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# Assessment of Hand Washing Practice and Associated Factors among Primary School Children in Sebeta Town Oromia Regional State, Ethiopia

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## Abstract

**Background:** Proper hand washing is one of the simplest, most affordable and effective means of preventing the spread of infection. The aim of this study is to assess hand washing practice and associated factors among primary school children in Sebeta town.

**Methods:** A cross-sectional study was conducted on 426 children in six primary schools in Sebeta town. Children were selected using simple random sampling technique. Data was collected using pretested self-administered questionnaire. Data was entered into EPI-info 3.5.2 then transported to SPSS 21 version for analysis.

**Result:** Out of total participants only one-third (32%) fulfilled the criteria of proper hand washing practice i.e., washing hand with soap always or very often before meal and after visiting toilet. Students with positive attitude were more likely to practice proper hand washing (AOR=2.29; 95%CI=1.43, 3.66). On the other hand students from rural areas were less likely to practice proper hand washing than their urban counter-part (AOR=0.53; 95%CI=0.30, 0.94).

**Conclusion:** Small proportion of children practiced proper hand washing behavior before meal and after toilet. Place of residency and attitude, were significantly associated with hand washing practice. Therefore, further modification of attitude by focusing on children living rural area is recommended.

**Keywords:** Hand washing practice; School children

**Abbreviations:** AOR: Adjusted Odds Ratio; COR: Crude Odds Ratio; CI: Confidence Interval; HWWS: Hand

Washing with Soap; MoH: Ministry of Health; SPSS: Statistically Package for Social Science

## Introduction

### Background

Worldwide about 400 million children are infected with worms due to poor hand washing practices. These worms cause: malnutrition, abdominal malfunction and impaired learning capacity [1]. In developing countries, 80% of the diseases are associated with poor domestic and personal hygiene [2]. More than 2 million people, mostly children die yearly due to diarrhea; the same numbers of children also die from acute respiratory infections [3]. In Ethiopia more than 250,000 children die annually from sanitation and hygiene related diseases. Some 60% of the disease burden is related to poor sanitation and hygiene in Ethiopia [4]. Studies have recommended proper hand washing as the simplest, the most affordable and effective means of stopping the spread of infection. Hands can be contaminated with feces, body fluids, and inanimate objects; it is also a common mode of transmission for gastrointestinal and respiratory infections [5]. Hand washing is especially important for children, as these age groups are the most susceptible to infections gained from unwashed hands [6]. In addition, due to the close proximity of children in schools, there is a high risk for the spread of infectious disease. Proper hand washing improves learning and teaching processes by reducing absenteeism [7]. However, worldwide rates of hand washing with soap at critical times (i.e., after visiting toilet or before meal) even in general population ranges from 0%-34% [8].

According to the study conducted in Colombia 36.6% of school children reported to wash hands with soap always or very often after using toilet and before eating. This study reported positive attitude positively affects hand washing

practice and recommended further modification of individual's attitude [9]. On other hand, in Uganda 54% among school children were observed to wash their hands after using toilet, but only 5% used soap [10]. Study done in Tanzania showed more than half (57%) of participated primary school children know important aspects of hand washing practice. According the study done in Tanzania attitudes towards hand washing practice were not associated hand washing practice [11].

A study conducted by United Nations Children's Fund (UNICEF) and Ministry of Health (MoH) found that children in Ethiopia had poor status regarding knowledge, attitudes, and practices of hygiene. About 60% of children surveyed did not know about the possible transmission of diseases through human waste. Simple hygienic measures such as hand washing with soap were poorly practiced [12]. On the other hand, study done in school children in Angolela in the Amhara regional state of Ethiopia showed, while 76.7% of students reported that hand washing after defecation is important, only 14.8% reported actually following this practice. According this study hygiene practice among school children is determined by the low level of parental literacy [13]. Although, national initiatives through Hand Washing Day have been made aiming at promoting school children's hand washing practice, further interventions are needed to increase student's frequency and compliance to hand washing practice [14]. Therefore, the purpose of this study was to assess hand washing practice and associated factors among primary school children in Sebeta town Oromia regional state, Ethiopia.

## Methods

School-based cross-sectional study was conducted in Sebeta town, located in the Southern direction on 25 km from Addis Ababa capital city of Ethiopia. Sample size was determined using single population proportion formula  $n = Z^2 p (1-p) / d^2$ , with the assumptions: prevalence (p) of 14.8% from a previous study [13], 95% confidence level, 5% margin of error, design effect of 2 and 10 % for anticipated non-response rate. Accordingly, the minimum sample size (n) was found to be 426 children. Study population consisted of students from grade 6th, 7th and 8th of both sexes attending primary school in the town. These grades were chosen because reading proficiency at these grades enables respondents to complete the questionnaire within the time available.

## Data Collection Procedures

The tool was designed after reviewing different literatures. The tool was developed in English and translated to Afan Oromo to insure the clarity of questions for the respondents. Pretest was conducted before actual data collection on children in primary school in Addis Ababa outside study area. The main sections of questionnaires comprised of socio-demographic characteristics, knowledge, and attitude and hand washing practice. The data was collected using self-administered questionnaire.

## Statistical methods

Filled-in questionnaires were checked for completeness and consistency of the responses. Data was entered into EPI-info 3.5.2 then transported to SPSS 21 version for analysis. Associations between dependent variable and independent variable were examined in logistic regression models and are expressed as crude odds ratios (COR) and adjusted odds ratio (AOR) and their corresponding 95% confidence intervals (CIs) were obtained from logistic regression models. Odds ratios (OR) were reported together with their 95% confidence intervals (CI).

## Results

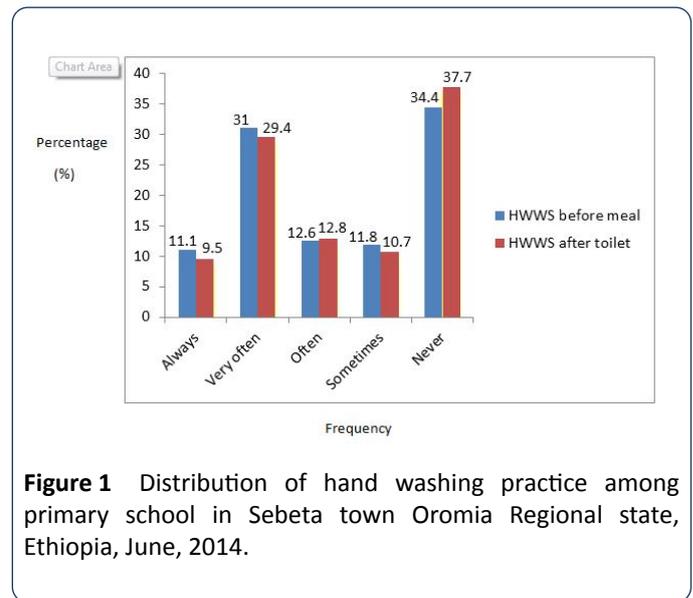
### Socio-demographic characteristics of children

A total of 426 children were invited and all of them participated in the study. So, response rate was 100%. However, 4 (0.9%) of the responses were excluded from the analysis because of incomplete responses while 422 students completed the questionnaires. Out of total participants 35.1%, 32.2% and 32.7% were from grade 6, 7 and 8 respectively. From total participants 43.4% were males and 56.6% were from urban areas. Mean age of participants was 14.42 years (SD=1.43). Other socio-demographic characteristics of study participant are presented in **Table 1**.

**Table 1** Socio-demographic characteristics of study participants among primary school students in Sebeta town, June, 2014.

Characteristics	Category	Number (n)	Percentage (%)
Grade	Six	148	35.1
	seven	136	32.2
	eight	138	32.7
Sex	Male	183	43.4
	Female	239	56.6
Age group	11-13	113	26.8
	14-18	309	73.2
Residency	Urban	133	31.5
	Rural	289	65.5
Religion	Orthodox	295	69.9
	Protestant	65	14.9
	Muslim	54	12.8
	Others	10	2.4
Ethnicity	Oromo	380	90
	Amhara	32	7.6
	Tigre	6	1.4
	Others	4	0.9

<b>Mother's Status</b>	<b>educational</b>	Illiterate	124	29.9
		Primary school	188	44.5
		High school	45	10.7
		College and above	65	15.4
<b>Father's Status</b>	<b>educational</b>	Illiterate	71	16.8
		Primary school	171	40.5
		High school	69	16.4
		College and above	111	26.3
<b>Parent's occupation</b>	Civil servant	103	24.4	
	Merchant	65	15.4	
	Farmer	220	52.1	
	Others	34	8.1	



**Figure 1** Distribution of hand washing practice among primary school in Sebeta town Oromia Regional state, Ethiopia, June, 2014.

### Hand washing practice among primary school children

Approximately one-third of children (32%) practiced proper hand washing according to criteria defined in the method (i.e., washing hands “always” or “very often” with soap after visiting toilet and before meal). However, 62.3% washed their hands with soap after visiting toilet and 66.6% washed their hands using soap before meal. Out of total participants 37.7% and 33.4% never wash their hands with soap after visiting toilet and before meal respectively. Distribution of Hand Washing with Soap (HWWS) after toilet and before meal of respondents on different frequency is depicted below (Figure 1).

### Knowledge and attitude of hand washing among primary school children

Nearly half of participated children (49.3%) have positive attitude towards hand washing with soap whereas (50.7%) have negative attitude. Approximately two thirds of children (66.4%) were found to have sufficient knowledge related to important aspects of hand washing practice while the rest had insufficient knowledge (Table 2).

**Table 2** Study variable and participating children in primary school in Sebeta town, June 2014.

Characteristics	Category	Number (n)	Percentages (%)
<b>Hand washing practice</b>	Proper	135	32
	Improper	287	68
<b>Knowledge</b>	Sufficient	280	66.4
	Insufficient	142	33.2
<b>Attitude</b>	Positive	208	49.3
	Negative	214	50.7

### Factors affecting hand washing practice among primary school children

Associations that were found to be significant in the bivariate analysis at a p-value <0.05 were included in the multivariate analysis to determine which factors best explained or predicted proper hand washing practice.

Residency was significant predictor of proper hand washing practice whereby students from rural areas were less likely to practice proper hand washing than their urban counter parts (AOR=0.53; 95% CI=0.30, 0.94). Students with positive attitude on hand washing were two times more likely to practice proper hand washing than students with negative attitude (AOR=2.29;95%CI=0.43, 3.66) (Table 3).

**Table 3** Bivariate and multivariate analysis of factors influencing hand washing with soap among primary school students in Sebeta town, June, 2014.

Factors	Hand washing practice		COR (95%CI)	AOR (95%CI)
	Proper N (%)	Improper N (%)		
<b>Age</b>				
11-13 years	71 (24.7)	42 (31.1)	1	
14-18 years	216 (73.5)	93 (68.9)	0.72 (.0.46,1.14)	
<b>Grade</b>				
Six (Ref)	113 (39.4)	35 (25.9)	1	1
Seven	85 (29)	51 (37.8)	1.93 (1.15, 3.23)	1.77 (0.99, 3.17)
Eight	89 (31)	49 (36.9)	1.77 (1.06, 2.93)	1.62 (0.90, 2.90)
<b>Sex</b>				
Female (Ref)	156 (54.4)	83 (61.5)	1	
Male	131 (45.6)	52 (38.5)	0.74 (0.49, 1.13)	
<b>Residency</b>				
Urban (Ref)	183 (63.8)	106 (78.5)	1	1
Rural	104 (36.2)	29 (21.5)	0.48 (0.29, 0.77)	0.53 (0.30, 0.94)
<b>Religion</b>				
Orthodox (Ref)	208 (72.5)	87 (64.4)	1	1
Protestant	41 (14.3)	21 (16.3)	1.28 (0.72, 2.28)	1.18 (0.60, 2.30)
Muslim	30 (10.5)	24 (17.8)	1.91 (1.05, 3.45)	1.72 (0.86, 3.75)
Others	8 (2.8)	2 (1.5)	0.59 (0.12, 2.87)	0.71 (0.12, 3.95)
<b>Mother's education</b>				
Illiterate (Ref)	85 (29.6)	39 (28.9)	1	
Primary school	133 (46.3)	55 (40.7)	0.90 (0.55, 1.47)	
Secondary school College and above	33 (11.5)	12 (8.9)	0.79 (0.37, 1.69)	
	36 (12.5)	29 (21.5)	1.75 (0.94, 3.26)	
<b>Father's education</b>				
Illiterate (Ref)	55 (19.2)	16 (11.9)	1	
Primary school	117 (40.8)	54 (40)	1.58 (0.83, 3.01)	
Secondary school	43 (15)	26 (19.3)	2.07 (0.99, 4.35)	
College and above	72 (25.1)	29 (28.9)	1.86 (0.94, 3.67)	
<b>Ethnicity</b>				
Oromo (Ref)	260 (90.6)	120 (88.9)	1	
Amhara	21 (7.3)	11 (8.1)	1.13 (0.53, 2.42)	
Tigre	5 (1.7)	1 (0.7)	0.43 (0.05, 3.75)	
Others	1 (0.3)	3 (2.2)	6.5 (0.66, 63.13)	
<b>Parental occupation</b>				

Civil servant (Ref)	63 (22)	40 (26.9)	1	
Merchant	43 (15)	22 (16.6)	0.8 (0.42, 1.5)	
Farmer	156 (54.4)	64 (47.4)	0.64 (0.39, 1.05)	
Others	25 (8.7)	9 (6.7)	0.56 (0.24, 1.33)	
<b>Knowledge</b>				
Insufficient (Ref)	104 (36.2)	38 (28.1)	1	
Sufficient	183 (63.8)	97 (71.9)	1.45 (0.92, 2.2)	
<b>Attitude</b>				
Negative (Ref)	167 (58.2)	47 (34.8)	1	1
Positive	88 (65.2)	120 (41.8)	2.6 (1.76, 3.9)	2.29 (1.43, 3.66)

## Discussion

The results from this study revealed that small (32%) proportions of primary school children practice proper hand washing behavior. A poor rate of hand washing practice was in line with what other previous study had shown in Colombia among school children [9]. Hence more hygiene empowering intervention should be emphasized among school children as those done in Pakistan and Kenya which brought tremendous improvement among school children [15].

In this study, there was a fragile and significantly varied practice of hand washing during critical moments among different grades. This finding is similar with the study done in Benishangul Gumuz regional state of Ethiopia [16]. The finding underlines the importance of targeting the both lower and higher grade children in HWWS education at school. Children from urban areas more likely to wash their hands those from rural areas. However, it is also worth noting that the study was done in town and students from rural villages near the town attending primary schools in the town were included. Therefore, contrast was not true urban-rural comparison, implying that children in both areas were almost homogenous. As recommended by WHO, both rural and urban schools should be targeted for hand washing intervention with similar emphasis [8]. Bivariate analysis also showed association between religion and hand washing practice whereby students whose religion is Muslim exercises hand washing practice than other classes of religion. This could be because of religious ritual of washing before prayer.

The findings of the study indicated that two thirds of children had sufficient knowledge about important aspects of hand washing. Nevertheless, knowledge status was not associated with hand washing practice. Similar studies were obtained from the study done in Colombia and Tanzania [9,11]. As reported by the study done in Nigeria [17] this study has also shown that students in higher grades (grade seven and eight) were more aware than the ones in lower grades (grade six) since knowledge grows as children progress from lower to higher grades. However, high individual's knowledge is not guarantee for the performance of corresponding behavior. For this reason factors other than knowledge should be looked at

in hygiene intervention to reinforce people's hand washing behavior. Attitudes, which reflect the degree to which performance of a behavior is positively or negatively valued by an individual, were found to be important in predicting hand-washing practice. This finding was consistent with study done Colombia [9]. Therefore, to further reinforce positive attitudes toward hand washing; negative beliefs related to hand hygiene and use of soap in hand washing need to be modified.

## Conclusion

In general this study revealed that only small proportion of children practiced proper hand washing behavior in the study area. The results from multivariate logistic regression analysis confirmed the strong significant the association between: place of residency and attitude. Proper hand washing is more likely to be practiced in children having positive attitude. On the other hand proper hand washing behavior is less likely to be practiced when children are from rural area.

## Authors' Contribution

MM designed the study, participated in data collection, analysis and interpretation. FA approved the design. TK and DS participated in data collection, analysis and interpretation. All authors participated and approved the final manuscript

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Funding support for data collection was covered by Addis Ababa University as partial fulfillment of MSc. Analysis, interpretation and manuscript writer was done by authors for free. The University had no role in study design, data collection and analysis, decision to publish or preparation of the manuscript for publication.

## Ethics Approval and Consent to Participate

Ethical clearance was obtained from Ethical Review Committee of Addis Ababa University Ethical Review

committee and it was given to Sebeta town education bureau. Then letter of permission was granted from education bureau to each school. Confidentiality of all study participants was assured. Everybody was informed that no names or direct identification made to the questionnaire. Study participant were requested to participate voluntarily

## Availability of Data and Materials

Data will not be shared. During Ethical review it was approved only to analyze data for study objectives and stated that it will never be shared except authors analyzing.

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