

## Assessment of Hand Washing Practice and it's Associated Factors among First Cycle Primary School Children in Arba Minch Town, Ethiopia, 2015

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### Abstract

**Introduction:** Proper hand washing is one of the simplest, most affordable and effective means of stopping the spread of infection via feces, body fluids, and inanimate objects. Hand washing is especially important for children and adolescents, as these age groups are the most susceptible to infections gained from unwashed hands. In addition to this due to the close proximity of children in schools and child care settings, there is a high risk for the spread of infectious disease. Proper hand washing also improves learning and teaching processes by reducing absenteeism.

**Objective:** To assess hand washing practice and associated factors in primary school children in Arba Minch town, 2015.

**Method and materials:** Institutional based cross sectional study design was employed on primary school children. Data were collected using interview questionnaires. School hand washing facilities inspection was also done using observation checklist. Data was entered and analyzed using SPSS version 16.0 software.

**Result:** One-fifth (22.23%) of participants had proper hand washing practice. Two hundred fifty four (72.57%) of 1st cycle primary school children had sufficient knowledge. Similarly, 254(78.28%) children had positive attitude towards hand washing practice. Only two schools were fulfilling criteria of medium hygiene facility. From all predictors, residency, availability and accessibility of water, and soap, and referent pressure were strongly associated with hand washing practice as it was statistically evidenced by (AOR: 1.37, 95% CI: (1.07, 20.11)), (AOR: 0.25, 95% CI: (0.02, 0.87)) and (AOR: 1.65, 95% CI: (1.03, 7.98)), respectively.

**Conclusion:** This study revealed that only small proportion of study participant practiced proper hand washing behavior. Place of residency, availability and accessibility of water, and soap, and pressure from important referents were significantly associated with hand washing practice.

**Keywords:** Hand washing practice; Predisposing; Enabling; Reinforcing; Factors

### Abbreviations

HEWs: Health Extension Workers; SD: Standard Deviation; UNICEF: United Nations Children's Fund; WASH: Water, Sanitation and Hygiene; and WHO: World Health organization

### Introduction

Proper hand washing is one of the simplest, most affordable and effective means of stopping the spread of infection via feces, body fluids, and inanimate objects [1].

Hand washing is especially important for children and adolescents, as these age groups are the most susceptible to infections gained from unwashed hands [2]. In addition to this due to the close proximity of children in schools and child care settings, there is a high risk for the spread of infectious disease.

Proper hand washing also improves learning and teaching processes by reducing absenteeism. Hand washing reduces absenteeism as evidenced by study conducted around the world like 54% (China), 40% (Egypt), 35% (Kenya), 27% (Philippines) and 20% in (Colombia) [3].

Furthermore, approximately about 443 million school days are lost each year due to water-related illnesses, making it a leading factor for school absenteeism in the developing world [4].

Half of hospital visit and 12% of all admission among children aged from 0 to 14 years are due to infections [5]. Among these, respiratory infections and infectious intestinal disease are responsible for 48% and 29% of children visit to health facility respectively [6].

In developing countries, 80% of the diseases are associated with poor domestic and personal hygiene and about 2.2 million people die; mostly children die annually due to diarrhea; the same number again die from acute respiratory infections [7].

Furthermore, worldwide about 400 million children are infected with worms due to poor hand washing practices. These worms

consume nutrients from children, therefore causing abdominal pain and malfunction, impair their learning capacity and thus reduce school attendance [8].

In Ethiopia more than 250,000 children die every year from sanitation and hygiene related diseases. Some 60 percent of the disease burden is related to poor sanitation and hygiene [9].

Even though the above problems are visible, proper hand washing is not as widespread as desired worldwide. It has been reported that the frequency of hand washing with soap before handling food or after using a toilet was observed in only between 0% and 34.0% cases [10].

Center for Disease Control and Association for Professionals in Infection Control and Epidemiology have created guidelines for hand washing [11]. In order to emphasize the importance of hand washing, October 15 has been declared as the Global Hand Washing Day by UNICEF since 2008 [12].

Ethiopia and foreign global public health agencies have been taking steps towards enhancing access to resources and to increase health literacy particularly concerning sanitation and hygiene. In 2007, United Nations Children's Fund (UNICEF) launched the Water, Sanitation, and Hygiene (WASH) program to promote hand-washing and sanitation practices in low income countries including Ethiopia [13].

In this regard, Ethiopia has made considerable progress to encourage increased access to and use of improved hygiene and sanitation through HEWs using house to house methods.

Different studies indicated educational interventions to promote hand washing in school settings aim to increase compliance with hand washing [14,15].

But developing countries [16,17], have drawn attention to the lack of rigorously conducted studies to evaluate the effectiveness of hand washing interventions in preventing the spread of respiratory and gastrointestinal infections.

In Ethiopia a study conducted by UNICEF and Ministry of health found that study participants had poor status regarding knowledge, attitudes, and practices of hygiene [18], but still there are not enough evidences for hand washing practice, and its contributing factors in Ethiopia in general in Arba Minch town in particular.

Therefore, the aim of this study was the assessment of hand washing practice and its associated factors among first cycle primary school children.

## Methods and Methods

### Study setting and period

This study was conducted from November 2015 to February 2016 in Arbaminch 1st cycle primary school, Arbaminch town, Southern Ethiopia province.

The town is located 505 km from Addis Ababa, the capital city of Ethiopia, and 276 km from Hawassa, the capital city of Southern Ethiopia province. Administratively it is divided into 14 kebeles.

Estimated populations of the town were 150,000. In this area, there were seventeen public primary schools. From this school, fifteen of them had first cycle primary school children. The town also had one general hospital, two health centers, and eleven health posts.

### Study design and population

A school based cross-sectional study involving quantitative method was undertaken among randomly selected students who were attending 1<sup>st</sup> cycle primary schools during the time of data collection. The study populations of this study were students in grades 1, 2, 3 and 4 in Arbaminch 1<sup>st</sup> cycle primary school during the 2015 academic year.

Students with learning disability and students attending evening classes were excluded. In Ethiopian context, students attending evening classes have different social characteristics from those who regularly attend. Thus, they were excluded from the study to avoid over or under estimation of the study findings.

### Sample size determination and sampling procedure

Single population proportion formula was used to calculate the required sample size. Proportion of hand washing practice, margin of error, confidence interval, design effect and non-response rate were assumed to be 11.7% (12), 5%, 95%, 2 and 5%, respectively.

Finally, adding 10% none response rate, the sample size was determined to be 350. Multistage sampling technique was used to select the study subjects. First stratification was made in to grades 1, 2, 3, and 4. Then, grades were further stratified by section.

Calculated sample size was proportionally allocated to each grade and section according to their number of students. Then, frames of students were developed from student roster of each grade in collaboration with instructors of respective classes.

Eligible students were selected using simple random sampling technique from the existing sampling frame (student's roster). In every step of selection, simple random sampling technique was used.

### Data quality management

Data quality was ensured during collection, coding, entry and analysis. Before the actual data collection, pretest was done to check the validity of the instrument.

During data collection, one bachelor degree nurse supervisor and six nurse data collectors with previous experience were recruited and adequate training and follow up was provided. Codes were given to the questionnaires during data collection so that errors could be timely addressed.

The filled questionnaires were checked for completeness and consistency by the data collectors, supervisor and principal investigator on a daily basis. The data were further cleaned by visualizing and calculating frequencies using SPSS version 16 statistical software. Corrections were made according to the original data.

### Data processing and analysis

Data were checked manually for completeness, then coded and entered into SPSS version 16 and analysed with this software. Descriptive analyses were executed for each of the variables. Bivariate analysis was performed to see the crude association of the independent variables with the outcome variable.

Finally, variables which showed significant association with the dependent variable on the bivariate analysis were entered to multivariate logistic regression model to identify their independent effects. P-value and 95% confidence interval (CI) for odds ratio (OR)

were used in judging the significance of the associations. P-value less than 0.05 were taken as significant association.

## Measurement

The instrument used to assess hand washing practice was designed by all authors in consultation with senior research experts. The English version questionnaire was translated to Amharic and to check its consistency it was again translated back to English by experts of both languages.

Before the actual data collection, the questionnaire was pre-tested on 10% of the study subjects in the neighboring Lante district school on a total of 35 students. Based on the findings of the pretest, the tool was modified and finally, the Amharic version questionnaire was administered

Hand washing practice was assessed based on two criteria i.e. hand washing with soap after using toilet and hand washing with soap before eating. Items measuring each criterion on 5 point frequency scale ranging from 1=always to 5=never.

The 5 frequency table was dichotomized where by those who answered 1=always to 2=very often were classified as washers (scale 0) and 3=often to 5=never were classified as non-washers (scale 1).

The dichotomized items were added up to create summative index point. Students who reported 1=always to 2=very often for both criterion were classified as proper hand washing category. Attitude or belief about soap and water in relation to hand washing practice and degree to which hand washing is positively or negatively valued by an individual.

Attitudes towards hand washing was assessed based on criteria using the 5 point Likert scale related to belief about hand washing with soap. (E.g. If you wash your hands many times with water you do not need to use soap).

The scale ranging from 1=strongly disagree to 5=strongly agree was dichotomized. The dichotomized item was added up to create summative index. Then students who answered 1=strongly disagree or 2=disagree for all questions were classified as having positive attitude towards hand washing practice while those who will score 3=neutral to 5=strongly agree to all criteria were be classified as having negative attitudes towards hand-washing practice.

Knowledge on hand washing was assessed based on eight questions related to infectious diseases transmission; critical times of hand washing and health outcome associated with hand washing (e.g. hand should be washed even after touching someone's hand).

In each item those who answered correctly scored 1 and those who answered wrongly will score 0. Those who scored 4 and more were be classified as having sufficient knowledge and those who scored 3 and less will be classified as having insufficient knowledge.

Reinforcing factors were assessed using 4 important referents (parents, friends, teachers, and health professionals) based on the 5 point frequency scale 1=always to 5=never. The 5 point frequency scale was dichotomized whereby those who scored 1=always to 2=very often were classified as perceiving high pressure from important referents (score 0) and those who scored 3=often to 5=never will be classified as perceiving less pressure from important referents (score 1).

The dichotomized items were added up to create summative index. Those who scored 1=always or 2=very often were regarded as perceiving high pressure from important referents on washing hand with soap.

Hygiene index was computed using a combination of four hygiene facilities in school (running water+soap+washing station+toilet). Those schools with 3 facilities were regarded as having medium amount of hygiene facilities while those with 2 and less than 2 have low amount of hygiene facilities and the schools with supplied with all hygiene facility were be considered as having high amount of hygiene facility.

## Ethical consideration

Ethical clearance was obtained from Arbaminch University, department of nursing institutional review board (IRB).

The letter of collaboration was written from department of Nursing to Arbaminch School for the main study and to Lante School for the pretest. The school director was briefed on the objectives of the study.

Each study participant was adequately informed about the purpose, benefits and risks of the study and their right to discontinue or refuse to participate in the study. Finally, written informed assent was obtained from their parents/guardians.

## Results

### Socio-demographic characteristics of participants

A total of 350 children were invited and all of them participated in the study making a response rate of 100%. Two hundred forty nine (71.10%) of the respondents were found to be in the age range of 9-11 years with mean of 10 (SD=0.483) years.

Regarding their educational status, 95 (26.29%) of children were grade four. From total participants, 203(58%) were males and 332 (94.9%) were from urban areas. Majority of the study children's family occupation was civil servant 160(45.7%).

Regarding their family educational status, 60 (17.14%), and 65(18.57%) of the participant's mothers and fathers were non-educated. Only 130 (34.14%) of respondents earned a monthly income of above 1500 Ethiopian birr (Table 1).

### Hand washing practice

From all children, 278 (79.4%), and 277 (79.1%) of them washed their hands with soap after visiting toilet and before meal respectively.

According to criteria defined in the method, 78 (22.3%) of children performed proper hand washing practice (Table 2).

### Predisposing factors (knowledge and attitude) for children's hand washing practice

From all children, 100 (28.57%) of them said that human feces does not contains germs.

Similarly, 95 (27.14%) of children said that human urine does not contains germs. Ninety seven (27.71%) of children said that all objects are not free from germs.

Variables		Frequency	Percent
<b>Age</b>	8-Jun	9	2.6
	11-Sep	249	71.1
	14-Dec	92	26.3
<b>Sex</b>	Male	203	58
	Female	147	42
<b>Grade of students</b>	Grade one	84	24
	Grade two	89	25.43
	Grade three	85	24.28
	Grade four	92	26.29
<b>Residency</b>	Urban	332	94.9
	Rural	18	5.1
<b>Religion</b>	Orthodox	189	54
	Protestant	143	40.9
	Muslim	18	5.1
<b>Family occupation</b>	Civil Servant	160	45.7
	Merchant	131	37.4
	Farmer	27	7.7
	Daily labor	32	9.1
<b>Maternal educational status</b>	Non Educated	60	17.14
	Read and write	57	16.29
	Grade 1-6	100	28.57
	Grade 7-8	40	11.42
	Grade9-12	33	9.42
	above 12	60	17.14
<b>Fathers educational status</b>	Non Educated	65	18.57
	Read and write	97	27.71
	Grade 1-6	32	9.14
	Grade 7-8	43	12.29
	Grade9-12	70	20
	Above 12	43	12.29
<b>Monthly income</b>	Below 1000 EBR	80	28.86
	1000-1500 EBR	140	40
	Above 15000 EBR	130	37.14

**Table 1:** Socio-demographic characteristics of study participants among primary school students in Arba Minch town, 2016.

Variables		Frequency	Percent
Washing hand with soap after visiting toilet	Yes	278	79.4
	No	72	20.6
Washed their hands using soap before meal	Yes	277	79.1
	No	73	20.9
Hand washing practice	Proper	78	22.3
	Improper	272	77.7

**Table 2:** Hand washing practice of primary school students in Arbaminch town, 2016.

Variables		Frequency	Percent
Do human's feces contain germs?	Yes	250	71.43
	No	100	28.57
Are all clean objects are not free from germs?	Yes	97	27.71
	No	253	72.29
Does human's urine contain germs?	Yes	255	72.86
	No	95	27.14
Can germs be acquired when desks, door, books and animals are touched?	Yes	280	80
	No	70	20
Do poor hand washing cause disease?	Yes	252	72
	No	98	28
Is water only enough for hand washing?	Yes	257	73.43
	No	93	26.57
Is hand washing with soap needed after coughing or sneezing?	Yes	269	76.86
	No	81	23.14
Is failure to wash hand transmitting infectious disease?	Yes	261	74.57
	No	89	25.423
Knowledge	Sufficient	254	72.57
	Insufficient	96	27.43
If you wash your hands really well with water you don't need to use soap?	Yes	271	77.43
	No	79	22.57
You only need to wash your hands with soap if they look dirty or smell bad?	Yes	289	82.57
	No	61	17.43
Is washing your hands with soap is important before feeding?	Yes	250	71.43
	No	100	28.57
Attitude	Positive	274	78.28

**Table 3:** Predisposing factors for children's hand washing practice in Arbaminch town, 2016.

From involved children, 252 (72%) of them said poor hand washing cause disease.

According to the measurements criteria for knowledge of hand washing practice, 254 (72.57%) were found to have sufficient knowledge while rest had insufficient knowledge.

Similarly, 254 (78.28%) children had positive attitude towards hand washing practice whereas 96 (21.72%) had negative attitude (Table 3).

### Reinforcing factors for children's hand washing practices

The sources of information about children hand washing practice were television (46.9%), radio (16.9%), leaflets (0.3%) and newspaper (36%).

Children hand washing practice was pressured by parents 296 (84.85%), teachers 196 (56.28%), health Professionals 91 (26%), and friends 61 (17.42%).

Variables		Frequency	Percent
From which media have you heard about hand washing?	Television	164	46.9
	Radio	59	16.9
	Leaflets	1	0.3
	News paper	126	36
Referents for hand washing practice	Parents	296	84.85
	Teachers	196	56.28
	Health professionals	91	26
	Friends	61	17.42
Pressure from parents	High	296	84.85
	Low	54	15.15
Pressure from friends	High	61	17.42
	Low	279	82.58
Pressure from teachers	High	196	56.28
	Low	94	43.72
Pressure from health professionals	High	26	26
	Low	74	74
Important referent pressure	High pressurized	162	46.28
	Less pressurized	188	53.72
Is there any hygiene and sanitation club in your school?	Yes	208	59.42
	No	142	40.58
Does your school celebrate Hand Washing Day?	Yes	117	33.42
If yes, have you ever participated?	No	233	66.58
	Yes	117	33.42
	No	233	66.58
	Yes	117	33.42

**Table 4:** Reinforcing factors for children's hand washing practices in Arbaminch town, 2016.

From the total participants, 46.28% of participated children had got high pressure to wash their hands from important referents. From the six schools included in the survey only two schools has sanitation and hygiene club.

All schools claimed hand washing day celebration, but among the participated children only 41% of children actually celebrated so far (Table 4).

### Enabling factors for children hand washing practice

In the observed school there were forty toilets. The toilet student ratios were 1:73 and 1:67 for male and female students respectively. From this toilets, 25 (62.5%) of them had hand washing station which was installed outside the latrines rooms. All the station had water but not soap supply at the time of observation. In relation to hygiene facility, only two school fulfilled criteria of medium hygiene facility, but none of them fulfilled criteria of high hygiene facility.



About 52.6% and 80.6% of students reported that there was regular access to water, and water, and soap at home respectively (Table 5).

Variables		Frequency	Percent
Presence of hand washing station	Present	25	62.5
	Absent	15	37.5
Place of hand washing station	Within latrine room	0	0
	Outside latrine room	25	100
Presence of water supply within washing installation?	Yes	25	100
	No	0	0
Presence of soap for hand washing?	Yes	0	0
	No	25	100
Ratio of toilet to male student	Within standard	0	0
	Below standard	6	100
Ratio of toilet to male student	Within standard	0	0
	Below standard	6	100
Presence of only water for hand washing at home?	Yes	282	80.6
	No	68	19.4
Presence of soap and water for hand washing at home?	Yes	184	52.6
	No	166	47.4
School hand washing facility	Medium	2	33.33
	Low	4	66.67

**Table 5:** Enabling factors for children hand washing practice in Arba Minch town, 2016.

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

In multivariate logistic regression analysis, residency, presence of water and soap, and referent pressure were significantly associated with hand washing practice in 1st cycle primary school children.

From all socio demographic profiles of children, only residency was significantly associated with hand washing practice. In this aspect, urban children more likely performed proper hand washing practice (AOR: 1.37, 95% CI: (1.07, 20.11)) than rural children.

Concerning to enabling factors for children hand washing practice, presence of water and soap showed strong statistical association with hand washing practice.

In this regard, absence of water and soap was protective for proper hand washing practice (AOR: 0.25, 95% CI: (0.02, 0.87)) as compared with presence of water and soap for hand washing practice.

Regarding to reinforcing factors for children's hand washing practices, pressure from important referents was independent predictor for hand washing practice in children.

In this, case, the odds of high pressure from important referents brought high chance for proper hand washing practice in primary

school children (AOR: 1.65, 95% CI: [1.03, 7.98]) than low pressure from important referents ( Table 6).

### Discussion

This school based cross-sectional study with the objective of the assessment of hand washing practice, and its associated factors in primary school children was conducted in Arbaminch town, Gamo Gofa Zone, Southern Ethiopia.

The results from this study revealed relatively small (22.3%) proportions of primary school children practice proper hand washing behavior and the rest 77.7% of children practice improper (poor) hand washing behavior. A poor rate of hand washing in this study was lower than other previous studies in Tanzania and Colombia [13,14].

This difference can be due to the time gap of in this research and the previous research works. In the present time in all parts of Ethiopia, the health extension workers designed schedule and give health education about hand washing practice for different segment of populations. On the other hand, poor rate of hand washing practice in this study was higher than the study conducted in Oromia Ethiopia [19].

Variables		Hand washing practice		COR(95%CI)	AOR(95%CI)
		Improper n (%)	Proper n (%)		
Age	11-Sep	53 (74.6)	196 (72.59)	1.19 (1.02, 24.00)	0.23 (0.15, 3.15)
	14-Dec	18 (25.4)	74 (17.41)	1	1
Sex	Male	38 (52.05)	165 (59.56)	0.74 (0.51, 2.75)	0.25 (0.04, 4.18)
	Female	35 (47.95)	112 (40.44)	1	1
Residence	Urban	69 (94.52)	163 (92.09)	1.48 (1.01, 11.61)*	1.37 (1.07, 9.11)*
	Rural	4 (5.48)	14 (7.91)	1	1
Knowledge	Sufficient	64 (87.68)	246 (88.8)	0.90 (0.45, 11.12)	0.37 (0.54, 11.22)
	Insufficient	9 (12.32)	31 (11.2)	1	1
Attitude	Positive	29 (39.73)	138 (49.82)	0.66 (0.32, 5.38)	0.10 (0.05, 1.22)
	Negative	44 (60.27)	139 (50.18)	1	1
School hygiene facility	Medium	2 (2.74)	66 (23.83)	0.09 (0.01, 2.01)	0.20 (0.10, 11.10)
	Low	71 (97.26)	211 (76.17)	1	1
Presence of soap and water for hand washing at home?	No	13 (17.8)	55 (19.55)	0.87 (0.05, 0.98)*	0.25 (0.02, 0.87)*
	Yes	60 (82.2)	222 (80.45)	1	1
Important Referents	High pressured	32 (43.84)	113 (40.79)	1.13(1.01, 5.15)*	1.65 (1.03, 7.98)*
	Less pressured	41 (56.16)	164 (59.21)	1	1

**Table 6:** Factors influencing hand washing practice among primary school students in Arba Minch town, 2016.

This disproportion can be due to residency. All the participants in Oromia were from urban but in this study some participants came from rural area. Thus being urban expose the children to different health extension packages via different communication mechanisms. Generally, global figures indicate hand washing is still practiced to a low extent [5].

In this study, there were different factors affecting hand washing practices of school children. Among these factors, the key predictor of hand washing practice of 1st cycle primary school children was residency. In this regard, urban children more likely practice proper hand washing behavior than rural children. This finding was in agreement with the study conducted in Oromia Ethiopia, Tanzania, and Colombia [12-14]. Similarly, another study showed hand washing behavior difference by rural and urban setting where urban dwellers practice hand washing than their rural counter parts. This can be due to the high level acceptance national initiatives like Hand Washing Day by urban 1st cycle primary school children, and further interventions by health extension workers can increase student's frequency and compliance to hand washing practice in urban residency than rural residency.

The other factor for hand washing practice in children was accessibility of water and soap for hand washing purpose at home. In this study unavailability of hand washing water and soap was found to be preventive factors for hand washing practices in the schools children. This is in line with the study conducted in Oromia Ethiopia, Tanzania and Colombia [13,19,20]. Since hands are the primary vehicle of transmission of many infectious diseases, providing

accessible water and soap in toilet area can be an effective program for potentially reducing this problem by properly practicing hand washing in the school children. In this regard, WHO recommended that hand washing with soap is one of the most important hygiene behaviors which should be promoted among school children since it beaks dirt and grease that carries most of the germs which cannot be removed by water alone [9].

The last but not the least determinants of hand washing practice among reinforcing factors was important referent pressures. In this, case, the odds of high pressure from important referents brought high chance for proper hand washing practice in primary school children. This finding is coincided with the study conducted in Oromia Ethiopia, Tanzania, and Colombia [13,19,20]. The referents pressure influences the way in which children approach personal hygiene, which will stay with them for life. Educating children on good hygiene is the best way to avoid the spread of infection and disorders and not just for childhood complaints; teaching the principles of correct hygiene at an early age can help keep individuals healthy in later life, and be taught to future generations. Principles of hygiene should be made part of everyday life and the best way for referents to teach their children about good hygiene is to lead by example.

The main decisive factors for hand washing practice for children in different part of the world can be predisposing factors like knowledge and attitude of children. Even though, knowledge status was not associated with hand washing practice, findings of this study indicated that one thirds of children had insufficient knowledge about important aspects of hand washing. In this regard, similar studies were obtained



from the study done in Tanzania and Colombia [13,20]. Likewise, low knowledge about hand washing practice was founded in many parts of the world [21]. In the same fashion, attitudes, which reflect the degree to which performance of a behavior is positively or negatively valued by an individual [22], were not found to be statically important in predicting hand-washing practice in this study? Attitudes are shaped by salient beliefs, perception of the expected outcomes, and subjective value of the expected outcomes, and intern it affects hand washing practices [22].

According to national guideline, for an effective school WASH, one toilet per 25 girls and one toilet plus one urinal per 50 boys is required. Toilets should be hygienic to use and easy to clean and should have convenient hand washing facilities [23,24]. But in this study student toilet ratio (i.e. 1:67 for male and 1:73 for females) was not consistent with national standard. Therefore to meet the recommended standard a considerable number of additional toilet and units are required with necessary levels of, privacy, safety and cleanliness.

In this study, hygiene index was computed using a combination of four hygiene facilities in school (running water+soap+washing station +toilet), but there were no schools fulfilling high hygiene facilities. Among all schools, two and four of them had medium and low hygiene facilities respectively. Therefore, special attention should be taken into consideration in provision of adequate water supply, hand washing stations and sanitation facilities in schools.

## Conclusion

The findings of this study indicated that small number of participated children had proper hand washing practice behavior in the selected primary school. The independent predictors of hand washing practices were residency, presence of water and soaps, and pressure from referents. It is recommended that fulfilling of water and soap for hand washing practices, and strictly follows up of children hand washing process should be given more emphasis to minimize improper hand washing practice in these settings. Therefore, information has to be disseminated via community health agents, health development army and mass media to alleviate these problems.

## Limitations

Due to financial limitation, the study could not cover private schools. As result of this, the finding is not generalized to all schools in the study area. The study does not indicate cause-effect relationship since cross sectional study was used.

## Benefit and Beneficiaries of the Study

The findings of this study enable the health services planners to design strategies for enhancing proper hand washing practice and also provide baseline data for health policy makers, health planners and different researchers to carry out further large longitudinal scale studies separately in each determinant. Finally, the findings should help and guide the development of focused behavior change strategies for hand washing practice, and provide information to health care practitioners regarding the predictors of hand washing practice in Arbaminch town, Gamo Gofa zone.

## Competing Interests

The authors declare that they have no competing interest.

## Authors Contributions

All the authors participated in all steps of the study starting from development of the proposal till the writing of the manuscript and approval of the final version of the manuscript.

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