

Determinant Of Access To Improved Latrine In Historical City Of Harar, East Ethiopia, 2016.

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Abstract: Background: According to the WHO, there are an estimated 1.7-million cases of diarrheal disease in the world each year, with 780,000 children dying from diarrhea. In sub-Saharan Africa, about 644,000 people died from diarrhea in 2012. Still, the majority of urban community in Ethiopia lacks improved latrine facility. So, this study is initiated to identify the determinant of access to improved latrine in the historical city of Harar. **Methods:** Historical city of Harar is located at 525 km east of Addis Ababa. The study was from conducted from December 13-17/2016. The study design was cross sectional study and simple random sampling technique was employed to select 422 sample size. Training was provided for data collector and supervisors. Standardized and pretested questionnaire was used to ensure the quality of data. Ethical issues were properly managed in data collection. Data entry and analysis was executed using SPSS edition 20. **Result:** Those household living in house built in Italian regime was 4.836 times to access improved latrine than those household who lives in historical Harari houses (AOR=4.836, 95% CI: 1.143-20.456). Household with private water supply were 4.758 more likely to access improved latrine than who did not have private meter water supply (AOR=4.758, 95% CI: 1.701-13.304) and government employee were 0.282 times less likely to access improved latrine than private employee (AOR=0.282, 95% CI: 0.080-0.997). **Conclusion:** it was concluded that determinants of access to improved latrine in the Historical City of Harar were having private water supply, living in houses built in Italian regime and being government employee.

Key words: Improved latrine, Historical city of Harar (Jugal), Improved water supply, Ethiopia, Harari Region

1. Introduction

Use of unimproved sanitation facilities and unsustainable disposal of human waste is a leading cause of diseases transmitted via human excrement, such as diarrhea, hepatitis and typhoid fever (1). According to the WHO, there are an estimated 1.7-million cases of diarrheal disease in the world each year, with 780,000 children dying from diarrhea. In sub-Saharan Africa, about 644,000 people died from diarrhea in 2012, accounting for 6.7% of deaths (2). The report of CDC estimated that 88% of diarrheal diseases are attributed to unsafe water supply, inadequate sanitation, and poor hygiene (3). World wide, 2.5 billion people did not have access to an improved sanitation facility in 2012 (4). Despite strong overall progress, 748 million people still did not have access to improved drinking water in 2012, 325 million (43%) of whom live in sub-Saharan Africa (4). 1.6 billion worldwide gained access to a piped supply water supply on premises (4). Eliminating open defecation, a practice strongly associated with poverty and exclusion (4). Open defecation is the worst form of sanitation as it pollutes public open spaces, water bodies, building construction sites, and includes the use of flying toilets (which is a form of open defecation inside polythene bags and throwing it away) (5). As the open defecation equity tree shows, there is a strong correlation between where people live and their level of access to improved drinking water sources and sanitation. Improved services have continued to be disproportionately more accessible to more advantaged populations (4). The sanitation ladder, encouraging communities to stop open defecation and construct sanitation facilities (4). In sub-Saharan Africa open defecation was estimated at 25% in 2012 (4). The Nigerian study indicated that type of water supply is significantly associated with household sanitation type (5). Moreover; In Ghana, households who used improved drinking water source were 1.36 times more likely to use improved sanitation facilities than those with unimproved water sources (7). Mini Ethiopia demography and health

survey (EDHS) result indicated that 82.5% of the urban population had no access to improved sanitation (8). On the other hand, the data from WHO and Unicef revealed that improved sanitation coverage in Ethiopia had increased to 47% in 2012 from 9% coverage in 2000. According to the same source, the Harari region improved sanitation coverage had increased to 58% in 2012 from 27% in 2000 (4). The findings from EDHS 2014 depicted that 8.7% of Ethiopia urban population practiced open defecation. However, the WHO and Unicef report showed a decline of open defecation in Ethiopia from 82% in 2000 to 34% in 2012 while the same source revealed that open defecation reduced in Harari region from 56% in 2000 to 37% in 2012 (4). According to Mini EDHS 2014 report, 94% of the urban households in Ethiopia have access to an improved source of drinking water. The most common source of improved drinking water in urban households is piped water, used by 87% of urban households (8). Housing ownership is an important factor in determining the type of household sanitation facility or the extent of facility improvement. For example, more tenants were reported to use unimproved facilities and defecate in the open than owner occupiers (9,10). There are intra-urban disparities in access. Those living in low-income, informal or illegal settlements tend to have lower levels of access to an improved water supply (4). Higher reliance on water kiosks in the informal settlements and less access to piped supplies on premises. According to study done in Nigeria and China, household income had significant association with access to improved sanitation in China (6,11). Wealth underpins access to improved water supply and sanitation and the ability to practice improved hygiene behaviors (4). Still, the majority of urban community in Ethiopia lacks improved latrine facility. So, this study is initiated to identify the determinant of access to improved latrine in the historical city of Harar.

2. Methods

2.1 Study area and period

Historical city of Harar (Jugal) is located at 42.03-42.16 north of latitude and 9.110-9.240 south of longitude, 525 km from Addis Ababa in the eastern part of Ethiopia. It has 48 ha area divided administratively into seven kebeles. The population of Jugal was estimated at 24590 with 6278 households in 2007(12). Out of this, females were 12729(51.8%) while males were 11861(48.2%). There were one Hospital and one health center in historical city of Harar. Jugal Hospital is the first National Hospital in Ethiopia, established in 1902 G.C. Currently it is a regional hospital which provides service for a catchment population of 500,000 for the region, East Oromia and Somali region population. The study period was from December 13-17/2016.

2.2 Study design

The study employed community based cross sectional study design.

2.3 Sampling size

The researcher could not find recent published figure of proportion of access to improved latrine in the historical city of Harar. Thus; in order to obtain large sample size, it become mandatory to take the proportion of access to improved latrine as 50%(P=0.5). The sample size was calculated using single population proportion formula with 95% confidence interval and 5% margin of error.

$$\text{Sample size} = \frac{(Z_{\alpha/2})^2 p * q}{d^2}$$

Where; 95% CI; $(Z_{\alpha/2})^2 = (1.96)^2$

d= Margin of error(0.05)

P=proportion of latrine ownership(0.5)

q=1-p= 0.5

The initial sample size became 384. Taking non response rate of 10%, the final sample size was 422.

2.4 Sampling procedure

The historical city of Harar contain 7 kebele administration. To get representative sample, proportionate allocation of sampling was done. House numbers were used as sampling frame and simple random sampling technique was used to select the study unit.

2.5 Data collection procedure

A two days training on the content of the questionnaire and how to carry out interview was give for 5 nurses and 2 supervisors. Pretest on 5% of the sample were done and reliability of the questionnaire was tested. Supervision was employed on each data collectors and checking of questionnaire on completeness was carried out on daily basis.

2.6 Variables of the study

The dependent variable of the study was latrine ownership while the independent variables were socioeconomic, water and sanitation variables

2.7 Data quality management

Data was collected by trained Nurses, pretest was done and adequate supervisors were employed during data collection. Moreover; the study used standardized questionnaire, reliability and validity were assured in pretest.

2.8 Ethical clearance

The respective administration and sectors were contacted, interviewee were asked for their consent and confidentiality was assured by not writing respondents name on the questionnaire.

2.9 Data processing & analysis

Data was entered, edited and analyzed using SPSS 20th edition. Descriptive statistics, bivariate and multivariate analysis was used to show the result. Those variables with $P \leq 0.05$ in bivariate analysis were entered in the final multivariate analysis to identify factors independently associated with latrine ownership

3. Results

3.1 Socioeconomic characteristics

A total of 422 household responded to this study, making 100% response rate. The household survey result showed that 49.1% of the houses were historical Harari houses followed by houses built after Italian regime(44.1%) and houses built in Italian regime(6.9%) respectively. The majority of the houses (63%) were rental while the rest (37%) were privately owned houses. Concerning economic situation, 64% of the household have a monthly income of 1200 birr and less while the rest 36% of the household have above 1200 birr per month income. The survey result also depicted that 13.5% of the household head were unemployed whereas the rest 30.6% and 55.9% of the household head were government and private firm employee respectively(Table:1).

Table:1 Socio economic characteristics of historical city of Harar,2016.

Variables	Category	Frequency	Percent
Housing typology	Historical Harari house	207	49.1
	Built in Italian regime	29	6.9
	After Italian regime	186	44.1
	Total	422	100.0
House ownership	Private	156	37.0
	Rental	266	63.0
	Total	422	100.0
Household income per month	1200 birr & less	270	64.0
	Above 1200 birr	152	36.0
	Total	422	100.0
Employment status	Unemployed	57	13.5
	Government Employee	129	30.6
	Private	236	55.9
	Total	422	100.0

3.2 Water and sanitation

The survey result revealed that 59.5% of the household in historical city of Harar have private meter water supply whereas 30.8% and 9.7% of the household got water by purchase and from distribution point respectively. The study result also showed that 50.7%,42.7% and 6.6% of the household possess private latrine, communal latrine and no toilet facility respectively. Regarding solid waste

management, 65.6% of the household dispose at municipal container while some 12.3%, 10.2%, 6.9% and 5% use a mix of disposal method, throw anywhere, burn and bury their solid waste respectively (Table:2).

Table: 2 Water and sanitation in historical city of Harar, 2016.

Variables	Category	Frequency	Percent
Water supply	Private	251	59.5
	Distribution point	41	9.7
	Purchase	130	30.8
	Total	422	100.0
Latrine type	Private	214	50.7
	Communal	180	42.7
	No latrine	28	6.6
	Total	422	100.0
Solid waste disposal method	Municipality Container	277	65.6
	Burning	29	6.9
	Burying	21	5.0
	Throwing	43	10.2
	Mix of methods	52	12.3
	Total	422	100.0

regime (P=0.008), houses built after Italian regime (P=0.011), private meter water supply (P=0.000) and government employee (P=0.039) were found to be significantly associated with ownership of latrine (Table:3).

3.3 Bivariate analysis of determinant of access to improved latrine

The bivariate analysis of determinant of access to improved latrine showed that houses built in Italian

Table: 3 Bivariate analysis of socioeconomic determinant of access to improved latrine in historical city of Harar, 2016

Variables	Category	COR (95% CI)	P-value
Housing type	Historical Harari houses	1	
	Houses built in Italian regime	6.464(1.628-25.665)	0.008
	Houses built after Italian regime	3.802(1.365-10.594)	0.011
House ownership	Private	1	
	Rental	0.792(0.333-1.880)	0.597
Household income	1200 birr & less	0.827(0.348-1.963)	0.666
	Above 1200 birr	1	
Water supply	Private meter	6.179(2.272-16.805)	0.000
	Not private meter	1	
Solid waste disposal	Properly	1	
	Improperly	0.588(0.192-1.799)	0.352
Employment status	Unemployed	0.635(0.181-2.223)	0.477
	Government employee	0.272(0.079-0.937)	0.039
	Private employee	1	

3.4 Multivariate analysis of determinant of access to improved latrine

Those variables which showed significance of $P \leq 0.05$ in bivariate analysis were entered in multivariate analysis. Thus; only three factors were found to be independently associated with access to improved latrine (Table:4). Those household living in house built in Italian regime was 4.836 times to access improved latrine than those

household who lives in historical Harari houses (AOR=4.836, 95% CI: 1.143-20.456). Household with private water supply were 4.758 more likely to access improved latrine than who did not have private meter water supply (AOR=4.758, 95% CI: 1.701-13.304) and government employee were 0.282 times less likely to access improved latrine than private employee (AOR=0.282, 95% CI: 0.080-0.997) (Table:4).

Table:4 Factors independently associated with access to improved latrine in historical city of Harar. 2016.

Variables	Category	AOR(95% CI)	P-value
Housing type	Historical Harari houses	1	
	Houses built in Italian regime	4.836(1.143-20.456)	0.032
	Houses built after Italian regime	2.499(0.867-7.197)	0.090
Water supply	Private meter	4.758(1.701-13.304)	0.003
	Not private meter	1	
Employment status	Unemployed	0.622(0.171-2.258)	0.470
	Government employee	0.282(0.080-0.997)	0.049
	Private employee	1	

4. Discussion

Accessible improved sanitation is critical to health and inequalities in improved sanitation can be interpreted as health inequities across socioeconomic groups(13). In this study, household living in house built in Italian regime was 4.836 times to access improved latrine than those household who lives in historical Harari houses. The finding of this study also depicted that household with private water supply were 4.758 more likely to access improved latrine than who did not have private meter water supply The finding was similar to the research done in Nigeria and Ghana where type of water source was found significantly associated with household sanitation type(6,7). Access to water sources such as piped water in the premises is important to access to sanitation as they facilitates cleaning and using the flush systems toilets(6). In this study being government employee was found to be less likely to access improved latrine. The fact that government employee were middle income households in Historical city of Harar context can be compared with the result of research done elsewhere that showed middle income household tend to use open defecation and other unimproved sanitation means than wealthier people and type of sanitation facility was not linear from the poorest to the well-off(6).

5. Strength and limitation

The strength of this study are adequate training and strong supervision was done during data collection period. More over; standardized and pretested questionnaire were used in data collection. The limitation is that it only showed the situation during the study time as it is cross sectional study.

6. Conclusion

According to this study findings, we conclude that predictors of access to improved latrine in historical city of Harar were living in houses built in Italian regime, possessing private meter water supply and being government employee.

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