disease Control and Prevention, 2007. The Social-ecological Model: A Framework for Prevention. CDC, Atlanta.

Christensen, L.B., Petersen, P.E., Bhambal, A., 2003. Oral health and oral health behaviour among 11-13-year-olds in Bhopal, India. Community Dent. Health 20 (3), 153–158.

Dasson Bajaj, P., Shenoy, R., Davda, L.S., Mala, K., Bajaj, G., Rao, A., K.S, A., Pai, M., Jodalli, P., B.R, A., 2023. A scoping review exploring oral health inequalities in India: a call for action to reform policy, practice and research (Available at). Int. J. Equity Health 22 (1), 242. https://doi.org/10.1186/s12939-023-02056-5.

Directorate General of Health Services and Ministry of Health and Family Welfare, 2001. National Oral Health Care Programme Implementation Strategies. Government of India. Available at: ⟨https://www.aiims.edu/aiims/events/dentalworkshop/nohc-prog.htm⟩.

Durie, M., 2004. Understanding health and illness: research at the interface between science and indigenous knowledge† (Available at:). Int. J. Epidemiol. 33 (5), 1138–1143. https://doi.org/10.1093/ije/dyh250.

Eder, K., Garcia Pu, M.M., 2003. Modelo de la medicina indígena maya en Guatemala: investigación participativa en Sipacapa, San Marcos; San Martín Jilotepeque, Chimaltenango y San Juan Ixcoy, Huehuetenango, 2a ed. ASECSA: DED, Guatemala.

Foláyan, M.O., Olagunju, M.T., Abodunrin, O.R., Alade, O.T., 2024. A scoping review on the use of traditional medicine and oral health in Africa (Available at:). PLOS ONE 19 (5), e0297570. https://doi.org/10.1371/journal.pone.0297570.

Gandhi, S., Verma, V.R., Dash, U., 2017. Health seeking behaviour among particularly vulnerable tribal groups: a case study of Nilgiris' (Available at:). J. Public Health Epidemiol. 9 (4), 74–83. https://doi.org/10.5897/JPHE2017.0911.

Gureje, O., Nortje, G., Makanjuola, V., Oladeji, B., Seedat, S., Jenkins, R., 2015. The role of global traditional and complementary systems of medicine in treating mental health problems (Available at:). Lancet Psychiatry 2 (2), 168–177. https://doi.org/10.1016/S2215-0366(15)00013-9.

Jama, N.A., Nyembezi, A., Ngcobo, S., Lehmann, U., 2024. Collaboration between traditional health practitioners and biomedical health practitioners: scoping review (Available at:). Afr. J. Prim. Health Care Fam. Med. 16 (1), 4430. https://doi.org/10.4102/phcfm.v16i1.4430.

James, A., Janakiram, C., Meghana, R.V., Kumar, V.S., Sagarkar, A.R., Y, Y.B., 2023. 'Impact of oral conditions on oral health-related quality of life among Indians- a systematic review and Meta-analysis' (Available at). Health Qual. Life Outcomes 21, 102. https://doi.org/10.1186/s12955-023-02170-6.

James, P.B., Wardle, J., Steel, A., Adams, J., 2018. Traditional, complementary and alternative medicine use in Sub-Saharan Africa: a systematic review (Available at:). BMJ Glob. Health 3 (5), e000895. https://doi.org/10.1136/bmjgh-2018-000895.

Janakiram, C., Sanjeevan, V., Rajeev, B.R., Joseph, J., Stauf, N., Benzian, H., 2017. Political priority of oral health in India: analysis of the reasons for neglect' (Available at:). J. Public Health Dent. 78 (2), 144–153. https://doi.org/10.1111/jphd.12254.

Kleinman, A., 1984. Indigenous systems of healing: questions for professional, popular, and folk care'. Alternative Medicines Popular and Policy Perspectives, 1st ed. Routledge, London, p. 327.

Krah, E., de Kruijf, J., Ragno, L., 2018. Integrating traditional healers into the health care system: challenges and opportunities in Rural Northern Ghana (Available at:). J. Community Health 43 (1), 157–163. https://doi.org/10.1007/s10900-017-0398-4.

Kumar, G., Tripathi, R.M., Dileep, C.L., Trehan, M., Malhotra, S., Singh, P., 2016. Assessment of oral health status and treatment needs of Santhal tribes of Dhanbad District, Jharkhand (Available at:). J. Int. Soc. Prev. Community Dent. 6 (4), 338. https://doi.org/10.4103/2231-0762.186798.

Kumar, T.S., Dagli, R.J., Mathur, A., Jain, M., Balasubramanyam, G., Prabu, D., Kulkarni, S., 2009. Oral health status and practices of dentate Bhil adult tribes of southern Rajasthan, India. Int. Dent. J. 59 (3), 133–140.

Kumaraguru, M., Balasubramaniam, A., Meignana Arumugham, I., 2023. Oral health status and oral health risks among tribes in Tamil Nadu, India: an epidemiological study (Available at:). Cureus 15 (11), e48721. https://doi.org/10.7759/cureus.48721.

Lampiao, F., Chisaka, J., Clements, C., 2019. Communication between traditional medical practitioners and western medical professionals (Available at:). Front. Sociol. 4, 37. https://doi.org/10.3389/fsoc.2019.00037.

Lock, M., Nguyen, V.-K., 2010. An Anthropology of Biomedicine. Wiley-Blackwell, Chichester, West Sussex, U.K.; Malden, MA.

Mack, M., 2024. Integrating traditional practitioners within primary healthcare teams: development of an accreditation framework (Available at:). Healthc. Manag. Forum 37 (1_), 7S–13S. https://doi.org/10.1177/08404704241271108.

Ministry of AYUSH, 2022. National AYUSH Mission (NAM) Operational Guidelines. Government of India.

Ministry of Tribal Affairs, 2014. Report on the high level committee on socio-economic, health and educational status of tribal communities of India. Ministry of Tribal Affairs, New Delhi. ⟨http://archive.nyu.edu/handle/2451/36746⟩ (Available at:).

Minstry of Tribal Affairs no date State-wise list of Particularly Vulnerable Tribal Groups (PVTGs), ⟨www.tribal.nic.in⟩. Available at: ⟨https://tribal.nic.in/DivisionsFiles/SwLPVTGs.pdf⟩ (Accessed: 17 July 2024).

Mishra, A., Nambiar, D., 2018. On the unraveling of "revitalization of local health traditions" in India: an ethnographic inquiry (Available at:). Int. J. Equity Health 17 (1), 175. https://doi.org/10.1186/s12939-018-0890-1.

Mishra, A., Nambiar, D., Madhavan, H., 2018. The making of "local health traditions" in India. Econ. Political Wkly. Available at: ⟨https://www.epw.in/journal/2018/30/special-articles/making-local-health-traditions-india.html⟩.

Nambiar, D., Mishra, A., 2019. "A light inside a pot": sites and sources of power emerging from an ethnography of traditional healing in South India' (Available at). Glob. Public Health 14 (4), 515–527. https://doi.org/10.1080/17441692.2018.1564349.

National Academies of Sciences, E., Division, H. and M., Services, B. on H.C., Care, C. on I.H.-Q.P, Robinson, S.K., Meisnere, M., Robert, L., Phillips, J., McCauley, L., 2021. Person-Centered, Family-Centered, and Community-Oriented Primary Care. Implementing High-Quality Primary Care: Rebuilding the Foundation of Health Care. National Academies Press (US). ⟨https://www.ncbi.nlm.nih.gov/books/NBK571814/⟩ (Available at:).

Nguyen, N.H., Subhan, F.B., Williams, K., Chan, C.B., 2020. Barriers and mitigating strategies to healthcare access in indigenous communities of Canada: a narrative review (Available at:). Healthcare 8 (2), 112. https://doi.org/10.3390/healthcare8020112.

Oberoi, S.S., Gautam, G., Oberoi, A., Yadav, R., 2017. Inverse care law still holds for oral health care in India despite so many dental graduates: where do we lack? (Available at:). J. Indian Assoc. Public Health Dent. 15 (2), 181. https://doi.org/10.4103/jiaphd.jiaphd_119_16.

Pandey, P., Nandkeoliar, T., Tikku, A.P., Singh, D., Singh, M.K., 2021. Prevalence of Dental Caries in the Indian Population: a systematic review and meta-analysis (Available at:). J. Int. Soc. Prev. Community Dent. 11 (3), 256–265. https://doi.org/10.4103/jispcd.JISPCD_42_21.

Patwardhan, B., Wieland, L.S., Aginam, O., Chuthaputti, A., Ghelman, R., Ghods, R., Soon, G.C., Matsabisa, M.G., Seifert, G., Tu'itahi, S., Chol, K.S., Kuruvilla, S., Kemper, K., Cramer, H., Nagendra, H.R., Thakar, A., Nesari, T., Sharma, S., Srikanth, N., Acharya, R., 2023. Evidence-based traditional medicine for transforming global health and well-being (Available at:). J. Ayurveda Integr. Med. 14 (4), 100790. https://doi.org/10.1016/j.jaim.2023.100790.

Payyappallimana, U. and Hariramamurthi, G., 2012. in Local health practitioners in India: Resilience, revitalisation and reintegration. Available at: ⟨https://scholar.google.com/scholar?cluster= 11158608068071009367&hl=en&oi=scholarr⟩ (Accessed: 17 July 2024).

Petersen, P.E., Kwan, S., 2011. Equity, social determinants and public health programmes–the case of oral health' (Available at:). Community Dent. Oral. Epidemiol. 39 (6), 481–487. https://doi.org/10.1111/j.1600-0528.2011.00623.x.

Priya, R., Shwetha, A.S., 2010. Role of AYUSH Services and Use of Local Health Traditions under the NRHM: A Health Systems Study across 18 States. National Health Systems Resource Centre, New Delhi. Available at: ⟨https://nhsrcindia.org/sites/default/files/2021-07/Status%20and%20Role%20of%20AYUSH%20and%20Local%20Health%20Traditions%20under%20NRHM.pdf⟩.

Quality Council of India, 2022. Project report of the certification of 120 tribal healers in the Nilgiris District, Tamil Nadu. Project report. New Delhi. Available at: ⟨https://qcin.org/public/uploads/ck-docs/PrCB%20TDU%20Initiative_PVTG%20certification_Nilgiri_Tamil%20Nadu_Report.pdf⟩.

Rigg, K.K., Engelman, D., Ramirez, J., 2018. A community-based approach to primary health care. In: Arxer, S.L., Murphy, J.W. (Eds.), Dimensions of Community-Based Projects in Health Care. Springer International Publishing, Cham, pp. 105–117. https://doi.org/10.1007/978-3-319-61557-8_9.

Saub, R., Jaafar, N., 2001. A dental-anthropological study of health and illness behaviour among Orang Asli of the Semai Tribe: the perspective of traditional healers'. Med. J. Malays. 56 (4), 401–407.

Shankar, D., 2001. Agenda for Revitalization of Indian Medical Heritage. Voluntary Health Association of India (Health policy series), New Delhi.

Subedi, B., 2023. Perspective chapter: integrating traditional healers into the national health care system – a review and reflection. In: Rusangwa, C. (Ed.), Rural Health. IntechOpen, Rijeka. https://doi.org/10.5772/intechopen.109885.

Valsan, I., Joseph, J., Janakiram, C., Mohamed, S., 2016. Oral health status and treatment needs of Paniya Tribes in Kerala (Available at:). J. Clin. Diagn. Res. JCDR 10 (10), ZC12–ZC15. https://doi.org/10.7860/JCDR/2016/21535.8631.

Verbunt, E., Luke, J., Paradies, Y., Bamblett, M., Salamone, C., Jones, A., Kelaher, M., 2021. Cultural determinants of health for Aboriginal and Torres Strait Islander people – a narrative overview of reviews (Available at:). Int. J. Equity Health 20 (1), 181. https://doi.org/10.1186/s12939-021-01514-2.

Vundavalli, S., 2020. Dental manpower planning in India: current scenario and future projections for the year 2020 (Available at:). Int. Dent. J. 64 (2), 62–67. https://doi.org/10.1111/idj.12063.

Watt, R.G., Sheiham, A., 2012. Social determinants of oral health inequalities: implications for action (Available at:). Community Dent. Oral. Epidemiol. 40 (2), 44–48. https://doi.org/10.1111/j.1600-0528.2012.00719.x.

WHO Regional Office for Africa, 2000. Promoting the Role of Traditional Medicine in Health Systems: A strategy for the African region. WHO Regional Office for Africa. Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.

afro.who.int/sites/default/files/sessions/working_documents/AFR-RC50-9%20Promoting%20the%20role%20of%20traditional.pdf.
World Health Organisation, 2024. Draft Traditional Medicine Strategy: 2025–2034. Universal access to safe, effective and people-centred traditional, complementary and integrative medicine for health and well-being'. WHO. Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://cdn.who.int/media/docs/default-source/tci/draft-traditional-medicine-strategy-2025-2034.pdf?sfvrsn=dd350962_1.
World Health Organization, 2013. WHO traditional medicine strategy 2014–2023. Available at: http://www.who.int/publications/i/item/9789241506096 (Accessed: 9 March 2025) .