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Hand Hygiene Knowledge, Perception and Practices among Women of 'Kirkos' Locality in Addis Ababa, Ethiopia

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Abstract

Background: The concept of hand hygiene is defined differently by different bodies. Among all, the definition given by Center for Disease Control was found appropriate and relevant to this study. Accordingly, hygiene is the practice of keeping personal and environmental hygiene or cleanness with the intention of preventing disease and illness. Hand hygiene is not a recent practice; rather it is as old as a man.

Objectives: To assess hand hygiene knowledge, perception and practice among women of "Kirkos" locality in Addis Ababa and to identify the factors associated with the existing hand hygiene practice.

Methods: A community based cross-sectional study was set out to conduct household survey. Three hundred eighty five women were selected using a multi-stage random sampling technique, which involved the selection of woreda, kebele and finally the households. Fully structured questionnaire was used to collect information on participants' knowledge, perception and practice of hand washing.

Results: Overall, majority (66.8%) of the respondents had lower level of knowledge of hand washing. Regarding, the hand washing practice, majority (61.3%) of the participants don't frequently wash their hands at critical times. Likewise, participants don't have the habit of drying hands, in which case majority (more than 70%) of the respondents were identified not to dry their hands at all. Education, perceived motivation and perceived beliefs were identified to be strongly associated with hand hygiene practice (AOR=2.47621, 95% CI; 3062, 4.6939), (AOR=2.0506, 95% CI; 1.2648, 3.3244), and (AOR=1.7916, 95% CI; 1.0553, 3.0415).

Conclusion: Smaller proportion of the women practiced proper hand washing. Furthermore, a smaller proportion

of women were identified to have knowledge of proper hand washing.

Keywords: Hand hygiene; Microorganisms; Acquired infection

Introduction

Hand hygiene is not a recent practice; rather it is as old as a man. The Jews used to practice hand washing before eating. Hands could be properly washed through brief rubbing together of all surfaces of lathered hands and rinsing under running water. Through hand washing microorganisms are suspended and mechanically removed by rising with water. Thus, the vital principle of hand washing is removal, not killing [1]. Hand hygiene has also been considered for several years as the single most effective and cost-effective means of preventing hospital acquired infection, as well as an effective means of preventing illness in the community that may lead to hospitalization [2].

The importance of hand hygiene is also associated with the use of our hands in many of our daily activities, including handling objects, food handling, food preparation, cleaning objects, etc., all of which could lead to contamination of our hands. Preparing and eating food with contaminated hands exposes for the transmission of contaminants (germs) into the body through food, which in turn causes ill-health. Despite its importance to prevent diarrheal diseases people have misunderstandings about hand washing and its time of practice.

There are critical times when hands should be properly washed. According to Center for Disease Control, the critical times for hand washing include, after using the toilet, changing diapers, attending to a sick person, handling raw meat, fish or poultry, after handling garbage [3].

According to World Health Organization, washing hands with soap and water at critical times, like before meals and

after using toilet have been found to prevent hepatitis A virus infection. Thus, it is appropriate for programs focusing on reduction of morbidity and mortality to include hand washing intervention. We couldn't find a specific figure about hand washing Practice in Ethiopia from the previous studies.

There is huge burden of hygiene and sanitation related diseases in Ethiopia, particularly among children. Besides, it was reported that hand washing is a crucial means for preventing hygiene and sanitation related diseases. In this regard, regular and proper hand washing by mothers of children was reported to have a crucial importance in reducing the prevalence of infectious diseases, hospital admissions, and mortality and morbidity in under-five children [4].

Objectives

To assess hand hygiene knowledge, perception and practice among women of "Kirkos" sub city in Addis Ababa and to identify the factors associated with the existing hand hygiene practice.

Specific objectives :

1. To assess women's knowledge about hand washing in "Kirkos" sub city.
2. To determine the perceptions of the women to wards hand hygiene practice.
3. To identify the existing hand hygiene practice among the women in kirkos sub city.
4. To determine factors associated with hand washing among women in kirkos sub city.

Methods

Study period and area

"Kirkos" locality is an area located in Kirkos Sub city, which is among the ten sub cities of the capital Addis Ababa. The locality is almost located at the center of the city. It is among the most slum areas of the city. Recently, majority of such slum areas in the city have been developed to have a new and modern city image, furnished with new and modern residential apartments and commercial buildings. But, Kirkos locality has not yet get this chance and is still the most slum area of the city, where poor street drainages, highly congested and poorly constructed houses, and insufficient number of public and private sanitary facilities are typical images of the locality. The study was conducted from June to August 2016.

Study design and sampling

A community based cross sectional study was conducted from June to august 2016. Multi stage sampling was employed to select the study subjects when a total of four stages were considered. Stage 1 selecting kirkos sub city, stage 2 selecting woereds (districts in kirkos sub city), stage 3 selecting kebeles (the smallest admirative unit), stage 4 selecting households. The sample size was calculated using a single population

proportion formula. Kirkos sub city was randomly selected from all sub cities in Addis Ababa and allkebeles in the selected woreda (district) were considered to randomly select 2 kebeles namely kebele 1 and 4. There are a total of ten kebeles in kirkos sub city. Because of the constrains of resource including time only two kebeles were randomly selected. Sample size was proportionally allotted for the selected kebeles depending up on the number of Eligible women in the randomly selected kebeles. A systematic sampling was applied to identify the required households from the selected kebeles. One eligible woman was expected from each household. One woman was randomly selected in the event where a household had two or more eligible women.

Data collection method and tools

The questionnaire was translated from English to Amharic language for the sake of convenience for data collectors to easily conduct their interviews, as Amharic is their mother tongue language. An interview administered was used to collect data using structured questionnaire.

Data management and analysis

After completion of the data collection, data cleaning was undertaken before data entry was commenced. After data cleaning, data were entered into Epi-Info version 3.5.3, for the sake of analysis. Descriptive analysis using frequencies was made for analyzing the demographic characteristics, knowledge, perception and hand washing practices. However, before analyzing the association between hand washing practice (outcome variable) and other exposure variables, including; demographic characteristics, knowledge, and perception, after doing this, logistic regression analysis was employed to identify factors influencing hand hygiene practice via crude and adjusted odds ratios, since this model provides a flexible means of analyzing the association between a binary outcome and a number of exposure variables.

Operational definitions

1. Kebele the smallest admirative unit in the country.
2. Cognitive is the dimension that represents the process of knowing.
3. Knowledge is factual information.
4. Perception is the individual's interpretation of reality. A perception is not necessarily based on truth.
5. Behavior is anything that an individual does that involves action and responses to stimulation from the internal and/or external environment.
6. Hand hygiene practices (behavioral domain) are the usual mode, method, or pattern of performance.

Ethical consideration

The study was approved by Institute of Review Board of Addis Ababa University. Official letter was obtained from Addis Ababa University, School of Psychology and delivered to Kirkos

Sub city to further be directed to the concerned lower level government administrative bodies till the research team gets legal permission to work in the intended locality.

Information about the study was given for the participants, including purpose and procedures, potential risk and benefits so that encourage provision of accurate and honest responses. Study subject was told participation is their volunteer and there was no interpretation of a single response (fully confidential). An informed consent was obtained from the study subjects and they will be told that they have a full right to refuse to response either partly or completely. But, participant was also informed that their genuine responses are vital importance for the study.

Results

Sociodemographic characteristics of the respondents June 2016

Three hundred Eighty-five women were participated in the survey making a response rate of 100% (Table 1).

The analysis of the data indicated that 78.4% of the respondents were married, while only 2.3% of them were single. Regarding the age of respondents, majority of them were in the age range of 36 to 45 years (34.8%) and 46 to 55 years (33.8%), while only 0.3% of them are aged in the range of 18 to 24 years. The result also indicated that, majority of the respondents didn't attend higher level of education. In this regard, about 25.5% didn't attend any formal education and 55.1% of them have attended only primary education. However, only 0.8%, 4.2% and 0.3% have attended preparatory school, college diploma, and first degree and above respectively. It was also observed that majority (76.6%) of the participants were orthodox Christians, while few of them were identified to be followers of protestant, Muslim and catholic religions. Besides, it was found out that majority of the respondents (85.7%) were found to be primarily responsible for the preparation of food in their households, while only few of them were found to have maids and other household members to take the responsibility of food preparation in their household.

Table 1 Demographic characteristics of respondents, Kirkos, Ethiopia.

Characteristics	Number	Percentage
Age range		
18-24	2	0.5
25-35	77	20
36-45	134	34.8
46-55	130	33.8
>55	42	10.9
Marital status		
Divorced	25	6.5

Married	302	78.4
Single	9	2.3
Widowed	49	12.7
Education		
No formal education	98	25.5
Primary school	212	55.1
Secondary school	55	14.3
Preparatory school	3	0.8
College diploma and above	17	4.5
Responsibility of food preparation		
Maid	17	4.4
Myself	330	85.7
Other household members	38	9.9

Hand hygiene knowledge among women in the study area June 2016

As indicated in table above, majority (62.1%) of the respondents were identified to have insufficient awareness about causes of food poisoning. Likewise, majority (70.9%) of the respondents were identified to have insufficient awareness about critical times for hand washing (Table 2).

Table 2 Proportion of women's knowledge for food poisoning and critical times for hand washing.

Level of awareness	Number	Percentage
Awareness about Causes of food poisoning		
Sufficient awareness	146	37.9
Insufficient awareness	239	62.1
Awareness about critical times for hand washing		
Sufficient awareness	273	70.9
Insufficient awareness	112	29.1

The result shows that majority (>90%) of the participants were reported to have knowledge about eating undercooked vegetable and not washing hands before handling food could cause food poisoning. However, almost half of the respondents were identified to lack knowledge with regard to the rest of the items in causing food poisoning. Likewise, majority (>75%) of the respondents were reported to have knowledge about all the items related to critical times for hand washing.

It was identified that majority (62.1%) of the respondent lack knowledge about causes of food poisoning. However, majority (70.9%) of the respondents were identified to have knowledge about critical times for hand washing. However, still a considerable proportion (29.1%) of the respondent lack to have knowledge about critical times for hand washing.

Majority (66.8%) of the respondents were classified as those who lack awareness about hand hygiene (**Tables 3 and 4**).

Table 3 Majority (66.8%) of the respondents were identified to have insufficient hand hygiene knowledge.

Level of awareness	Number	Percentage
Sufficient awareness	128	33.2
Insufficient awareness	257	66.8

As indicated in table above, majority (66.8%) of the respondents were identified to have insufficient hand hygiene knowledge.

As indicated in table above, majority (76.9%) of the respondents were identified to have negative perception of susceptibility to foodborne diseases. Likewise, significant proportion of the respondents were identified to have positive perception of motivation to hand hygiene. Still, a considerable number (41.8%), (28.1%) and (27.5%) of the respondents were identified to have low perception towards seriousness of foodborne diseases, benefits of hand hygiene, and barriers to hand hygiene respectively.

Hand hygiene practices among the respondents June 2016

The result for each hand hygiene practice is summarized in subsequent tables and details following that (**Tables 5 and 6**).

Use of hand sanitizer at specific hand washing events

The frequency distribution for use of hand sanitizer at specific hand washing events. The result has shown that almost all (99% and more) of the respondents were found not to use hand sanitizer at any of the critical times for hand washing.

Method of drying hands after washing hands at specific hand washing events

Majority (>70%) of the respondents were identified that they do not dry their hands at all after washing their hands in any of the critical times for hand washing. However, a considerable number (25%) of the respondents were found to dry their hands with cloth towel.

Duration of hand washing at specific hand washing events

Significant proportion of the respondents (>70%) of the respondents were identified to wash their hands for more than 20 seconds in any of the critical times for hand washing. However, about (25%) of them were found out that they do not clearly know the length of time that they wash their hands.

Temperature of water used at specific hand washing events

The study showed the frequency score for respondents with regard to temperature of water used by respondents at different events of hand washing. It was reported that majority (>79%) of the respondents were identified to use cold water to wash their hands in any of the hand washing events. However, a considerable number (19.7%) and (13%) of the respondents were reported to use warm water after using toilet and after cleaning children respectively.

The result has shown that almost all (99% and more) of the respondents were found not to use hand sanitizer at any of the events of hand washing. Majority (75%) of the respondents were reported that they do not at all dry their hands at any of the indicated events. However, a considerable number (25%) of the respondents were found to dry their hands with cloth towel. Majority (71%) of the respondents were reported to wash their hands for more than 20 seconds. However, about (25%) of them were found that they do not clearly know the length of time they wash their hands.

Association between respondent's hand washing frequency and demographic characteristics, hand hygiene knowledge, and perception

Firstly, bivariate association was used to identify variables, which could significantly associate with the frequency of hand washing. These variables were used to further develop logistic regression model so that variables, which have strong association with hand washing frequency were identified via crude and adjusted odds ratio (**Table 7**).

Table 4 Proportion of women's hand hygiene perception.

Perception	Have positive perception		Have negative perception	
	Number	%	Number	%
Susceptibility to foodborne diseases	89	23.1	296	76.9
Seriousness of Foodborne diseases	224	58.2	161	41.8
Benefits of hand hygiene	277	71.9	108	28.1
Barriers to hand hygiene	279	72.5	106	27.5
Importance of hand hygiene	347	90.1	38	9.9
Motivation to wash hands	125	32.5	260	67.5

Bivariate association using chi-square test indicated that there is a significant ($p=0.0377$) association between frequency of hand washing and age. This shows that (46.8%) of women of age 35 and less wash their hands more frequently than those of older age (35.6%). Likewise, there is a significant association ($p=0.00039$) between hand washing frequency and level of education of respondents. This shows that

respondents at high school or higher level of education (56.0%) wash their hands more frequently as compared to those with at lower level of education (34.5%). The result is indicated in **Table 7** below.

Table 5 Frequency of hand washing practice.

Hand washing events	Always		Most of the time		Often		Occasionally		Never	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
After using the toilet	344	89.4	39	10.1	2	0.5	0	0	0	0
After handling garbage	74	19.2	130	33.8	114	29.6	63	16.4	4	1
Before eating	284	73.8	95	24.7	5	1.3	1	0.3	0	0
Before preparing food	74	19.2	180	46.8	80	20.8	49	12.7	2	0.5
Before handling food	73	19	171	44.4	84	21.8	56	14.5	1	0.3
After cleaning children	253	65.7	102	26.5	28	7.3	2	0.5	0	0

Table 6 Hand washing practice after specific events.

Hand washing events	Yes		No	
	Number	Percent	Number	Percent
After using the toilet	4	1	381	99
After handling garbage	4	1	381	99
Before eating	4	1	381	99
Before preparing food	3	0.8	382	99.2
Before handling food	3	0.8	382	99.2
After cleaning children	3	0.8	382	99.2

Table 7 Distribution of frequency of hand washing practice by demographic characteristics, hand hygiene knowledge and perception among respondents kirkos, Ethiopia.

Demographic, knowledge and perception items	Frequency of hand hygiene N (%)		Statistical indices
	Regular	Irregular	
Age-group (years)			
35 and less	37 (46.8)	42 (53.2)	$\chi^2 = 2.79$ df = 1 p = 0.0377*
Greater than 35	94 (35.6)	170 (64.4)	
Educational status			
Less than secondary	107 (34.5)	203 (65.5)	$\chi^2 = 10.86$ df = 1

Secondary and above	42 (56.0)	33 (44.0)	p = 0.00039**
Religion			
Christian	134 (39.8)	203 (60.2)	$\chi^2 = 0.9496$ df = 1 p = 0.131 (NS)
Muslim	15 (31.3)	33 (68.8)	
Responsibility of food preparation			
Self	129 (39.1)	201 (60.9)	$\chi^2 = 0.0552$ df = 1 p = 0.355 (NS)
Other members	20 (36.4)	35 (63.6)	
Awareness about cause of food poisoning			
More aware	67 (45.9)	79 (54.1)	$\chi^2 = 4.65$ df = 1 p = 0.012*
Less aware	82 (34.3)	157 (65.7)	
Awareness about critical times for hand washing			
More aware	114 (41.8)	159 (58.2)	$\chi^2 = 3.27$ df = 1 p = 0.027*
Less aware	35 (31.3)	77 (68.8)	
Perceived susceptibility to foodborne diseases			
Have positive perception	34 (38.2)	55 (61.8)	$\chi^2 = 0.0121$ df = 1 p = 0.45 (NS)
Have negative perception	115 (38.9)	181 (61.1)	
Perceived seriousness of foodborne diseases			

Have positive perception	85 (37.9)	139 (62.1)	$\chi^2 = 0.1283$ df = 1 p = 0.36 (NS)
Have negative perception	64 (39.8)	97 (60.2)	
Perceived benefits of hand hygiene			
Have positive perception	119 (43.0)	158 (57.0)	$\chi^2 = 6.92$ df = 1 p = 0.0028*
Have negative perception	30 (27.8)	78 (72.2)	
Perceived barriers to hand hygiene			
Have positive perception	111 (39.8)	168 (60.2)	$\chi^2 = 0.50$ df = 1 p = 0.24 (NS)
Have negative perception	38 (35.8)	68 (64.2)	
Perceived importance of hand hygiene			
Have positive perception	137 (39.5)	210 (60.5)	$\chi^2 = 0.899$ df = 1 p = 0.175 (NS)
Have negative perception	12 (31.6)	26 (68.4)	
Perceived motivation to hand hygiene			
Have the motive	66 (52.8)	59 (47.2)	$\chi^2 = 15.47$ df = 1 p = 0.000045**
Lack the motive	83 (31.9)	177 (68.1)	
Note: *p ≤ 0.05, **p ≤ 0.01 and NS=Not statistically significant			

There is a significant ($p=0.012$) association between hand washing frequency and awareness for causes of food poisoning. This implies that respondents who have better awareness (45.9%) wash their hands more frequently as compared to those with less awareness (34.3%). Similarly, it was observed that there is a significant ($p=0.027$) association between the frequency of hand washing and awareness about critical times for hand washing. In this regard, respondents who aware more (41.8%) about critical times for hand washing, wash their hands more frequently than those with lesser awareness (31.3%).

In this regard, it was identified that there is a significant ($p=0.0028$) association between frequency of hand washing and perceived benefits of hand washing. This shows that respondents who have positive perception towards the benefits of hand hygiene (43.0%) wash their hands more frequently than those who have negative perceptions (27.8%). Similarly, there is a significant ($p=0.0005$) association between frequency of hand washing and perceived motivation to hand hygiene. As a result, respondents who have the motive for hand hygiene (52.8%) wash their hands more frequently than those who lack the motive for hand hygiene (31.9%) (**Table 8**).

On multivariate logistic regression education, perceived benefit to hand hygiene and perceived motivation to hand hygiene were found to be significantly associated with frequency of hand washing.

The women with higher level of education (AOR=2.47621, 95% CI; 3062, 4.6939) is 2.47 times more likely to wash hands

frequently as compared to those in lower level of education, while women who have positive perception towards the benefit of hand hygiene (AOR=1.7916, 95% CI; 1.0553, 3.0415) is likely to have 1.79 times frequent hand washing as compared to those who have negative perception. Furthermore, women who have the motive towards hand hygiene (AOR=2.0506, 95% CI; 1.2648, 3.3244) is likely to practice hand washing 2.05 times more frequently than those who lack the motive.

Table 8 Crude and adjusted odds ratio and 95% CI for respondent's June 2016.

Factors	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age	1.5932 (0.9580, 2.6496)	0.8886 (0.4712, 1.6755)NS
Education	2.4146 (1.4463, 4.0313)	2.4762 (1.3062, 4.6939)**
Knowledge on food poisoning	1.6238 (1.0658, 2.4739)	1.3540 (0.8073, 2.2709)NS
Knowledge on critical times for hand washing	1.5774 (0.9894, 2.5146)	0.9302 (0.5308, 1.6298)NS
Perceived benefits to hand hygiene	1.9582 (1.2074, 3.1761)	1.7916 (1.0553, 3.0415)*
Perceived motivation to hand hygiene	2.3855 (1.5404, 3.6943)	2.0506 (1.2648, 3.3244)**
Reference group, *p<0.05, **p<0.01 and NS= Not statistically significant		

Discussion

The determinants of hand hygiene among urban women was inadequately studied in Ethiopia. Besides, most assessments of hand hygiene have measured knowledge (cognitive domain) and general practices (behavioral domain) rather than affective factors (values, beliefs, perceptions, motivation). Measuring affective factors in conjunction with hand hygiene knowledge could provide more comprehensive information about their influence on hand hygiene practices. Schafer et al. found that affective factors significantly influenced positive hand hygiene practices. Thus, this study has employed a comprehensive method to properly identify factors that affect hand hygiene practices.

Hand washing has crucial importance for control of fecorally transmitted communicable diseases, which include the reduction of the occurrence of diarrheal diseases by about 14-40%, and decontamination of the hands in order to prevent cross-transmission of infections [5-12].

This study documents the association between frequency of hand washing practice and demographic characteristics, knowledge and perception in "Kirkos" locality. Results from this study revealed that majority (89.4%) of women was found to always wash their hands, which is similar to the finding of the research conducted in Nigeria in which majority (88.7%) of the women was found to always wash their hands. With reference to the same research the overall proportion of hand washing practice, which is lower in this finding (38.7%) is

supported with the finding with the research in Nigeria, where the proportion of good hand washing practice is low (21.7%). However, the finding from this research in Nigeria is in contrary to the finding here with regard to, hand washing after cleaning garbage and before food preparation. In this regard, majority of the respondents (79.0%) and (62.3%) respectively were identified to always wash their hands after cleaning garbage and before preparation of food. But, the finding in this research shows that lower proportion (19.2%) of the women participants were identified to always practice hand washing after cleaning garbage and before preparation of food [13-15].

Knowledge and awareness are some of the measures which are thought to be on the causal pathway to behavior. According to the present study, the overall hand hygiene knowledge was found to be low, where majority (66.8%) of them were identified that they don't have proper hand washing knowledge. Besides, specific to awareness about critical times for hand washing, still large proportion (70.9%) of the respondents lack hand washing knowledge. However, this result is in contrary to the finding of the research conducted on mothers of under-five children in Nigeria, where majority of the respondents were knowledgeable on critical times for hand washing. However, result from logistic regression analysis revealed, the association between frequency of hand washing and awareness about critical times for hand washing was not significant (AOR=0.9302, CI; 0.5308, 1.6298). Thus, this finding is in contrary to the study conducted in India Chitungwiza, and Cameroon which indicated with improvement in knowledge level, respondent's exhibit better hygiene practices. For that reason, factors other than awareness should be looked at in hygiene interventions to reinforce people's hand washing behavior [16-19].

The assessment of hand hygiene among women in 'Kirkos' locality was determined by measuring knowledge (cognitive domain), general practices (behavioral domain), and six perceptions (susceptibility to foodborne disease, seriousness of foodborne disease, benefits of hand hygiene, barriers to hand hygiene, importance of hand hygiene, motivation to hand hygiene). The six hand hygiene perceptions were developed with the help of Health Belief Model [20].

The finding of this research reveals that only two of the six perception items have shown to have a significant association with hand washing frequency. As a result, perceived benefits to food borne diseases (AOR=1.7916, 95% CI; 1.0553, 3.0415) and perceived motivation to food borne diseases (AOR=2.0506, 95% CI; 1.2648, 3.3244) were identified to have a significant association with hand washing practice [21-23].

From demographic subjects, only education was found to have a significant (AOR=2.47621, 95% CI; 3062, 4.6939) association with hand washing practice. This finding was similar to the finding of the research conducted in Kenya and other similar study in which mothers with higher socio-demographic status and higher education status were reported to have better hand washing practices [24-26].

Conclusion

Finding of this study demonstrated that a smaller proportion of the women practiced proper hand washing. Furthermore, a smaller proportion of women were identified to have knowledge of proper hand washing.

Competing Interests

The authors declare that they have no competing of interests.

Authors' Contributions

Alis involved in conceived the original idea, proposal writing, designed the study, got funding for the study, participate in data collection, participated in all implementation stages of the study. MA involved in the critical review of the proposal and research work. BA involved drafting manuscript, finalization of the Manuscript and critically reviewing research work. All authors read and approved the final manuscript.

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