Latrine availability and associated factors among Religious institution in Northern Ethiopia, 2018

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Abstract

Background

Religious institutions found at the community, not only uphold belief and cultural values but also as a force for positive change and development. Improved sanitation and hygiene is crucial in these institutions to decrease preventable infections due to unsanitary conditions. However, there are no studies among religious institution on availability of latrine. So this study was conducted to assess the latrine availability and associated factors among religious institution in Tigray Region, Ethiopia.

Method

Institution based cross-sectional study design was conducted in Tigray Region, Northern Ethiopia. Multi-stage sampling was used to sample 385 religious institutions. Data was collected using pre tested, structured questionnaire and observation checklist. Logistic regression was fitted and odds ratio with 95% confidence interval (CI) with p-value less than 0.05 was used to determine the predictors of latrine availability. Analysis was carried out using SPSS 20 TM - software package.

Results

In this study latrine availability was 32.8%. And was significantly affected by currently saved money towards having a latrine (Adjusted Odds ratio (AOR): 0.32, 95% confidence interval (CI) 0.25, 0.42), any messages seen, heard or received on sanitation and hygiene (AOR: 0.43, 95% CI 0.38, 0.51) and place where messages seen, heard, received (AOR: 2.95, 95% CI 1.11, 5.55).

Conclusion

Availability of latrine was very low when compared to the national target of 100% among the religious institution and was affected by the currently saved money towards having a latrine, any messages seen, heard or received on sanitation and hygiene and place where the messages receive. Information regarding latrine availability should be provided to the community visiting religious institutions through available channels and practical models promotion.
Background

Worldwide lack of sanitation is a serious health risk, affecting billions of people around the world, particularly the poor and disadvantaged people around the world [1, 2, 3, 4]. Lack of sanitation facilities compels people to practice open defecation and this increases the risk of transmission of diseases [5, 6]. The disease burden associated with poor water, sanitation, and hygiene is estimated to account for 4.0% of all deaths and 5.7% of the total disease burden in disability-adjusted life year (DALY) in worldwide, principally through diarrheal diseases, schistosomiasis, trachoma, ascariasis, trichuriasis, and hookworm infection [7,8]. About 1.8 million people die every year due to diarrheal diseases and children under the age of 5 years account for 90% of diarrheal deaths. Moreover, 88% of diarrheal diseases are attributed to unsafe water supply, inadequate sanitation, and poor hygiene [9, 10].

In Ethiopia up to 60% of the current disease burden is attributable to poor sanitation where 15% of total deaths are from diarrhea, mainly among the large population of under-five year’s children. Children in the country still suffer from diarrheal diseases, respiratory problems, and malnutrition. According to Ethiopian demographic and health survey, the two week prevalence of diarrheal diseases was 12% among under five years children [11,12].

The local religious institutions are often found at the heart of a community, not only upholding belief, cultural values and social tradition, but also as a force for positive change and development. Holy springs are frequently contaminated with fecal bacteria and different infections are potentially transmitted from an infected person to a healthy one by various routes involving excreta [13]. Study from India showed that possible source of infection for a confirmed case of cholera in a 3-day-old neonate was by holy water given to the baby [14]. So, religious institution might be the point of infection for
community served there and also despite concerted efforts by governmental and non-
governmental organizations, water and adequate sanitation still remain a challenge like
these institutions. The study was conducted to determine latrine availability and factors
associated among Religious institution, Tigray region, Ethiopia. Aiming establish baseline
information which will be very important for local decision makers knowing the current
status and what should be done in the future.

Methods

Study design, setting and Participants
Cross-sectional, religious institution based study design was employed in Tigray Region,
Northern Ethiopia from May to June/2018. Source of population were all religious
institutions found in Tigray region while the study populations were those religious
institutions found in the selected district.

Sampling technique and procedure
Multi-stage probability sampling of four stages was used to select religious institutions.
Using simple random sampling technique three zones were selected from the seven zones
of Tigray Region and from the selected zones ten districts were sampled. Then, a
proportional sample size was allocated according to the number of religious institutions in
each district. Then after, religious institutions were questioned consecutively till
fulfillment of the sample size. Sample size was determined using single population
formula with prevalence estimates of 50%, with a marginal error of 0.05% at 95%
confidence level. The total sample size is calculated to be 385. Respondents were heads
or delegates of the religious institution but in situations where the head or delegate was
not available after two or three visits, other in similar position was questioned and these
were selected purposely.

Data collection instrument and quality management
The data was collected using face to face interview with head of the institution and observation. One-week prior to the actual data collection period pretest was done and based on the finding, minor modifications of questions, wordings, phrases was made. During data collection time, a clear introduction that explains the purpose and objectives of the study was provided to respondents. A close supervision, honest communication and on spot decisions was done during data collection.

**Explanatory Variables**

The study variables were selected after reviewing relevant literatures according to objective of the research and by considering the local context of the study area. The dependent variable was latrine availability. The independent variables were general characteristics, communication, behavioral and environmental factor.

**Statistical Analyses**

Data were coded and entered in to EPI-Info version 7 Software and analyzed using SPSS software version 20. Frequency distribution tables’ graphs & narratives were used to present the findings. Frequency distributions, percentages and odds ratios (OR) with 95% confidence level (C.I) was calculate for statistical significance tests between variables and logistic regression model was used to identify predictors of latrine availability of religious institutions.

**Ethical consideration**

Ethical approval and clearance was obtained from the Tigray health research institution and official letter from religious leaders. Written informed consent was warranted from all participants.

**Results**

**Characteristics of the religious institution**

In the present study total of 385 religious institution sampled and 351 of them had been
included to the study. From this 285(81.2%) of them were Orthodox Church. Majority of the religious institutions service 288(82.1%) were church/mosque only and fifty four percent of the participants (n=188) found in rural area. Mean age of the institution were 83.2 years with ±SD of ±119 [Table 1].

Table 1: General characteristic of religious institution, Northern Ethiopia, 2017 (n=351)

| Characteristics                     | Category          | Frequency | Percentage |
|-------------------------------------|-------------------|-----------|------------|
| Type of religious institution       | Orthodox church   | 285       | 81.2       |
|                                     | Muslim mosque     | 60        | 17.1       |
|                                     | Catholic church   | 4         | 1.1        |
|                                     | Protestant church | 2         | 0.6        |
| Service given in the institution    | Church/Mosque only| 288       | 82.1       |
|                                     | Church with holy water | 63     | 17.1       |
| Residence                           | Urban             | 159       | 45.5       |
|                                     | Rural             | 188       | 54.5       |

| Characteristics                          | Mean± SD          |
|------------------------------------------|-------------------|
| Age of the institution                    | 83.2±119          |
| Age of the respondent                     | 52.3±15.2         |
| Peoples permanently living here           | 11.6±36.6         |
| Estimation of the community served here   | 1308±382          |

**Environmental characteristics**

Of the institutions, 236(67.2%) had no latrine and the majority of the latrine were pit latrines 80(69.6%). Fifty seven percent of the institutions reasons for not having latrine was cost is too high to build latrine, no materials and no external assistance. Around ninety eight percent of the (n=233, 98.7%) institutions from those who didn’t have latrine the priests and servant defecate openly. At the time of data collection, 82 (23.4%) latrines were functional. Around one third or 41(35.7%) of the latrines were below 15 meter from the drinking water/holy water/. Seventy six percent of the latrine was in a distance of above 12 meter from the priests serve.

Table 2: Environmental conditions of religious institutions, Northern Ethiopia, 2017,
(n=351)

| Characteristics                              | Category                                      | Frequency |
|----------------------------------------------|-----------------------------------------------|-----------|
| Any type of latrine                          | Yes                                           | 115       |
|                                              | No                                            | 236       |
| Type of latrine                              | Pit latrine                                   | 80        |
|                                              | Others                                        | 35        |
| Reasons for not having latrine               | Cost is too high, no materials and no external assistance | 202       |
|                                              | Open defecation tradition, habit               | 19        |
|                                              | Not thought about it and no one to build latrine | 15        |
| Place of defecation                          | Open field                                    | 233       |
|                                              | Other                                         | 3         |
| Functional latrine                           | Yes                                           | 82        |
|                                              | No                                            | 33        |
| Distance of latrine to the closest drinking water/holy water/ | Below 15 meter                                | 41        |
|                                              | 15-30 meter                                   | 25        |
|                                              | Greater than 30 meter                         | 49        |
| Distance of latrine from the room priests serve | Below 6 meter                                 | 18        |
|                                              | 6-12 meter                                    | 9         |
|                                              | Above 12 meter                                | 88        |
| Number of rooms of the latrine               | Below 2 rooms                                 | 59        |
|                                              | 2-4 rooms                                     | 29        |
|                                              | Above 4 rooms                                 | 24        |
| Clean latrine                                | Yes                                           | 55        |
|                                              | No                                            | 60        |
| Frequency of cleaning latrine                | Daily                                         | 42        |
|                                              | Weekly                                        | 35        |
|                                              | Almost never                                  | 38        |
| Presence of hand washing                     | Yes                                           | 39        |
|                                              | No                                            | 76        |
| Type of hand washing                         | Tap only and sink                             | 18        |
|                                              | Water pot/container and cup                   | 21        |
| Latrine condition                            | Need maintenance                              | 80        |
|                                              | No need maintenance                           | 35        |
| Reasons for not improving/ changing latrine type | Financial problem/No support                 | 40        |
|                                              | Personal and space problem                    | 40        |
| Possible ways encouraging you build a latrine | Full subsidy and Contribution from NGOs       | 147       |
|                                              | Community pressure and/or material and labor assistance | 89        |
| Anyone diseased in this institution          | Yes                                           | 42        |
|                                              | No                                            | 309       |
Currently any money saved towards having a latrine

| Characteristics                  | Yes | No |
|----------------------------------|-----|----|
| Currently any money saved towards having a latrine | 16  | 220|

Institution discussed about building latrine

| Characteristics                  | Yes | No |
|----------------------------------|-----|----|
| Institution discussed about building latrine | 113 | 123|

**Behavioral characteristics**

Regarding the behavioral condition majority 319 (90.9%) of the respondents believe that using latrine can prevent disease and nine out of 10 respondents believe that hand washing can prevent disease. Out of the religious institutions that have hand washing facility with latrine 32 (82.1%) was using only water for hand washing. Fifty six percent (n=22) of the community or priest served in the institutions wash their hands after toilet. Half 59 (51.3%) of the respondents who have latrine serve their latrine properly.

Table 3: Behavioral conditions of religious institutions, northern Ethiopia, 2017

| Characteristics                  | Category                      | Frequency | Percentage |
|----------------------------------|-------------------------------|-----------|------------|
| Do you believe that using latrine can prevent disease | Yes                           | 319       | 90.9       |
|                                  | No                            | 32        | 9.1        |
| Do you believe that hand washing can prevent disease? | Yes                           | 320       | 91.2       |
|                                  | No                            | 31        | 8.8        |
| Materials used in hand washing  | Only water                    | 32        | 82.1       |
|                                  | water + soap or ash           | 7         | 17.9       |
| Wash their hand after toilet (community and priests) | Yes                           | 22        | 56.4       |
|                                  | No                            | 17        | 43.6       |
| Serving the latrine properly    | Yes                           | 59        | 51.3       |
|                                  | No                            | 56        | 48.7       |

**Communication related factors**

Seventy eight percent (n=275) of the respondent seen, heard or received any messages or materials on sanitation and hygiene. Around one-third of (n=90) respondents had received
message on building latrine. One hundred twenty five (45.5%) of the respondents heard or observe the messages from community meetings. Three out of ten 103(29.3%) of the sanitation and hygiene message was delivered by health extension workers. Below half of 153(43.6%) respondents prefer radio or/and Television (TV) for health education.

Table 3: Communication related factors of religious institutions, Northern Ethiopia, 2017

| Characteristics                                                                 | Category                                                                 | Frequency |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------|
| Seen, heard or received any messages or materials on sanitation and hygiene      | Yes                                                                      | 275       |
|                                                                                  | No                                                                       | 76        |
| Kinds of sanitation and hygiene messages have you seen, heard or received       | Build a latrine                                                          | 90        |
|                                                                                  | Use a latrine/ stop open defecation                                      | 58        |
|                                                                                  | Proper solid, liquid waste management                                    | 15        |
|                                                                                  | Wash hands with soap                                                     | 65        |
|                                                                                  | Water and food hygiene                                                   | 46        |
| where did you see, hear, receive these messages                                 | Posters or leaflets and newspapers or magazines                           | 55        |
|                                                                                  | At community meetings                                                    | 125       |
|                                                                                  | When visiting a health facility                                          | 56        |
|                                                                                  | On Television and/or Radio                                               | 39        |
| From whom did you hear/ receive these messages                                  | Village chief                                                           | 82        |
|                                                                                  | Commune chief/ council                                                   | 29        |
|                                                                                  | Government agency other than health                                      | 35        |
|                                                                                  | From health extension works                                              | 103       |
|                                                                                  | From coordinators of church                                              | 26        |
| Preferred channel of communication or mechanisms to get information            | Radio or/and TV                                                          | 153       |
|                                                                                  | House visit                                                              | 90        |
|                                                                                  | Through Church/mosque                                                    | 63        |
|                                                                                  | Pictures /posters                                                        | 45        |

Factors associated with availability of latrine

In order to identify significant variables that were associated with the outcome variable,
all significant variables with p-value less than 0.25 in bi-variate analysis were fitted into the final model. The model showed that currently any money saved towards having a latrine (AOR: 0.32, 95% CI [0.25, 0.42]), seen, heard or received any messages on sanitation and hygiene (AOR: 0.43, 95% CI [0.38, 0.51]) and place you see, hear, receive these messages (AOR: 2.95, 95% CI [1.11, 5.55]).

Religious institutions that had not saved money for sanitation and hygiene were 68% times less likely to have latrine than institutions that had saved money. Head of religious institutions that had not seen, heard or received any messages on sanitation and hygiene were 57% times less likely to own latrine than those who had seen, heard or received any messages on sanitation and hygiene. Head of religious institutions that had receive message from Posters or leaflets and newspapers or magazines were 2.95 times more likely to own latrine than received message by television and/or radio [Table 5].

Table 5: The main predictors of latrine availability among religious institutions of Tigray Region, Northern Ethiopia, 2018 (n = 351)
| Characteristics                                                                 | Latrine Availability, n (%) | OR (95%CI)  |
|--------------------------------------------------------------------------------|-----------------------------|------------|
|                                                                                | Yes | No          | Crude | Adjusted |
| Possible ways encouraging you build a latrine                                  |     |             |       |          |
| Full subsidy and Contribution from NGOs                                         | 12(8.16) | 135(91.84) | 1.42(0.58-3.45) | NS       |
| Community pressure and/or material and labor assistance                         | 10(11.24) | 79(88.76) | 1   |          |
| Currently any money saved towards having a latrine                              |     |             |       |          |
| Yes                                                                             | 9(56.25) | 7(43.75) | 1   |          |
| No                                                                              | 57(25.91) | 163(74.09) | 0.27(0.09-0.76) | 0.3      |
| Institution discussed about building latrine                                     |     |             |       |          |
| Yes                                                                             | 34(30.09) | 79(69.91) | 1   | NS       |
| No                                                                              | 30(24.39) | 93(75.61) | 0.75(0.42-1.33) |          |
| Seen, heard or received any messages or materials on sanitation and hygiene      |     |             |       |          |
| Yes                                                                             | 105(38.18) | 170(61.82) | 1   |          |
| No                                                                              | 10(13.16) | 66(86.84) | 0.25(0.12-0.49) | 0.4      |
| Kinds of sanitation and hygiene messages have you seen, heard or received       |     |             |       |          |
| Build a latrine                                                                 | 26(28.89) | 64(71.11) | 1.89(0.90-3.97) |          |
| Use a latrine/ stop open defecation                                             | 27(46.55) | 31(53.45) | 0.88(0.41-1.92) |          |
| Proper solid, liquid waste management                                           | 8(53.33) | 7(46.67) | 0.67(0.21-2.17) |          |
| Wash hands with soap                                                            | 24(36.92) | 41(63.08) | 1.31(0.61-2.84) |          |
| Water and food hygiene                                                          | 20(43.48) | 26(56.52) | 1   | NS       |
| where did you see, hear, receive these messages                                 |     |             |       |          |
| Posters or leaflets and newspapers or magazines                                 | 17(30.91) | 38(69.09) | 2.35(1.01-5.50) | 2.5(1.2) |
| At community meetings                                                           | 48(38.40) | 77(61.60) | 1.69(0.82-3.48) | 1.5(1.3) |
| When visiting a health facility                                                 | 14(25.00) | 42(75.00) | 3.16(1.32-7.55) | 3.0(1.7) |
| On Television and/or Radio                                                      | 20(51.28) | 19(48.72) | 1   | 1        |
| From whom did you hear/ receive these messages                                  |     |             |       |          |
| Village chief                                                                   | 23(28.05) | 59(71.95) | 2.99(1.21-7.43) |          |
| Commune chief/ council                                                          | 13(44.83) | 16(55.17) | 1.44(0.49-4.16) |          |
| Government agency other than health                                             | 16(45.71) | 19(54.29) | 1.39(0.50-3.84) |          |
| From health extension works                                                     | 39(37.86) | 64(62.14) | 1.92(0.80-4.56) |          |
| From coordinators of church                                                    | 14(53.85) | 12(46.15) | 1   | NS       |
| Age of the institution                                                          |     |             |       |          |
| Age of the respondent                                                           |     |             |       |          |
| Peoples permanently living here                                                 |     |             |       |          |

NB: NS indicates non-significance

Discussion

The main objective of this study was to assess level of latrine availability and its associated factors in religious institution in Tigray Region. Accordingly, the present study revealed that the overall availability of latrine was 32.8%. The national and regional
The target for latrine availability is 100% in all settings [15]. However, the study reported that three out of ten religious institutions had latrines, so this implies that there is low coverage of latrines among religious institutions in the region. This study result was low compared with the study done in Ethiopia (which 59% of households own latrine) [16] and with EDHS 2016 which showed more than half (56%) of rural households use unimproved toilet facilities [17]. This might be due to the fact that there was no persistent health education program carried out to visitors of religious institutions. So, communities who are served there will not perceive that building latrines can prevent different diseases and childhood diarrhea. Also, possible reasons could be that heads of the institution did not strongly handle visitors' defecation practice.

This study exposed that religious institutions that had saved money for sanitation and hygiene was significantly associated with availability of latrines. This is consistent with study done by the World Bank which indicates that those without latrines tend to be poorer than those higher on the sanitation ladder and open defecators cite lack of finances,” or “don’t have money” as key barriers to building latrines or making improvements [18]. So, religious institutions that have saved money for the purpose of latrine construction might employ daily laborers to construct the latrine. A study indicated that latrine promotion programs like community-led total sanitation were least effective in communities where subsidies had already been given to the community members [19]. Thus, institutions saved money for the purpose of latrine construction might own or build latrines.

Head of religious institutions that had not seen, heard or received any messages on sanitation and hygiene were 57% times less likely to own latrine than those who had seen, heard or received any messages on sanitation and hygiene. This could be because institutions receiving messages concerning latrine construction were better informed about the importance of building latrine facilities and its utilization through health-promotion
programs and community mobilization. If communities visiting religious get information regarding latrine and they might perceive risk of practicing open defecation and has the potential to stimulate and shape communities’ behaviors [20].

Religious institutions that had receive message from posters or leaflets and newspapers or magazines were more likely to own latrine than received message by television and/or radio. This could indicate the socio economic of the community, if government and nongovernmental organizations need to educate the community, they should have to use low cost mechanism of transmissions. Generally to increase latrine availability health professionals should sustainably educate on the implementation of the community-led total sanitation and hygiene approach [21].

Conclusion

Availability of latrine was very low when compared to the national target of 100% among the religious institution and also over half of the available latrines required maintenance. Latrine availability was influenced by the currently saved any money towards having latrine, any messages on sanitation and hygiene received and place where the message received. Information regarding latrine availability should be provided to the community visiting religious institutions through available channels and practical models promotion. Messages focusing on human proper feces disposal should be scale up into the community throughout. Providing enough information about latrine construction and cleanliness through health education is good to improve latrine availability.

Abbreviations

AOR          Adjusted Odds Ratio
CI           Confidence Interval
DALY         Disability Adjusted Life Year
Declarations

**Ethics approval and consent to participate**

Participation was voluntary. Before the interview, the interviewer explained in detail the content of the questionnaire, informed the participants on confidentiality of their responses and of their free choice to withdraw from the study during the interview or later. A written consent was obtained from all participants. The study was approved by the Institutional Review Board of the Tigray health research Institute (No: RMT/0061/2018).

**Consent for publication**

“Not applicable”

**Availability data and material**

The datasets used and/or analyzed during the current study is available from the corresponding author on request.

**Competing interest**

The authors’ declare that they have no conflict of interest.

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**Author’s contribution:**

MWA: Conceptualization, Methodology, analysis, writing original draft of the manuscript.

KD: Methodology, review & editing of the manuscript

TT: Methodology, review & editing of the manuscript

All authors have read and approved the manuscript

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