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Original Research Article

Water, sanitation and hygiene practices among adult women in a rural area of Kolar district, South India: a community based survey

Nagesh Ramya, Mahendra M. Reddy*, Prasanna B. T. Kamath

Department of Community Medicine, Sri Devaraj Urs Medical College, Sri Devaraj Urs Academy of Higher Education and Research, Tamaka, Kolar, Karnataka, India

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***Correspondence:**
Dr. Mahendra M. Reddy,
E-mail: mahendrabmc@gmail.com

ABSTRACT

Background: In developing countries, monitoring and assessing the change in water, sanitation and hygiene (WaSH) practices still remains to be a challenge especially in rural areas. The objective of the study was to assess the practices related to WaSH and factors associated with good WaSH practices among rural adult women belonging to Kolar district of Karnataka, India.
Methods: A community based cross-sectional study was conducted in a village of Kolar district during July - October 2018. Socio-demographic details and water related characteristics were collected from an adult female of the household using a pre-tested semi-structured interview schedule. The WaSH practices were captured using a set of 15 questions designed after a thorough literature search. WaSH score was categorised into good practice or not based on cut-off value of WaSH score ≥third quartile.
Results: Out of total 108 households enlisted a total of 82 households (76%) comprising of 464 individuals was surveyed. The number of people reporting good WaSH practices was 40 (48.8%). Multivariable logistic regression model containing all independent variables studied showed statistical significance with respect to family type alone (nuclear family having statistically significance compared to three generation family; Odds ratio (95% Confidence Interval) =11.9 (2.7-52.0).
Conclusions: One in two women had good WaSH practice and among the individual components use of soap after defecation was practiced in less than one in ten women under study.

Keywords: Gender equality, Sustainable development goal, Water, sanitation and hygiene

INTRODUCTION

Women and girls are known to be disproportionally affected by the lack of access to adequate water, sanitation and hygiene (WaSH). Sustainable development goal (SDG) 6 envisages to 'ensure availability and sustainable management of water and sanitation for all' with special emphasis to women.[1,2] The recent National Family Health Survey (NFHS) - 4 India fact sheet reports that the households with an improved drinking water source and improved sanitation facility to be 89.9% and 48.4% respectively.[3] With all the efforts of gender equality in picture, women still share the major burden of household procurement of water especially in rural parts of India.

At the community level, focussed interventional programmes on WaSH have shown the potential to increase awareness of and also challenge unequal gender power dynamics not only at the level of 'household' but also at larger 'public places' through community engagement and participation.[4] It is not only initiating

such interventions but monitoring and assessing the impact of these interventions and also assessing the change in WaSH practices still remains to be a challenge, more so in rural areas.

To achieve the targets of SDG 6, India launched programmes like Swachh Bharath Abhiyan (SBA) to improve WaSH practices in both urban and rural India.[5] Studies focussing on WaSH practices among mothers of under five children, and WaSH practices specific to menstruation among school going girls and adolescents have been done and its impact on various domains of social, health and economic situations are also well documented.[6-9]

Studies focussing on general household WaSH practices among women who happen to be the primary collectors, transporters and users of water at household level in developing countries are very few. With this background a study was conducted among rural adult women belonging to Kolar district of Karnataka, India to assess their practices related to WaSH and also factors associated with good WaSH practice.

METHODS

A community based cross sectional study was conducted in a single village of Kolar district, Karnataka, South India. This was a village with naturally formed two clusters based on caste (scheduled caste (SC) or scheduled tribe (ST) and other backward caste (OBC's)).

Sample size was calculated keeping that at least 50% of the population will have access to good quality water which was the primary objective; with absolute precision of 10%, the minimum required sample size was calculated to be 97 households (calculated using OpenEpi version 3.01). A house to house survey was conducted during the period of July to October 2018 to collect the socio-demographic details and details regarding the WaSH practices at the household. All the households in the village were included in the study. The details regarding the family socio-demography and water related characteristics were collected from an adult female of the household using a pre-tested semi-structured interview schedule after obtaining written informed consent. The household which is locked was again accessed the next two consecutive days and if still found locked on the third day the household were considered to be 'locked' and taken as non response.

The WaSH practices were captured using a set of 15 questions and each question was given a score and the total score was calculated as shown in Table 1. The questions were designed for adult women after a thorough review of literature and were pre-tested among five women not belonging to the study area but of same socio-demographic background. Questions were modified based on pre-testing and final questionnaire was used to capture the outcome variable.

This study was part of larger mixed methods study which also assessed the practice with respect to rain water harvesting and also the community perceptions on quality of water and its concurrency with the biochemical findings done in laboratory.[10] This study protocol was approved by the Institutional Ethics Committee for human studies.

Table 1: Individual components used in developing composite WaSH score.

	Water score	Sanitation score	Hygiene score
Individual components	Presence of piped water supplied at house	Use of sanitary latrine in the house	Taking bath daily
	Distance of water supply less than 100 meters	Waste disposal done away from the house (or collected by municipality)	Changing clothes daily
	Daily cleaning of vessels used to store drinking water		Brushing teeth daily at least once
	Covering utensils with a lid		Washing raw food before consumption
	Practice any water treating methods before use		Washing hands after defecation
	Water drawn from vessel without hand getting contact with the water/ vessel (through tap/glass with handle)		Wash hands before starting to prepare food
			Wash hands before eating food
Possible scores	No=0, yes=1	No=0, yes=1	No=0, yes=1
			Washing with soap=2, washing only with water=1
Component score	0 to 6	0 to 2	0 to 10
Total score	18		

Data entry and analysis

Data were single entered using Microsoft Excel and analysed using IBM SPSS Statistics for Windows, version 20 (IBM Corp., Armonk, N.Y., USA). The outcome variable (WaSH score) was plotted using a histogram. WaSH score was expressed using median and inter-quartile range (IQR). WaSH score was categorised into 'good practice or not' based on cut-off value of WaSH score ≥ third quartile (Q3). Proportion of people practising good WaSH practice was reported using proportion with its 95% Confidence Interval (CI). Continuous variable like age were converted to categorical variables and expressed as frequency and percentage. All categorical variables like gender, occupation, marital status, education, above/below poverty line status (APL or BPL), caste and religion were expressed using frequency and proportions. For Univariate analysis we used Pearson chi-square or Fischer exact test were used to test the association. For multivariable analysis logistic regression model was done using enter method and model significance was reported using pseudo R^2 (Nagelkerke) value and association was reported using Odds ratio (OR) and 95% CI. P value <0.05 were considered to be statistically significant.

RESULTS

Out of total 108 households enlisted a total of 82 households (76%) comprising of 464 individuals was surveyed. Thus, a total of 82 women (one from each household) were interviewed. The socio-demographic profile of the 82 women interviewed is as described in Table 2.

Distribution of WaSH practices with respect to components of WaSH score is given in figure 1 and table 3. The median (IQR) of WaSH score was 10 (10 to 11). The third quartile (Q3) value was 11. The number of people reporting good WaSH practices was 40 (48.8%; 95% CI: 38.1%-59.6%). With respect to the individual WaSH practices, in the studied village none of them had piped water supply at house although 16 (19.5%) had tap just outside house or within 100 metres distance from house (although all the households had safe drinking water supply in form of tap or well water). About 10% of them washed hands with soap after defecation. Of the 82 households, 78 (95.1%) of them used sanitary latrine at house.

Table 2: Socio-demographic characteristics of women under study in a rural area of Kolar (n=82).

Socio-demographic characteristic	Number (%)
Age category (in years)	
<40	43 (52.4)
≥40	39 (47.6)
Family type	
Nuclear	39 (47.6)
Joint	11 (13.4)
Three generation	32 (39.0)
Marital status	
Married	73 (89.0)
Others*	09 (11.0)
Education	
No formal education	50 (61.0)
Has formal education	32 (39.0)
Occupation	
Unemployed	32 (39.0)
Employed	50 (61.0)
Caste	
Scheduled caste / scheduled tribe	65 (79.3)
Other backward caste	17 (20.7)
Socio-economic status	
Above poverty line	12 (14.6)
Below poverty line	70 (85.4)

*Others include unmarried/ widowed/ separated.

Table 3: Reported individual good practices as per individual components of WaSH score.

Water (%)	Sanitation (%)	Hygiene (%)
Presence of piped water supplied at house=0 (0.0)	Use of sanitary latrine in the house=78 (95.1)	Taking bath daily=82 (100.0)
Distance of water supply less than 100 meters=16 (19.5)	Waste disposal done away from the house (or collected by municipality) =82 (100.0)	Changing clothes daily=82 (100.0)
Daily cleaning of vessels used to store drinking water=60 (73.2)		Brushing teeth daily at least once=82 (100.0)
Covering utensils with a lid =47 (57.3)		Washing raw food before consumption=82 (100.0)
Practice any water treating methods before use=0 (0.0)		Washing hands after defecation: Soap=8 (9.8) Water=74 (90.2)
Water drawn from vessel without hand getting contact with the water/ vessel (through tap/glass with handle)=0 (0.0)		Wash hands before starting to prepare food: Water=82 (100.0)
		Wash hands before eating food: Water=82 (100.0)

Table 4: Factors associated with good WaSH practices in a rural area of Kolar (n=82 households).

Socio-demographic characteristic	Total	Good WaSH practices* N (%)	Pearson chi-square value	P value
Age category (in years)				
<40	43	25 (58.1)	3.170	0.075
≥40	39	15 (38.5)		
Family type				
Nuclear	39	25 (64.1)	7.649	0.022
Joint	11	05 (45.5)		
Three generation	32	10 (31.3)		
Marital status				
Married	73	37 (50.7)	0.965	0.483†
Others#	09	03 (33.3)		
Education				
No formal education	50	20 (40.0)	3.954	0.047
Has formal education	32	20 (62.5)		
Occupation				
Unemployed	32	19 (59.4)	2.358	0.125
Employed	50	21 (42.0)		
Caste				
Scheduled caste or scheduled tribe	65	24 (36.9)	17.643	<0.001
Other backward caste	17	16 (94.1)		
Socio-economic status$				
Above poverty line	12	11 (91.7)	10.348	0.001
Below poverty line	70	29 (41.4)		
Total	82	40 (48.8)		

*Good WasH practice - WaSH score ≥third quartile (Q3); #include widow or separated or unmarried, $as reported by the participant / based on their ration card, †Fischer's Exact test 'p' value.

Univariate analysis showed that family type, education, socio-economic status and caste showed association with having good WaSH practices (Table 4). Multivariable logistic regression model containing all independent variables studied showed statistical significance with respect to family type alone (Nuclear family having statistically significance compared to three generation family; OR (95% CI =11.9 (2.7-52.0); model significance: pseudo R^2=0.543).

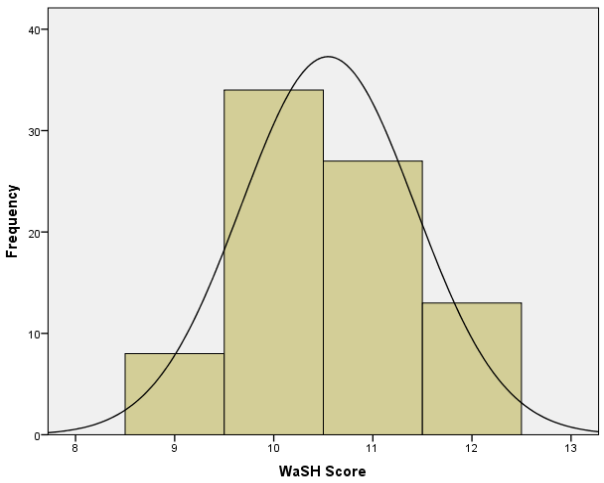

Figure 1: Distribution of households based on WaSH score in a rural area of Kolar (n=82 households).

DISCUSSION

Our study conducted in a single village among adult women regarding their WaSH practices showed that about one in two women had good WaSH practices and women belonging to nuclear family had higher odds of having good WaSH practice.

The NFHS-4 district fact sheet of Kolar reports that the households with an improved drinking water source and improved sanitation facility in rural areas to be 85.5% and 48% respectively.[11] Our study had all households having good drinking water source and more than 95% of them used sanitary latrine. The improvement in sanitation in the village could be attributed to the robust implementation of Swachh Bharath Abhiyan after the NFHS survey (conducted in 2015-16).

In our study less than 10% of them used soap to clean their hands after defecation. The hunger and malnutrition survey conducted across 112 rural districts of India in 2011 showed that only 19% mothers used soap to wash hands after defecation.[12] This emphasises the need for more focussed approach in health education citing importance to usage of soap and also we may need to look into the issue of accessibility and affordability of soap in rural areas of India.

There was an interesting finding regarding the practice of storage of drinking water and also practices relating to it

as none of them practiced any of the water treating methods before drinking water. Qualitative explorations to find the answers for the same were done and shall be reported in a separate paper.

With regards to factors associated with good WaSH practice only family type was found to be associated (women belonging to nuclear families had good WaSH practices). The reasons could be as the number of members is less, lesser the water requirement and more time for personal hygiene among women. More so in the rural areas wherein water for home has to be drawn from the source by the women of the family and this could have an influence on their WaSH practices.

The study has few strengths. This is one of the very few studies focussed on WaSH practices among adult rural women in India and not only on under-five mothers. We have used a pre-tested validated questionnaire with a scoring system developed after a thorough review of literature to capture WaSH practices. We have followed Strengthening The reporting of observational studies in epidemiology guidelines to report our observations.[13] The study is not without limitations. Even with repeated attempts we were not able to cover about one-fourth of the households and this could have had an influence on our study findings although we cannot predict whether it could be on positive or negative side. The scoring used although captures all the individual domains of WaSH, we have failed to give weightages for each domain (or a minimum scoring in every domain to say as 'good' practice') thus leaving a chance of having 'good practice' in spite of being poor in one of the three domains. As the study was done in a single geographical area, generalizability of our study findings is difficult. Further although we may have used robust statistical methods to find factors associated with good WaSH practices the study may be underpowered to detect statistical difference across all factors.

Our study has thus identified the need for focussed health education intervention programme based on the findings of the local community and also encourages research in other such settings to establish factors related to their context and plan for interventions thus feasible. Further research on usage of soap with respect to economics at household level needs to be explored in future.

CONCLUSION

One in two women had good WaSH practice and among the individual components use of soap after defecation was practiced in less than one in ten women under study. There is need for more focussed health education intervention to bring about the behavioural change in WaSH practice in rural areas.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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