

Original Research Article

A study regarding the availability and utilization of water supply and sanitation practices in rural Amritsar, Punjab, India

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ABSTRACT

Background: Access to safe water and sanitation practices is an important issue of health and development at local, regional and national levels. The government has come up with various facilities regarding the water supply and sanitation but there are various factors which curtail their utilization. The present study deals with the extent of utilization and factors impeding the utilization of such services at the village level.

Methods: The present impeding cross-sectional study was carried out in village Nagkalan, Amritsar, where the eldest adult member present in the house at the time of the visit was interviewed. Every house of the village was visited during the period of January 2017 to December 2017, and a total of 1123 families were included in the final analysis. Thereafter, data was compiled and analyzed.

Results: Out of total 1123 families, only 31.4% were using government water supply (tap water); while 42.7% had no government connection at all and used submersible as their sole source of water supply. 20.2% did not have a toilet at their house and therefore practiced open defecation; out of which majority families belonged to lower socio-economic status (statistically significant). Out of total 896 families having a toilet at their house, there were only 30 families (3.4%) who responded that some of the family members practice open defecation. Also, only 6.1% of the respondents were aware about the functions of Village Health Sanitation and Nutrition Committee (VHSNC).

Conclusions: More number of families (42.7%) were dependent on submersible pump as sole source of water supply. 20.2% lacked separate toilet facility, mostly belonging to lower socio-economic status. Only 6.1% were aware regarding the VHSNC. All the families disposed of their household waste on the roads.

Keywords: Availability, Rural, Sanitation, Utilization, Water supply

INTRODUCTION

The concept of safe water and adequate sanitation practice assumes greater significance in countries like India where the majority of the population lives in villages with poor water and sanitation facilities.

It is not only an important measure of the socio-economic status of the household but is also fundamental to the health of its members.

The provision of safe drinking water and adequate sanitation facility is a priority for improving public health standards. India has the largest rural water supply program in the world serving about 1.6 million habitations spread over 15 diverse ecological regions and 742 million people. However, around 37.7 million Indians are still affected by waterborne diseases annually, 1.5 million children are estimated to die of diarrhoea alone and 73 million working days are lost due to waterborne disease each year. Also, 66 million Indians

are at risk due to excess fluoride and arsenic in groundwater.¹

Sanitation is considered one of the most important aspects of community well-being because it protects human health, extends life spans, and provides benefits to the economy. Open defecation and sewage contamination of drinking water has been an endemic sanitary problem in India. In 2017, India was the country with the highest number of people practicing open defecation, around 525 million people, despite the Swachh Bharat Mission launched on 2nd October 2014, with the goal of achieving an open defecation free (ODF) India by 2nd October 2019.²

The present study was thus conducted because to identify the existing system of water supply, environmental sanitation and waste management with respect to its structure and functioning and to prioritize the control strategies according to the needs of the people. These priorities are particularly important because of issue of water constraints, environment-related health problems, inequitable distribution of water resources, inappropriate management of waste and issues related to administrative problems.³

METHODS

Study design was cross-sectional. Study area was village Nagkalan, the rural field practice area of Department of Community Medicine, Government Medical College, Amritsar. Study population was All families of the village Nagkalan. Study period was January 1, 2017 to December 31, 2017. Study sample was 1171 families residing in the village; out of which 29 families were not available (their houses were permanently locked) and 19 families were non-cooperative. Rest 1123 families were interviewed. Study tool was Semi-structured and predesigned questionnaire

Exclusion criteria

- Families who did not give consent for the study.
- Those houses which were found locked even after the third visit.

The present cross-sectional study was conducted in village Nagkalan, the rural field practice area of Department of Community Medicine, Government Medical College, Amritsar, extending from the period of 1st January 2017 to 31st December 2017. After explaining the purpose of the study; written informed consent was obtained from the respondents.

The eldest adult member of the family present in the house at the time of the visit, served as the respondent and interviewed using a semi-structured and predesigned questionnaire at their place of residence. All questions were asked in the vernacular language of the respondent. A total of 1123 families were included in the final

analysis. The socio-economic status of the families was assessed using the modified Kuppuswamy Scale (2017).

Statistical analysis

The data thus collected was compiled and analyzed by using Microsoft Excel, and chi square test was used as test of significance.

Ethical approval

Institutional Ethics Committee, Government Medical College, Amritsar, Punjab, India.

Research objective was to study regarding the availability and utilization of water supply and sanitation practices in village Nagkalan, district Amritsar, Punjab, India.

RESULTS

The present study showed that more than half (64.8%) of the families in the village belonged to upper lower socio-economic status according to modified kuppuswamy scale (2017). 17.2%, 16.0% and 1.8% belonged to upper middle, lower middle, lower categories respectively, whereas only 0.2% belonged to upper socio-economic status (Table 1).

Table 1: Distribution of families according to socio- economic status (modified kuppuswamy 2017).

| Socio-economic status | Number | Percentage (%) |
|-----------------------|--------|----------------|
| Upper | 2 | 0.2 |
| Upper middle | 193 | 17.2 |
| Lower middle | 180 | 16.0 |
| Upper lower | 728 | 64.8 |
| Lower | 20 | 1.8 |
| Total | 1123 | 100 |

Out of total 1123 families, 31.4% of the families were using only government supply of water (tap water) for their activities. 25.9% families, apart from the government connection, also had submersible motor connection. 42.7% had no government connection at all and used submersible as their sole source of water supply (Table 2).

Table 2: Distribution of families according to source of water supply (n=1123).

| Response | Number | Percentage (%) |
|----------------------------|--------|----------------|
| Submersible only | 480 | 42.7 |
| Govt tap water supply only | 352 | 31.4 |
| Both (govt/ private) | 291 | 25.9 |
| Total | 1123 | 100% |

It was observed that out of 480 families who had submersible pumps as the only source of water supply;

351 families (73.1%) did not opt for the government connection of water supply because of the limited duration of government water supply (2 hours in the morning and 2 hours in the evening). Also, there were 123 families (25.6%) who were unable to get the government connection as the water pressure was not sufficient to fill their overhead tanks. Other reasons cited for not getting the government tap water connection were that 14.6% complained that the government source of water contained particles, 25.2% said it was turbid on many occasions, 4.2% had complaints regarding the odour and 3.6% did not like the taste (Table 3).

Table 3: Distribution of families for not having the government connection of water supply (n=480) (multiple response allowed).

| Response | Number | Percentage (%) |
|----------------------|--------|----------------|
| Supply is time bound | 351 | 73.1 |
| Water pressure less | 123 | 25.6 |
| Turbid | 121 | 25.2 |
| Contains particles | 70 | 14.6 |
| Bad odour | 20 | 4.2 |
| Taste not good | 18 | 3.6 |

The study showed that out of total 1123 families, 896 families (79.8%) had a separate toilet facility in their house, whereas 227(20.2%) did not have a toilet at their house and therefore practiced open defecation (Table 4).

Table 4: Distribution of families according to separate toilet facility at home (n=1123).

| Separate toilet | Number | Percentage (%) |
|-----------------|--------|----------------|
| Present | 896 | 79.8 |
| Not present | 227 | 20.2 |
| Total | 1123 | 100 |

Out of those families belonging to lower socio-economic status, 215(28.8%) families did not have separate toilet facility at home while only 12(3.2%) families belonging to middle and upper socio-economic status lacked separate toilets (Table 5).

It was observed that out of total 896 families having a toilet at their house, there were only 30 families (3.4%) who responded that not all the members use the toilet present at their residence and go for open defecation even when the toilet was present at their house.

Out of those 30 families whose family members defecate in the open, 13 families (43.3%) said that the reason for going for open defecation was that the construction of the toilets was not proper and there was blockage while 17 families (56.7%) preferred open defecation and said they were more comfortable that way (Table 6).

Table 5: Distribution of families according to separate latrine facility at home in relation with the socio-economic status of the families.

| Response | Lower | Middle and upper | Total |
|--------------------|------------|------------------|------------|
| Latrine present | 533(71.2%) | 363(96.8%) | 896(79.8%) |
| No latrine at home | 215(28.8%) | 12(3.2%) | 227(20.2%) |
| Total | 748(100%) | 375(100%) | 1123(100%) |

Chi square 97.3, significant at p<0.05

Table 6: Distribution of families on the basis if every member of the family is using the household toilets and the reasons for not using it (n=896).

| Response | Number | Percentage (%) |
|------------------------------|--------|----------------|
| Yes | 866 | 96.6 |
| No | 30 | 3.4 |
| Total | 896 | 100 |
| Reasons for not using (n=30) | | |
| Construction not proper | 13 | 43.3 |
| More comfortable outside | 17 | 56.7 |
| Total | 30 | 100 |

Distribution of families on the basis of knowledge about village health sanitation and nutrition committee (VHSNC) showed that only 68(6.1%) of them were aware about the existence and functions of village health sanitation and nutrition committee (VHSNC) while majority of them (93.9%), were not aware (Table 7).

Table 7: Distribution of families on the basis of knowledge about village health sanitation and nutrition committee (VHSNC).

| Response | Number | Percentage (%) |
|-----------|--------|----------------|
| Aware | 68 | 6.1 |
| Not aware | 1055 | 93.9 |
| Total | 1123 | 100 |

This study further revealed that, 1017 families (90.6%) used either a dustbin or polythene to collect waste inside their house, while 106 families (9.4%) were not using any kind of collection bin (Table 8).

Table 8: Distribution of families according to method of waste collection (and disposal).

| Method | Number | Percentage (%) |
|----------------------|--------|----------------|
| Dustbin/ polythene | 1017 | 90.6 |
| Litter at the corner | 106 | 9.4 |
| Total | 1123 | 100% |

However, all the families of the village responded that the only means of disposal of waste outside their houses was the rudi where all the waste from the entire village got dumped on daily basis. These were the open spaces of waste disposal which was present at several different locations in the village, near the houses of the people. Hence, these were the major source of environmental pollution providing breeding opportunities for the flies, and a major health hazard for the villagers.

DISCUSSION

In the present study, 42.7% had no government source of water supply at all and used submersible as their sole source of water supply. According to NFHS 4, 27.9% of the households have submersible connection as source of water supply in the state of Punjab.⁴ Use of tube well/borewell as principal source is higher in the state of Punjab, which has the drawback of high fluoride, arsenic and iron contamination, further affecting the health of the people. Also, larger use of borewell leads to more exploitation of ground water, thereby depleting the water table.¹ Reasons given for more dependence on submersible source of water supply in the present study (42.7% families) were the availability of government water supply for limited duration, water pressure not sufficient to fill their overhead tanks, and other complaints regarding the quality (odour, colour, taste) of the government water supply.

A study done in 2017 in the rural area of Raipur, Chhattisgarh by Panda et al, showed that 70.3% respondents had sanitary latrines in their house, 6.5% used community toilets, while 23.2% did not have a separate toilet facility and practiced open defecation.⁵ A study on Socio-Demographic and Housing Condition Urban Slum and Rural Households, Gujarat, India by Prajapati et al, (2017) showed that 88.6% rural houses had a separate toilet facility.⁶

According to NFHS-4 Punjab, 79.1% rural households are using improved sanitary facility.⁷ The present study showed similar results. According to a study done in 2017 in the rural area of Raipur district, significant association was found between socio economic status and the practice of open defecation, where open defecation was practiced by families belonging to lower socio-economic status mostly.⁵ Similar results were seen in the present study where 215 families having no separate toilet facility practicing open defecation belonged to lower socio-economic status. The present study showed that 93.9% of the respondents were not aware about the VHSNC, which may be due to the lack of awareness generation on the part of health workers of the village; but despite of that, a large number of families were using sanitary latrines at their homes. A study about the utilization of health services in India showed that, about 28% of all sub-centers did not have a VHSNC constituted in their area. Furthermore, about 12% of all sub-centers

that do have VHSNCs in their area were not monitored regularly.⁸

A study done by Rashmi et al, in 2012 in a cluster of villages near Tekanpur area on NH-75 showed that nearly 287 grams of residential/ agricultural waste per capita was generated per day in those villages and most common practice of waste processing was uncontrolled dumping which caused heavy water and soil pollution.⁹ According to a study in Mahalung, Solapur, the waste from the village households was dumped on the open land, which was clearly hazardous to the environment and health of the residents. No scientific management of waste was carried out or looked after by the Gram Panchayat.¹⁰ Similar results were seen in the present study where although majority of the families collected the waste in bins inside the house (90.6%) but all of the families disposed it off in the rudis (open spaces on the roads) outside their houses suggesting that the waste disposal from the village was not proper and posed a great threat on the health of the villagers as well as served as a source of environmental pollution.

CONCLUSION

Government source of water supply was limited, and a greater number of families were dependent on submersible as source of water supply. Separate toilet facility was present with majority of the families, however those lacking the separate toilet facility mostly belonged to lower socio- economic status. Only 6.1% families were aware regarding the VHSNC. Although majority of the families (90.6%) collected waste in the bins inside their houses, all of them disposed it off on the roads (open spaces) outside their houses; which was a major health and environmental hazard for the people.

Recommendations

Availability and quality of government piped water should be ensured. The health workers should be actively involved in carrying out the IEC/ BCC activities of VHSNC. 100% coverage of sanitary latrine construction and its usage must be ensured through intersectoral coordination with various departments like Department of Water Supply and Sanitation and Department of Rural Development. Scientific management of waste collection must be ensured by the active involvement of the concerned authorities.

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REFERENCES

1. Biswas PK, Mandal K. Drinking water in rural India: a study of deficiency, quality and some social implications. *Water Pol.* 2010;12(6):885-97.
2. WHO fast facts. Available at: http://www.who.int/water_sanitation_health/monitoring/jmp2012/fast_facts/en/. Accessed on 17 October 2019.
3. Kumar SG, Jayarama S. Issues related to sanitation failure in India and future perspective. *Ind J Occup Environ Med.* 2009;13(2):104.
4. Awasthi DP. District-wise Key Indicators of NFHS-4 for Punjab. data.gov.in. 2017. Available at: <https://data.gov.in/resources/district-wise-key-indicators-nfhs-4-punjab>. Accessed on 22 October 2019.
5. Panda PS, Chandrakar A, Soni GP. Prevalence of open-air defecation and awareness and practices of sanitary latrine usage in a rural village of Raipur district. *Int J Commun Medi Pub Health.* 2017;4(9):3279-82.
6. Prajapati BJ, Banker K, Chauhan J, Nayak S. Sociodemographic and housing condition urban slum and rural households, Gujarat India. *Nat J Commun Medi.* 2017;8(2):90-3.
7. National Family health survey 2016, Punjab. Available from: <http://rchiips.org/NFHS/NFHS-4Reports/Punjab.pdf>. Accessed on 17 October 2019.
8. Singh A. Supply-side barriers to maternal health care utilization at health sub-centers in India. *Peer J.* 2016;4:e2675.
9. Shah R, Sharma US, Tiwari A. Sustainable solid waste management in rural areas. *Int J Theor Appl Sci.* 2012;4:72-5.
10. Sutar SA, Gawande SM. Solid Waste Management in Rural Areas emerging towards growth centre through GIS system. Mahalung, Solapur. 2013;4(7):4.

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