Research Article

Assessment of hand hygiene practices among rural population in Davangere

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Received: November 09, 2019; **Accepted:** November 30, 2019

ABSTRACT

Background: Handwashing is well-recognized preventive tool for disease prevention. Handwashing with soap has been viewed as one of the most cost-effective ways of reducing the global infectious disease burden. Hence, the present study was conducted with an aim to study handwashing practices in rural communities. **Objectives:** The objectives are as follows: (i) To assess the handwashing practices in rural areas, (ii) to identify the factors associated with handwashing practices, and (iii) to determine the association between handwashing and certain infections. **Materials and Methods:** A cross-sectional study was conducted among 128 respondents, residing in Kukkuwada village, Davangere Taluk. Data were collected by house to house surveys using semi-structured and pre-tested questionnaire. Data were entered into Microsoft Excel and analyzed using SPSS version 16.0. **Results:** A total of 128 (44 males and 84 females) individuals participated in the study. The majority were from 21 to 40 years age-group (49.2%). All of them practiced handwashing after defecation. A majority, 80 (62.5%) were using soap and water, 12 (9.4%) used water and antiseptic solution for handwashing, and 36 (28.1%) used only water for handwashing. Handwashing practices (medium and technique) were significantly associated with history of episode of diarrhea and upper respiratory tract infection in the past 3 months. **Conclusions:** Among all the study participants who practiced handwashing, majority of them used water with soap and is influenced by factors such as age, frequency of health facility visits, and previous infections. The findings were found encouraging, and we recommend measures for sustainable practice.

KEY WORDS: Handwashing; Rural Population; Infections

INTRODUCTION

Since Roman times, handwashing has been common practice, yet throughout history, its' benefits for the control of infection have been, and remain, frequently overlooked.[1] The handwashing significance in patient care was conceptualized in the early 19th century. The first evidence provided by Labarraque that hand decontamination can markedly reduce the incidence of puerperal fever and maternal mortality.[2] Hygiene behaviors are critical to prevent leading causes of death and diseases in children, particularly diarrhea and acute respiratory infections (ARI) such as flu among children under age 5. An analysis of causes of neonatal and child mortality in India found that half of all under 5 years mortality was a result of pneumonia and diarrheal diseases. The Global Burden of Disease Study notes that unsafe water, sanitation, and poor hand hygiene as a major risk factor which drives to death and disability resulting from these conditions.[3]

Access this article online	
Website: http://www.ijmsph.com	Quick Response code
DOI: 10.5455/ijmsph.2020.1132230112019	

Hand hygiene, particularly, handwashing with soap, recognized as cost-effective public health intervention, having the significant potential to reduce disease burden globally.[3] It is estimated that diarrheal diseases by 47% and respiratory infections by 23% reduced by practicing handwashing with

soap at 5 critical times – after defecation, after cleaning a child's bottom, before feeding infants/children, before eating and food preparation. Therefore, meaningfully contributing to reductions in infant and child mortality and improved child survival rates.[4]

The Global Burden of Disease Study 2015 reported that there is decline in the prevalence of diseases due to no handwashing since 1990s, and mortality and disability-adjusted life years (DALY) due to this have declined since 2000. The number of global deaths attributing to unsafe water and no handwashing with soap between 2005 and 2015 was more than 12%, and DALYs decreased by more than 20%.[5]

Every year October 15 is observed as a Global Handwashing Day. Global Handwashing Day was originally created for children and in schools, but can be observed by anyone promoting handwashing with soap.[6]

Good handwashing requires ideally water, soap, and clean hand drying facilities. However, most importantly hygiene promotion is required to encourage handwashing after using the toilet, before and after handling food, changing a child's nappy, and touching animals, and before eating.[1]

The majority of the studies related to handwashing practices were carried out in healthcare workers, hospital staff and specific groups. Since there are limited studies about handwashing practices in general populations, this study was taken up.

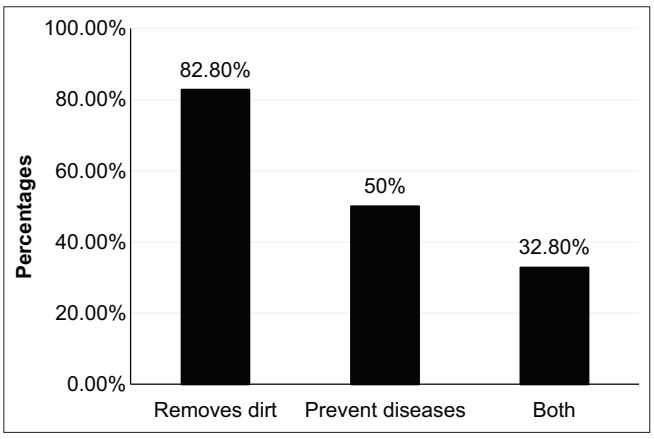

Figure 1: Knowledge regarding importance of handwashing among the study participants *n*=128 (multiple responses)

Objectives

The objectives are as follows:

1. To assess the handwashing practices in rural areas
2. To identify the factors associated with handwashing practices
3. To determine the association between handwashing and certain infections.

MATERIALS AND METHODS

A community-based cross-sectional study was conducted for a period of 3 months from September to November 2018 in Kukkuwada village, rural field practice area of J.J.M Medical College, Davangere, Karnataka state of India among the residents in the study area for more than 1 year, more than 18 years of age, and who consented for the study.

Sample Size

According to a study done in Pune, Maharashtra, on handwashing practices, it was estimated that 79.49% were using soap and water for handwashing. Using the formula $n = 4pq/d^2$ and considering 10% non-response rates final sample size calculated was $n = 127.8 \approx 128$. Sampling: multistage random sampling was used. Kukkuwada village belonging to Rural Health Training Centre (RHTC) area of J.J.M Medical College with the population 2800 and three areas divided according to 900–1000 population assigned to each Accredited Social Health Activist (ASHA) worker. Households were selected randomly from each area, and one individual from each household was selected until the sample size was reached by random sampling. Individuals of age more than 18 years, residents of the area for more than a year, one from each household who give consent and willing to participate were included in the study. Those households with children <5 years preferably interview of the mother or caregiver was taken. Those households found locked after three consecutive visits were excluded from the study. Ethical clearance from Institutional Ethical Committee of J.J.M.

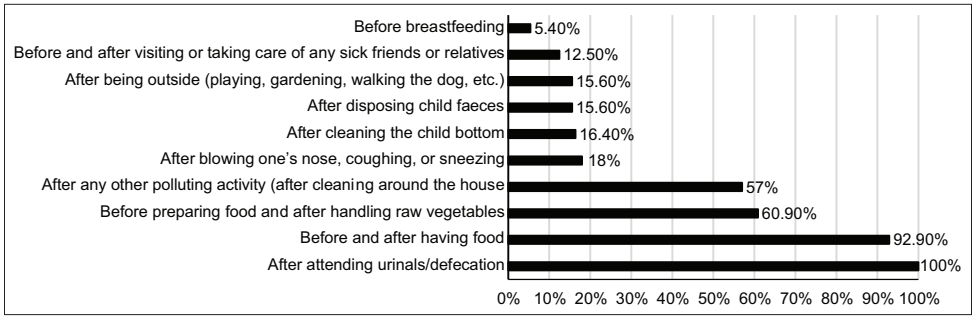

Figure 2: Critical times of handwashing *n*=128 (multiple responses)

Medical College (Ref no. JJMMC/IEC-53-2018) and written informed consent from the study participants were taken.

Data were collected by personal interview method using semi-structured and pre-tested questionnaire which included socio-demographic characteristics, handwashing practices, which included medium and technique of handwashing, timing of handwashing. It also included history episodes of ARIs or episodes of diarrhea in the past 3 months period. The period of 3 months was taken to reduce any recall bias. Spot-check observations of handwashing, when and technique, medium used was done among the study participants.[7] Criteria for correct method in case of general population taken were wash palm, back of their hands, in between the fingers, fingernails, thumb, and wrist for 15–20 s under running tap water.[7] For medium of handwashing, three categories were made (1) handwashing only with water, (2) handwashing with water and soap, and (3) handwashing with water and antiseptic solution.

Statistical Analysis

Data were entered into Microsoft-Excel and analyzed using SPSS version 16.0. Variables were described using frequencies, percentages, and mean with standard deviation. Chi-square test and Fischer exact tests were used to study the factors associated with medium and technique of handwashing.

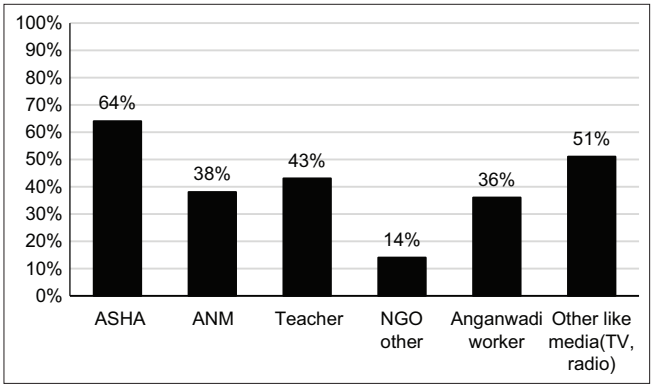

Figure 3: Source of information on hand hygiene among the study participants (*n*=128)

RESULTS

A total of 128 (34.4% males and 65.6% females) individuals were participated in the study. The majority of 63 (49.2%) were from 21 to 40 years of age-group and 43 (33.6%) have completed high school education. Majority of 52 (40.6%) of them belonged to Class IV socio-economic status according to the Modified BG Prasad's classification, and 51 (39.8%) were semi-professionals by occupation. Knowledge regarding importance of handwashing was good. Majority of 106 (82.8%) said that handwashing helps in removing dirt and maintain cleanliness, and 64 (50%) of them said that it protects against germs and prevents diseases [Figure 1].

All of them, that is, 128 (100%) practiced handwashing after defecation followed by 119 (92.9%) before and after having food. Only 7 (5.4%) of them practiced handwashing before breastfeeding [Figure 2].

The majority of 80 (62.5%) were using soap and water. In 56 (44.34%) study participants, the ASHA worker was the major source of information regarding handwashing. In 82 (64%) study participants, the ASHA worker was the major source of information regarding handwashing followed by 65 (51%) media such as TV and radio [Figures 3 and 4].

Out of 128 study participants majority, 80 (63%) of them were using water with soap and were in 21–40 years age group followed by 41–60 years. Overall handwashing practices using water with soap, water with antiseptic lotion, and water only for handwashing decreased with increasing age. This difference in proportion was statistically significant. No association was found between gender, socio-economic status, occupation, literacy level of study participants, and medium of handwashing [Table 1].

Only 45 (35.2%) of them practiced the correct technique of handwashing. Out of them, majority were in the age group of 21–40 years this decreased with increasing age. The majority of 16 (35%) of them were those who completed their high school education. Correct practice decreased with decrease

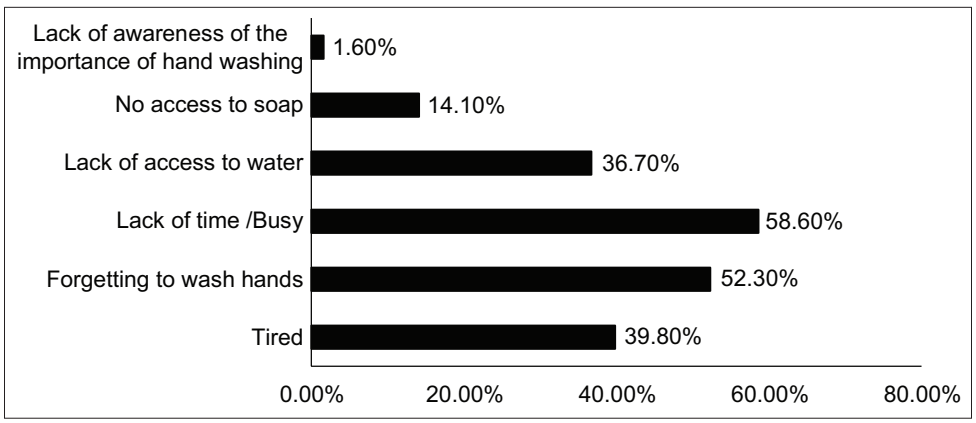

Figure 4: Barriers for handwashing according to the study participants *n*=128 (multiple responses)

Table 1: Factors associated with medium of handwashing (*n*=128)

Parameter	Medium of handwashing *n*=128				*P*-value
	Water only 36 (28%)	Water with soap 80 (63%)	Water with antiseptic lotion 12 (9%)	Total	
Age					
<20	2 (5.6)	5 (6.3)	3 (25)	10 (7.8)	0.038#
21–40	16 (44.4)	40 (50)	7 (58.3)	63 (49.2)	
41–60	10 (27.8)	29 (36.3)	2 (16.7)	41 (32)	
>60	8 (22.2)	6 (7.5)	0 (0)	14 (11)	
Gender					
Female	20 (55.6)	55 (68.7)	9 (75)	84 (65.6)	0.294#
Male	16 (44.4)	25 (31.3)	3 (25)	44 (34.4)	
Literacy level					
Illiterate	7 (19.4)	11 (13.8)	0 (0)	18 (14.1)	0.372#
Primary	4 (11.1)	6 (7.5)	0 (0)	10 (7.8)	
Higher primary	8 (22.2)	8 (10)	2 (16.7)	18 (14.1)	
High school	8 (22.2)	31 (38.8)	4 (33.3)	43 (33.6)	
Primary urethral cancer	7 (19.4)	16 (20)	4 (33.3)	27 (21.1)	
Degree	2 (5.6)	8 (10)	2 (16.7)	12 (9.3)	

#Fischer exact test

Table 2: Factors associated with technique of handwashing (*n*=128)

Parameter	Technique of handwashing *n*=128			*P*-value
	Correct 45 (35.2%)	Incorrect 83 (64.8%)	Total	
Age				
<20	6 (13.3)	4 (4.8)	10 (7.8)	0.004#
21–40	26 (57.8)	37 (44.6)	63 (49.2)	
41–60	13 (28.9)	28 (33.7)	41 (32)	
>60	0 (0)	14 (16.9)	14 (10.9)	
Gender				
Female	33 (73.3)	51 (61.4)	84 (65.6)	0.123#
Male	12 (26.7)	32 (38.6)	44 (34.4)	
Literacy level				
Illiterate	4 (8.9)	14 (16.9)	18 (14.1)	0.048#
Primary	3 (6.7)	7 (8.4)	10 (7.8)	
Higher primary	2 (4.4)	16 (19.3)	18 (14.1)	
High school	16 (35.5)	27 (32.5)	43 (33.6)	
Primary urethral cancer	13 (28.9)	14 (16.9)	27 (21.1)	
Degree	7 (15.5)	5 (6)	12 (9.4)	

#Fischer exact test

in literacy level. Statistical significance association was found between the age group, literacy level, and technique of handwashing [Table 2].

Out of 36 (28%) and 80 (63%) study participants using water only and water with soap for handwashing, 17 (47.2%) and 3 (3.7%) had acute gastroenteritis, and 7 (19.4%) and 21 (26.3%) had upper respiratory tract infection (URTI) at least one episode in the past 3 months [Table 3].

Out of 83 (64.8%), majority 18 (90%) of acute gastroenteritis cases and 24 (82.8%) of URTI cases practiced incorrect method of handwashing. Statistically significant association was found between technique of handwashing and history of acute illnesses [Table 4].

DISCUSSION

In the present study, the majority of 106 (82.8%) said that handwashing helps in removing dirt and maintain cleanliness. All of them, that is, 128 (100%) practiced handwashing after defecation followed by 119 (92.9%) before and after having food. Majority, 80 (62.5%) were using soap and water,

Table 3: Association of medium of handwashing with a history of acute illnesses (*n*=128)

History of acute illnesses	Medium of handwashing *n*=128				*P*-value
	Water only 36 (28%)	Water with soap 80 (63%)	Water with antiseptic lotion 12 (9%)	Total	
Acute gastroenteritis	17 (47.2)	3 (3.7)	0 (0)	20 (15)	0.0001[#]
Upper respiratory tract infection	7 (19.4)	21 (26.3)	1 (8.3)	29 (23)	
No illnesses	12 (33.3)	56 (70)	11 (91.7)	79 (62)	

[#]Fischer exact test

Table 4: Association of technique of handwashing with a history of acute illnesses (*n*=128)

History of acute illnesses	Technique of handwashing *n*=128			*P*-value
	Correct *n*=45 (35.2%)	Incorrect *n*=83 (64.8%)	Total	
Acute gastroenteritis	2 (10)	18 (90)	20 (15)	0.003[#]
Upper respiratory tract infection	5 (17.2)	24 (82.8)	29 (23)	
No illnesses	38 (48.1)	41 (51.9)	79 (62)	

[#]Fischer exact test

12 (9.4%) used water and antiseptic solution for handwashing, and 36 (28.1%) used only water for handwashing.

Similar findings were found in the study by Pandey *et al*. where almost 80% of the study participants used water with soap for handwashing. This particular finding was really encouraging.[2] In a study conducted by Ray *et al*. in urban and rural communities in and around Kolkata, West Bengal 100% respondents interviewed practiced handwashing after defecation either with soap (59%) or with plain water, ash and mud (41%).[8] In another study conducted in West Bengal, in rural area 71% used soap and water after defecation while 26% used mud or ash.[9] As per conducted in rural areas of Bangladesh, 47% of caregivers reported and 51% demonstrated washing both hands with soap after defecation, in structured observation, only 33% of caregivers and 14% of observed washed both hands with soap after defecation.[10] Handwashing practices found to be low in other countries when compared to studies done in India. Ghana observed rate of handwashing with soap rate of only 3% after defecation.[3] In Senegal, it was 31% after defecation and 26% after cleaning the child. In rural areas of Nigeria 10% washed hands with soap and water after cleaning the child. In rural Kyrgyzstan observed rates of handwashing with soap were 18% after using the toilets and none after cleaning the child.[3] In periurban areas of Northern England observed rates of handwashing with soap were 47% after cleaning the child. This decreased in handwashing rates compared to Indian scenario is due to lack of soap and even if soap is present used for bathing and laundry and not for handwashing everytime after cleaning child's bottom in the vast majority of households. Lack of water is not usually a problem because, as hands can be effectively washed with little or recycled water. In many studies found, the main reason cited for low rates of handwashing with soap was that simply not a habit.[3]

Strengths and Limitations of the Study

The technique of handwashing was demonstrated by the study subjects and was corrected on spot if it is wrong, and our study population includes adults of all age groups unless most of the studies conducted among school children and health-care professionals are the strengths of the study. Limitations of the study include episodes of URTI and acute diarrheal diseases are based on retrospective memory-based data so there can be recall bias. We did not include hand sanitizer even though it is one of the media of handwashing. Only one village in RHTC was included, and results cannot be generalized to entire population, but the practice of hand hygiene was found satisfactory.

Recommendation

Since healthcare workers are in direct contact with the community should demonstrate and show proper technique of handwashing. Repeated periodical interventions to sustain the practices/encourage right practices and more awareness should be created regarding importance of handwashing, agents to be used, and proper technique of handwashing to elderly age group as they are most neglected one and need to be concentrated more as seen in this study. Children in school must have been educated and should ask to teach their family members regarding importance of handwashing.

CONCLUSIONS

All of them, that is, 128 (100%) practiced handwashing after defecation followed by 119 (92.9%) before and after having food. Majority of 80 (63%) used water with soap as medium, but the technique of handwashing was incorrect. Overall handwashing practices decreased with increasing age. This difference in proportion was statistically significant.

Statistical significance association was found between age group, literacy level and technique of handwashing. Episodes of acute gastroenteritis and URTI were more common among those using water only and water with soap for handwashing, respectively, in the past 3 months.

REFERENCES

1. Cairncross S, Valdmanis V. Water supply, sanitation, and hygiene promotion. In: Disease Control Priorities in Developing Countries. New York: Oxford University Press; 2006. p. 771-92.
2. Pandey HT, Chawla PS, Giri PA, Fernandez K, Singru SA. Study of hand washing practices in rural community of Pune, India. Int J Community Med Public Health 2016;3:190-3.
3. World Bank. The Handbook: A Guide for Guide for Developing a Hygiene Promotion Program to Increase Handwashing with Soap. Washington, DC: World Bank; 2005.
4. Spotlight on Handwashing in Rural India. Available from: http//www.outlineindia.com›othermedia›1531392037.Hand-hygiene-study.pdf. [Last accessed on 2018 May 09].
5. The State of Handwashing. Annual Review; 2016. Available from: http://www.globalhandwashing.Org/wp-content/uploads/ 2017/03/the-state-of-handwashing-in-2016.pdf. [Last accessed on 2018 May 11].
6. Global Hand Washing Day. Available from: http://www.globalhandwashing.org/ghw-day. [Last accessed on 2018 Jun 03].
7. When and How to Wash Your Hands. Handwashing CDC. Available from: https://www.cdc.gov/handwashing/when-how-handwashing.html. [Last accessed on 2018 Jul 01].
8. Ray SK, Dobe M, Lahiri A, Basu SS. Hand washing practices in urban and rural communities in and around Kolkata, West Bengal. Indian J Public Health 2009;53:192-5.
9. Ray SK, Dobe M, Maji S, Chakrabarty D, Roy AK, Basu SS. A pilot survey on hand washing among some communities of West Bengal. Indian J Public Health 2006;50:225-30.
10. Halder AK, Tronchet C, Akhter S, Bhuiya A, Johnston R, Luby SP. Observed hand cleanliness and other measures of hand washing behavior in rural Bangladesh. BMC Public Health 2010;10:545.

How to cite this article: Ashwini LH, Balu PS, Javalkar SR. Assessment of hand hygiene practices among rural population in Davangere. Int J Med Sci Public Health 2020;9(2):128-133.

Source of Support: Nil, **Conflicts of Interest:** None declared.