Original article

Sanitary Survey in Gondar Town

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Abstract

Background: The health and well being of population is directly affected by extremely low coverage of water supply and sanitation.

Objectives: This study aims to assess the environmental sanitation status of Gondar town.

Methods: A cross-sectional study was conducted on the basis of the administrative structure of the town. The town was stratified into high density and low-density areas from which households were selected randomly from each stratum. A structured questionnaire was used for the household survey.

Results: There is a relatively high risk of exposure to poor environmental conditions in high population than low population density area. The association between educational status and income with availability of latrine was statistically significant, the literates and the economically better-off have a better sanitary facility. Excreta disposal facilities are generally inadequate and poorly maintained. The per capita water consumption was 12 liters/day, which is very low when compared to 30-40 liters per day for urban residents, as per the WHO standard.

Conclusion and recommendation: This study found that the sanitary status of the town to be poor. Thus, the municipality should give priority attention to improve the sanitary conditions in the town. [*Ethiop.J.Health Dev.* 2004;18(1):39-42]

Introduction

The health and well being of population is directly affected by the coverage of water supply and sanitation (1). The impact of poor environmental conditions on the transmission of communicable disease is well established. High incidence of childhood diarrhea, helimenthiasis, trachoma and high mortality rates are associated with poor sanitation and water supply (2-6). Excreta contain a wide variety of human pathogens and removal of these pathogens from the immediate environment has a dramatic impact on health (7). Ethiopia is among the few countries were such problems have clearly manifested (1,8). Health is highly influenced water and sanitation related diseases.

Gondar town is located in the northwestern part of Ethiopia and its varied landscape, dominantly covered with ragged hills and plateau formations, imparts variable temperatures largely favoring a wide range of illnesses. Gondar is an old town, which is not properly planned, zoned, and has no sufficient sanitation facilities. Alike most towns in Ethiopia, the population size is rapidly increasing, which is about 112,000(8). The existing environmental condition compounded with the poor hygiene behavior of the community has caused the expected improvement to be unchanged for a long time. On the other hand, environmental problems have worsened from time to time. The purpose of this study is to assess the sanitation status in Gondar town.

Methods

A cross-sectional study was conducted from February to March 1999 in Gondar town. The town is divided into 20 "Kebeles", each of which is divided into a number of "Ketenas" which represent the lowest administrative urban units. The basic administrative structure of the town and the population size was estimated based on 1994 Population and Housing Census. There was marked division between population densities of different "Kebeles" with in the town. Population density was therefore viewed as a key variable to stratify the population for sampling in order to get a fairly representative study subjects. High population density in reference to "Kebeles" was assumed that with a size above the median population, and low population density was chosen below the median population among the study "Kebeles". "Ketenas" within "Kebeles'" were assumed to have relatively similar size. Population density was taken in order to detect the magnitude of the problem associated with congestion, overcrowding of houses, overloading of drainage, solid wastes, high risk of transmission of infections and accidents, scarcity of water and sharing spaces.

The median population density was chosen as a reference point to separate high and low density "Kebeles". A stratified multistage sampling design was adapted to select the study subjects. Five "Kebeles" from each high and lowdensity area were randomly selected in the first stage. Twenty-eight out of 48 "Ketenas" from high-density "Kebeles" and 20 out of 30 "Ketenas" from low-density areas were also randomly selected in the second stage. Finally, a systematic sampling method for the selection of households was applied for each chosen "Ketenas", the numbers of which were proportional to population size. Sample size was calculated for a single proportion assuming 30% sanitation coverage.

A structured pre-tested questionnaire was prepared to collect information on socio-demographic factors, latrine solid waste management, and drinking water supply. Per capita water consumption was estimated based on the frequency of water collection, the commonly used container used for water collection, and household size. Fifteen

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enumerators were trained for data collection. Head of each household were interviewed. Two supervisors (sanitarians),

There were a total of 1516 households during the study period. Of these, 985 (65%) were in the high density Kebeles and 531 (35%) were in the low density Kebeles. Respondents

Table 1: **Distribution of latrines availability, by educational status, monthly income (Birr), and population density in Gondar town, March, 1999 (n=1516)**

Characteristics	Latrine availability		Total	X^2 (p-value)
	Yes No (%)	No No (%)	No (%)	
Educational status				
Literate	509 (58.6)	359 (41.4)	868 (57.3)	48.39 (P<0.001)
Illiterate	263 (40.6)	385 (59.4)	648 (42.7)	
Monthly income (ETB)				
< 100	137 (27.9)	354 (72.1)	491 (32.4)	244.34 (p<0.001)
101-300	282 (48.9)	295 (51.1)	577 (38.0)	
> 300	353 (78.8)	95 (21.2)	448 (29.6)	
Population density				
High	461 (46.8)	524 (53.2)	985 (65.0)	19.11 (p<0.001)
Low	311 (58.6)	220 (41.4)	531 (35.0)	

There was a statistically significant association between higher educational status and latrine availability (X^2=48.4; p<0.001). Four hundred ninety one (32.4%) of the households were getting a monthly income of less than100 Birr. There is also a statistically significant association between income and availability of latrine (p<0.001). An average area of a housing unit was 34.96 square meters with a mean of 5.20 persons and 2 rooms per housing unit. Only 758 (50 %) of households had kitchen.

Four hundred ninety nine (64%) of the latrines were privately constructed; others were by governmental, nongovernmental organization (NGO) and communities. About 80% of the latrines one of the traditional type (Table 2). An

average of 18 users shared one pit latrine. Seven hundred seventy two households (50.9%) had latrines and 23 (3%) had facilities for urination. Eighty seven (11.3%), of the children did not use latrines, because of fear of falling   in   through the squatting hole and darkness. The main reasons for not having latrine are high cost and lack of space (Table3). Seven hundred sixty nine (50.7%) of the households were disposing solid waste in the open field. Others used private pit, *Kebele's* selected site and municipal collection containers. One thousand four hundred thirty one respondents (94%) washed their hands after toilet. Of these, eight hundred fifty three (59.6%) of the respondents washed without soap, while 579(40.4%) washed with soap.

Table2: **Ownership and type of latrines in Gondar town households, March, 1999, (n=772)**

Characteristics		Latrine availability	
		No	%
	Individual	499	64.6
Latrine ownership	Communal	251	32.5
	Public	22	2.9
	Traditional	611	79.1
Type of latrine	VIP	90	11.7
	Water-flush	71	9.2

one for each density category, were trained for cocoordination and data quality management. The dimensions of the housing units were measured using a metered tape measure. Data was then entered, edited and analyzed using EPI- info version 6 statistical package.

interviewed at the households' level were 771(51.9%) male and 745(49.1%) female. Eight hundred sixty eight (57.3%) of the respondents were found to be literate and seven hundred seventy two (50.9%) of the households had latrines (Table 1).

Table 3: **Reasons for not having Latrine, Gondar town, March 1999 (n=744)**

Reasons	Number	%
Too costy	356	47.8
No space	294	39.6
Not necessary	10	1.3
Others	84	11.3

The per capita consumption of water in the study area was low (12 liters) compared to other urban areas of Ethiopia (1). Inability to pay for water, poor health awareness, and the poor level of personal hygiene might explain lesser amount of water consumption. Diarrhea, poor personal hygiene and eye problems, are common health problems in the study area. Personal and Environmental hygiene is very low where water is not adequately used (5).

Table 4: **Ownership and type of latrines in Gondar town households, March, 1999, (n=772)**

Characteristics	Latrine availability		
		No	%
Latrine ownership	Individual	499	64.6
	Communal	251	32.5
	Public	22	2.9
	Total	722	100
Type of latrine	Traditional	611	79.1
	VIP	90	11.7
	Water-flush	71	9.2
	Total	772	100

Majority, 1449 (95.6%), of the households were using safe and municipal piped water. Eight hundred forty six (55.8%) of the households fetched water outside their housing compounds using public distribution points. The average consumption of water per capita per day was 12 liters. Eight hundred ninety nine (81 %) of the households were complain about scarcity of water and 150 (13.5%) complain about turbidity of water during the rainy seasons. Only 60 (4%) of the households were using home based water treatment facilities like boiling, chlorination and filtration.

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Discussion
The study was able to indicate the condition of environmental sanitation in Gondar town mainly in relation to water supply, housing, sanitation and hygienic practices. The situation in most cases was very poor. This may be due to socio-economical, cultural, and related knowledge barriers inherent in the study area.

The high converge of safe water supply can be linked to the reasonable accessibility of municipal water supply facilities.

The availability of excreta disposal facilities in 50.9% of the households is grossly inadequate, and is characterized by poor maintenance. That is not different from the 1994 population and housing census results for Gondar, which was about 50% (8). These figures were evident for the low priorities in the implementation of urban sanitation related developments. Free land space is not available for private and communal latrine construction in highly crowded Kebeles.

The main source of municipal solid waste is domestic refuse. Because of lack of space for storing and collecting wastes and possibly low awareness on how to handle the refuse, especially in high-density areas, the household vicinities were found to be full of solid wastes scattered all over. The condition is, therefore, likely to present a high risk for the continued transmission of communicable diseases despite the efforts made by the municipality to alleviate the existing solid waste management problems.

In conclusion, the results of this study showed the extent of the sanitary problems of the town. Hygienic practices were not observed in accordance with established norms for

keeping hygiene and sanitation better. Crowding and mismanagement of the urban land have been the contributing factors for the worsening of the provision of health services in general, and the urban sanitation in particular. The poor sanitation conditions in many urban centers of Ethiopia is largely contributed by the negligence of sanitation developments by responsible agencies. Based on the findings the following were recommended:

- Communal water standpipes should be provided for low-income households in order to improve accessibility and adequateness of water supply.
- Proper and adequate public latrines should be constructed at selected areas to improve accessibility and use.
- More municipal refuse containers for secondary waste storage have to be established to ensure proper waste collection.
- Policy makers should continue their efforts in addressing the proper management of urban sanitation.

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