

Original Research Article

A Study to Assess the Knowledge and Practice of Hand Washing among School Going Adolescents in Chennai

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ABSTRACT

Introduction: Globally pneumonia (18%) and diarrhoea (11%) remain the major killers of young children. India has the maximum burden of these two diseases. Medical evidence suggests that the hands are the main transmitters of these diseases. Health experts recommend hand washing with soap as it is a mainstay in infection control.

Objectives: To assess the knowledge and practice of hand washing among the school going adolescents in Chennai.

Materials and Methods: This cross sectional study was done in randomly selected schools in Chennai city, from September 2014 to December 2014 included 450 adolescents of 10 to 19 years age using Semi-structured questionnaire. Multistage sampling method was used. Descriptive and inferential statistics were used in data analysis.

Results: Out of the 450 students 54.7% were males and 45.3% were females. Adequate knowledge and practice of hand washing was described as hand washing with soap and water during two critical times (before eating, after using toilet). 85.6% of had adequate knowledge but only 24.9% were practising adequate hand washing. 95% participants knew that adequate hand washing is must before eating but only 32% were practising the same. 90% of the students knew that adequate and washing after using toilet was essential but only 69% were practising the same.

Conclusions: This study found sub optimal hand washing knowledge and poor hand washing practice among students. So this study concludes that the students have significant level of hand washing knowledge but effective measures and long term motivating activities should be taken to improve their hand washing behaviour.

Key words: Hand washing, Knowledge, Practice, School adolescents.

INTRODUCTION

Hygiene is essential to the public health mission of reducing the transmission and consequences of Infectious diseases which are still the deadly group of diseases for developing world. The leading causes of childhood mortality like diarrheal disease (11%) and acute respiratory infections (18%) are closely associated with

inadequate hygiene practices. As per the recently released Pneumonia and Diarrheal Report 2014, every 20 seconds a young child under the age of five years succumbs to either of these major but preventable diseases. Unfortunately, India has the maximum burden of these two diseases in the world. [1-3]

Medical evidence suggests that the hands are the main transmitters of the most common communicable diseases among children. Effective hand washing technique which doesn't take much time or effort is supposed to decrease transmission of infection. Hand washing is like a "do-it-yourself" vaccine-it involves five simple and effective steps (Wet, Lather, Scrub, Rinse, Dry). Adopting this simple habit can play a major role in protecting your health. [4-8]

The first historical evidence on the importance of hand washing was revealed in a maternity clinic in Vienna in 1847 where Cleaning hands by medical personnel reduced maternal mortality. An interventional study showed that children younger than 15 years living in households who received hand washing promotion and plain soap had a 53% lower incidence of diarrhoea than the controls. Hand washing interventions have been shown to significantly reduce illness-related absences in elementary school students by as much as 26%, and significantly reduce a subset of illness related absences (i.e. gastrointestinal illnesses) by as much as 32%. An average of 65% of death caused by diarrheal diseases could be reduced if good hygiene practice accompanies the provision of water and sanitation. [9,10]

According to a UNICEF (United Nations Children's Fund) report, involving children themselves as active participants in promoting hand washing with soap in schools creates a sense of ownership in the children and they are likely to take further into their adulthood. Bearing in mind that school children have been consistently implicated in the spread of communicable diseases and that the school has been recognized as a vital setting for health promotion, this study was conducted to assess the knowledge and practice of hand washing among school going adolescents who will be the adults in the future.

MATERIALS AND METHODS

This cross sectional study was done in three governments, one government aided and one private school in Chennai city, for the period of 4 months from September to December 2014. The estimated sample size of 450 school going adolescents (10 to 19 years) and who are willing to participate were included and the students who were all absent to the school on the day of data collection were excluded.

The sample size was calculated based on the findings of a study done in Chennai among school children in 2009, where the overall prevalence of hand washing practice with soap and water was 19.2%. [11] Considering Confidence levels of 95%, relative precision of 20% with 10% excess sampling to account for non-response, the sample size derived was 445.

Sample size was calculated using the formula: $N = Z_{1-\alpha}^2 pq/d^2$

Where,

$Z_{1-\alpha}$ = standard normal deviant at 95% confidence level i.e. 1.96

p = prevalence of domestic accidents
=19.2%

d = relative precision of 20%.

$N = (1.96)^2 * 19.2 * 80.8 / (3.84)^2$
= 404.322~ 405

Allowing a 10% non-response rate the sample size comes around 445.

Sampling Method

Multistage sampling method was used.

Tool

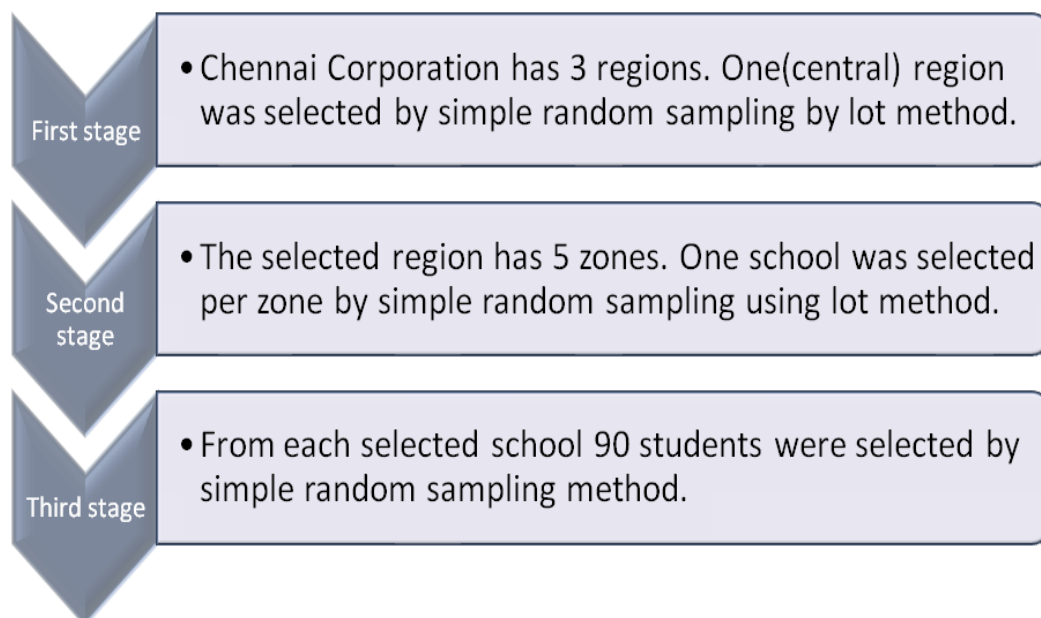
Pre-tested semi-structured questionnaire was used. The questionnaire was developed based on the previous literatures and articles reviewed. The questionnaire had questions on basic socio demographic profile of the students, questions to assess the hand washing knowledge, practice of the students and availability of hand washing facilities.

Data collection

Official permission to conduct the study was obtained from the Chief Educational Officer, and from the Institutional Ethics Committee. Consent of

the respective school authorities and teachers was obtained. After obtaining the informed written consent of the parents and from the participants, the semi-structured questionnaire was administered to the

students. Each question in the study questionnaire was read out loudly and explained to them and made them to respond.



Statistical Analysis

The data collected was entered in MS Excel and analyzed using SPSS Version 16. Descriptive and inferential statistics were used to analyze the data. Simple frequencies of each variable were done. Chi-square test was used to find associations.

RESULTS

Table 1 shows the socio demographic details of the study participants. Out of the 450 study population 54.7% (246) were male and 45.3% (204) were female students. The average age of study participants was 14.42 years and students from eleventh grade constitute the maximum number of participants. 18% of the student's fathers and 26% of the student's mothers were illiterate. Most of the students were from 9th and 10th standard (46.7%), 32.2% were from 11th and 12th standard, and 21.1% were from 6th to 8th standard.

Table 1: Socio demographic details of the study population

Details of study population	Frequency	Percentage
Age (n=450)		
10-14 years	210	46.7
15-19years	240	53.3
Sex (n=450)		
Male	246	54.7
Female	204	45.3
Class (n=450)		
Middle school	95	21.1
High school	210	46.7
Higher secondary	145	32.2
Education of father (n=450)		
Illiterate	81	18
Primary education	73	16.2
High school	231	51.3
Higher secondary	48	10.7
UG/PG degree	17	3.8
Education of mother (n=450)		
Illiterate	117	26
Primary education	94	20.9
High school	193	42.9
Higher secondary	34	7.6
UG/PG degree	12	2.6
Total	450	100

Availability of hand washing facilities

Table 2 reports that 64.7% participants had separate hand washing stands in the school 59.8% had separate hand wash near toilet. 57.8% of students reported to have all time water supply in the school. Nearly 58.4% had soap availability near the hand wash facility but irregularly.

Some of the students also used their own liquids or soap for hand washing. 65.3% had the ideal water source for hand washing that is running water supply through taps. Adequate hand washing practice was strongly associated with availability of hand washing facilities like hand wash stand, water supply, soap availability. ($p < 0.001$)

Table 2: Availability of hand washing facilities

Hand washing facilities	Frequency	Percentage
Separate hand wash facility in school (n=450)		
Yes	291	64.7
No	159	35.3
Separate hand wash facility near toilet in school (n=450)		
Yes	269	59.8
No	181	40.2
24 hour water supply in wash areas in school (n=450)		
Yes	260	57.8
No	190	42.2
Availability of soap near hand wash in school (n=450)		
Yes	263	58.4
No	187	42.6
Water source for hand washing in school (n=450)		
Tap water	294	65.4
Water in bucket	96	21.3
Water in tank/ big containers	55	12.2
Others	5	1.1
Total	450	100

Table 3: Hand washing knowledge and practice

Moments of hand washing	Knowledge (n=450)		Practice (n=450)			X2 (p value) df=1
	Yes	No	Soap and water	Water only	Do not wash	
Before eating	425(94.4%)	25(5.6%)	143(31.8%)	285(63.3%)	22(4.9%)	19.462 *** (0.000)
After toileting	404(89.8%)	46(10.2%)	311(69.1%)	106(23.6%)	33(7.3%)	23.970 *** (0.000)
Come from outside	328(72.9%)	122(27.1%)	103(22.9%)	267(59.3%)	80(17.8%)	4.247 * (0.120)
Touching animals	338(75.1%)	112(24.9%)	150(33.3%)	191(42.4%)	109(24.2%)	15.636 *** (0.000)
Cleaning work	352(78.2%)	98(21.8%)	142(31.7%)	251(55.8%)	57(12.7%)	3.659 * (0.160)
After touching sick persons	326(72.4%)	124(27.6%)	138(30.7%)	158(35.1%)	154(34.2%)	6.632 ** (0.036)
Handling garbage	371(82.4%)	79(17.6%)	181(40.2%)	226(50.2%)	43(9.6%)	2.811 * (0.245)
Blowing nose	353(78.4%)	97(21.6%)	118(26.2%)	214(47.6%)	118(26.2%)	12.645 ** (0.002)
After playing	347(77.1%)	103(22.9%)	129(28.7%)	242(53.8%)	79(17.6%)	8.900 ** (0.012)
Looks dirty	353(78.4%)	97(21.6%)	178(39.6%)	239(53.1%)	33(7.3%)	9.514 ** (0.009)
Critical times	385(85.6%)	65(14.4%)	112(24.9%)	295(65.6%)	43(9.6%)	23.548 *** (0.003)

*** p value <0.001; ** = p value <0.05; * = p value >0.05

Knowledge about hand washing

According to UNICEF (United Nations children's fund) and CDC (Centre for disease control) hand washing with soap and warm running water for at least 20-30 seconds is ideal.

In this study 34.7% of the students knew that warm water is ideal for hand washing. 12.9% told hot water and 52.4% said cold water. 77.6% of students knew that it is must to remove the things worn in the hands like watch, bracelets, rings etc., before hand washing. Most of the students (53.4%) answered drying the hands with their own towels is enough, 15.7% told tissue paper towel, 19% told a common towel can be used to dry the hands and only 11.9% told that drying the hands in air is must.

Hand washing training

Nearly 95% of the students had already learnt about hand washing moments and technique either in school (40.9%), or by parents (54.2%), by friends (3%), or

through media. Nearly 9% of the students were not using wash area in the school. The reasons told by the students for not using hand washing premises were the wash area is not clean, don't need to wash the hands, wash area is too distant to wash, laziness, etc.

Hand washing knowledge and practice

Table 3 shows that most of the students have adequate hand washing knowledge. But only few students were practising hand washing properly.

Adequate knowledge and practice of hand washing was described as hand washing with soap and water during two critical times that is before eating and after using toilet. 85.6% of students have adequate knowledge but only 24.9% were practising adequate hand washing.

There is statistically significant association present between adequate hand washing practice and adequate knowledge of hand washing. That is students who were

having adequate knowledge also have adequate hand washing practice. $p < 0.003$

Relation between hand washing knowledge and sex, level of schooling of the study population

Out of the 385 students having adequate knowledge most of them were higher secondary students and female students. Higher is the level of education (standard), greater is the knowledge of hand washing ($p = 0.004$) among the study participants and most of the female students have adequate knowledge than male students ($p = 0.000001$) which is also statistically significant. Hand washing practice was also significantly associated with student's gender ($p = 0.014$) or class ($p = 0.000043$).

DISCUSSION

Although the effect of hand washing was demonstrated many decades ago, this cross sectional study to assess the hand washing knowledge and practice among 450 adolescent school students in Chennai city revealed inadequate knowledge and poor hand washing practice. That is only 85.6% students have adequate hand washing knowledge and 25% students practiced adequate hand washing though it is higher than a study done in Chennai schools in 2009 to know the hand washing knowledge and practice among school going adolescents of 8th to 12th standard students in which nearly 77% of students washed their hands before eating and 80.7% of students washed their hands after using the toilet. But only 19.2% of them used soap for washing hands at both times. This could be attributed to increased awareness over a period of time. [11]

The present study showed findings similar to a cross sectional study done among 30 thousand households in Bangladesh where the proper hand washing with soap and water at six critical times (before eating, after using toilet, before serving food, before cooking, before feeding babies, after cleaning child's stool) was measured. But the hand washing practice

before taking food in the present study was higher (31.4% > 18%) and hand washing after using toilet was less (69% < 72%) than in the study done in Bangladesh. [12]

The percentage of students having adequate knowledge about critical times of hand washing in this present study was much higher than the findings of a study to explore the impact of health education on hand washing among primary school children done in Karnataka which could be attributed to the age group of the participant students. In that study 45.2% said hand washing was essential before eating and 55.2% after using toilet. Even the post health education knowledge was much lower than this present study. [13]

The proportion of proper hand washing practice in the present study was lower than a study done among middle schoolers in Colombia by Lopez et al, 33.6% of respondents practiced proper hand washing behaviour, where it was defined as washing hands "always" or "very often" with soap and clean water before eating and after using the toilet and this discrepancy might be seen as the present study did not use "always" or "very often" as criteria. [14]

Hand washing practice is strongly influenced by indicators such as education of parents, media access, better economic condition, etc. This study reported low level of hand washing practice among students than a study done in Turkey by Yalcin et al and s. pati et al though the hand washing knowledge was higher. [15,16] But the hand washing practice of the students in this present study was similar to the Tran's study in the Pacific where the students washed their hands more often after using the toilet than before eating. [17]

Indonesia Global School-Based Health Survey (GSHS) done by Soerachman et al in 2007 among adolescents aged 13-15 years revealed that 2.6% of them never or rarely washed hands after using the toilet; and 4.3% had also never or rarely washed their hands before eating in the previous 30 days. This was lower than the current study. [18]

Having attractive and clean facilities available was seen to encourage hand washing. Number of functional and easily accessible hand washing facilities may positively influence hand washing behaviour. This present study also availability and accessibility to hand washing facilities have positive effect on hand washing behaviour. So provision of facilities to improve the behaviour is equally important. [14]

So, most of the earlier studies have observed inadequate knowledge and poor hand washing practices in various group people including school children. Provision of a supportive and protective school environment will help school children develop a sense of attachment that will bring them to respect their surroundings and improve their behaviors.

Because many children attend school and school children have been repeatedly implicated in the spread of infectious diseases within schools, homes, and the broader community school-based hygiene and health promotion strategies have been shown to be cost effective. School-aged children are receptive to learning and thus are more inclined than are adults to change their behaviors and adopt new, more-healthy habits and can therefore act as agents of health change in the context of their social environments. Moreover, hygiene promotion affects the health of individuals and, in turn, reduces the burden of communicable diseases on the health care, social, and economic systems in terms of physician visits, medical treatment, hospitalization costs, and school and parental work absenteeism. [19,20]

CONCLUSIONS

This study done among Chennai school going adolescents found sub optimal hand washing knowledge and poor hand washing practice among students. Gap between knowledge and practice of hand washing persist and long term motivating activities are needed to improve hand washing practice with soap. In some critical

period of hand washing, the students still don't feel about the necessity of hand washing with soap. The children of today will be the adults of tomorrow. So by giving a comprehensive focus and care today by providing them with knowledge and tools we can change their behaviour towards good hygienic practices and make them stronger and healthier. So this study concludes that though the students have significant level of hand washing knowledge, effective measures should be taken to improve their hand washing behaviour.

Limitations

It was not based on direct observation or practical intervention but on respondent's answers to a questionnaire.

This study was confined only to the particular and specific geographical setting and the population under study. Therefore, the results of this study may not represent the general situation in Tamilnadu.

RECOMMENDATIONS

Health promotion regarding proper hand washing should be led by teachers together with and supervised by health workers, in order to impress on the students that this positive habit is easy to do and has positive outcomes.

This can be implemented by using various creative ideas for health promotion at schools such as reminders, cues and motivators for proper hand washing in many places within the schools.

The facilities related to proper hand washing such as clean water, soap and hand washing stands should be more available in certain places in schools such as in the classroom, canteen and toilets, to enable and encourage students to wash their hands properly at any time.

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QUESTIONNAIRE:

S. No. _____

School Name: _____

DETAILS OF PARTICIPANT:

Name : _____

Age : _____

Sex : 1) Male 2) Female

Class : _____

Father's Education : _____

Family Income / Month (Rs): _____

Mother's Education : _____

Religion : 1) Hindu 2) Muslim
 3) Christian 4) Others (specify)

Do you have separate bathroom in your house? 1) Yes 2) No

Do you have separate toilet in your house? 1) Yes 2) No

Do you have separate wash basin in your house? 1) Yes 2) No

Is hand washing facility available near the toilet? 1) Yes 2) No

Is there 24 hours water supply in the hand washing facility? 1) Yes 2) No

Is soap/ hand washing liquid available near the wash basin?

1) Always 2) sometimes 3) never

What type of water source is used for hand washing purpose?

1) Pipe 2) water in bucket 3) water in tank 4) others

II. KNOWLEDGE

When should you wash your hands?

1) Before meals 2) After using toilet 3) After coming home from outside

4) After handling the animals 5) After any cleaning work

6) After handling with sick people 7) After touching the garbage

8) After blowing the nose 9) After playing

10) Whenever the hands look dirty

Which type of water should be used for hand washing?

1) Cold water 2) Warm water 3) Hot water

Hands need to be washed at least for

1) 5 seconds 2) 10 seconds 3) 15 seconds 4) 30 seconds 5) 1 minute

Do you need to remove watch and bracelets and rings while washing hands?

1) Yes 2) No 3) Do not know

Do you need to wash wrists while washing hands?

1) Yes 2) No 3) Do not know

How should you close the tap after hand washing?

1) With Left Hand 2) No need to close 3) After cleaning the tap with water

4) Do not know

Do you need to dry after washing the hands?

1) Yes 2) No 3) Do not know

If yes, what is the ideal way to dry your hands after washing?

1) Using common towel 2) using your separate towel

3) tissue paper 4) air dry

Have you ever been taught about hand washing? 1) YES 2) NO

If yes, who taught you about hand washing?

1) School 2) parents 3) friends/ relatives 4) media

III. PRACTICE

How many times a day do you wash your hands?

- 1) Never 2) 12 times 3) 3-5 times 4) 6-10 times 5) 11 and over

Do you use the hand washing facility in the school/ house? 1) YES 2) NO

If No, why?

- 1) Far from the sink 2) No need 3) No time 4) Side effects
 5) keep forgetting 6) Wash area is not clean 7) laziness
 8) others (specify) _____

When and how do you wash your hands?

1) Before meals

- 1)With soap and water 2) water only 3) Do not wash

2) After using toilet

- 1)With soap and water 2) water only 3) Do not wash

3) After coming home from outside

- 1)With soap and water 2) water only 3) Do not wash

4) After handling the animals

- 1)With soap and water 2) water only 3) Do not wash

5) After any cleaning work

- 1)With soap and water 2) water only 3) Do not wash

6) After handling with sick people

- 1)With soap and water 2) water only 3) Do not wash

7) After touching the garbage

- 1)With soap and water 2) water only 3) Do not wash

8) After blowing the nose

- 1)With soap and water 2) water only 3) Do not wash

9) After playing

- 1)With soap and water 2) water only 3) Do not wash

10) Whenever the hands look dirty

- 1)With soap and water 2) water only 3) Do not wash

How do you dry your hands after hand washing?

- 1) Using commontowel 2) using your separate towel
 3) tissue paper 4) air dry

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