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Snapshot of the WASH Situation Among Tribal Households of Andhra Pradesh, India

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Abstract Background: Safe drinking water and proper sanitary facilities can go a long way in preventing many infectious diseases. Children are the worst affected by inadequate sanitary facilities as well as unsafe water source. NFHS-5 reveals that 72% of population in rural areas in Andhra Pradesh has improved sanitary facilities. There is no separate data for the tribal areas. The present study was aimed at finding the number of tribal families who had access to better sanitation and drinking water facilities. Methodology: This cross-sectional study was undertaken in 10 villages in a tribal dominated block in Srikakulam district of the state of Andhra Pradesh in India. A total of 350 households were surveyed (35 households in each village). A pre validated questionnaire developed and used by WHO/UNICEF was used for data collection. Results: It was found that all households used “improved” drinking water source. But only 69% of households had “improved” sanitary facility at home. The rest 31% of households still practice open air defecation. Open air defecation was significantly associated with lower level of education and occupation. Further occupation was found to be significantly associated with the practice of open air defecation. Conclusion: Tribal households in this district have access to safe drinking water but not to sanitary facilities.

Keywords WASH, Toilet, Latrine, Tribal

1. Introduction

Many diseases are linked to use of unsafe drinking water and poor sanitary practices. Safe drinking water and safely managed sanitary facility are vital for the prevention of many diseases. Most diseases of alimentary tract and gastrointestinal system are associated with unsafe drinking water and unhygienic sanitary facilities.

Many diarrheal illnesses caused by infections from rota virus, enterovirus, adenovirus, E.coli, Shigella, Salmonella, Vibrio cholerae etc. are caused due to unsafe drinking water and poor sanitation.

Helminthic infections like Giardiaisis, Amoebiasis, Trichuriasis, Cyclospora can directly result from poor water and sanitary facilities [1-4]. Inadequate water and sanitary facilities can also lead to skin and eye infections [1-3].

More than 2.5 lakhs deaths could be attributed to inadequate sanitation in low- and middle- income countries [5]. As per global data, in 2015, 663 million and 2.4 billion people lacked safe drinking water and proper sanitation respectively [6]. Unsafe water and a lack of basic sanitation contribute to deaths of more than 1.2 million under –five children every year [7].

There is a glaring urban –rural divide. Most people residing in urban areas have access to drinking water but it is not the case for people living in rural areas. Safe water is used by more than 90% of urban population in comparison to less than 50% of rural population [8].

Sustainable Development Goal 6 aims at universal and equitable access to safe and affordable drinking water for all (Target 6.1) and access to adequate and equitable sanitation and hygiene for all and ending open defecation (Target 6.2) by 2030 [8]. This is far from being achieved.

As per National Family Health Survey (NFHS) - 5, 95.9% of total population is using safe source of drinking water whereas only 70.2% are using improved sanitation facility. Poor sanitation is still a major issue in rural areas. Among rural population in India, only 64.9% are using improved sanitation facility [9].

As per National Family Health Survey (NFHS) - 5, in Andhra Pradesh, 95% of rural households have improved drinking water source and only 72% of rural households are using improved sanitation facility [10]. These statistics combine both tribal and non-tribal areas, thereby masking the differences in both areas.

The tribal population in India is usually less developed in comparison to non-tribals. It is expected that the tribal population will fare poorer in comparison to non-tribal population on most of the social parameters.

The tribal population, which constitutes 8% of our population is less developed and is traditionally low on these social indicators due to geographical barriers as well as other social and educational backwardness [11, 12]. There is a lack of data from tribal areas on drinking water and sanitary facilities.

The present study was aimed at finding the number of tribal families who had access to better sanitation and drinking water facilities.

We also looked at the various determinants associated with the use of various sanitary facilities.

2. Materials and Methods

This was a cross sectional study done to assess the proportion of households using improved method of drinking water source and improved sanitation facility in a tribal dominated block in Srikakulam district in northern Andhra Pradesh.

2.1. Setting of the Study

The study was conducted in 10 villages of Seethampeta block in Srikakulam district of Andhra Pradesh, one of the southern states of India. Seethampeta block in the district of Srikakulam has an estimated population of 77,000 in 2023. It has the highest population of tribal households among all the blocks of Srikakulam district. This block has 113 villages, out of which 10 were selected for the present study. Probability proportion to size (PPS) technique was used to select these 10 villages out of the 113 villages.

2.2. Sample Size Calculation

The sample size was calculated using the following criteria: Z= 1.96 (95% confidence interval), P= prevalence which was taken as 72% (improved sanitation facility in rural households in Andhra Pradesh as per NFHS-5) relative precision of 10% of prevalence and a design effect of two [10]. Adding another 10% for non-responders during the survey total sample size was calculated to be 338. This was rounded up to 350.

2.3. Data Collection Instrument

Data collection tool was based on the WHO/UNICEF Joint Monitoring Program core questions on drinking water and sanitation [11]. Improved sources included a piped water supply into the dwelling, piped water to a yard/plot, a public tap/standpipe, a tube well/borehole, and a protected dug well. Improved sanitary facility depicts flush to piped sewer system, flush to septic tank, flush/pour flush to pit, composting toilet, ventilated improved pit latrine, and pit latrine with a slab [11].

2.4. Ethical Clearance

Ethical clearance for the study was obtained from the institutional ethical committee of Great Eastern Medical School and Hospital, Srikakulam. Verbal consent from the senior member of the household was taken before administering the questionnaire.

2.5. Statistical Analysis

The obtained data was entered in MS excel sheet. The data was edited for accuracy and completeness. The data was analysed using SPSS 17.0.1. The data was presented with frequency and percentage distribution tables and diagrams. Proportion of households using improved drinking water source and improved sanitary facility was measured. Univariate analysis was performed with each of the socio-demographic indicators. Multivariate analysis was done taking those factors which were found to be significant in univariate analysis. A p value <5 % was considered statistically significant.

2.6. Data Collection Procedure

The data was collected in the months of October-November 2022. Two medical social workers (MSW) were given one-day training on how to select the houses in the village and how to administer the questionnaire. A pilot study was done in a nearby village. On reaching the village on the survey day, first, the houses were selected randomly from the list of houses given by the ASHA. Each selected house was visited by one MSW. A senior household

member was explained about the purpose of the study and that the data or information provided by them will be kept confidential and their identities will not be revealed. The MSW verified the type of water source and sanitary facility in the selected household.

3. Results

The current study included 350 households in 10 villages of a tribal dominated block in a northern district of Andhra Pradesh. The socio-economic characteristics of the study population are shown in Table 1.

Table 1. Socio-demographic characteristics of the study population

Variable	Data	Value No.(%)
House Type	Pucca	189 (54)
	Mixed	115 (33)
	Katcha	46 (13)
Education	Illiterate	75 (21)
	Read up to 10th Class	121 (34)
	Above 10th Standard	154 (45)
Occupation	Laborer / Menial Work	277 (79)
	Employed / Business	73 (21)
Socio-Economic Status (Updated BG Prasad SES)	I	12 (3)
	II	43 (12)
	III	69 (20)
	IV	190 (54)
	V	36 (11)

Most of the households 189 (54%) reside in pucca houses. Among all the heads of the households, 154(45%) had education above 10th standard.

An overwhelming majority of 277(79%) were engaged either as daily wage laborers or farm laborers. Overall socio economic status was assessed using updated BG Prasad scale. Most of the households 190(54%) and 69(20%) belongs to Class 4 and Class 3 respectively.

Out of a total of 350 households, 230(65.71%) collected their drinking water from tube well or bore well and another 106(30.29%) from public tap or stand pipe (Table 2). Only 10(2.86%) used bottled water supplied through agencies. Other sources of drinking water were very few. As per the survey, all families obtained drinking water from "improved source".

Table 2. Main source of drinking water among households (N=350)

Source	No. of Households (%)
Piped water to yard / plot	3 (0.86)
Public Tap / Standpipe	106 (30.29)
Tube well / Bore well	230 (65.71)
Bottled water	10 (2.86)
Cart with small tank	1 (0.29)

A majority of the households 237(67.71%) used pour flush latrine with septic tank. A total of 240(69%) household had "improved source" of sanitary facility at home. The rest 110(31%) were practicing open air defecation (Table 3). Negligible proportion of households had pit latrines.

Table 3. Type of toilet facility used by the household members

Type of Toilet Facility	No. of Households (%)
Flush / Pour Flush – Piped Sewer System	2 (0.57)
Flush / Pour Flush – Septic Tank	237 (67.72)
Flush / Pour Flush – Pit Latrine	2 (0.57)
No facility / Open Air Defecation	109 (31.14)

Education (P = 0.046) and occupation (P = 0.002) were significantly associated with type of sanitary facility (Table 4) in univariate analysis. Socio-economic status and the type of house in which the family is residing were not found to be statistically associated with open air defecation. Those factors which were found to be significantly associated with univariate analysis were taken up for multivariate analysis. Multivariate logistic regression showed that menial occupation is significantly associated with sanitation facility but not education (Table 5).

Table 4. Association between determinants and type of sanitation facility among households (N=350)

Determinants	**Sanitation Facility**		**Chi Square**	**P value**
	Improved (%)	**Not Improved (%)**		
Education			6.154	0.046
Illiterate	43 (12.28)	32 (9.14)		
Read up to 10th Class	89 (25.42)	32 (9.14)		
Above 10th Standard	109 (31.14)	45 (12.85)		
Occupation			9.305	0.002
Laborer / Menial Work	180 (51.42)	97 (27.71)		
Employed / Business	61 (17.42)	12 (3.42)		
Socio-Economic Status (Updated BG Prasad SES)			8.099	0.088
I	7 (2)	5 (1.42)		
II	30 (8.57)	13 (3.71)		
III	46 (13.14)	23 (6.57)		
IV	126 (36)	64 (18.28)		
V	32 (9.14)	4 (1.14)		
House Type			5.400	0.067
Pucca	140 (40)	49 (14)		
Mixed	30 (8.57)	16 (4.57)		
Katcha	71 (20.28)	44 (12.57)		

Table 5. Multivariate Logistic Regression showing association between various factors and sanitation facility

Determinants	Adjusted Odds Ratio	C.I	*P* value
Occupation			
Laborer / Menial Work	Reference		
Employed/ Business	2.93	1.421 – 6.041	0.004
Education			
Illiterate	Reference		
Read up to 10th Class	1.249	0.674 – 2.312	0.480
Above 10th Standard	0.633	0.358 – 1.121	0.117

4. Discussion

It was a cross-sectional study conducted in 10 villages in a tribal predominated block in a district in north Andhra Pradesh. This study provides many facts on the practice of sanitation and drinking water source among tribal households.

Almost two-thirds of the population (65%) used bore well or tube well water as the main source of drinking water and another 30% had piped water within their households. (Table 1). This result was found to be similar to the findings of another study among tribal households of Jawadhi hills near Vellore, which found that 52% used bore well or tube well and another 35% had piped water within their premises [12].

As per the definition all families obtained drinking water from an "improved" source. The NFHS-5 data for 2019-21 showed that 94% of the rural population in India used "improved" drinking water source [9]. Similarly, in Andhra Pradesh, the NFHS-5 data showed that around 95% of households had access to an "improved" source of drinking water [10]. Hence our study findings were concordant with national level and state level NFHS -5 data [9, 10]. This showed tribal households are at par with other rural households in accessing "improved" source of drinking water.

Sanitation data were a little disappointing for the tribal households. The present study showed that 69% of the tribal households used "improved" sanitation facility while the rest 31% resorted to open air defecation (Table 2). The present study results were far better than the findings from the Vellore study among Jawadhi tribal, which showed almost all (99%) practicing open air defecation [12]. But our study results were close to the findings in NFHS-5, which showed that 72% of rural households in Andhra Pradesh and 64% of households in India have access to improved sanitation facility [9, 10]. As per WHO, in 2022,

57% of the global population (4.6 billion people) used a safely managed sanitation service [13].

Further studies in Ethiopia (Africa) and Vietnam (Asia) reported improved sanitary facility being used by 55% and 67% of the population [14,15].

Open air defecation was proportionately higher in illiterate and less educated in comparison to those who had studied more than 10th grade. This finding was also found to be statistically significant (P = 0.046). Similarly, open air defecation was also found to be higher in those households that were daily wage laborers in comparison to households who were either employed or have a business of their own. This difference in practice of open air defecation in relation to the occupation of the head of the household was also found to be statistically significant (P = 0.002).

Multivariate regression analysis showed that only occupation is significantly associated with unimproved sanitary facilities. The study identified that the type of dwelling and the socio-economic status of the family are not significantly associated with the type of sanitation facility. Our study findings were discordant in respect to findings from the Ethiopian study which showed that use of unimproved sanitary facility is associated with occupation as well as income and education.

5. Conclusions

There are very few studies in India which have identified the drinking water source and sanitation facility among a tribal population.

This study concludes that the drinking water facility among this tribal population is satisfactory. But one third of this tribal population still practice open air defecation. As open air defecation is an important factor in transmission of many communicable diseases, these findings are very important.

The study reveals that as the education level improves, more households were found to have “improved source” of sanitary facility. Similarly, people engaged in daily wage labour are more likely to practice open air defecation.

Recommendations

More awareness campaigns should be directed at tribal areas for adopting improved sanitary facilities.

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Conflict of Interest

None to declare

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