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Prevalence of Morbidity and Healthcare-Seeking Behavior among the Chuktia Bhunjia, a Particularly Vulnerable Tribal Group in Western Odisha

Debaprakash Patra[†] Arpita Santra[†*] Bharathi Karri[†]

Abstract

The Particularly Vulnerable Tribal Groups (PVTGs) of India experience a high burden of morbidity due to their geographic isolation, limited access to healthcare, and persistent socioeconomic disadvantages. These conditions not only shape the types of illnesses they face, but also influence their healthcare-seeking behavior. The present study sought to examine the prevalence of morbidity and the associated healthcare-seeking behavior of adult males and females belonging to the Chuktia Bhunjia PVTG residing in the Nuapada district of Western Odisha, India. The study incorporated a total of 112 adults aged 18–80 years belonging to the Chuktia Bhunjia community, comprising 55 males and 57 females. A cross-sectional survey was conducted to document self-reported and clinically diagnosed morbidities over six months. Healthcare-seeking behavior was classified into modern, traditional, informal, and no care sought categories. Results showed that musculoskeletal disorders and general symptoms (such as fever, fatigue, loss of appetite, etc.) were most prevalent, followed by respiratory problems. Non-communicable diseases were emerging, with hypertension at 17% and diabetes at 1.8%. Correspondence analysis revealed that healthcare-seeking varied by condition, with modern care primarily used for respiratory, gastrointestinal, and musculoskeletal problems, traditional healers consulted for ear and oral ailments, dermatological and minor complaints often managed through informal care, and hepatic, deficiency-related, and eye conditions largely left untreated. The findings highlight a substantial burden of physical and general morbidity and selective utilization of healthcare systems. Interventions should integrate culturally sensitive health education, strengthen primary care, and collaborate with traditional healers to improve health outcomes among this PVTG.

Keywords: Medical pluralism, Indigenous health, Epidemiological transition, Tribal health, India, Health service utilization, Correspondence analysis

1 Introduction

Health inequalities remain a persistent challenge in many low- and middle-income countries, particularly among indigenous and tribal populations who experience significant socio-economic and geographic disadvantages (Rami et al., 2023). In India, Scheduled Tribes (STs) constitute one of the most marginalized social groups, with health indicators consistently lagging behind national averages (Maity, 2017); Punetha and Pandey (2023). Empirical studies have documented a disproportionately higher burden of infectious diseases, poor maternal and child health outcomes, and an emerging prevalence of non-communicable diseases among ST populations compared to non-tribal communities (Akkiraju, 2022; Singh et al., 2025; Subramanian & Joe, 2023). These disparities are shaped by factors such as poverty, low literacy, and inadequate access to healthcare services (Haddad et al., 2012; Sahu et al., 2024), further compounded by social exclusion and cultural differences in health beliefs that influence health-related decision-making (Acharya, 2022; Sahoo et al., 2023).

Morbidity, defined as the presence of illness, symptoms or functional impairment (Hernandez & Kim, 2022), is a key indicator of population health and is particularly consequential in tribal communities, where

† Department of Anthropology, Sambalpur University, Jyoti Vihar, Burla, Sambalpur, Odisha – 768019, India
* Corresponding author, email: santra91arpita@gmail.com

subsistence-based livelihoods make even minor illnesses disruptive to daily survival (Balgir, 2006). Existing research highlights a high prevalence of communicable diseases such as respiratory infections, diarrheal diseases, malaria and skin diseases, along with emerging evidence of hypertension, diabetes, and other non-communicable conditions in many tribal populations of India (Jain et al., 2015; Maramraj et al., 2020; Rizwan et al., 2014; Shriraam et al., 2021). However, available evidence remains uneven and is largely derived from relatively accessible tribal populations, with limited attention to smaller and more isolated groups.

Healthcare-seeking behavior is closely associated with morbidity patterns and the perceived seriousness of illness. A study among the tribal population of India reported that treatment-seeking behavior was higher for acute conditions than for chronic conditions (Raushan & Acharya, 2019). This may be because acute conditions, which are often characterized by evident symptoms such as fever or infections, are more likely to prompt treatment-seeking as they cause immediate discomfort and interfere with routine activities. In contrast, many chronic non-communicable diseases remain asymptomatic or minimally disabling during their early stages; consequently, affected individuals may not perceive an urgent need for medical attention, resulting in delayed or inadequate healthcare-seeking and prolonged periods of untreated morbidity (Haridoss et al., 2025). Again, in tribal populations of India, healthcare decisions are influenced by cultural beliefs, perceived effectiveness of treatment, financial constraints, and accessibility of services (Asokan et al., 2025; Islary, 2014). Studies conducted in tribal-dominated states such as Odisha and Chhattisgarh indicate a continued reliance on traditional healing practices, delayed engagement with formal healthcare providers, and underutilization of available public health facilities (Balgir, 2011; Lenka & Mohapatra, 2015; Sabar & Midya, 2023). The interaction between morbidity and healthcare-seeking behavior is therefore critical for understanding disease burden, treatment pathways, and health outcomes in these communities.

Within the broader tribal population in India, Particularly Vulnerable Tribal Groups (PVTGs) represent the most socio-economically disadvantaged segments, characterized by small population size, relative isolation, and limited access to basic services (Ministry of Tribal Affairs, Government of India, 2024; Ota & Mohanty, 2015). Odisha is home to the largest number of PVTGs in India, making it a critical setting for examining health vulnerabilities among these groups. Despite this, empirical evidence on morbidity patterns and healthcare-seeking behavior among PVTGs in Odisha remains limited, particularly at the community level. Among these PVTGs in Odisha, the Chuktia Bhunjia represent a relatively understudied community residing in the remote regions of Western Odisha. Their geographic isolation and socio-economic conditions are likely to influence both their exposure to illness and their access to healthcare services. However, no systematic empirical study has specifically examined the prevalence of morbidity or healthcare-seeking behavior among the Chuktia Bhunjia PVTG. As a result, reliable data on their disease burden and treatment practices remain largely unavailable. The present study seeks to fill this critical knowledge gap by generating community-level evidence on morbidity prevalence and healthcare-seeking behavior among this PVTG.

In this context, the present study aims to generate empirical evidence on morbidity prevalence and healthcare-seeking behavior among the Chuktia Bhunjia PVTG in Western Odisha. Specifically, the study seeks to answer the following research questions:

1. What is the prevalence of morbidity among adult members of the Chuktia Bhunjia PVTG?
2. What types of healthcare-seeking behaviors are undertaken by adult members of the Chuktia Bhunjia PVTG in response to morbidity?

2 Materials and methods

2.1 Study design and setting

A cross-sectional research design was adopted to conduct the study among the Chuktia Bhunjia PVTG. The study focused on a portion of the community residing in the Komna Block of the Nuapada district, Odisha. Within the block, Sunabeda Gram Panchayat was selected for data collection. Two villages, Sunabeda and Junapani, were chosen for participant recruitment. These two selected villages represent

major habitation clusters of the Chuktia Bhunjia community within Komna Block. These villages share comparable socio-economic conditions, livelihood patterns, geographic remoteness, and access to public healthcare services with other Chuktia Bhunjia settlements in the region. Villages were selected purposively based on the concentration of Chuktia Bhunjia households, ensuring that major habitation clusters of the community in the study area were included. Logistical accessibility and feasibility of repeated field visits were also considered.

2.2 Study population

The present study was conducted among the Chuktia Bhunjia, one of the 13 officially recognized PVTGs of Odisha. The community is predominantly concentrated in the Sunabeda plateau of the Nuapada district in Western Odisha (Sabar, 2014). Ota et al. (2020), on the basis of a baseline survey, reported that the community's population totals 3,086, comprising 1,593 males and 1,493 females across 938 households. They belong to the Proto-Australoid racial group and speak the Bhunjia dialect, a blend of Odia and Chhattisgarhi (Pradhan & Rout, 2025; Sabar & Midya, 2024). Their livelihood mainly depends on agriculture, supplemented by livestock rearing and the collection of forest products sold in local markets (Sabar, 2014). This PVTG lives in remote and difficult-to-access forest areas where health services remain limited, irregular, and culturally mismatched with community practices. Their socio-economic marginalization and traditional subsistence activities are likely to make them highly vulnerable to illness.

2.3 Study participants

Data for the current study were collected from a total of 112 adults aged 18-80 years belonging to the Chuktia Bhunjia community, comprising 55 males and 57 females. The first author (DP) approached the participants after compiling census data from households in the selected villages. Eligible adults who were available during the data collection period were approached for participation.

Those participants who were available during the data collection period, able to communicate in the Odia language and willing to voluntarily participate in the current study were considered for inclusion. A total of 64 individuals approached were excluded from the study for various reasons: reluctant to participate – 55, unable to communicate properly – 4, and severely ill – 5. Participants were included in the study after the nature and purpose of the study were clearly explained, followed by obtaining their verbal consent. An in-person interview was conducted to collect information on socio-demographic details, perceived morbidity, and related healthcare-seeking behavior. Prior fieldwork had been conducted in the same community, which helped in establishing familiarity and trust among the participants. Repeated interactions during the study period further strengthened rapport. The objectives were explained clearly in the local language. A local field guide from the same community assisted during interviews to facilitate communication and enhance participant comfort. The questions were administered orally, and responses were recorded by the investigator after ensuring clear understanding. The entire data collection was carried out throughout the month of January 2025.

2.4 Measures

Socio-demographic data

A structured schedule was employed to collect socio-demographic data, which included current age (in completed years), sex, educational attainment, type of occupation, monthly household income (in INR), number of family members, etc. Another structured schedule was also used to gather information on household characteristics, which incorporated information on their sanitation facility, source of drinking water, water treatment prior to drinking, number of living rooms inside the house, and availability of electricity. Further, a crowding index (Melki et al., 2004) was calculated to assess household density, as overcrowding is an important socio-environmental factor associated with health risks, particularly communicable diseases. It was calculated using the formula: number of family members aged >1 year/total number of living rooms in

the house. Based on the obtained values, three categories were created: up to 1 (denoting less crowding), up to 2 (denoting moderate crowding), and more than 2 (denoting high crowding).

Data on morbidity

Each of the study participants included in the study was questioned on whether he/she experienced any type of morbidity in the six-month period prior to the study. A six-month recall period was selected to capture both acute and chronic morbidity episodes while minimizing excessive recall bias. A pre-tested schedule containing a total of 84 morbidity symptoms and clinically evaluated diseases was canvassed to obtain comprehensive data on the morbidity profile of this study population (Santra, 2025).

The morbidity schedule was organized into major categories of health conditions. General symptoms included fever, fatigue, loss of appetite, and episodes of weakness. Respiratory conditions comprised symptoms like prolonged cough, breathlessness, and clinically diagnosed conditions such as tuberculosis. Gastrointestinal problems included abdominal pain, vomiting, dysentery, peptic ulcer, etc. Musculoskeletal, rheumatologic and other pain-related conditions covered back pain, joint pain, joint swelling, stiffness, and frequent headache. Dermatological conditions included rash, itching, and wounds. Hepatic morbidity included jaundice. Eye-related conditions comprised poor vision, redness, discharge, and night blindness. Ear and oral morbidities included ear pain, discharge, hearing problems, dental caries, gum bleeding, and toothache. Injury and bite cases were recorded separately. Non-communicable diseases included hypertension, diabetes mellitus, heart diseases, hypercholesterolemia, etc. Deficiency symptoms covered signs such as cheilosis, glossitis, Bitot's spot, goiter, etc. Self-reported symptoms were recorded based on participants' responses. Certain physical conditions were identified through direct field-based clinical examination using standard visual inspection and palpation techniques commonly employed in community health screening. These assessments were conducted under natural light and followed basic screening procedures appropriate for field settings. Diagnosed conditions such as tuberculosis, pleuritis, peptic ulcer, diabetes mellitus, hypertension, and jaundice were included only when supported by valid medical prescriptions. Medical prescriptions were evaluated to verify the clinically diagnosed diseases.

Healthcare-seeking behavior for morbidity

Along with the morbidity symptoms, associated healthcare-seeking behaviors were also assessed. The participants were asked to report the type of healthcare they sought for their health problems or whether they did nothing. Based on their responses, this variable was later converted into four major categories: no care sought, traditional healthcare, modern healthcare, and informal care. This categorization was guided by the pluralistic healthcare framework, which recognizes the coexistence of multiple therapeutic systems within rural and tribal contexts. In such settings, formal biomedical services, indigenous healing practices, and informal providers operate simultaneously, shaping healthcare-seeking behavior.

'No care sought' referred to instances where individuals did not seek any form of treatment despite experiencing morbidity. 'Traditional healthcare' included consultation with indigenous healers, herbal practitioners, or faith-based healers whose practices are rooted in culturally transmitted ethno-medical knowledge. 'Modern healthcare' comprised services obtained from formally trained and licensed medical practitioners and government or private biomedical health facilities. 'Informal care' referred to treatment sought from unlicensed or unregulated providers, including local drug sellers, self-medication through pharmacies without prescription, or practitioners lacking formal medical certification.

2.5 Statistical analyses

Descriptive statistics

To summarize the continuous variables like age and monthly household income, means and standard deviations were calculated. Frequencies and percentages were computed to show the distribution of the categorical variables.

Correspondence analysis

Correspondence analysis (CA), an exploratory multivariate technique, was applied to examine patterns of association between morbidities and the types of healthcare consulted. The types of healthcare availed were considered as column profile and morbidities as row profile in this analysis. CA was selected as an appropriate analytical technique because both morbidity categories and types of healthcare sought were categorical variables with multiple levels. CA enabled multidimensional exploration of relationships and provides a visual representation of patterns between categories. This approach facilitated identification of clustering tendencies and underlying structures in the data within an exploratory framework. For the purpose of CA, individual morbidity sub-categories were grouped into broader clinically meaningful categories (e.g., gastrointestinal, respiratory, musculoskeletal) to avoid sparse cell frequencies and ensure analytical stability.

The chi-square test first established a significant overall association between the two categorical variables. CA then decomposed this association into dimensions, each characterized by a canonical correlation whose square represents the inertia explained by that dimension. The first two dimensions captured the maximum inertia, thereby summarizing most of the relationship between the variables. A bi-plot was generated to simultaneously display both row and column categories. In this graphical representation, the horizontal and vertical axes (Dimension 1 and Dimension 2) summarize the major patterns of association between morbidity categories and types of healthcare sought. Categories positioned closer together in the plot indicate stronger associations, whereas those located farther apart reflect weaker or no association. The entire data analysis was performed using IBM SPSS Statistics version 24.0.

2.6 Ethical considerations

The study was approved by the Institutional Ethics Committee of Sambalpur University (IEC No.: 43/IEC-SU/25). The research was conducted in accordance with the ethical guidelines involving human participants of the Indian Council of Medical Research (Indian Council of Medical Research (ICMR), 2018). Prior to data collection, the nature and purpose of the study were clearly explained to all participants in their local language. Verbal informed consent was obtained from each participant before inclusion in the study.

3 Results

Table 1 shows that the mean age of the participants was 42.8 years (SD = 16.4 years), and the distribution of males and females in the study population was proportionate. The table also indicates that the majority of participants were married (86.6%), had no formal education (45.5%), and a substantial proportion (58.0%) were engaged in agricultural activities as their occupation. Regarding household characteristics, a significant portion had no access to improved sanitation (64.3%). However, access to electricity was observed to be nearly ubiquitous within the study population, with 99.1% of the participants reporting its availability. Nearly 70% of the participants collected drinking water from wells located within their household premises; however, overall, the majority (54.5%) did not employ any method of water treatment prior to consumption. The crowding index indicated that a considerable proportion of respondents (57.1%) lived in overcrowded conditions, with more than two individuals residing in a single room, while fewer than 10% lived in comparatively better housing conditions, characterized by one person per room.

Table 2 outlines the self-reported morbidity symptoms and clinically diagnosed conditions experienced by the participants within the six months preceding the survey. Overall, musculoskeletal, rheumatologic and other pain-related conditions were the most commonly reported health issues (68.8%), followed by general symptoms or illnesses (57.1%) and respiratory-related problems (48.2%). The most commonly cited symptoms included joint pain (46.4%), fatigue (44.6%), back pain (34.8%), frequent headaches (33.9%), abdominal pain (30.4%), loss of appetite (27.7%), fever of any type (27.7%), and a persistent cough lasting more than a week (26.8%). Symptoms such as ear-related issues, tuberculosis, jaundice, and deficiency-related conditions (e.g., Bitot's spots and goiter) were reported less frequently (less than 1%). Hypertension exhibited a moderate prevalence among the population (17.0%), while diabetes mellitus was reported by only a negligible proportion (1.8%). No cases of other non-communicable diseases such as

Table 1: Socio-demographic and household characteristics of the participants

Characteristics	Mean ± SD / n (%)
Mean age (years)	42.8 ± 16.4 [range: 18–80 years]
Sex	
Male	55 (49.1)
Female	57 (50.9)
Marital status	
Married	97 (86.6)
Unmarried	12 (10.7)
Widowed/Separated/Divorced	3 (2.7)
Education level	
Non-literate	51 (45.5)
Up to primary level	21 (18.8)
Up to upper primary level	24 (21.4)
Secondary and above	16 (14.3)
Occupation	
Unemployed	8 (7.1)
Agricultural activities	65 (58.0)
*Laborer**	7 (6.2)
Household works	29 (25.9)
Animal husbandry	2 (1.8)
Service	1 (0.9)
Mean monthly household income (INR)	9044.6 ± 4362.8
Sanitation facility	
Unimproved	72 (64.3)
Improved	40 (35.7)
Source of drinking water	
Tap/bore well	11 (9.8)
Tube well	8 (7.1)
Well	78 (69.6)
River	15 (13.4)
Water treatment prior to drinking	
No	61 (54.5)
Yes	51 (45.5)
Electricity	
No	1 (0.9)
Yes	111 (99.1)
Crowding index	
Up to 1	11 (9.8)
Up to 2	37 (33.1)
More than 2	64 (57.1)

* Laborer at construction site, brick field, daily wage earners, etc.
Source: Authors' calculation based on the primary data collected by the authors through field survey, 2025.

cardiovascular conditions, hyperuricemia, or arthritis were identified. Remarkably, there were no reported instances of communicable diseases such as typhoid, leprosy, measles, or chickenpox in this population.

Table 2: Prevalence of morbidity among the participants

Morbidity symptoms/Diagnosed diseases	n (%)	95% CI
General symptoms/illnesses	64 (57.1)	47.5–66.5
Any type of fever	31 (27.7)	19.6–36.9
Fatigue	50 (44.6)	35.2–54.3
Loss of appetite	31 (27.7)	19.6–36.9
Sudden attack of weakness and fainting	14 (12.5)	7.0–20.1
Sleeplessness	12 (10.7)	5.7–18.0
Respiratory	54 (48.2)	38.7–57.9
Coughed > 1 week	30 (26.8)	18.9–36.0
Coughed out phlegm > 2 weeks	26 (23.2)	15.8–32.1
Coughed out blood	1 (0.9)	0.0–4.9
Shortness of breath	3 (2.7)	0.6–7.6
Tuberculosis[#]	1 (0.9)	0.0–4.9
Pleuritis[#]	12 (10.7)	5.7–18.0
Gastrointestinal	47 (42.0)	32.7–51.7
Abdominal pain	34 (30.4)	22.0–39.8
Vomited > 1 day	7 (6.3)	2.6–12.5
Dysentery	19 (17.0)	10.5–25.2
Peptic ulcer[#]	1 (0.9)	0.0–4.9
Musculoskeletal, rheumatologic and other pain-related conditions	77 (68.8)	59.3–77.9
Back pain	39 (34.8)	26.1–44.4
Joint pain	52 (46.4)	37.0–56.1
Joint swelling	3 (2.7)	0.6–7.6
Waking up with stiff joint	7 (6.3)	2.6–12.5
Frequent headache	38 (33.9)	25.2–43.5
Dermatological	14 (12.5)	7.0–20.1
Rash	7 (6.3)	2.6–12.5
Itching	8 (7.1)	3.1–13.6
Wound	1 (0.9)	0.0–4.9
Hepatic (Jaundice[#])	1 (0.9)	0.0–4.9
Eye	31 (27.7)	19.6–36.9
Poor vision	19 (17.0)	10.5–25.2
Eye discharge	17 (15.2)	9.1–23.2
Night blindness	2 (1.8)	0.2–6.3
Red eyes	2 (1.8)	0.2–6.3
Ear	10 (8.9)	4.4–15.8
Ear pain	8 (7.1)	3.1–13.6
Discharge from ear	1 (0.9)	0.0–4.9
Hearing	1 (0.9)	0.0–4.9
Ear infection	1 (0.9)	0.0–4.9
Oral	34 (30.4)	22.0–39.8
Dental caries	28 (25.0)	17.3–34.1
Bleeding gums	2 (1.8)	0.2–6.3
Toothache	16 (14.3)	8.4–22.2
Injury and bite	3 (2.7)	0.6–7.6
Non-communicable diseases[#]	21 (18.8)	12.0–27.2
Diabetes mellitus[#]	2 (1.8)	0.2–6.3
Hypertension[#]	19 (17.0)	10.5–25.2
Deficiency symptoms	14 (12.5)	7.0–20.1
Cheilosis	2 (1.8)	0.2–6.3
Glossitis	10 (8.9)	4.4–15.8
Bitot's spot	1 (0.9)	0.0–4.9
Goiter	1 (0.9)	0.0–4.9

[#] Diagnosed diseases; CI: Confidence Interval.

Source: Authors' calculation based on the primary data collected by the authors through field survey, 2025.

The results of the CA on the data in Table 3, as presented in the summary table (Table 4), indicate a statistically significant association between morbidity and healthcare-seeking behavior, evidenced by

Table 3: Correspondence table showing healthcare-seeking behaviour for different morbidities

Morbidity	Healthcare-seeking behaviour				
	No care sought	Traditional healthcare	Modern healthcare	Informal care	Total
General symptoms/diseases	18	2	44	0	64
Respiratory	8	3	42	1	54
Gastrointestinal	11	3	32	1	47
Musculoskeletal, rheumatologic and other pain-related conditions	17	6	51	2	76
Dermatological	3	2	8	1	14
Hepatic	0	1	0	0	1
Eye	19	2	11	0	32
Ear	1	2	6	1	10
Oral	14	7	12	1	34
Injury and bite	3	0	3	0	6
Non-communicable diseases	0	1	19	0	20
Deficiency symptoms	6	3	5	0	14
Total	100	32	233	7	372

Source: Authors' calculation based on the primary data collected by the authors through field survey, 2025.

a chi-square value of 77.9 and a *p* value of .000. The total inertia of the model is 0.209, indicating that approximately 20.9% of the variability in the relationship between morbidity and healthcare-seeking behavior is explained by the CA. Among the extracted dimensions, Dimension 1 accounts for the highest inertia and explains 59.5% of the total variance, followed by Dimension 2 with an inertia of 0.069, contributing 33.1% to the overall variance. These two dimensions together capture 92.7% of the explained variance, suggesting that they sufficiently summarize the relationship between the variables. The third dimension contributes only 7.3% of the variance and may offer limited additional insight. Canonical correlation values for the three dimensions—0.353, 0.263, and 0.124—indicate that Dimension 1 holds the strongest discriminatory power in representing the associations within the data.

Table 4: Summary of the correspondence analysis

Dimension	Canonical correlation	Inertia	χ^2	*p* value	Proportion of inertia	
					Accounted for	Cumulative
1	0.353	0.125			0.595	0.595
2	0.263	0.069			0.331	0.927
3	0.124	0.015			0.073	1.000
Total		0.209	77.9	0.000	1.000	1.000

Source: Authors' calculation based on the primary data collected by the authors through field survey, 2025.

Table 5 presents the distance values derived from the CA, which quantify the degree of association between various morbidity categories and types of healthcare-seeking behavior. Figure 1, which depicts the bi-plot from the CA, visually illustrates these relationships between morbidity types and healthcare-seeking behavior. As indicated in both Table 5 and Figure 1, respiratory (0.109), gastrointestinal (0.252), and musculoskeletal, rheumatologic and other pain-related conditions (0.294) are most closely associated with the modern healthcare system category. General symptoms/diseases (0.479) along with non-communicable diseases (0.674) also show a moderate association with modern care. The *traditional* healthcare *system*

category shows the closest proximity to ear-related conditions (0.916) and oral morbidities (0.932). *Informal care* is most closely linked to ear conditions (0.094) and dermatological issues (0.761). The category "*no care sought"* is most closely associated with eye-related conditions (0.396), injury and bite (0.571), and deficiency symptoms (0.809). Conversely, the CA displays that hepatic conditions are positioned distantly from all categories of healthcare behavior, with only a weak association observed with traditional care.

Table 5: Euclidean distances between morbidities and healthcare-seeking behaviors

Morbidity category	No care sought	Traditional healthcare	Modern healthcare	Informal care
General symptoms/diseases	0.967	2.047	0.479	1.857
Respiratory	1.426	1.897	0.109	1.468
Gastrointestinal	1.082	1.745	0.252	1.487
Musculoskeletal, rheumatologic and other pain-related conditions	1.119	1.630	0.294	1.359
Dermatological	1.373	1.016	0.882	0.761
Hepatic	5.894	4.122	5.925	4.467
Eye	0.396	2.174	1.673	2.487
Ear	2.031	0.916	1.417	0.094
Oral	0.942	0.932	1.473	1.415
Injury and bite	0.571	2.358	1.321	2.460
Non-communicable diseases	1.995	2.262	0.674	1.632
Deficiency symptoms	0.809	1.087	1.489	1.561

Source: Authors' calculation based on the primary data collected by the authors through field survey, 2025.

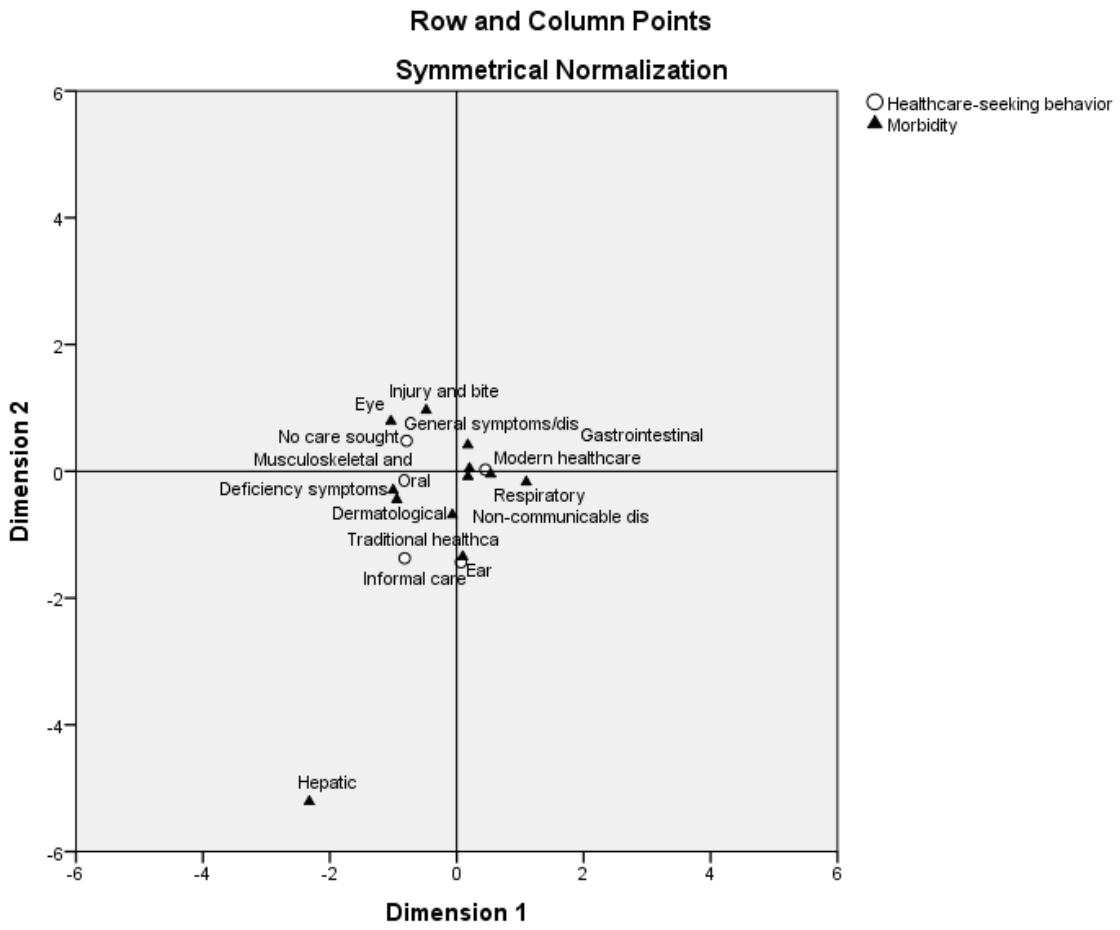

Figure 1: Bi-plot showing the association between morbidity categories and healthcare-seeking behavior types

4 Discussion

To our knowledge, this is the first study to investigate the prevalence of morbidity and related healthcare-seeking behavior among the Chuktia Bhunjia PVTG. The findings of the study are of considerable significance, as they provide baseline evidence on the burden of illness and healthcare-seeking behavior within this community. In the subsequent sections, these results, including the observed prevalence rates and associated behaviors, are discussed in detail to highlight their implications for understanding the health situation of this marginalized group.

The study revealed that the prevalence of musculoskeletal issues, especially back pain and joint pain, is quite high in the studied population. A recent study reported that the PVTG population in Odisha experiences a high burden of back pain (Kavitha et al., 2025). The Chuktia Bhunjia primarily depend on agriculture, forest-based livelihood activities and other labor-intensive activities, which involve repetitive physical strain. Previous studies in India established that many different tribal populations engaged in physically demanding jobs and agriculture face a high burden of musculoskeletal problems (Mullerpatan et al., 2021; Santra et al., 2024). In the context of the present study population, these occupational risks are further intensified by environmental and infrastructural constraints such as uneven terrain, forest-based work settings, lack of mechanization, and absence of ergonomically designed tools. Activities such as prolonged bending during cultivation, carrying heavy loads of firewood or forest produce, and working in awkward postures for extended periods contribute significantly to cumulative physical stress. These factors, operating together, increase the likelihood of musculoskeletal conditions and related functional limitations (Bang et al.,

2021; Mullerpatan et al., 2021; Santra et al., 2024). A study of another tribal group that depends mainly on forest-related activities yielded similar results (Mandi et al., 2019). The PVTG studied by us shares many characteristics with the participants of the previously mentioned studies. The high prevalence observed among the Chuktia Bhunjia thus reflects not only the nature of their occupations but also the environmental conditions under which these activities are performed, highlighting the persistent occupational health burden faced by PVTGs.

General symptoms such as fatigue, headache, abdominal pain, fever, and loss of appetite were also highly prevalent. These nonspecific complaints might be linked to both nutritional inadequacies (Bresnahan & Tanumihardjo, 2014) and recurrent infectious exposures (El-Radhi, 2019). Studies among Koraga people, a PVTG of Karnataka (Mallya et al., 2022), and various tribal individuals of West Bengal (Dhanuka et al., 2019) have documented high levels of undernutrition and anemia, which typically manifest as fatigue or weakness. The frequent reporting of fever and abdominal pain in the present study is consistent with the high burden of infections, particularly gastrointestinal and vector-borne diseases, commonly observed in tribal communities (Dwibedi et al., 2024; Maramraj et al., 2020). In the present study population, these symptoms are closely associated with environmental conditions that increase exposure to infections and limit nutritional security. The Chuktia Bhunjia reside in remote forested areas where access to safe drinking water and sanitation facilities is limited. Dependence on natural water sources, often untreated, and open defecation practices can increase the risk of gastrointestinal infections and parasitic infestations. Additionally, poor housing conditions, close proximity to forested areas, and seasonal exposure to vectors may further contribute to recurrent febrile illnesses. Intestinal parasites, including hookworms and other helminths, are likely to be significant contributors, as they thrive in conditions of poor sanitation and contaminated soil and water.

Respiratory-related problems, including prolonged cough, affected nearly half of the population surveyed. This finding is echoed by a study conducted among tribal women in Darjeeling District, West Bengal (Sarkar, 2016). Indoor air pollution from biomass fuel use is a well-documented risk factor in tribal households across India (Mitra et al., 2023; Rabha et al., 2019). Among PVTGs who depend heavily on firewood for cooking, exposure to smoke is continuous and often exacerbated by poorly ventilated housing. It suggests that such environmental exposures possibly contributed to chronic cough and respiratory morbidity in the current study.

The results suggest that while hypertension is emerging as an important health concern even among remote tribal groups, the prevalence of diabetes remains very low in this PVTG. Hypertension was reported in 17% of the population, which is relatively low compared to other PVTGs (Bhoi & Acharya, 2024; Nayak et al., 2024). Previous studies evidenced that hypertension is rising among tribal populations as well as PVTGs in India as a result of the nutritional transition, increased salt intake, psychosocial stress, and reduced physical activity (B. V. Babu et al., 2024; Hazarika & Babu, 2024). In the case of this PVTG, a high consumption of alcohol may be another contributing factor that further elevates the risk of hypertension. In contrast, diabetes prevalence was negligible (1.8%). This stands in sharp contrast to national averages (Anjana et al., 2017) and to findings from some other Indian tribal communities (Chinnaiyan et al., 2023; Shriraam et al., 2021) where prevalence is relatively higher, but it aligns with findings of a study conducted among PVTGs of Odisha (Nayak et al., 2024). The lower occurrence of diabetes among the Chuktia Bhunjia may be partly explained by protective dietary practices such as limited reliance on refined carbohydrates, alongside the possibility of under-diagnosis due to poor awareness and inadequate screening in PVTG areas. However, this contrasting pattern of rising hypertension with continuing low diabetes prevalence has important implications in the context of the epidemiological transition. It suggests that the study population may be in an early stage of transition, where certain cardiovascular risk factors are beginning to emerge while metabolic disorders such as diabetes remain relatively uncommon. This indicates a potential shift in disease patterns driven by gradual lifestyle and behavioral changes. Importantly, this pattern suggests that managing these risk factors early may help reduce the future burden of non-communicable diseases.

Interestingly, communicable diseases such as typhoid, measles, or leprosy were not reported among the Chuktia Bhunjia. The absence of typhoid and leprosy in our study population may indicate the positive effects of control programs, although studies from Odisha confirm that these diseases continue to be

reported in other PVTGs (Kerketta et al., 2009). However, the possibility of underreporting cannot be excluded, as stigma and lack of access to formal healthcare facilities often lead to nondisclosure of such diseases (Jacob & Franco-Paredes, 2008). Furthermore, the low prevalence of communicable diseases in this PVTG may signal an epidemiological transition in line with patterns seen in the broader Indian population (Narain, 2022).

Regarding healthcare-seeking behavior, the findings indicate a higher utilization of modern healthcare systems for various morbidities among this PVTG. This contrasts with earlier studies, which have shown that tribal communities in India predominantly rely on traditional medicine (Bhuyan & Pradhan, 2025; Tiwari et al., 2022). A recent study similarly reported that traditional medicine remains the primary mode of treatment for different morbidities among the Juang PVTG of Odisha, particularly in remote and hilly regions (Kanrar, 2024). On the contrary, the increased use of modern healthcare observed in the present study may be attributed to greater acceptance of modern medical practices, improved access to public health services and ongoing socio-economic changes, especially in the context of chronic and debilitating conditions among the studied PVTG.

The CA reveals that the healthcare-seeking behavior of the Chuktia Bhunjia PVTG shows distinct patterns that closely align with both cultural traditions and accessibility to health services. The spatial proximity observed in the biplot and the smaller Euclidian distance indicate that modern healthcare was most often sought for respiratory, gastrointestinal, musculoskeletal, and non-communicable conditions. Existing literature suggests that PVTGs in India often perceive several illnesses as less severe, which in turn leads to reduced care-seeking and greater reliance on traditional practices (Sonowal & Konc, 2021). It is likely that these previously mentioned illnesses are generally perceived as more severe and debilitating, which may explain the stronger reliance on modern biomedical services. Similar trends have been reported among other tribal groups in India, where chronic conditions such as musculoskeletal pain and chronic non-communicable diseases like hypertension are increasingly linked with visits to government or private health centers (Bang et al., 2022; Raushan & Acharya, 2019). This reflects a gradual integration of modern care into PVTG health practices, although barriers such as distance, cost, and limited infrastructure may affect their access (Raushan & Acharya, 2019).

The CA and biplot indicate that other conditions, such as ear- and oral-related problems, were more closely associated with traditional healthcare. The relatively smaller Euclidean distances between these conditions and traditional care categories suggest a stronger relationship, indicating that these morbidities are more likely to be managed within traditional systems. However, there is insufficient evidence regarding healthcare-seeking behaviors for these health problems among tribal populations in India. The preference for traditional care in such cases may be attributed to cultural familiarity, previous successful experiences, lower cost, or the perception that these issues are less life-threatening. Further research is required to gain a deeper understanding of this phenomenon.

In this study, the relative proximity, as indicated by the shorter Euclidean distances, suggests that dermatological issues in this PVTG are more closely associated with informal or over-the-counter care, which can be explained by the community's perception of such conditions as minor and easily manageable. Previous studies conducted among tribal communities in Odisha (Bindhani & Nayak, 2021) and Gujarat (Singhal et al., 2020) have reported that a substantial proportion of individuals rely either on traditional healing practices or on formal healthcare providers. Within the PVTG community, common dermatological problems such as rashes, itching, and fungal infections are likely to be managed using readily available creams, balms, or antiseptic agents purchased directly from local shops at low cost. Non-pharmacy general storekeepers in tribal areas might often dispense these medications without prescription, and prior positive treatment experiences could further reinforce the community's reliance on such informal care practices.

The finding that no care was sought for eye conditions, injuries, bites, and deficiency-related symptoms is particularly concerning. The results of CA indicate a close association between these conditions and the "no care sought" category, as reflected in their relative proximity (smaller Euclidean distances), suggesting that such conditions are less likely to prompt treatment-seeking behavior. This may reflect the normalization of certain health issues and limited awareness of their long-term consequences. The Tribal Odisha Eye Disease Study, conducted among the Dongaria Kandha PVTG in Rayagada district, identified ignorance,

poverty, time constraints, distance, and fear of treatment as major barriers to seeking care for eye disorders (Scheduled Castes and Scheduled Tribes Research and Training Institute (Scheduled Castes and Scheduled Tribes Research and Training Institute (SCSTRTI), Development Department Government of Odisha, 2022)). Similarly, a study among the Sahariya tribes of Madhya Pradesh reported neglect of various nutritional deficiency conditions, often attributable to low awareness (Ghosh-Jerath et al., 2013). In this study population, the absence of care-seeking appears to be influenced by a combination of factors. Lack of specialized healthcare services, geographic isolation, poor transport facilities, and treatment costs may act as important structural barriers to seeking care. At the same time, certain conditions, such as visual impairment, may be considered a normal part of ageing and therefore may not lead to care-seeking. Fear or mistrust of biomedical treatment may further discourage individuals from seeking care. As a result, even when healthcare services are available, their use remains low for conditions that are not seen as immediately serious. The neglect of deficiency-related symptoms also reflects the broader issue of chronic undernutrition among PVTGs, where such conditions are common and often not recognized as health problems requiring medical attention, partly due to low awareness. However, the limited availability of empirical research makes it difficult to explain these patterns in greater detail. Further in-depth studies are needed to provide clearer insights.

In this study, the correspondence analysis indicated that hepatic conditions were most closely associated with traditional care. Among the tribal population, utilization of traditional remedies may be preferred due to cultural familiarity, local availability, perceived efficacy, and alignment with community perceptions of illness and health, particularly in the absence of accessible biomedical diagnostics. Previous studies among other tribal populations have documented extensive traditional management of jaundice, including the use of 66 plant species by the Bagata and Khond tribes of Visakhapatnam (M. H. Babu et al., 2020) and 40 species by the Bhoxa, Tharu, and nomadic Gujjar communities of Uttarakhand (Sharma et al., 2012).

4.1 Cultural context and transitional dynamics

The morbidity profile and healthcare-seeking behavior observed among the Chuktia Bhunjia PVTG reflect not only epidemiological patterns but also deep-rooted socio-cultural and transitional dynamics. Health perceptions among the study population are highly likely to be influenced by their beliefs and practices, which often determine how symptoms are recognized and treated. Previous studies documented that cultural perceptions of illness play a significant role in shaping both morbidity reporting and treatment-seeking behavior. The present study identified a high burden of musculoskeletal, respiratory and gastrointestinal conditions, whereas certain conditions which were frequently reported in other PVTGs across the country, such as ear problems, jaundice, tuberculosis, and deficiency-related disorders are rare. Conditions perceived as minor or routine are often normalized within the community, leading to delayed or no care-seeking, whereas more severe or functionally limiting conditions are more likely to prompt engagement with modern healthcare services. At the same time, traditional beliefs and indigenous healing practices continue to influence initial health responses, particularly for ear, oral, and dermatological conditions.

The findings also reflect a transitional phase in healthcare behavior among PVTG communities, where traditional and biomedical systems coexist. Increasing exposure to public health services and changing socio-economic conditions are contributing to greater utilization of modern healthcare, particularly for chronic and disabling conditions. However, cultural interpretations of illness, accessibility barriers, and long-standing reliance on traditional systems continue to shape healthcare decisions.

Thus, the observed morbidity patterns and healthcare-seeking behaviors should be understood within a broader cultural and ecological framework, where disease prevalence and treatment choices are interlinked with lived experiences, subsistence practices, and ongoing health system transitions.

4.2 Limitations of the study

This study has certain limitations that warrant consideration. The relatively small sample size and focus on a single PVTG community within a specific geographic region may limit the generalizability of the

findings to other groups with different socio-cultural and environmental contexts. The cross-sectional design further restricts causal interpretation of the observed associations between morbidity patterns and healthcare-seeking behavior. As the data were primarily self-reported, recall bias and social desirability bias may have influenced the reporting of certain conditions, particularly those associated with stigma. Also misclassification of symptoms due to low health literacy cannot be ruled out. Additionally, the lack of clinical validation of many self-reported conditions may have affected the accuracy of morbidity estimates. Diagnostic verification was constrained by limited clinical resources in remote field settings, and information on chronic conditions was based on self-report, which may have resulted in underestimation of chronic or asymptomatic conditions due to undiagnosed cases. The small sample size and non-random (purposive) sampling of villages limit the representativeness of the findings, and therefore, the results should be interpreted within the context of the selected villages rather than generalized to the entire Chuktia Bhunjia population. Additionally, the exclusion of severely ill individuals who were unable to participate may have introduced selection bias, potentially resulting in an underestimation of the overall morbidity burden in the study population. The study adopts a quantitative approach using structured instruments, which effectively captures biomedical aspects of morbidity and healthcare utilization. However, it does not incorporate qualitative methods to explore emic perspectives or the cultural reasoning behind healthcare choices. This may limit a deeper understanding of socio-cultural influences, particularly in tribal contexts. Future studies may incorporate qualitative methods such as in-depth interviews, illness narratives, and engagement with traditional healers to better understand the cultural perceptions and reasoning underlying healthcare choices. Despite these limitations, the study provides important evidence on the morbidity profile and healthcare-seeking behavior of a marginalized PVTG, contributing valuable insights for designing culturally appropriate health interventions.

5 Conclusion

The Chuktia Bhunjia show a high burden of musculoskeletal, rheumatologic and other pain-related conditions, and several general health problems with common symptoms including joint pain, fatigue, and back pain, alongside frequent respiratory conditions. Conditions such as ear problems, jaundice, tuberculosis, and deficiency-related disorders are rare, while non-communicable diseases like hypertension are emerging. Healthcare-seeking behavior among the Chuktia Bhunjia is highly condition-specific. Modern care is primarily utilized for respiratory, gastrointestinal, and musculoskeletal conditions, while traditional care is more associated with ear and oral morbidities, and minor ailments often rely on informal sources. Eye disorders, injuries, and deficiency-related symptoms are largely neglected, and hepatic conditions show minimal engagement with any care.

The high prevalence of musculoskeletal disorders, general symptoms, and emerging non-communicable diseases underscores the need for public health interventions that address occupational, nutritional, and lifestyle-related risks within the community. The selective use of modern medicine for severe conditions, reliance on traditional healers for culturally defined ailments, and neglect of conditions such as eye problems and deficiency-related morbidities highlight both limited awareness and cultural interpretations of illness severity, which shape healthcare-seeking behavior.

The findings of this study also have broader societal implications. They highlight the persistent health inequalities faced by marginalized tribal populations and the need for more inclusive and equitable healthcare systems. The limited care-seeking for certain conditions reflects not only structural barriers but also gaps in awareness and social recognition of health needs. Addressing these challenges requires greater attention to culturally sensitive health communication and community engagement to ensure that vulnerable populations are not left behind in ongoing health transitions.

There is a clear need for integrated health strategies that combine accessible primary healthcare services with culturally appropriate health education and active engagement of traditional healers. Such approaches can improve awareness, promote timely care-seeking, and ensure that both biomedical and indigenous systems work together to address the health needs of this vulnerable population.

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