ETHNO MEDICINAL STUDY OF PLANTS IN JIGJIGA WOREDA, EASTERN ETHIOPIA

By

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ABSTRACT

Ethno medicinal study of plants in Jigjiga Woreda, eastern Ethiopia

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Traditional medicine (TM) is the ancient and culture bound medical practice which existed in human societies before the application of modern science to health. The practice of TM varies widely, in keeping with the societal and cultural heritage of different countries. The heritage has not been well documented in the developing countries including Ethiopia and this is even more so in the emerging regions of the country. The objective of this study was to determine the prevalence and identify factors determining the use of TM and record medicinal plants used by Somali ethnic group in Ethiopia. A community based cross-sectional study in which ethno medicinal information was collected from the community by using semi-structured questionnaires, supplemented by an in-depth interview with the healers, field observations, and market survey was conducted. The questionnaire was administered to 800 heads of households, 9 healers and 2 markets & 3 herbal drug shops. The study documented an overall prevalence rate of 40% in the use of herbal medicine in one month recall period. A total of 107 plant species were reported, among these plant species, 34 were fully identified by their scientific names. The reasons for preferring for herbal drugs were lower price, efficacy and geographic inaccessibility of modern medicine. The study found that leaves are the most frequently utilized plant part (30.5%), followed by roots (23%). Religion is the main source of knowledge for the healers. Age, gender, educational status and occupation are important factors that determine the use of TM. This comprehensive ethno- medicinal study showed that the community in Jigjiga Woreda

relies on considerable number of traditional medicinal plant species to treat wide spectrum of human ailments.

Key words: Ethnomedcine, Herbal medicine, In-depth interview, Market survey, Medcinal plants, Prevalence, Traditional medicine

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List of abbreviations

AOR	Adjusted Odds Ratio
CAM	Complementary Alternative Medicine
COR	Crude Odds Ratio
HHs	Households
JWHO	Jigjiga Woreda Health Office
MHI	Modern Health Institution
MOH	Ministry of Health
PHC	Primary Healthcare
RS	Random Sampling
SRS	Systematic Random Sampling
SPSS	Statistical Package for Social Science
TB	Tuberculosis
TM	Traditional Medicine
WHO	World Health Organization

1. INTRODUCTION

1.1. Background

Traditional medicine (TM) is the ancient and culture–bound medical practice which existed in human societies before the application of modern science to health. The practice of TM varies widely, in keeping with the societal and cultural heritage of different countries (WHO, 2000). Globally, people developed unique indigenous healing traditions adapted and defined by their culture, beliefs and environment, which satisfied the health needs of their communities over centuries (WHO, 2005).

The importance of TM as a source of primary healthcare (PHC) was first officially recognized by the World Health Organization (WHO) in the PHC Declaration of Alma Ata (1978) and has been globally addressed since 1976 by the TM Programme of the WHO. According to that Programme they defined TM as "the sum total of all the knowledge and practices, whether explicable or not, used in diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observation handed down from generation to generation, whether verbally or in writing" (WHO, 1978).

According to the WHO, the percentage of the population in developing countries that depends on TM for their PHC ranges from 40% (Colombia) to 90% (Ethiopia) (WHO, 2002). How these figures were calculated is not revealed in the WHO statistics, nor do we know the share of herbal medicine within these TM percentages. Most figures seem to refer to rural communities that have a limited access to conventional medicine and are surrounded by environments in which herbs are easily accessible (Bodeker and Kronenberg, 2002). However different studies indicate

that a significant number of populations use TM in Ethiopia. For example, a study conducted in Bankogazer Woreda, Wombera district, Dabat district, and Berta ethnic group showed that the prevalence of TM uses during the two weeks period was 44.9%, 41.6% 25.2%, 4.6%, respectively (Weldegerima *et al.*, 2004; Mideks *et al.*, 2005; Flatie *et al.*, 2009; Guji *et al.*, 2011). At the same time, various studies conducted in different parts of the country revealed the availability of plenty of traditional medicinal plants (Hunde *et al.*, 2006; Tolossa *et al.*, 2013; Yirga 2010; Yirga and Zeraburk, 2011). In fact, the richness of Ethiopian flora has led researchers to classify it as a world center of diversity, and the country is often quoted as one of the six countries of the world where about 60% of the plants are said to be indigenous with their healing potential (Giday, 2001; Addis, *et al.*, 2001). Even though the literature indicates that a significant number of people use TM in Ethiopia, this heritage has not been well documented. This is even more so in relatively emerging parts of the country.

1.2. Statement of the problem

The amount of medicinal plants of Ethiopia, as documented by National Biodiversity Strategy and Action Plan shows that about 887 plants are utilized in the TM. Among these, about 26 species are endemic and they are becoming increasingly rare and are at the verge of extinction. Equally threatened is the knowledge base on which the traditional medicinal system is based, as the ethnobotanical information is not documented and remains in the memory of elderly practitioners (Tanto *et al.*, 2002).

The National Policy of TM under the current Federal Democratic Republic of Ethiopia was issued as part of the Health, Drug, and Science and Technology Policy issued in 1993 (FMOH, 1993).TM is placed as one of the eight priorities of the current Health Policy. The policy indicates that due attention shall be given to the development of the beneficial aspects of TM including related research and its gradual integration into modern medicine. The general strategies adopted include identifying and encouraging the utilization of its beneficial components, coordinating and encouraging research including its linkage with modern medicine and developing appropriate regulation and registration of practitioners (FMOH, 1993). Unfortunately, little has been done in recent decades to enhance and develop the beneficial aspects of TM including relevant research to explore possibilities for its gradual integration into modern medicine (Kassaye *et al.*, 2006).

In Ethiopia, even though traditional medical practitioners are the best sources of information about the knowledge of medicinal plants, it is very difficult to obtain their traditional medicinal information as they consider their indigenous knowledge as a professional secret, only to be

passed orally to their older son, at their oldest age (Jansen, 1981). Moreover, the local indigenous knowledge on medicinal plants is being lost at a faster rate with the increase of modern education, which has made the younger generation to underestimate its traditional values (Pankhurst, 2001). As is happening elsewhere in Ethiopia, traditional medication is believed to be an important healthcare system, which mainly involves the use of locally available medicinal plants. However, the loss of valuable medicinal plants due to population pressure, agricultural expansion, which is aggravated by deforestation, is widely reported by different researchers in Ethiopia (Abebe, 2001; Getachew and Shiferaw 2002).

The other reasons stated were increasing high mobility and displacement of communities due to several factors (Addis, *et al.,* 2001). Knowledge is conveyed from generation to generation through word of mouth. Lack of documentation and underreporting of ethnomedicinal plant knowledge are some of the major problems of TM in Ethiopia (Yineger and Yewhalaw, 2007; Birhanu, 2013). Therefore, detailed information on medicinal plants of Ethiopia could only be obtained when studies are undertaken in the various parts of the country where little or no botanical and ethnobotanical explorations have been made.

The available literature has no information about the use of traditional medicinal plants in the study area. Hence, documentation of cultural heritage as a whole and ethnobotanical information of medicinal plants of the country in particular is one of the ways of preserving indigenous knowledge of the people on medicinal plants before it is lost irretrievably. Therefore, the present study is, initiated with an intention to add information concerning indigenous knowledge associated with traditional use of medicinal plants by people of Jigjiga Woreda, eastern Ethiopia.

1.3. Literature review

1.3.1. Herbal medicine

Herbal medicines, also called botanical medicines or phyto-medicines, refer to the use of herbs, herbal materials, herbal preparations, and finished herbal products that contain parts or whole plant materials as active ingredients (WHO, 2007). The plant materials include seeds, berries, roots, leaves, bark or flowers (Ehrlich, 2010). During the past decades, public interest in natural therapies, namely herbal medicine, has increased dramatically not only in developing countries but mainly in industrialized countries (Blumenthal, 1998).

Of the 252 drugs considered as basic and essential by the WHO, 11% are exclusively of plant origin and a number of synthetic drugs are obtained from natural precursors. Examples of important drugs obtained from plants are digoxin from *Digitalis* spp., quinine and quinidine from *Cinchona* spp., vincristrine and vinblastine from *Catharanthus roseus*, atropine from *Atropa belladonna* and morphine and codeine from *Papaver somniferum*. It is estimated that 60% of anti-tumour and anti-infectious drugs already on the market or under clinical trial are of natural origin (Rates, 2000). Currently, phytomedicines obtained from herbal sources are in great demand in the developed world as they are able to cure many infectious diseases. These plant based drugs provide outstanding contribution to modern therapeutics. The natural medicines are attracting renewed attention from both practical and scientific points of view (Pandey *et al*., 2011).

1.3.2. African traditional medicine

African TM is the oldest and perhaps the most diverse of all medicine systems. Africa is considered to be the cradle of humankind with a rich biological and cultural diversity marked by

regional difference in healing practices. Unfortunately, the systems of medicine are poorly recorded and remain so to date. Yet the documentation of medicinal uses of African plants is becoming increasingly urgent because of the rapid loss of the natural habitats of some of these plants because of anthropogenic activities. The African continent is reported to have one of the highest rates of deforestation in the world. The paradox is that it is also a continent with a high rate of endemism with the Republic of Madagascar topping the list at 82% (Green and Sussman, 1990). African TM in its varied forms is a holistic system involving both the body and the mind. The healer typically diagnoses and treats the psychological basis of an illness before prescribing medicines to treat the symptoms (Gurib-Fakim, 2006).

1.3.3. Ethiopian traditional medicine

Traditional mechanisms of dealing with illness had been utilized for centuries in Ethiopia. It was the exclusive source of healthcare for the majority of people until fairly recently (Pankhurst, 1990). The practice of TM in Ethiopia consists of the use of herbs, spiritual healing, bone-setting, and minor surgical procedures, and vary in their form, procedure, and content according to local customs, and are very widely practiced. During and after Italian occupation, the general population, with the exception of few privileged groups, depended almost entirely on TM. Until in 1942 TM was not protected by law or until Proclamation No.27 of 1942, which related to the registration of medical practitioners (Pankhurst, 1990).

Formal recognition to TM in Ethiopia was given in 1942 (Proclamation 27) where the legality of the practice is acknowledged as long as it does not have negative impact on health. This was reaffirmed in the 1943 and 1948 (Proclamation 100) Medical Registration Proclamations. Articles in the Ethiopian Penal Code (512/1957) and the Civil Code (8/1967) provide guidelines

for the practice of TM. But they did not stipulate any requirement for registration. Registration and licensing were introduced in 1950 (Beshaw, 1991).

During the Derg period of the 1970s and 1980s the country's health policy emphasized disease prevention and health service development in the rural areas. It was followed by official attention to the promotion and development of TM, particularly after the adoption of the PHC Strategy in 1978. In November 1979, the Office for the Coordination of TM was established. It conducted chemical assays and biomedical studies of some herbal medicines and a total of 6,000 traditional practitioners were registered and a monograph describing 260 medicinal plants was prepared. Meetings and workshops were organized that brought together traditional and modern medical practitioners. In different areas of the country healers also formed their own professional associations. However, these lacked guidance, funds and personnel to help them move forward. Laws and regulations on TM were issued under the Drug Administration and Control Proclamation No. 176/99. The national drug program is one of the responsibilities of the former Drug Administration and Control Authority (DACA) which was established by Proclamation No. 176.DACA. An Expert Committee is also a part of the former DACA. The former DACA was responsible for preparing standards of safety, efficacy and quality of TM, and for evaluating laboratory and clinical studies. It was also entrusted with the provision of license for the use of TM in the official health services (Kassaye *et al*., 2006).

2. OBJECTIVES OF THE STUDY

2.1. General objective

To determine the prevalence and identify factors determining the use of TM and record medicinal plants used by Somali ethnic group in Jigjiga Woreda, eastern Ethiopia

2.2. Specific objectives

- To determine the prevalence of the use of TM among Somali ethnic group in Jigjiga Woreda, eastern Ethiopia;
- To identify factors that influences the choice of healthcare in Jigjiga Woreda, eastern Ethiopia;
- To document knowledge of indigenous people and traditional healers on medicinal plants as regard their use, formulation, dosage, side effects and drug interactions;
- To collect specimens of medicinal plants used by household respondents and TM practitioners of Somali people in Jigjiga Woreda for identification and deposition; and
- To determine market price of medicinal plants sold in the market in Jigjiga Woreda, eastern Ethiopia.

3. DESCRIPTION OF THE STUDY AREA

3.1. Location and climate

Jigjiga is a city in eastern Ethiopia and the capital of the Somali Region. It is located in the Jigjiga Zone approximately 80 km east of Harar and 60 km west of the border with Somalia, this city has an elevation of 1,609 meters above sea level. The climate of Jijiga is semi-arid (Köppen climate classification: BSk), with the influence of mountain climate, with hot and dry summers and cold winters. This is attributed to the fact that Jijiga is located on a plain surrounded by mountains and to its distance to the sea and its effects (Fig 1).

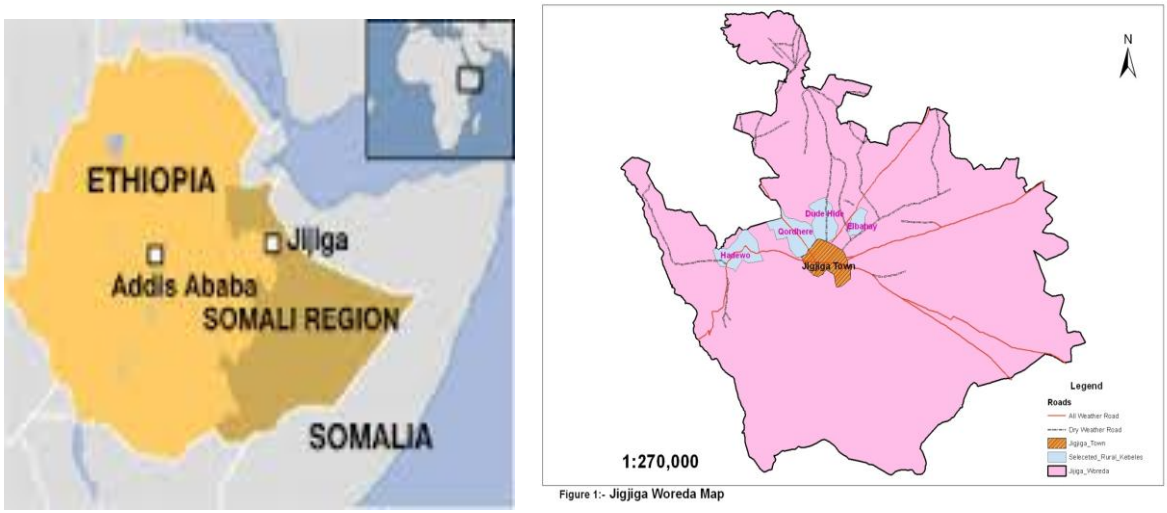


Figure 1: Map of Jigjiga Woreda

Source: Central Statistical Agency, Cartography Department, 2014.

3.2. Population

From unpublished documents of the Woreda, the population is estimated to be about 230,174; of whom 56.4% are males while the remaining 43.6% are females. In Jigjiga Woreda there are four ethnic groups (Somali, Oromo, Amhara, Guragae). The Somali ethnic group is the most

predominant (99.0%) followed by Oromo (0.44%), Guragae (0.30%), and Amhara (0.25%) (JWHo, 2013).

3.3. Health services and common health problems

Manpower and infrastructure: Currently the Woreda has one general hospital, five health centers, and twenty six health posts, which are government owned.In the Woreda, 10 specialist, 20 physicians, 10 health officers, 30 BSC nurses, 10 druggists, 10 lab professtionals, 25 diploma midwives, forty clinical nurses and thirty seven health extension workers are working (JWHo, 2013).

Disease prevalence: In decreasing order of their disease prevalence, the ten leading causes of outpatient visit in Jigjiga Woreda were diarrheal diseases, pneumonia, upper respiratory infections, dysentery, anemia, urinary tract infections, muscoskeletal diseases, dyspepsia, helminthiasis, and otitis media (JWHO, 2013).

4. METHODS

4.1. Study design

Cross sectional survey using semi-structured questionnaires supplemented by key informant interview and market survey was conducted in Jigjiga Woreda, eastern Ethiopia between January 2014 to March 2014 to determine the prevalence of TM use in Somali ethnic group.

4.2. Sample size calculation and sampling technique

Jigjiga Woreda has forty six kebelles (smallest administrative unit), of which thirty six are rural and ten are urban. Five study kebelles were selected based on probability proportional to size. The kebelles were Ellebahay, Dudehidi, Hadew, Qordehaere and Kebelle 08.These kebelles have total households of 548, 524, 815, 533 and 2971, respectively (Fig 2).

The practitioners were selected based on their reputation in healing practice by the assistance of the community leaders of each Woreda. While household respondents were chosen through systematic random sampling. In each selected village, a respondent was chosen randomly until the proportional number assigned for that selected kebelle is obtained.

Inclusion criteria

Age greater than 18 years old (household heads and wives)

Somali ethnic

Exclusion criteria

Non Somali ethnic group

Age less than 18 years old

Taking an estimated prevalence (p) of TM use of 50%, a confidence level of 95% (i.e._Z $\alpha/2=1.96$, $\alpha = 0.05$), standard deviation (d) 5% and 10% allowance and the sample size (n) is calculated as follows:

$$n = \left(\frac{Z\alpha}{2}\right)^2 P\,(1-P)/d^2 \qquad (1.96)^2 \times \frac{0.5(1-0.5)}{(0.05)^2} = 384$$

To correct the design effect "n" was multiplied by the number of stages, 2. Nx2 =768 households and assuming 10% non response rate, 768 X0.1=77 77+768=845 was the total sample size considered for the study.

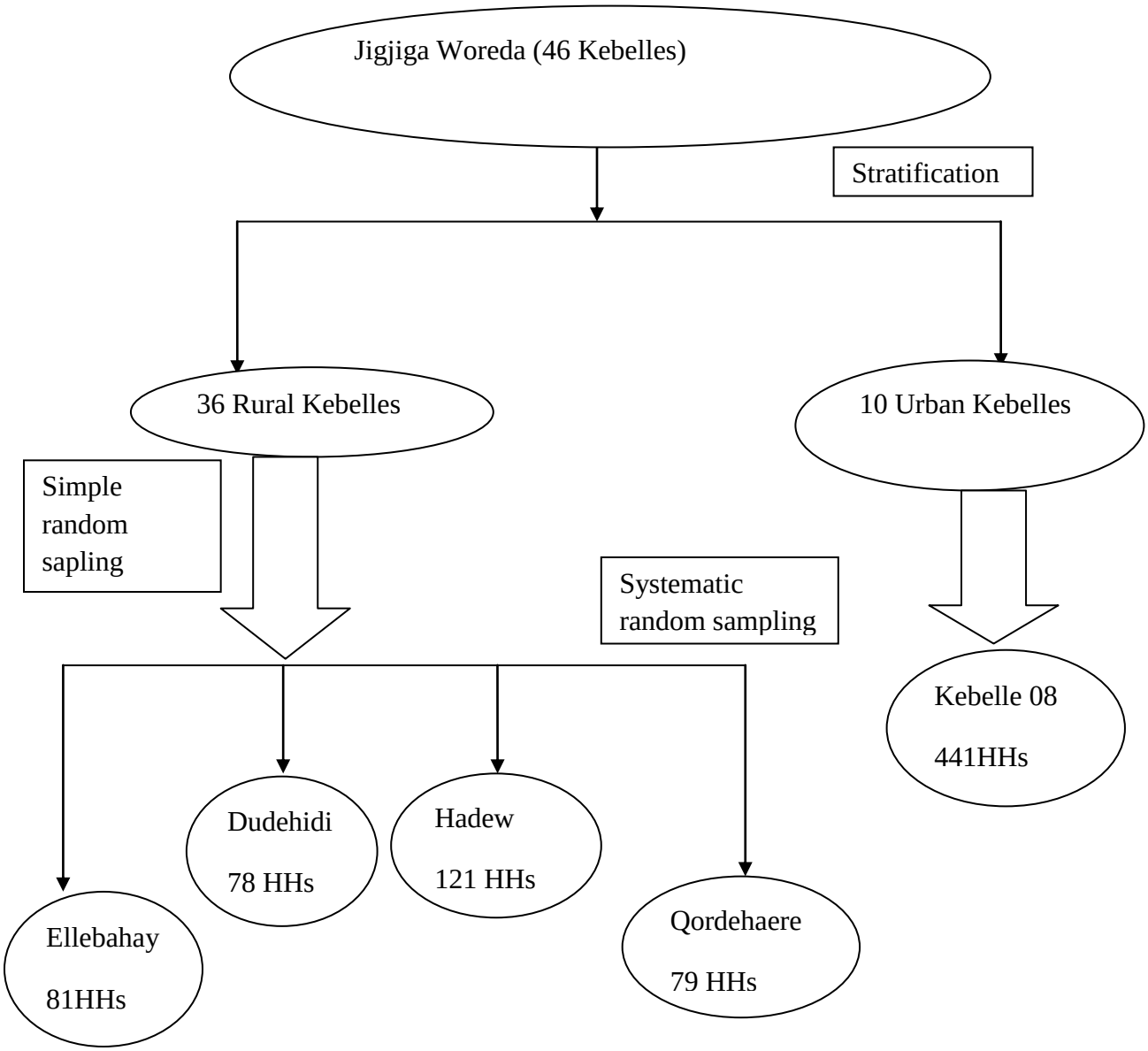


Figure 2: Sampling frame of households in Jigjiga Woreda, March 2014

4.3. Data collection and management

Field work was carried out between January and March 2014. The data was collected using three separate questionnaires, Annex 1 for household survey, Annex 2 for traditional healers and Annex 3 for the market survey. The questionnaires were prepared in English and translated into local language. Ten data collectors and one supervisor were employed and given training for five days. The training included the importance of the study, on how data are filled in the questionnaires and interview with the respondents and also clear understanding about the scientific terms used. Ethnobotanical, ethnomedicinal and market survey data were collected using semi-structured questionnaires (see appendices 1-3).

The field work focused on collecting information on medicinal plant use and preparation of plant specimens for further botanical identification. The data collected for each plant comprise the local name, its uses or effects, the part of the plant used, place of collection, its preparation and administration process. At the end of the interviews, specimens of plants mentioned for medicinal uses were collected. For the collected samples of medicinal plants, vernacular names and the plant part used were recorded. All the vernacular names were in the Somali language. Botanically identified plant specimens were stored at the National Herbarium, Addis Ababa University.

4.4. Data Analysis

SPSS statistical package was employed for entry, and analysis of the quantitative and some qualitative data. Most qualitative data were categorized and analyzed manually. The collected data were entered after being encoded. Any logical and consistency errors identified during data entry were corrected after revision of the original completed questionnaire. The ethnomedicinal information collected was analyzed to obtain the following data: number of useful plants

mentioned, number of botanical families and the most common plants; plants to which most uses were attributed to, number of different uses; most reported medicinal uses; part of the plants most frequently mentioned and the most commonly mentioned preparation and application processes.

4.5. Ethical consideration

Before conducting the survey, discussion about the study was made with Jigjiga Woreda Health Office. In addition, in each village the local community leaders were informed about the aim and purpose of the survey and were requested for their cooperation. The consent of each respondent was asked verbally to participate in the study.

5. RESULTS

5.1. Household survey

5.1.2. Sociodemographic characteristics

In the questionnaire survey, 845 households (HHs) were included; out of which 800 HHs were successfully covered making a response rate of 94.6%. Five hundred eleven (64%) of the respondents were females and 289 (32%) were males. All of the HH respondents were Somali ethnics and all of them are Muslims by religion. About 504 (63%) of the respondents had never gone to school (non-literate) while 202 (25%) had attended Islamic education. The age of the respondents varied between 18 and 98 years. Ninety seven (12.1%) of the respondents were less than 25 years of age, 489 (61%) were 25-45 years, 172 (21.5%) were 45- 65 years, and the remaining 42 (5.3%) were greater than 65 years of age.

Most of the HHs, 467 (58.4%) had average HH size of 7 with a range of 5-8 and 161 (20.1%) had HH size of 11 with a range of 9-12, 157 (19.6%) had average HH size of 3 with a range of 1-4, whereas the remaining 15 (1.9%) had more than 12 members. Among the respondents 222 (27.75%) were house wives (Table 1).

Table 1: Sociodemographic characteristics of household respondents (N = 800) in Jigjiga Woreda, March 2014

Characteristic	Frequency	Percent
Sex		
Female	511	63.9
Male	289	36.1
Age		
<25	97	12.1
25-45	489	61.1
45-65	172	21.5
>65	42	5.3
Religion		
Muslims	800	100
Educational status		
Illiterate	504	63.0
Literacy campaign	17	2.1
Islamic education	202	25.3
Grade 1-6	27	3.4
Grade 7-8	11	1.4
Grade 9-10	15	1.9
Grade 11-12	4	0.5
Above grade 12	20	2.5
Household size		
1-4	157	19.6
5-8	467	58.4
9-12	161	20.1
>12	15	1.9
Main occupation		
Agro pastoralist	358	44.7
House wife	222	27.7
Jobless	61	7.6
Merchant	67	8.3
Government employee	20	2.5
Others	72	9.0
Total	800	100

Others: Wood collectors, Butchers, Shoe maker

5.1.3. Perceived illness and patterns of resort

Among 5494 population in the studied 800 HHs, a total of 251 ill persons were reported in one month recall period preceding the interview date, which gives a prevalence rate, from all causes, of 4.5%. Females 127 (51%) had more morbidity than males 124 (49%) and those with age ranging from less than 25 had more frequent morbidity 184 (73.3%) but the age group of greater than 65 had less morbidity 8 (3%).

In response to perceived illness episodes, large proportion 234 (97%) of those who reported illness took action against their illness; of whom about 133 (53%) went to health institutions, 86 (34%) visited healers, 14 (6%) used homemade herbal remedies, while, 10 (4%) took no action (Table 2). Therefore, the actual prevalence of use of TM among the respondents both prescribed by healers and homemade remedies during the recall period was 40%. TM was found to be more frequent choice of care for males 55 (44.3%) than for females 45 (35.4%) with perceived illness in one month recall period.

Table 2: Types of action taken by those with perceived illness in one month recall period (N=251), in Jigjiga Woreda, March, 2014

Factor	Consulted Healers N (%)	Went to health facility N (%)	Used homemade remedies N (%)	No action taken N (%)	Both healers and health facility N (%)	Total
Sex						
Male	48 (38.7)	62 (50.0)	7 (5.6)	4 (3.2)	3 (2.4)	**124 (49.4)**
Female	38 (29.9)	72 (56.6)	7 (5.5)	6 (4.7)	4 (3.1)	**127 (50.5)**
Age						
<25	58 (31.5)	106 (57.6)	9 (4.8)	7 (3.8)	4(2.1)	**184 (73.3)**
25-45	17 (3.7)	21 (46.6)	2 (4.4)	3 (6.6)	2 (4.4)	**45 (18.0)**
45-65	8 (57.1)	3 (21.4)	2 (14.2)	0	1(7.1)	**14 (5.5)**
>65	3 (37.5)	3 (37.5)	1 (12.5)	0	1(12.5)	**8 (3.0)**
Total	**86 (34.2)**	**133 (53.0)**	**14 (5.5)**	**10 (4.0)**	**8 (3.0)**	**251 (100.0)**

5.1.4. Preferences of care

A preference of healthcare has also been assessed by asking respondents about their usual practice during illness episodes. As shown in (Table 3), 684 (85.5%) prefer going to health institutions, 99 (12.3%) prefer going to healers and 17 (2.2%) prefer to use homemade herbal remedies. More females 13.6% prefer visiting traditional healers than males 10%.

The respondents were also asked their reasons for preferring TM, 75 (65.5%) preferred TM for its lower price, 25 (21.5%) believed TM to be more effective than modern medicine, 15 (13%) prefer TM due to lack of access to modern medicine.

Table 3: Preferences of care by households' respondents in Jigjiga Woreda, March, 2014

What do you usually do when any member of the family sick?	**Sex of the respondents**		
	Female N (%)	**Male N (%)**	**Total N (%)**
Go to health institution	431(84.3)	253(87.5)	684(85.5)
Go to healers	70(13.6)	29(10)	99(12.3)
Use homemade herbal remedy	10(2)	(2.4)	17(2.15)
Total	511(100)	289(100)	800(100)

5.1.5. Factors associated with patterns of resort/action taken

As shown in Table 4, preference to TM was directly associated to gender, in this regard female preferring TM more than male counterpart (AOR = 1.769; 95% CI [1.071-2.923]). There was no significant difference in the preference of care between the rural residents and urban residents. There was a significant difference in the preferences of care when respondents with the age group of less than 25 compared with other age groups. In this regard, age group greater than 65 years prefer to go to TM as compared to respondents with the age group of less than 25 years (AOR = 3.473; 95%CI [1.188-10.155]). The rest of the group didn't show any significant association. There were no significant differences in the preference of care of either traditional or MHI with an increase of HH size. To evaluate whether educational status has an effect on the preference of modern healthcare, binary logistic regression was done. The educational status of

the HHs was classified as non-literate for those who had no education (be it formal or informal) and literates for those with any type and level of education. Similarly "Go to health institution" is taken as one preference and other action were grouped together. There is statistically significant association between the preference of TM and being non-literate, (AOR = 2.337; 95% CI [1.438-3.798]). Preference to TM was negatively related to being house wives and merchants as compared to being agro-pastoralists with (AOR =0.42; 95%CI [0.222-0.789]) and (AOR = 0.220; 95%CI [0.06-0.72]); respectively.

Table 4: Factors affecting patterns of resort/care seeking behavior among household respondents in Jigjiga Woreda, March 2014 (N=800, 95% Confidence interval).

		TM	Modern health institution	Crude odds ratio	Adjusted odds ratio
Sex					
	Female	80	431	1.30 [0.85-1.99]	1.76 [1.07-2.92]*
	Male	36	253	1.00	1.00
Residence					
	Rural	58	281	1.43 [0.967-2.128]	0.85 [0.48-1.49]
	Urban	58	403	1.00	1.00
Age					
	<25	8	89	1.00	1.00
	26-45	75	414	2.01 [0.93-4.32]	1.83 [0.82-4.05]
	46-65	23	149	1.71 [0.73-4.00]	1.579 [.65-3.82]
	>65	10	32	3.47 [1.26-9.58]*	3.47 [1.18-10.15]*
Household size					
	1-4	19	133	1.00	1.00
	5-8	73	394	1.29 [0.75-2.22]	1.090 [0.61-1.93]
	>8	24	157	1.07 [0.56-2.03]	0.876 [0.44-1.73]
Educational status					
	Literate	24	272	1.00	1.00
	Non- literate	92	410	2.54 [1.58-4.08]	2.33 [1.43-3.79]*
Occupation					
	Agro pastoralist	45	177	1.00	1.00
	House wife	47	311	0.59 [0.38-0.93]	0.41 [0.22-0.78]*
	Jobless	8	53	0.59 [0.26-1.33]	0.45 [0.19-1.08]
	Merchant	4	63	0.25 [0.08-.72]	0.22 [0.06-0.72]*
	Government employee	1	19	0.20 [0.02-1.58]	0.24 [0.02-2.04]
	Others	11	61	0.70 [0.34-1.45]	0.70 [0.28-1.73]

*** Statistically significant**

Others: Butcher, wood collector, Shoe maker

5.1.6. The effect of age and sex of ill person on action taken against reported illness

Binary logistic regression was done to see the effects of age and sex of the ill person on the preferences of care during the illness episodes by categorizing the preferences of care into MHI and TM and excluding no action and going to both health facility and TM (Table 5) and the result shows that females is less likely to use TM than MHI but the association is not statistically significant, with (AOR = 0.68; 95%CI [0.39 -1.15]). Being in age group of 45-65 increase five times the use of TM than MHI with (AOR= 5.6; 95% CI [1.55-21.5]), than being in age group of less than 25, and the association was statistically significant, at the same time being in age group 25-35 and greater than 65 increase the odds of use of TM twice than MHI when compared to the age group of less than 25 but the association was not statistically significant.

Table 5: Effects of age and sex on action taken during one month recall period in Jigjiga Woreda, March, 2014

Socio demographic variables [N=234]	Action taken		95% Confidence interval	
	TM	Modern health institution	Crude odds ratio	Adjusted odds ratio
Sex				
Female	45	72	0.70 [0.419 -1.185]	0.68 [0.39-1.15]
Male	55	62	1.00	1.00
Age				
<25	68	106	1.00	1.00
25-45	19	21	1.4 [0.71- 2.85]	1.5 [0.73-3.02]
45-65	10	3	5.3 [1.43-19.8]	5.6 [1.55-21.54]
>65	4	3	2.10[0.45 - 9.721]	1.9 [0.42-9.23]

5.1.7. Illness claimed to be treated by medicinal plants

Among 800 HH respondents, 334 (41.7%) reported knowing one or more medicinal plants used in their locality. Among the illness for which the reported plants are claimed to be effective, diarrhea, is the most frequently mentioned (50), followed by back pain and arthritis (49), tooth pain (43), cough and chest pain (37), bleeding (24), urinary tract infection (20), constipation (15), eye disease (14) and burn and wound healing (14) (Table 5).

Table 6: Illness claimed to be cured by medicinal plants among household respondents in Jigjiga Woreda, March, 2014

Perceived illness in respondents terms	**Disease equivalent**	**Frequency**	**Percent**
Shuban	Diarrhea	51	14
Dhabar xanuun iyo xubno garaac	Back pain & arthritis	49	13
Ilka xanuun	Tooth pain	43	12
Qufac iyo lab wareen	Cough & chest pain	37	10
Dhiig bax	Bleeding	24	6.5
Infekshinka kaadi mareenka	Urinary tract infection	20	5.4
Calool ingeeg	Constipation	15	4
Indha xanuun	Eye disease	14	4
Gubasho iyo boog	Burn & wound	14	4
Gaaska caloosha	Gastric disorder	13	3.5
Finan maqaarka	Herpes zoster	13	3.5
Laqanyo iyo matag	Nausea & vomiting	12	3.5
Cudurka Qaaxada	Tb	10	3
Jidh barar	Body swelling	9	2.4
Il(shaydaan)	Evil spirit	9	2.4
Duray	Common cold	8	2
Wadna xanuun	Cardiac disease	7	2
Xanuunka maqaarka	Skin disease	7	2
Xumad	Fever	7	2
Faalid	Paralysis	7	2
Total		369	100

5.2. Interview with traditional healers

5.2.1. Traditional healers' background

Nine traditional healers from 5 Kebelles were interviewed. All of them were greater than 50 years of age, 7 of the healers had attended Islamic education, while 1 of them had attended literacy campaign and the other 1 had finished grade 12. All of the healers were Muslims, of whom 1 of them had an experience of 10 years, 4 had 11-20 years, 1 had 21-30 years and the remaining 3 had an experience of more than 30 years as traditional healers.

Sources of healing knowledge:

Four of the interviewed THs claimed that they acquired the knowledge from their religious institution, followed by those who said they acquired it from family members (2); two of them claimed they learned it from friends and one of the healers got the knowledge from other healers.

Mode of service delivery and source of medicine:

Five of the healers were giving their services on a full time basis and the rest four of the healers were working as part timers. Most of the healers claimed to give the service for 10 to 20 patients per week, while one of the healers reported to have been giving service for 70 patients per week.

Health problems treated by the healers

Healers claimed that they treat the following. Haemorrhoid, rabies, eye disease, diabetes, asthma, constipation, back pain, urinary retention, prolonged labor, mania (Waali), recurrent fever, swelling paralysis, and tuberculosis.

5.2.2. Medicinal plants and their applications

The study demonstrated that about 107 plants species have application in the traditional healthcare delivery system of the people in Jigjiga Woreda. Among these plant species, 34 were fully identified by scientific names and the rest could not be identified and thus were recorded only by their vernacular names. The identified plants fall under 24 plant families the largest number falling under Solonaceae which has the highest number of species (5), followed by Rutaceae and Meliaceae which contain 3 species each. *Dregea sp*., *Lepidium sativum* L., *Coriandurm sativum* L., *Aloe megalacanth, and Parthenium hysterophorus* L. were the top five frequently used plants species by HHs in Jigjiga Woreda (Table 7).

Table 7: Top ten most frequently used plants by HH (N=334), Jigjiga Woreda, March, 2014

Scientific name	**Vernacular name**	**Indication**	**Number of informants**
***Dregea sp*.**	Geed sare	Diarrhea (32), Vomiting (18), Fever (9), TB (1), Pneumonia (1), Night dreams (1)	38
***Lepidium sativum* L.**	Shunfax	Cough (11), Back pain (7), Chest pain (9), TB (6), Tooth pain (2), Diarrhea (1), Eye disease (1), All disease (1)	26
***Coriandurm sativum* L.**	Qorjeen	Back pain (20), Arthritis (2), Impotence (3), Fever (1)	23
Aloe megalacanth	Dacar	Eye disease (17), Cardiac disease(2), Constipation (3), Throat infection (2) Ear disease (1), Nausea (1), Vomiting (1)	21
***Viscum tuberculatum* A. Rich**	Dhigir	Diarrhea(10), Vomiting (8), Fever (4) Headache (2)	21

***Parthenium hysterophorus* L.**	kalignoole	Bleeding (18), Tetanus (1), Back pain (1), Tooth pain (1)	21
	Geed gofle	Tooth pain (12), Tonsillitis (3) Goiter (2), Breast swelling(1)	19
***Allium sativum* L.**	Toon	Cough (13), Common cold (5), Evil spirit (2), Cardiac disease (1), Tumor (1), Chest pain (1), Fever (1),Tooth pain (1), Every disease (1)	18
	Gurryofan	Evil sprite (3), Amebiasis (2), Hepatitis (2), Animal bite (2)	10
***Zingiber officinale* Roscoe**	Singibill	Cough (4), Common cold (4), Tonsillitis (1), Throat infection (1	9

Informants' consensus

Out of the 34 plants identified by their scientific names, 30 (88%) of them were reported by both the HH respondents and the healers, at the same time 16 of the herbs were founded in the local markets of the study area but only 7 were identified by their scientific names while the remaining 4 were reported by the healers and drug vendors. Among the 30 (88%) plants which were identified by both the household respondents and healers, both agreed in claimed use of 23 (76.6%) plants while 7 (23.4%) of the plants were claimed for different indications. Since most of the plants were not identified by scientific names it is difficult to compare the level of consensus.

Table 8: Plants used in the treatment of human disorders in Jigjiga Woreda, March 2014

(Key: L – Leaves, R- Roots, Rh- Rhizomes, Fr-Fruits, Fl- Flowers, St- Stem, La-Latex, Se- Seed, B- Bark, Bu-Bulb, Wh- Whole parts,

Scientific name	**Family**	**Vernacular name**	**Coll. No.**	**Indication in respondents terms**	**Indication**	**Part used**	**Preparation and administration**
		Abakari		Il(shaydaan)	Evil spirit (1)	R	Grounded and applied into the body or the fluid form is taken like tea by adding sugar
				Fuuq bax	Dehydrations (1)	L	Grounded, mixed with water and sugar and drunk
				Shuban	Diarrhea (1)	L	Grounded, dissolved in water and drunk
				Faalid	Paralysis (1)		Boiled with water and drunk
		Canbaha		Cagaarshow/ joonis	Hepatitis (1)		
Eucalyptus sp.	Myrtaceae	Baxarsaf	AI-33	Ifilo	Influenza (1)	L	Boiled with water, sugar added and drunk
				Faalid	Paralysis (1)	R	Fresh leaves are boiled in water and drunk
				Qufac	Cough (3)		
				Duumo/kaneeco	Malaria (2)		
				Xumad	Fever (1)		

Basal	Ilka xanuun	Tooth pain (1)	Rh	Cut, put into a fire and applied on the affected tooth
Balcaad	Faalid	Paralysis (2)	L	Grounded, the leaves and taken with water
			R	
Bilcil	Boog	Wound (1)		Grounded, water added and the wound is washed
Biqe	Infekshinka fangasku sababo	Fungal infection (1)	L	Grounded, mixed with water and applied on affected area
	Infekshinka xubinka taranka dumarka	Vaginal infection (1)		
Booc	Xanuunka maqaarka	Skin infection (1)	L	Squeezed between palms and the fluid is applied on the affected area
	Finan maqaarka	Herpes zoster (1)	La	fresh latex is applied on the affected area
Boogo dhaye	Boog	Wound (1)	L	Grounded, and applied on the affected area
Caano gocatada	Laab wareen	Chest pain (1)	Wh	Cut, charred on hot oven and mixed with oil then applied
	Finan maqaarka	Herpes zoster (6)	L	on the affected area
			S	Grounded, and drunk with water
				Grounded, mixed with oil, boiled and applied on the affected area

	Cudurka maqaarka	Skin infection (1)	R	Grounded, mixed with oil and applied on the affected area
	Dhiig bax	Hemorrhage (1)	L	
Canjii	Dhiig bax	joint pain (2)	R	Grounded, and applied to the affected area Grounded, mixed with oil and applied on the body
Caraa car	Infekshinka kaliyaha	kidney infection (6)	R	The fresh root of the plants are macerated for one night then drunk
	Furuuruc/xiin	Skin rash (1)		The roots are grounded, and smoked
Carmo	Ilka xanuun	Tooth pain (1)	R	Grounded,mixed with wated and drunk
	Calool ingeeg	Constipation (1)	L	Grounded, mixed with water
	Xanuunka maqaarka	skin disease (1)		
Cayeecay	Furuuruc/xiin	Skin rash (2)	L	Grounded, boiled with water and drunk
	Infekshin	Infection (2)		
Ciid mogale	Shuban	Diarrhea (1)	R	The roots are crushed mixed with sugar and water and drunk
Ciin	Boog	Wound (1)	L	The latex are applied on the wound

		Daarajiin		Qufac	Cough (1)	L	The leaves are chewed
				Ilka xanuun	Tooth ache (1)		
Aloe megalacanth	Aloaceae	Dacar	AI-34	Indha xanuun	Eye disease (17)	L	Cut, the leaves , dissolved in water and applied, on the affected area
				Wadna xanuun	Cardiac disease(2)	La	Dissolve the latex in water and drunk
				Calool ingeeg	Constipation (3)		
				Infekshinka hunguriga	Throat infection (2)Ear disease (1)		
				Indha xanuun			
				Laqanyo	Nausea (1)		
				Matag	Vomiting (1)		

		Dalal kinin		Duumo/kane eco	Malaria (1)	L	Grounded, mixed with water and sugar and drunk
		Dalataan		Calool guruuruc	Abdominal cramp (2)	L S	Grounded, mixed with milk and sugar and drunk
				Quman/qanjiro xanuun	Tonsillitis (1)		
		Dhiga dhogod		Dhiig bax	Bleeding (1)	Se	The seeds are grounded, boiled and drunk
Viscum tuberculatum A. Rich	Viscaceae	Dhigri	AI-7	Shuban	Diarrhea(10)	R	Grounded, boiled with water and drunk
				Laqanyo	Vomiting (8)	L	
				Xumad	Fever (4)		
				Madax xanuun	Headache (2)		
		Dhinta cab		Cudurka Qaaxada	Tb (1)	R	Grounded, dispersed in water and drunk
		Dibow		Gubasho	Burn (4)	S	The stems are squeezed, and applied to the affected area
		Dubad damurad		Calool ingeeg	Constipation (1)	R	Grounded, mixed with water and drunk
Capsicum annuum L.	Solanaceae	Filfil	AI-9	Kabiibeyso	Anesthethic (1)	Se	The seeds are chewed and held in the teeth

Fooxd	Ilka xanuun	Tooth pain (1)	L S	Fresh leaves or stem is chewed and held in teeth
Galalka	Ilka xanuun	Tooth pain (1)	L	Leaves are grounded, chewed and hold in teeth
Galii	Finan maqaarka Furuuruc/xiin Ilka xanuun	Herpes zoster (1) Skin rash (1) Tooth pain (1)	L B	Grounded, and applied on the skin
Gaydhe	Gaaska	Gastric (2)	Se	The seeds are grounded, mixed with sugar and milk and drunk
Geed case	Cuno bacuuc Cudurka Qaaxada Jidh barar Ilka xanuun	Goiter (1) Tb (1) Swelling (3) Tooth pain (1)	S	The stem are grounded, dissolved with water & drunk
Gedlalese	Ilka xanuun	Tooth pain (1)	R	The roots are grounded, chewed and hold in teeth
Geed bey	Ilka xanuun	Tooth pain (1)	L	The leaves are grounded, and hold in tooth

		Geedka carada		Calool ingeeg	Constipation (1)	R	The roots are grounded, boiled and mixed with sugar and drunk
				Qix dheer	whooping cough (1)		
		Geed fixi		Jix dheer	Pertusis(1)	R	The roots are grounded, boiled and mixed with sugar
				Qix dheer	whooping cough (1)		and drunk
		Geed gofle		Ilka xanuun	Tooth pain (12)	R	The fresh root are grounded and hold in teeth
				Quman/qanjiro xanuun	Tonsillitis (3)	L	The leaves are grounded and hold in teeth
				Cuno bacuuc	Goiter (2)		
				Naas barar	Breast swelling(1)		
Azadiraht a indica A.Juss	Meliaceae	Geed hindi	AI-8	Dhabar xanuun	Back pain (1)	L	The fresh leaves are boiled and drunk
				Ilka xanuun	Tooth pain (5)		
				Calool gururuc	Abdominal cramp (2)		
		Geed hole		Barar	Swelling (2)	R	Both the fresh roots and stems are pounded and squeezed
				Dhabar xanuun	Back pain (2)	S	with water and applied

		Ggeed howsha		Dhabar xanuun Jabto Kaadin kari waaya	Back pain (2) Gonorrhea (1) Unable to urinate (1)	R	The fresh leaves are boiled, mixed with sugar and water and drunk
		Geed irmaan		Dhabar xanuun	Back pain (2)	R	The fresh roots are grounded, boiled with with milk and drunk
Melia azedarach L.	Meliaceae	Geed kinin	AI-19	Ilka xanuun	Tooth pain (1)	L	The leaves are grounded and hold in teeth
		Geed laan		Ilka xanuun	Tooth pain (1)	R	The roots are grounded and hold in teeth
Dregea sp.	Asclepiadaceae	Geed sare	AI-26	Shuban Matag Xumad Kolbaariya Cudurka Qaaxada Madax xanuun Habeen Qarow iyo	Diaharrhea (30) Vomiting (17) Fever (7) Pneumonia (1) Tb (1) Headache (1) Night dreams and evil sprite	R L	The fresh or dry leaves are grounded, boiled with water and drunk. The roots are grounded, and mixed with milk and drunk. The leaves are grounded, and boiled with milk and drunk.

				il(shaydaan)	(1)		
		Gombosh		Boog	Wound healing (1)	L	The leaves are grounded, and applied on the affected area
		Gubtaanyo		Esfiilito	syphilis (1)	L	The leaves, barks, and roots are grounded, boiled
				Roomatism	Arthritis (1)	B	with water and sugar and drunk
				Infekshinka makaanka	Uterus infection (1)	R	
Alternanthera pungens Kunth.	Amarantaceae	Gucundho	AI-5	Barar	Swelling (3)	Wh	The whole plant is grounded, boiled with water and applied
				Kaadi olol	Dysuria (2)		on the affected area
Solanum jubae Bitter	Solanaceae	Gurryofan	AI-31	Il(shaydaan)	Evil sprite (3)	L	The roots and barks are grounded, and inhaled
				Gooriyaan	Amebiasis (2)	R	The roots are grounded, and smoked
				Beer xanuun	Hepatitis (2)	B	
				Qaniinyo xayawaan	Animal bite (2)		
		Hiddiaali		Laqanyo	Nausea (1)	L	The leaves are boiled with water mixed with milk and sugar
				Matag	Vomiting (1)		and drunk

		Hidigali		Shuban	Diarrhea (1)	L	The leaves are boiled, and drunk
				Xumad	Fever (1)		
				Qufac	Cough (1)		
Senna italica aaii	Fabaceae	Jaleelo	AI-21	Calool ingeeg	Constipation (1)	L	The leaves are grounded, mixed with water and drunk
		Ka hoolaha		Barar	Swelling (1)	L	The leaves are grounded, and applied on the affected area
Partheniu m hysteroph orus L.	Asteraceae	Kalignoole	AI-1	Dhiig bax	Bleeding (18)	L	The leaves are grounded, applied on the wound
				Teetano	Tetanus (1)	R	The roots are chewed hold in teeth
				Dhabar xanuun	Back pain (1)		
				Ilka xanuun	Tooth pain (1)		
		Khamoun		Kaadi ku dhagid	Anuria (12)	R	The roots are grounded, and mixed with water and drunk
				Ilka xanuun	Tooth pain (2)	L	The roots are grounded, and chewed in teeth
Solanum incanum gloup	Solanaceae	Kariir	AI-29	Dhiig bax	Bleeding (4)	L	The leaves are grounded, and applied on the wound
Solanum giganteu	Solanaceae	Kariir	AI-30	Dhiig bax	Bleeding	L	

m Jacq.	Solanaceae						
Solanum jubae Bitter	Solanaceae	Kariir	AI-31	Dhiig bax	Bleeding	L	
				Dhiig bax	Bleeding	L	
Withania Somnifera (L.) Dunal in DC		Kariir	AI-17				
				Dhabar xanuun	Back pain (1)	Fr	The fruits are grounded, boiled with water and drunk
				Calool ingeeg	Constipation (2)	S	The stems are grounded, boiled with water and drunk
Ziziphus mauritiana Lam.	Opiliaceae	Kasil	AI-2	Loo isticmaalo qurxinta jidhka	For cosmetics purpose (1)	L	The leaves are grounded, and soaked in water and applied on the face
		Laaliis		Roomatism	Arthritis (3)	Wh	The whole plant is grounded, boiled and drunk
				Ilka xanuun	Tooth pain (2)		
				Calool canuun	Stomach pain (1)		

		Laan		Matag	Vomiting (1)	R	The root is grounded, boiled with water and sugar and drunk
				Shuban	Diarrhea (5)	L	The leaves are grounded, mixed with tea and drunk
				Laqanyo	Nausea (1)	S	The stem is grounded, mixed with milk and drunk
				Xumad	Fever (2)		
		Laqlokobcis		Cudurka maqaarka	Skin disease (1)	L	The leaves are grounded, mixed with water and oil, and applied on the skin
Citrus limon (L.) Burmj	Rutaceae	Lendenan	AI-11	Shuban	Diarrhea (1)	Fr	The fruit is squeezed and the juice drunk
Euphorbia tirucalli L.	Euphorbiaceae	iin	AI-12	Feex	Tumor (1)	La	The latex is dissolved in water, and sugar is added and drunk
		likaha		Xanuunka Macaan	Diabetes (1)	R	The root is boiled, and sugar is added and drunk
		Maays		Calool ingeeg	Constipation (1)	R	The root is grounded, and mixed with sugar and water and drunk
Amaranthus caudatus L.	Amaranthaceae	Milax buur	AI-23	Xanuunka neefta	Asthma (2)	L	The leaves are grounded and added to the food
				Qix dheer	Whooping cough (1)		The leaves are grounded, boiled with water and sugar added, and drunk

				Barar	Edema (1)		
		Mal mal		Qaniiny mas	Snake bite (2)	Se	The seeds are grounded, and mixed with oil and applied
				Barar	Edema (3)		on the affected area
		Mawada		Furuuruc/xiin	Rash ()	S	The steams are grounded, dispersed in water and drunk
		Mawe		Xanuunka Macaan	Diabetes (6)	L	The leaves are grounded, dispersed in water and drunk
				Dhiig kar	Hypertension (2)	S R	The stems and roots are grounded and smoked
				Qufac	Cough (1)		
		Mieska		Dhabar xanuun	Back pain (1)	R L	The roots and leaves are grounded, boiled with water and sugar and drunk
Schinus molle L.	Anacardiaceae	Mirmir	AI-27	Dirxi	Worms (3)	L	The leaves are grounded, dispersed in water and drunk
				Gooriyaan	Amebiasis (1)	L	The leaves are grounded, and hold in teeth
				Dirxi nooc balaaran	Tapeworm (1)		
				Ilka xanuun	Tooth pain (1)		
Moringa stenopetala (Bak. F.) Cuf.	Moringaceae	Moringa	AI-3	Xanuunka Macaan	Diabetes (1)	L	The leaves are grounded, dispersed in tea and drunk
				Dhiig kar	Hypertension (1)		
				Dhiig laáan	Anemia (1)		
				Loo			

				isticmaalo qurxinta jidhka	Cosmetics (1)		
		Naylo kobciso		Finan maqaarka	Herpes zoster ()	L	The leaves are grounded, mixed with oil and applied on the affected area
		Ogol		Madax xanuun	Head ache (1)	R	The roots are grounded, boiled with water and sugar, and drunk
Carica papaya L.	Caricaceae	Papyee	AI-14	Dirxiga mindhiqirka	Intestinal worms (1)	Se	The seeds are grounded , dispersed in water and drunk
		Qajajuli		Boog	Wound (1)	L	The leaves are grounded, boiled with water and drunk
		Qaliilc		Finan maqaarka	Herpes zoster (1)	L	The leaves are grounded, dispersed in water and drunk, or applied on the affected area
		Qambo		Calool ingeeg Infekshin	Constipation (1) Infection (1)	Se R	The seeds and the roots are grounded, dispersed in water and drunk
		Qaraari		Shuban	Diarrhea (1)	S	The seeds are grounded, dispersed in water and drunk
Ricinus communis L.	Euphorbiaceae	Qobo	AI-4	Calool ingeeg	Constipation (1)	R	The roots are grounded, and drunk with tea

		Qojojuli		Boog	Wound (1)	R	The roots are grounded and applied on the affected area
		Qoonder		Calool ingeeg	Constipation (3)	Se	The seeds are grounded, dispersed in water and drunk
				Quman/qanjiro xanuun	Tonsillitis (2)		The seeds are grounded, mixed with sugar and drunk
Coriandurm sativum L.	Apiaceae	Qorjeen	AI-6	Dhabar xanuun	Back pain (15)	Se	The seeds are grounded and mixed with honey or sugar
				Roomatism	Arthritis (8)		and drunk or the seeds are grounded, and added in to food
		Qudi		Shuban	Diarrhea (1)	S	The seeds are grounded, and boiled for three hours and
				Dhiig laáan	Anemia (1)	L	drunk
Sphaeranthus suaveolens (Forssk.) Dc.	Asteraceae	Rashaid	AI-32	Maskax xanuun	Mental illness (1)	L	The leaves or fruit are grounded, and mixed with water, oil
						F	and honey, and applied to the head
		Rinji		Dhiig bax	Bleeding (1)	L	The leaves are grounded, and applied to the affected area
Punica granatum L.	Lythraceae	Ruman	AI-28	Il(shaydaan)	evil spirits (2)	L	The leaves and seeds are grounded, mixed with milk and
						Se	drunk
		Saayetun		Shuban	Diarrhea (1)	L	The leaves are grounded, dispersed in water and sugar, then
				Matag	Vomiting (1)		drunk

Brassica oleracea L.	Brassica ceae	Sagaxoor	AI-13	Xanuunka neefta	Asthma (2)	L	The leaves are grounded, and added to the food or the leaves
				Qix dheer	Whooping cough (1)		are grounded, boiled and sugar added, and drunk
				Barar	Edema (1)		
		Shaq shaq		Boog	Wound (2)	R	The roots are grounded, and mixed with oil and applied to
							the affected area
Lepidium sativum L.	Brassica ceae	Shunfax	AI-20	Qufac	Cough (11)	Se	The fresh seeds are Swallowed
				Dhabar xanuun	Back pain (7)		
				Laab wareen	Chest pain (9)		
				Cudurka Qaaxada	Tb (6)		
				Ilka xanuun	Tooth pain (2)		
				Shuban	Diarrhea (2)		
				Indha xanuun	Eye disease (1)		
				Xanuun kaste	All the disease (1)		
Zingiber officinale	Zingiber aceae	Singibill	AI-10	Qufac	Cough (4)	Bu	Grounded, boiled with water and sugar added, and drunk
				Duaray	Common cold		Grounded, and drunk with tea

Roscoe				Quman/qanjiro xanuun Infekshinka hunguriga	(4) Tonsillitis (1) Throat infection (1)		
		Sokay		Jiljileec caruurta iyo hooyada uurka leh Sanboor	weakness in children & pregnant mother (1) Sinitius (4)	L R	The leaves are grounded, boiled with water, sugar added, and drunk
Ruta chalepensis L.	Rutaceae	Taltan	AI-24	Il(shaydaan)	Evil spirit (3)	L	The leaves are boiled with water and drunk
Opuntia sp.	Cactaceae	Tiin	AI-16	Madax xanuun Wadna xanuun	Headache (1) Heart failure (1)	L	The leaves grounded, and mixed with oil, and applied to the affected area

		Tirra		Dhabar xanuun Kaadi ku dhagid Handisada Laab wareen Indha xanuun	Back pain (11) Anuria (3) Sneezing (1) Chest pain (1) Ear disease (1)	R S B Wh	The roots are grounded, boiled with water and drunk The stems are grounded, boiled with water and drunk The barks are Grounded, boiled with water and sugar, and drunk The whole plant is grounded, boiled with water and sugar, and drunk
Allium sativum L.	Alliaceae	Toon	AI-15	Qufac Duray Il(shaydaan) Wadna xanuun Feex Laab wareen Xumad Ilka xanuun Xanuun kaste	Cough (13) Common cold (5) Evil spirit (2) Cardiac disease (1) Tumor (1) Chest pain (1) Fever (1) Tooth pain (1) Every disease (1)	Bu	The bulb is grounded, and mixed with tea and drunk The bulb is grounded, mixed with milk and sugar and boiled and drunk The bulbs are Chewed

Euphorbia polyacantha Boiss	Euphorbiaceae	Waantays	AI-18	Gaaska	Gastric (2)	L	The leaves are grounded, dispersed in water and drunk
				Gubasho	Burn (2)	Wh	The whole plant is grounded, and mixed with oil and
				Infekshinka fangasku sababo	Fungal infection (1)		applied to the affected area
				Ilka xanuun	Tooth pain (1)	R	The roots are grounded, boiled in water and sugar, and
				Calool ingeeg	Constipation (1)		drunk
		Urowaawe yn		Madax xanuun	Headache (1)	L	The leaves are grounded, boiled with water and drunk
				Laab wareen	Chest pain (1)		
Combretum molle G. Don	Combretaceae	Woob	AI-25	Faalid	Paralysis (1)	R	The roots are grounded, mixed with oil and applied to
				Beer xanuun	Hepatitis (5)	Ba	the affected area
				Barar	Edema (1)	La	The bark is grounded, dispersed in water and drunk
							The latex is boiled with water and drunk
		Xaabagta		Calool ingeeg	Constipation (1)	S	The stems is grounded, dispersed in water and milk,
							and drunk
		Xaasharka		Xanuunka safarka	Motion sickness (1)	Se	The seeds are boiled with water and sugar, and drunk

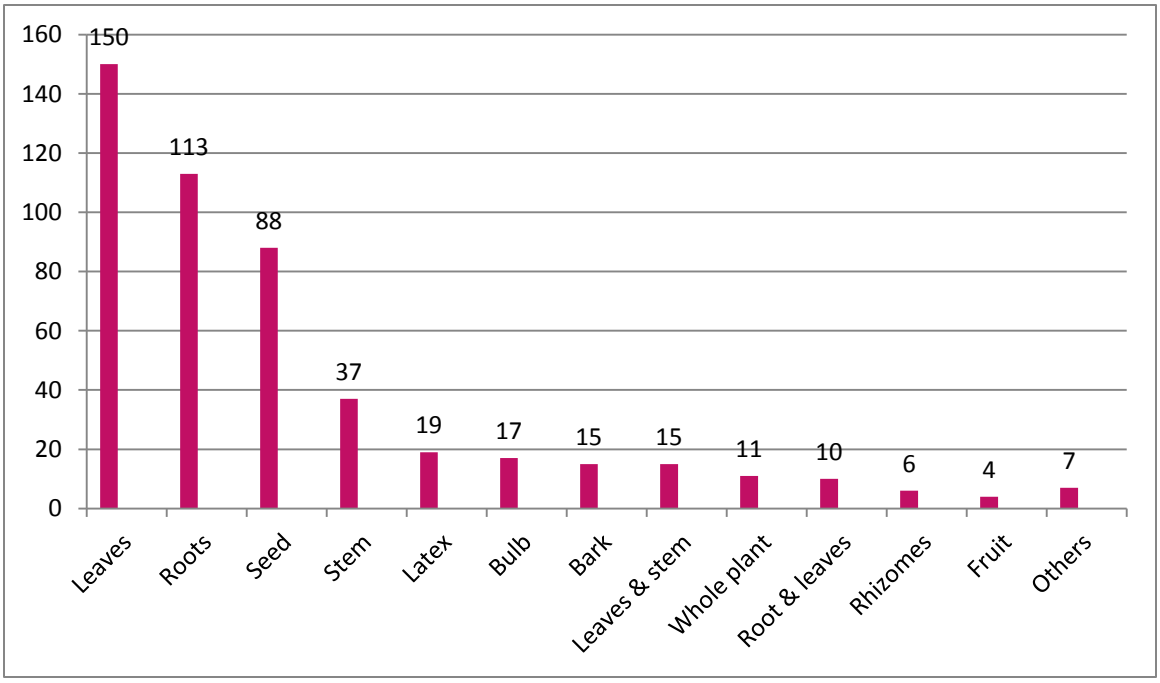
	Xamasuda	Xumad	Fever (1)	Se	The seeds are grounded and drunk the oil
		Cudurka Qaaxada	Tb (1)	L	The leaves are grounded, boiled and drunk
		Kolbaariya	Pneumonia (1)		
		Madax xanuun	Headache (1)		
		Laab jeex	Heart burn (1)		
		Wadna xanuun	Cardiac disease (1)		
		Il(shaydaan)	Evil sprite (1)		
	Xamakadi	Ibida oo go'da	Placental intact (1)	Wh	The whole plant is grounded, dispersed in water and milk, and drunk
	Xarmal	Kabiibeyso	Anesthetics (1)	S	The stem and leaves are chewed and hold on the teeth
		Ilka xanuun	Tooth pain (1)	L	
	Xiguureed	Calool ingeeg	Constipation (1)	R	The roots are grounded, dispersed in water and sugar, and drunk
		Indha xanuun	Ear pain (1)		The roots are grounded, mixed with oil and applied on the ear

	Xildid	Wadna xanuun	Heart disease ()	L	Inhaled the seed
		Il(shaydaan)	evil spirit (2)	S	The leaves and stems are grounded, dispersed in water
		Cudurka Qaaxada	Tb (2)	Se	and drunk
		Madax xanuun	Head ache (2)		
		Xumad	Fever (1)		
		Qufac	Cough (1)		
		Faalid	Paralysis (1)		
	Xood	Qufac	Cough (1)	R	The roots are grounded, boiled and sugar added and drunk
	Xulbad	Roomatism	Arthritis (2)	Se	The seeds are roasted, soaked, and grounded dispersed in
		Dhiig joojin	Blood clotting (1)		water and drunk after 12 hours.
		Calool ingeeg	Constipation (2)		The seeds are grounded, dispersed in water and mixed with sugar, and drunk
		Gaaska	Gastric (2)		
		Xanuun kaste	Every disease (1)		
	Xum boox	Ilka xanuun	Tooth pain (1)	Se	The seeds are Chewed, and hold in teeth

5.2.3. Use characteristics of plants

5.2.3.1. Plant parts used

The most frequently utilized plant parts were the leaves 150 (18.7%), followed by the root 113 (14%), seed 88 (11%), and stem 37 (4.6%). Plant parts such as fruits, rhizomes, flower and bark are rarely used (Fig 3).



Others: leaves and seed, bark and root, leaves, bark and root

Figure 3: Plant parts used in herbal preparation of Jigjiga Woreda, March 2014

5.2.3.2. Sources, collection and storage of medicinal plants

The major proportion of plants collected by HHs is from wild sources 310 (63%) while only 67 (14%) is cultivated and the remaining 114 (23%) are from both sources. Healers also get the medicinal herbs from the wild but some of the healers cultivate in their farm lands. Most of the THs stored herbal formulations in plastic bags, tin containers and bottles. Sometimes paper bags are also used.

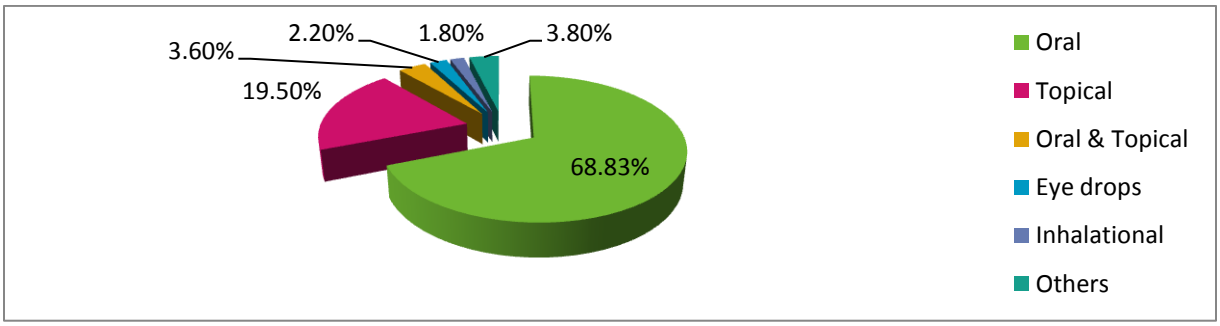
5.2.3.3. Time, ritual procedures in collection and habitat of medicinal plants

This study showed that the overwhelming majority (454, 91.9%) believes that medicinal plants could be collected at any time of the day, few HHs however, preferred to collect the medicinal plants at mid day 18 (3.6%) and at down 17 (3.4%).

In the present study fresh plant parts 262 (53.4%) are used in formulating herbal prescriptions. According to some healers and HH respondents, medicinl plants should be collected with certain ritual procedures such as reading verses from the Quran, throwing maize, money, spaghetti or seven pieces of stone on the plant. Some collectors abstain from sexual contact preceding the day of collection

5.2.3.4. Dosage and routes of administration

As indicated in Fig 4 the most widely used route of administration is oral 338 (66.8%), followed by topical application 96 (19.5%), oral and topical 18 (3.6%), and eye drops 11 (2.2%).



Others: Eye drops and oral, oral and inhalation, topical and inhalation, fumigants

Figure 4: Routes of administration of herbal preparations in Jigjiga Woreda, March, 2014

5.2.3.5. Measurement of dose

In the present study, lack of precision in the cases of doses has been noted i.e. mostly doses are determined by approximation in 328 (66.9%) cases, followed by using cup (97, 19.8%), tea spoon (30, 6.1%), and hand (15, 3.1%) (Fig 5).

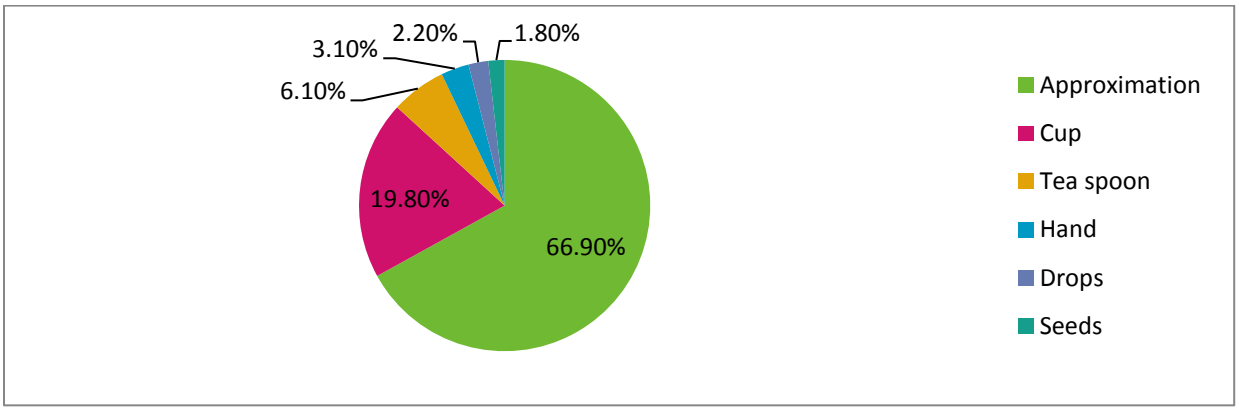


Figure 5: Measurements used for delivery and preparation of herbal medicine in Jigjiga Woreda, March, 2004

5.2.3.6. Additives

In the present study, water is the most frequently (87, 37.02%) used additive by the community followed by a combination of water and sugar, tea, milk, oil, accounting for (52, 22.2%), (21, 8.9%), (20, 8.5%), and (19, 8%) cases respectively (Fig 6). Sugar and honey are used as flavoring agents while oil and fats are used as ointment bases in preparing herbal preparations for topical applications.

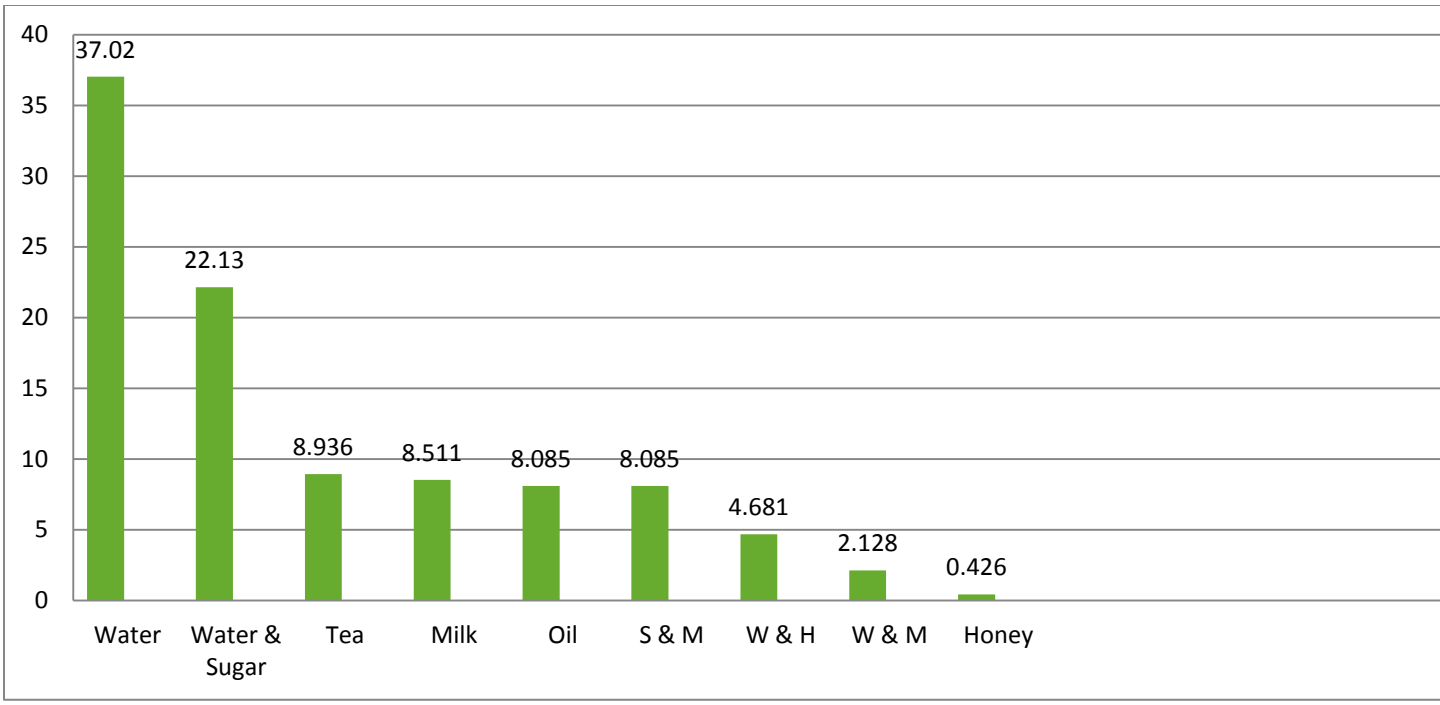


Figure 6: Additives used in herbal preparations of Jigjiga Woreda, March, 2014

5.2.3.7. Contraindications, adverse effects of medicinal plants and their claimed antidotes

Among 107 medicinal plants species reported, only 2 (1%) of them were claimed to have minor side effects, while no antidotes were reported for these plants. The side effects mentioned were vomiting and diarrhea. Of the plants reported, 49 (46%) have different reported contraindications, while 58 (54%) had no contraindications. From the reported contraindications, 19 (29.2%) were for pregnant mothers, 16 (24.6%) for children, 8 (12.3%) for pregnant mothers and children, 4 (6.1%) for lactating mothers, 4 (6.1%) for children, lactating and pregnant mothers, 3 (4.6%) for the elderly, 1(1.5%) each for children and lactating, for pregnant and elders, and for children pregnant and elders (Table 9).

Table 9: Medicinal plants with contraindications reported by household respondent in Jigjiga Woreda, March, 2014

Vernacular name	Scientific name	Contraindicated in
Qorjeen	*Coriandurm sativum* L.	Children, pregnancy & lactating mother
Moringa	*Moringa stenopetala* (Bak. F.) Cuf.	Pregnancy
Kalignooole	*Parthenium hysterophorus* L.	Children & lactating mother
Geed sare	*Dregea sp*.	Pregnancy
Karir	*Solanum giganteum* Jacq.	Children, pregnancy & lactating mother
Gurayofan	*Solanum jubae Bitter*	Pregnancy & elderly
Baxarasaaf	*Eucalyptus sp.*	Pregnancy
Geed hindi	*Azadirachta indica* A.Juss	Pregnancy & lactating mother
Jaleloo	*Senna italica aaii*	Children & pregnancy
Shunfax	*Lepidium sativum* L.	Children
Geed gofle		Children
Dhigri		Children, pregnancy, lactating mother & elderly
Hidigali		Lactating mother, pregnancy & elderly
Dacarta	*Aloe megalacanth*	Lactating mother, pregnancy & children
Xildid		Pregnancy

Singibile	*Zingiber officinale* Roscoe	Children
Geed bey		Children
Dibow		Pregnancy & children
Dalalta		Children
Tire		Lactating mother, pregnancy, children & elderly
Hilddiali		Elderly
Geed laan		Pregnancy & children
Caano gucato		Pregnancy, lactating mother & children
Xood		Children & pregnancy
Geed howsha		Lactating mother & pregnancy
Sokay		Children & pregnancy
Daarajiin		Elderly
Mirmir		Pregnancy
Woob	*Combretum molle* G. Don	Children & pregnancy
Gedlalese		Children & pregnancy
Ogol		Children
Geed hole		Elderly
Wantays	*Euphorbia polyacantha* Boiss	Lactating mother
Laalis		Pregnancy

Car car		Pregnancy & children
Kamuun		Children
Toon	*Allium sativum* L.	Pregnancy
Ciid mogale		Pregnancy
Dhamaajo		Children , pregnancy & elderly
Mal mal		Children , pregnancy & elderly
Qondar		Pregnancy
Cayeecay		Children
Laan		Lactating mother & pregnancy
Timir		Lactating mother
Xum boox		Children
Xarmal		Pregnancy
Sagaxoor	*Amaranthus caudatus* L.	Pregnancy
Qaraari		Pregnancy

5.3. MARKET SURVEY

In the market survey 3 vendors and 2 healers were interviewed from 2 Kebelles. Among them, 2 were 31-40 years of age, 2 were greater than 50 years of age while one was less than 30 years of age. Two of the vendors attended a literacy campaign, while the rest 3 had attended formal education. All of them were Muslims.

The surveys were conducted in one local market and three herbal drug shops (Jigjiga and Hadew), out of the 34 plants recorded in the area, 17 plant species were found in the market survey (Table 10). In addition to the above the herbal medicine a variety of items are sold in the market like spices, oils, and food items (Fig 7).

Figure 7: Medcinal plants being sold on the market of Jigjiga Woreda, March, 2014

Mode of practice and number of herbal drugs dispensed

All of the sellers practice TM as a full time work and have a fixed payment rate; and the average cost per medicament ranges from 2 to 40 Birr. Three of the sellers claimed that topical preparations are the preferred dosage form by the patient while two of the healers claimed that solid dosage forms are the preferred choice by the patients (Table 10).

Table 10: Plants being sold on the Market of Jigjiga Woreda, March, 2014

Ser. No.	Vernacular name	Scientific name	Parts of the plants	Price in Birr
1	Kasil	*Ziziphus mauritiana* Lam.	Leaf	5
2	Hina		Flower	10
3	Huwrud		Root	5
4	Cusbure		Flower	5
5	Moringa	*Moringa stenopetala* (Bak. F.) Cuf.	Leaf	40
6	Samanaki		Latex	20
7	Qurjeen	*Coriandurm sativum* L.	Seed	10
8	Xabassood		Seed	15
9	Taltan	*Ruta chalepensis* L.	Root & leaf	5
10	Dacar	*Aloe megalacanth*	Latex & leaf	2
11	kalignoole	*Parthenium hysterophorus* L.	Leaves & root	2
12	Gaydhana		Seed	15
13	Caanogocto		Leaves & steam	20
14	Gofleilkaha		Root	40
15	Geed irmaan		Root	20
16	Geedka hawaska		Root	15
17	Waatays	*Euphorbia polyacantha* Boiss		10

6. DISCUSSION

Perceived illness and patterns of resort

The present study revealed an overall prevalence of 4.5% illness episodes in one month recall period. A higher prevalence rate (8%) was reported in one month recall period in Addis Ababa (Gedif and Hahn, 2002), while 8% & 5.2% were reported in Berta ethnic group and in Benshangule Gumz, respectively, in two weeks recall period (Flatie *et al.,* 2009; Guji *et al.,* 2011). A lower prevalence rate (3.1%) was documented in Dabat District in two weeks recall period (Weldegerima *et al.,* 2004).

The reasons for the above differences of the prevalence of perceived illness could be due to differences in the recall periods, seasonal variation when the study was conducted and difference study design (Gedif and Hahn, 2002). Like other studies, the current study also showed that the burden of illness is more pronounced in females than males (Kitaw, 1987; Gedif and Hahn, 2003; Flatie *et al.*, 2009; Guji *et al.,* 2011). This might have a strong association with the literacy level of women in Somali community. As documented by EDHS (2011), 68% of women in Somali region are non-literate and this figure rises in rural areas.

Even if there are variations among study designs, recall periods and seasonal variations in disease prevalence and associated resort patterns, most study proved high rate of TM use. A study conducted in Addis Ababa found out the prevalence of the use of herbal medicine was 37% (Gedif and Hahn, 2002), and studies in Wombera District of Benishangul-Gumuz region and Dabat Dstrict reported prevalence rate of 41.6%, 25.2%, respectively (Weldegerima *et al.,* 2004; Guji *et al.,* 2011). In the current study, the prevalence of use of herbal medicine was found to be 40%. A study conducted in Butajira and among Berta ethnic group found a

prevalence rate of 12.5%, and 4.6%, respectively, in four weeks and two weeks recall period (Gedif and Hahn, 2003; Flatie *et al.,* 2009).

The reasons given for preferring herbal drugs were lower price, better efficacy and inaccessibility of modern medicine. The study also showed that more females (13%) prefer visiting traditional healers than males (10%). Similar findings were reported in earlier works in other parts of Ethiopia (Wolde and Gebre-Mariam, 2002; Gedif and Hahn, 2003; Weldegerima *et al.,* 2004; Flataie *et al.,* 2009; Guji *et al.,* 2011).

Factors affecting patterns of resort

The current study found that more females chose TM than male counter parts, and the association was statistically significant (AOR = 1.76; 95% CI [1.07-2.92]). Similar findings were reported by Gedif and Hahn (2003). Shih *et al. (*2012) also reported that more girls use TM than males in Taiwan. In contrast to the above findings, a study conducted in Suriname showed that gender does not have association with herbal medicine use (Van Andel and Carvalheiro, 2013). In contrast to the hypothetical scenario, the actual practice shows that more males use TM than females; during the one month recall period but, the results were not statistically significant, in addition, this result may not indicate the association of TM use with gender because the majority of the ill pesons were under the age of 18 and the decistion where to go for treatmeant will be decided by their parents.

In the present study, residence of the respondents whether in rural or urban did not have any significant association with preferences of TM over MHI (AOR = 0.85; 95% CI [0.48-1.49]). The study revealed that age group greater than 65 and being non-literate were positively

associated with the preferences of TM and the association was statistically significant. A similar finding was reported in different parts of the country where non-literates and older residents are significantly more likely to use herbal medicine than literate and younger people (Gedif and Hahn, 2002; Flatie *et al.*, 2009; Belayneh *et al.*, 2012; Belayneh and Bussa, 2014; Kidane *et al.*, 2014). A study conducted in rural Tanzania also showed that age and education were the main factors that influence the choice of healthcare (Satimia *et al*., 1998). Other studies indicated that younger generation are less knowledgeable and underestimate traditional values (Pankhurst, 2001; Tanto *et al*., 2002; Belayneh and Bussa, 2014). In contrast to the above findings other studies indicated that age and educational status were not the predictors of herbal medicine use (Van Andel and Carvalheiro, 2013).

In this study, the preference of TM by house wives and merchants was negatively associated and the association was statistically significant (AOR = 0 .42; 95% CI [0.22- 0.79]), AOR= 0.22; 95% CI [0.06-0.72]), respectively) as compared to the use by agro-pastoralists. The preference of TM by such groups as government employees, and the jobless was shown to have no statistically significant association. As agro-pastoralists spend most of their time in the field, they may have a better knowledge about TM and herbs than the other sectors of the community.

Source of knowledge

The study showed that religion is the main source of knowledge for the healers, which was similar to the findings among the Bertha ethnic group (Flatie *et al*., 2009). In various other studies conducted in Ethiopia, it was shown that family members are the major sources of knowledge of TM (Gedif and Hahn, 2002; Weldegerima *et al*., 2004; Guji *et al*., 2011). Since all members of the study population are Muslims, either TM is practiced as part of religious

teaching among the community or most believe that the healing power of herbs is more acceptable and effective when associated with supernatural power (Flatie *et al*., 2009).

In this study, all of the healers were men which may indicate that TM is dominantly practiced as a full time by men and it can be inferred that men are more knowledgeable on TM than women or it might be related with the local tradition of restricting traditional medical practices mostly to men. Similar findings were reported in many other parts of Ethiopia (Giday *et al*., 2007; Yineger and Yewhalaw, 2007; Giday *et al*., 2010; Belayneh and Bussa, 2014; Belayneh *et al*., 2012).

Sources and plant parts used

According to the present study, leaves are the most frequently utilized plant part (30.5%), followed by roots (23%), a finding similar to previous studies conducted in other parts of the country (Hammond, 1998; Gedif and Hahn, 2003; Giday, 2001; Seiyfu and Gebre-Mariam, 2004; Weldegerima *et al*., 2004; Midekesa *et al*., 2005; Tadesse *et al*., 2005; Tolasa, 2007; Belayneh *et al*., 2012; Belayneh and Bussa, 2014). However, in some other studies conducted in different communities, roots have been reported to be the most extensively used plant part (Addis *et al*., 2001; Hunde *et al*., 2006; Flataie *et al*., 2009; Giday *et al*., 2009; Mesfin *et al*., 2009; Guji *et al*., 2011). It is well known that herbal preparation that involve roots, rhizomes, bulbs, barks, stems or whole parts have effects on the survival of the mother plant (Abebe and Ayehu, 1993). The possible destruction of medicinal plants due to plant parts collected for the medical purposes is minimal as leaves were the leading plant parts used in the area. Moreover, the use of the whole plant is not often practiced in the area. However, since most of the medicinal plants reported are obtained from the wild (63.1%) and roots of the plants are used (23%) as source of medicines; these can pose threat to biodiversity.

Among 107 plant species that were reported to be utilized in the TM of the study area only, 34 were fully identified by their scientific names. The fact that only few number of plants were recorded is due to majority of the plant species are obtained from wild areas that made it difficult to collect the plant specimens.

The study showed that lack of precision in the determination of doses of medicaments used, which is consistent with other works conducted in different parts of the country (Tolasa, 2007; Flatie *et al*., 2009; Gidey, 2009; Belayneh *et al*., 2012; Belayneh and Bussa, 2014). The real drawback in TM mostly arises from lack of precision in dosage (Abebe and Ayehu, 1993).

Market survey

Among the medicinal plants identified in this study, the dried and powdered sap of *Aloe. megalacantha*, a seed of *Coriandurm. sativum* the dried powderd leaves of *Ziziphus. Mauritiana* and *Moringa stenopetal* are commonly sold in local markets of the town. In these markets the venders primarily sell plant products for cosmetic use, a finding similar to that obtained in another study (Fasil, 2005). The above mentioned medicinal plants scored high frequency of citations among the medicinal plant species which were marketable in the market places. The higher frequency of citation of these species indicates their importance for local communities and attracts more attention for conservation in the study area as argued by Belayneh and Bussa (2014).

Among 107 plant species reported in the study area, only 17 of the plant species are found in the market survey, of which only 7 of them are identified by scientific names. The fact that small numbers of medicinal plants are reported in the market survey is also reported by different

studies conducted in the country (Tollosa, 2007, Giday, *et al*., 2009; Kidane, *et al*., 2014; Belayneh and Bussa, 2014; Kidane, *et al*., 2014). The price of the herbs ranges from 2 Birr for the most common herb (*Parthenium. hysterophorus* L.) to 40 Birr for *Moringa. stenopetala* (Bak. F.) Cuf. Leaves and roots are the most common observed plant parts in the market survey.

Claimed activities of five most frequently used medicinal plants in other literature

Aloe megalacanth (*Aloaceae*)

This plant is locally called Dacar and it is leaves are used to treat constipation and eye disease, cardiac problems, nausea & vomiting. Other studies indicate that this plant is used to treat colon cancer, malaria, amoeba, evil eye (Teklay *et al.*, 2013, Belayneh and Bussa, 2014). The latex of the plant is used for the treatment of external wound, ascariasis, and the root is used for impotence and urine retention, while the whole plant is used for the treatment of snake bite (Teklay *et al.*, 2013).

***Dregea sp*. (Asclepiadaceae)**

This plant is locally called Geed sare and the roots and leaves of the plant are used against diarrhea, nausea and vomiting. Since the species of the plant is not identified, it is difficult to compare the use of the plant in other parts of the world.

***Coriandurm sativum* L. (Apiaceae)**

This plant is locally called qurjen and its seeds are used to treat back pain and arthritis. The seeds are also used to treat ascariasis in some parts of the country (Guji *et al.*, 2011).

Different studies indicated that the essential oil of *Coriandurm. sativum* may be useful as natural bactericides for the control of bacterial diseases of plants and for seed treatment, in particular, in organic agriculture. The significant antibacterial activity of the essential oil against bacterial pathogens of mushrooms appears to be promising (Cantore *et al.,* 2004). Other studies also reported that antioxidant and hepatoprotective activity potential of essential oils of *Coriandurm sativum* (Samojlik *et al.,* 2010). Another study reported that the essential oil of *C. sativum* possess larvicidal and repellent activity against the filariasis vector Aedes albopictus Skuse (Diptera: Culicidae) (Benelli *et al.,* 2013). The essential oil also shows hypoglycemic and hypolipidemic effects in Meriones shawi rats (Aissaoui *et al.,* 2011).

***Lepidium sativum* L. (Brassicaceae)**

The seeds of *Lepidium sativum,* locally called Shunfax are used for the treatment of cough, chest pain, back pain, tuberculosis, tooth pain, diarrhea, and eye disease. Other Studies indicate that the plant is used for topical treatmeant of wound, heartache, diarrhea and dysentery, skin disorders, abdominal cramp, headache, tonsilitus, itching, anthrax, haemorrhoids and michi (Wolde and Gebre-Mariam, 2002, Gedif and Hahn, 2003, Giday *et al.,* 2009, Yirga and Zeraburk, 2011, Teklay *et al.,* 2013).

In Indian TM, various parts of the plant are used to treat various human ailments such as diarrhea, dysentery, leprosy, skin and eye diseases, leucorrhoea, scurvy, liver diseases, renal diseases, dyspepsia, asthma, cough, cold and seminal weakness, also it is considered as bitter, diuretic, tonic, abortifacient, aphrodisiac, thermogenic, galactagogue, emmenagogue, depurative, ophthalmic, also used to treat tenesmus and secondary syphilis (Bansal, *et al.,* 2012, Manohar, *et al.,* 2012). The seeds of *Lepidium sativum* could be used as food supplement in human diet as it

contains considerable amount of iron and calcium. Presence of high carbohydrates, macro and micro elements and antioxidant properties would increase its utilization. Due to its high free radical scavenging potential, consumption of mixed or balanced diet may show rich nutritional as well as medicinal value of the plant (Kasabe *et al.*, 2012).

***Parthenium hysterophorus* L. (Asteraceae)**

The plant is locally called Kalignoole. Its leaves and root are used to stop bleeding against tetanus, back pain and tooth pain. The plant is known to be a noxious weed in America, Asia, Africa and Australia. This weed is considered to be a cause of allergic respiratory problems, contact dermatitis, mutagenicity in human and livestock. Crop production is drastically reduced owing to its allelopathy. Also aggressive dominance of this weed threatens biodiversity (Patel, 2011).

Parthenium hysterophorus confers many health benefits, remedy for skin inflammation, rheumatic pain, diarrhea, urinary tract infections, dysentery, malaria and neuralgia. Its prospect as nano-medicine is being carried out with some preliminary success so far. It has a potential for removal of heavy metals and dye from the environment, eradication of aquatic weeds, use as substrate for commercial enzyme production, additives in cattle manure for biogas production, as bio pesticide, as green manure and compost (Patel, 2011).

The decoction of *Parthenium hysterophorus* has been used in TM to treat fever, diarrhoea, neurologic disorders, urinary tract infections, dysentery, malaria and as emmenagogue (Surib-Fakim *et al.,* 1996). Ethnobotanically, it is used by some tribes as remedy for inflammation, eczema, skin rashes, herpes, rheumatic pain, cold, heart trouble and gynecological ailments.

Parthenium hysterophorus has been found to be pharmacologically active as analgesic in muscular rheumatism, therapeutic for neuralgia and as vermifuge (Maishi *et al.,* 1998). This weed is also reported as promising remedy against hepatic amoebiasis. Parthenin, the major constituent of the plant, exhibits significant medicinal attributes including anticancer property (Venkataiah *et al.,* 2003). The methanol extract of the flowers showed significant antitumour activity and parthenin exhibited cytotoxic properties against T cell leukaemia, HL-60 and Hela cancer cell lines (Das *et al.,* 2007). Earlier study had established the antitumour potential of *Parthenium hysterophorus* extracts in vitro and in vivo with positive results in terms of tumour size reduction and overall survival of cell lines (Ramos *et al.,* 2002). Aqueous extract of *Parthenium hysterophorus* has hypoglycaemic activity against alloxan-induced diabetic rats.It was proposed that the flower extract can be used for developing drug for diabetes mellitus (Patel *et al.,* 2008). The use of this plant should be cautious since different allergic reactions have been reported in different litratures.

7. LIMITATIONS OF THE STUDY

- This study might be subjected to recall bias as it is also true for all cross sectional surveys.
- Few number of healers participated in the survey
- Few plant specimens were collected and identified by their scientific name, due to the distance of the plant from the respondents house so that, majority of the plant species were recorded by their vernacular name

8. CONCLUSION

Overall, this ethnomedicinal study showed that the community in Jigjiga Woreda relies on considerable number of traditional medicinal plants species to treat a wide spectrum of human ailments. A total of 34 plant species are fully identified by scientific names. The identified plants fall under 24 plant families of which largest number falling under, Solanaceae which has the highest number of species (5), followed by Rutaceae and Meliaceae which contain 3 species each. The study found that leaves are the most frequently utilized plant part, followed by roots. The reasons for preferring for herbal drugs were lower price, efficacy and geographic inaccessibility to modern medicine.

Age, gender, educational status and occupation are important factors that determine the use of TM in the study area. Many young people, males, literate and occupations other than agro-pastoralists were found to have less preference to the use of TM for their illness. The price of medicinal plants in the study area ranges from 2-40 birr.

9. RECOMMENDATIONS

- This survey has recorded only part of untapped indigenous resources of the region in the area of TM. It is therefore suggested that other studies be made to explore the potential of the different Woredas and zones of the region to preserve this indigenous knowledge of TMs by proper documentation, identification of plant species, herbal preparation and dosage forms used.

- There is a need to carry out further phytochemical and pharmacological investigations to ensure the safety and efficacy of *Dregea sp*., *Coriandurm sativum* L., *Lepidium sativum* L., *Aloe megalacanth and Parthenium hysterophorus L*.

- Anthropological research is necessary to understand and document the various ritual procedures performed prior to the collection of the medicinal plants.

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Annexes

Annex I: Questionnarie used to collect ethnomedicinal information from Jigjiga Woreda, Eastern Ethiopia (from head of Households/ Wives).

Instruction to data collectors

- Please greet the respondents according to the culture of Somali custom.
- Explain the aim of the study with special emphasis to its importance for the Somali people.
- Don't forget to listen the respondent about issues other than your concern.
- Conduct the interview in place where the informants feels comfortable.
- Ask the respondents to show you the medicinal plants.

Name of the interviewer----------Date of the interview----------

Part I Socio demographic characteristics of the respondents Instruction: Put the right sign "✓ "where choices are given

1. Sex of the respondents:

   A. Male ☐ B. Female ☐

2. Age: _____

3. What is your status in the family?

   A. Husband ☐ B. Wife ☐

4. Address: _____

   A. Woreda_____ B. Kebelle_____

5. Religion:

   A. Muslim ☐ B. Orthodox Christian ☐

   C. Protestant ☐ D. Others specify_____

6. Educational status:

A. Illiterate	☐	B. Literacy campaign	☐
C. Islamic education	☐	D. Grade 1-6	☐
E .Grade 7-8	☐	F. Grade 9-10	☐
G. Grade 11-12	☐	H. Above grade 12	☐

7. What is your main occupation: _____

8. Household size: _____

9. Average monthly income (in Birr) for urban area_____

10. Type of house for rural area: A. Corrugated iron sheet ☐ B. Doselae

11. A. Number of goats: _____

B. Number of cattels: _____

C. Number of camels: _____

Part II practice of the community on traditional medicine

12. Was there illness in the family in the last month?

A. Yes ☐ B. No ☐

(If yes, fill the table below. If no, go to question no 14).

. The table below is not drawn professionally.

S. No	Patient		Type of illness(symptoms)	Go to healers	Go to health facility	Used home-made herbal medicine	No action taken
	Sex	Age					
1							
2							
3							
4							
5							

13. If the answer to question 12 is go to healers and used homemade herbal remedies ask the following questions

A. Could you tell me the name of the plant used?

B. Part of the plant used?

C. How the plant is prepared?

D. How much was the cost?

Part III. Hypothetical question for the community on use of traditional medicine

14. What do you usually do when any member of the family is sick?

A. Go to health institutions ☐

B. Go to traditional healers ☐

C. Use homemade herbal medicine ☐

D. Others, if any_____

15. If the answer for question 14 is "B" or "C", why do you use TM when any member of the family is sick?

A. It is cheap ☐

B. No access to health institutions ☐

C. It is more effective than modern medicine ☐

D. Others if any_____

16. Do you use medicinal plant for self care?

A. Yes ☐ B. No ☐ (if No skip to question 19)

17. If yes to question #17 what is the source of your knowledge about traditional medicine?

A. Family member ☐ C. Traditional healer ☐

B. Friends ☐ D. Other ☐

18. Do you know plants used as medicine in your locality?

A. Yes ☐ B. No ☐ If the response is yes, fill the table below

S.N.	**Questions Items**	**Plant 1**	**Plant 2**	**Plant 3**
18.1.	Vernacular name			
18.2.	Indications	Click right (✓) in the blank space	Click right (✓) in the blank space	Click right (✓) in the blank space
	A			
	B			
	C			

	D			
18.3.	Part of the plant	Write the part of the plant they tell you	Write the part of the plant they tell you	Write the part of the plant they tell you
	A. Leaf			
	B. Steam			
	C. Bark			
	D. Root			
	E. Seed			
	F. Fruit			
	G. The whole plant			
	H. Leaf & steam			
	I. Root & leaf			
	J. Flower			
18.4.	Mode of use	Click right (✓) in the blank space	Click right (✓) in the blank space	Click right (✓) in the blank space
	A. Fresh			
	B. Dried			
	C. Both			
18.5.	Time of collection	Click right (✓) in the blank space	Click right (✓) in the blank space	Click right (✓) in the blank space
	A. Dusk			
	B. Mild day			
	C. Down			
	D. Any time			
18.6	Why time of collection is important? A. To keep from evil spirits			
	B. To maintain the efficacy			
	C. To protect the secreacy			

18.7.	Special precautions taken during collection of the plant A.Facing away from shadow			
	B.Throwing seven pieces of stone on the medicinal plants			
	C.Abstaining from sexual contact preceding day of collection			
	D.Collecting early in the morning before washing hand and face			
	E.Reading from verses from Bible or Qorean			
18.8.	Site of growth	Click right (✓) in the blank space	Click right (✓) in the blank space	Click right (✓) in the blank space
	A. Domestic (cultivated)			
	B. Wild			
	c. Both			
18.9.	Stepwise preparation of the medications and additives used			
18.10.	Routes of administration	Click right (✓) in the blank space	Click right (✓) in the blank space	Click right (✓) in the blank space
	A. Per oral			
	B. Topical			
	C. Inhalational			
	D. Others, if any			
18.11	What dosage forms are used to deliver the medicine?	Click right (✓) in the blank space	Click right (✓) in the blank space	Click right (✓) in the blank space
	A .Powder			
	B .Juice			

	C .Decoction			
	E .Tea			
18.12.	Dosage regimen for the medicaments given to the patients	Click right (✓) in the blank space	Click right (✓) in the blank space	Click right (✓) in the blank space
	A. Dose			
	B. Frequency			
	C. Duration of treatment			
18.13.	Dietary restrictions and other precautions during treatment			
18.14	Could you tell me any Adverse effects that appear upon taking the medicament?			
18.15	Could you tell me any Antidotes to the unwanted effects of the medicament?			
18.16	Could you tell me any Contraindications of the medicaments?	Click right (✓) in the blank space	Click right (✓) in the blank space	Click right (✓) in the blank space
	A. Children			
	B. Pregnancy			
	C. Lactating			
	D. Elderly			
	E. Disease conditions(specify)			
18.17.	Storage and shelf life	Click right (✓) in the blank space	Click right (✓) in the blank space	Click right (✓) in the blank space
	A. Containers used			
	B. Site of storage			
	C. Shelf life			
	D. What will happen			

	if it used after the specified shelf			
17.18	What will you do if treatment fails			

Annex II: Questionnaires administered to traditional healers to collect ethno botanical and ethno medicinal information of medicinal plants in Jigjiga Woreda.

Instruction to data collectors

- Please greet the respondents according to the culture of Somali people.
- Explain the aim of the study with special emphasis to its importance for the Somali people.
- Don't forget to listen the respondent about issues other than your concern.
- Conduct the interview in place where the informants fell comfortable.
- Ask the respondents to show you the medicinal plants.

Name of the interviewer----------Date of the interview----------

Part I Socio demographic characteristics of the healers Instruction: Put the right sign "✓ "where choices are given

1. Sex of the respondents:

A. Male ☐ B. Female ☐

2. Age: _____

3. Address:

Woreda_____ Kebele_____ Gote_____

4. Religion:

A. Muslim ☐ B. Orthodox Christian ☐

C. Protestant ☐ D. Others ☐

5. Educational status:

A. Illiterate ☐ B. Literacy campaign ☐

C. Islamic education ☐ D. Grade 1-6 ☐

E. Grade 7-8 ☐ F. Grade 9-10 ☐

G. Grade 11-12 ☐ H. Above grade 12 ☐

6. Economic status:

6.1. Average monthly income (in birr) if known _____

6.2. Types of houses A. Doselae ☐ B.Corrugated iron ☐

6.3. Number of domestic animals:

Number of goats/sheep: _____ Camels: _____ Cattle: _____

7. Years of experience as a healer_____

8. Source of knowledge_____

A. Family members ☐ B. Friends ☐

C. Religious institutions ☐ D. Other healers ☐

E. God gift ☐ F. Others, if any_____

9. Mode of practice:

A. Full time ☐ B. Part time ☐

10. How many patients do you treat per week? _____

11. What is your monthly income from TM practice alone? (In birr)_____

12. Do you have fixed treatment cost? A. Yes ☐ B. No ☐

If yes what is the average cost per medicament? _____

If No how do you charge your clients?

_____

13. Illness treated by the healer if there is more than 11 disease treated by the healers use the back of the questionnaires to write

S.N	Name of the illness	Symptoms	Causes	Mode of transmission
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

14. What are the sources of your medicine?

A. Plants ☐ B. Animals ☐

C. Minerals ☐ D. Others, if any_____

15. Could you tell me the plants you use as medicine?

1.	Vernacular name	1.	2.

	A .Tree		
	B .Shrub		
	C .Herb		
	D .Liana		
	E .Parasite plant		
	F .Aquatic		
	Others, specify		
3.	If parasite what is the host?		
4.	If trees, height and bulk Bark -description		
5.	Flower color, if any		
6.	Fruit description, if any		
7.	Smell of flower, if any		
8.	Which part of the plant is used?	Click right (✓) in the blank space	Click right (✓) in the blank space
	A .Root		
	B .Leaf		
	C .Stem		
	D .Fruit		
	E .Root bark		
	F .Stem bark		

	G .Flower		
	H .Herb		
	I .Seed		
	J .Small twinges with leaves		
9.	Mode of use	Click right (✓) in the blank space	Click right (✓) in the blank space
	A .Fresh		
	B .Dried		
	Time of collection	Click right (✓) in the blank space	Click right (✓) in the blank space
	A .Dusk		
	B .Down		
	C .Any time		
10.	Day of plant collection	Click right (✓) in the blank space	Click right (✓) in the blank space
	A .Specific day, if any, specify		
	B .Any day of the week		
11.	Is there any ritual procedure followed for collection of the plants?	Click right (✓) in the blank space	Click right (✓) in the blank space
12.	If yes to Q.11 A .Please mention the procedure		

`	B .Rationale behind the procedure		
13.	In which season the plant is collected	Click right (✓) in the blank space	Click right (✓) in the blank space
	A .Summer		
	B .Winter		
	C .Autumn		
	D .Spring		
14.	What are the claimed medicinal uses of the plant?		
	A .		
	B .		
	C .		
15.	Is the drug(herb) mixed with another drug (herb) or other additive?		
16.	If the response to incorporation of another drug is yes fill the description of the plant in a separate questionnaire and attach as annex.		
17.	If yes to Q.16 please mention them with their importance of their incorporation		
	A. Additives		
	B . Drugs		

18.	What dosage forms are used to deliver the medicine?	Click right (✓) in the blank space	Click right (✓) in the blank space
	A .Powder		
	B .Juice		
	C .Decoction		
	E .Tea		
	Others specify		
19.	Please provide detailed procedure for the ethno formulation? (for each medicinal use)		
20.	What is the rationale behind the route of administration used?		
21.	What do you think is the mechanism of action of the drug		
22.	What are you going to do if treatment fails upon the use of the drug?		
23.	Containers used for storage of the formulations?		

24.	What is the recommended storage condition of the formulation?		
25.	For how long can you keep the formulation without deterioration?		
26.	Is there any observed Traditional medicine – interaction?		
27.	If yes to Q.26 mention the interaction		
28.	Is there any observed Traditional medicine-Modern medicine interaction?		
29.	If yes to Q .28 please mention the interaction		
30.	Is there any observed Traditional medicine –Food interaction?		
31.	If yes to Q.30 please mention the interaction		

Table 1.Indications, Route of administration, Dose, Duration and Antidotes of

Indication	Stage of illness	Diagnosis	Routes of administration	Dose and duration			Antidote, if any or the plant name
				Adult	Pediatric	Geriatric	
	Mild						
	Serious						
	chronic						

Table 2 Side effects, Contraindications, Precautions, and Recommendation in pregnancy_____

Indication	Stage of illness	Side effects	Contraindications	Precautions	Recommendation in pregnancy
	Mild				
	Serious				
	Chronic				

Annex III: Questionnaire administered to market survey to collect market value of medicinal preparation in Jigjiga Woreda

Instruction to data collectors

If the market survey is for the traditional healers leave part one general question and ask part II question, but if the seller is not a traditional healer ask all the questions.

Part I. General questions

Name of the interviewer----------Date of the interview----------

Instruction: Put the right sign "✓ "where choices are given

2. Age: _____

3. Sex of the respondents:

A. Male ☐ B. Female ☐

4. Address:

Woreda_____ Kebele_____ Gote_____

5. Religion:

A. Muslim	☐	B. Orthodox Christian	☐
C. Protestant	☐	D. Others	☐

6. Educational status:

A. Illiterate	☐	B. Literacy campaign	☐
C. Islamic education	☐	D. Grade 1-6	☐
E. Grade 7-8	☐	F. Grade 9-10	☐
G. Grade 11-12	☐	H. above grade 12	☐

7. Economic status:

7.1. Average monthly income (in birr) if known _____

8. Mode of practice:

A. Full time ☐ B. Part time ☐

12. How many drugs did you dispense per week? _____

13. What is your monthly income from TM practice alone? (In birr)_____

14. Do you have fixed treatment cost?

A. Yes ☐ B. No ☐

If yes what is the average cost per medicament? _____

If No how do you charge your clients?

15. What types of dosage for that patient likes

A. Solid dosage form ☐ B. Liquid dosage forms C. Decoctions D.

16. from where you get your preparations

A. From traditional healers ☐ B. From shops ☐ C. Others specify_____

Part II. Question on the market values of medicinal plants

S. No	Name of the disease	Name of medicinal plants	Parts of the plants & ingredients	Cost of the medication

Lifaaqa 1: Su'aalaha loo isticmaasho ururinta xogta geedaha daawo dhaqameedka loo adeegsado , taaso waliba su'aalahan xoog ururinta waxaa loogu talo galay Degmada Jigjiga , Bariga Itoobiya , gaar ahaan xaaska/ guri joogto ah /

Tilmaamaha uu gaar ka ah xog ururiyaasha :-

- Fadlan waa in aad marka hore salaam u soo jeediso cida aad wareeysanayo sida uu waafaqsan dhaqanka soomaalidda .
- Faah faahin ka bixi muhiimada uu gaarka ah cilimi baadhistan & faa'iidada uu leeyaha bulshada .
- Hamooganin in aad dhageysato qofka aad wareeysanayso .
- Hawsha wareeysiga waa in aad ka fuliso goobta ugu habboon cida su'aalaha loo jeedinayo.
- Weydi qofka aad wareeysanayso in uu ku tuuso geedaha daawo dhaqameedka . Magaca qofka wareeysiga soo jeedinayo_____Taariikhda_____

Qaybta 1/aad :- su'aalaha ku saabsan bulshada & tirakoobka .jawaabta qofka la wareeysanayo waa in aad geliso calaamada ." ✓".

1. Lab/ dheddiga qofka la wareeys

B. Lab ☐ T. dheddiga b ☐

2. Da'da :_____

3. xilka / masuuliyada aan ka haysato qoyska dhexdisa

B. sayga ☐ T , xaas ☐

4. Ciwaanka degananshaha

B. Degmada ___ T. qabalaha _____

5. Diinta

B. muslin ☐ T. ortodhoges ☐ J. barooteestantiiga ☐

X. kuwo kale haddii ay yihiin caddeyn ka bixi ._____

6. Xaalada waxbarashada

B. male ☐ T, waxbarashada dadkawawayin ☐ J. waxbarashada islaamka ☐

X. faslaka 1- 6 /aad ☐ Kh. Fasalka 7- 8/aad ☐ D. fasalka 9-10/aad ☐

R. fasalka 11- 12/aad ☐ S. ka sareeya fasalka 12/aad ☐

7. shaqada muhiimka aad hayso _____

8. Waa imisa tirade qoyskinu _____

9. dakhliga bisha ee ceel ceelis ahaan lacag ahaan add ku helayso

[magaalada dhexdeeda/ lacagta Birrta _____

10. Nooca guriga [miyiga dhexdeeda /

B. jingad ☐ T. dasooleeyda ☐

11. Tirada xoolaha aad leedahay

B.Adhigq _____ T. Lo'_____ J. Geela _____

Qaybta 2/aad :- xaalada ku dhaqanka daawo dhaqameedka la xirira .

12. hal bil oo la soo dhaafay qof qoyskaga ka mid ah oo xanuun ku dhacay majira ?

B. haa ☐ T. maya ☐ [jawaabtu hadi ay tahay " haa" fadlan waa in aad buuxiso shaxdan hoos ku qoran balse hadi jawaabtau tahay "maya" ka firso su'aasha ku qeexan No. 14 /aad .

No.	Bukaan		Astaamaha xanuunka				
	Lab ama dhediiga	Da"da		Daawo dhaqameed	Daaweynta casriga	Geedo daawo ahaan lagu dhax sameeyey guriga	Wax daaweyn loo sameeyey majirto
1							
2							
3							
4							
5							

13. Su'aasha 12/aad hadi jawaabtu tahay :- daawo dhaqameed - geedo daawo ahaan lagu dhax sameeyey guriga , waxaad soo jeedinaysa su'aalahan soo socda .

B. ma sheegi kartamagaca dhirta aad dawada u isticmaashay?

T. qaybaha dhirta ka midka ah ee aad isticmaashay?

J. qaabka aad daawada ku diyaarisay ?

D. qimaha daawada kubaxtay waa imisa ?

Qaybta III. Su'aalaha mala – abaarka ah uu gaarka ah loo soo jeedinayo bulshada ee la xirira isticmaalka daawo- dhaqameedka .

14. xubin ka mid ah qoyskaga marka uu xanuunsanayo maxad badana uu qabata ?

B. waxaan uu geeyna rugta caafiimaadka ☐

T. waxaan uu geeyana xirfadlayaasha daawo dhaqameedka ☐

J. isticmaalka daawo- dhaqameedka guriga dhexdiisa lagu sameeyey ☐

X. hadi ay jiran kuwo kale sheeg _____

15. jwaabta uu gaarka su'aasha 15/aad , hadi uu yahay sida ku cad xarafka "T" ama "J", maxa sabab uu ah isticmaalida daawo dhaqameedka

B. Qimaha oo ah mid aad u jeban ☐

T. jiritaan la 'aanta xarunta caafiimaadka casriga ☐

J. tayo buuxda & bogsimo kalsooni leh in laga helayo, marka lala barbar dhigo daawooyinka casriga ☐

X. hadi ay jiran kuwo kale _____

16. miyaad isticmaasha daawooyinka ka samaysan Dhirta adigu?

B. haa ☐ T. maya ☐ (hadi jawaabtu tahay maya fadlan waxaad u gudbta su'aasha 19/aad)

17. jawaabtaada su'aaasha 16/aad hadi ay tahay haa , xageed ka heshaa aqoonta daawo- dhaqameedka ?

B. xubno qoyskayga ka mid ka ah ☐ J. xirfadlayasha daawo- dhaqameedka ku daweya ☐

T . saaxibaday ☐ X.Diinta ☐ Kh.Dhaqanka ☐

D ,kuwo kale hadi ay jiraan sheeg_____

18. Ma garanaysa dhirta nawaaxigaga ka ku tala oo loo isticmaalo daawo ahaan ?

B. haa ☐ T. Mayaa ☐

hadii jawaabtu tahay Haa fadlan waa in aad buuxiso shaxda hoosta ku qeexan

No		Dhirta 1/aad	Dhirta 2/aad	Dhirta 3/aad
18.1.	Magaca cadiga loo yaqaano			
18.2.	Isticmalka	Ku qoor jaawabta	Ku qoor jaawabta	Ku qoor jaawabta
	B.			
	T.			
	J.			
	X.			
18.3.		Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)
	Qaybaha ka mid ka ah dhirta ee laisticmalo			

B. Caleenta				
T. jirridka geedka				
J. Diirka geedka				
X. Xidhiidka				
KH. Seedka[mirah]				
KH. Khudrada				
D. Dhamaan geedka R.Caleenta &jirridka geedka				
S. Xiidiidka & caleenta				
SH. Ubaxa				

18.4.	Qaabka isticimaalida	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)
	B. Sidaada loosogoyo			

	T. Ingeejin			
	J. Labadaba			
18.5.	Waqtiga la so goynayo	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)
	B.Aas madoobaad			
	T. Duhurka			
	G. Galbta			
	J. Waqti kasta			
18.6	X. Saacadaha dhirta la go'yo faa'iidadedu waa maxay			

	B. Si laga hortago shaydaanka			
	T. Sugida tayada bogsimada			
	J. Sugida sirta [qarinta]			
	X.Waxkale hadhii uu jiro			
18.7	Ficilada la hirgeliyo intaka horeeysa go'ynta dhirta			
	B. Wejiga hadhka laga weeciyo			
	T. Todoba dhegax oo la tirsdey oo l;agu tuuro geedka			
	J. Ka foojignanta galmada kahor halmalin			
	X. Xili subaaxnimo iyadon gacanta & wejiga la meydin oo la go'yo geedka.			
	KH. Waxa la Akhrista ayaado kamid ah Quraanka kariimka ama kitaabka quduska			
18.8	Goobta lagu beero dhirta	Qaaybta aay isticimalan	Qaaybta aay isticimalan caalamade (sida ✓	Qaaybta aay isticimalan caalamade (sida ✓)

		caalamade (sida ✓)	)	
	B, guriga gadaashisa			
	T. keynta dhexdisa			
	J. labadaba			
18.9	Nidamka daawada loo diyaariyo iyo waxa kale ee lagu daro			
18.10	Sida daawada loo qaato	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)
	b. Afka			

	T.Maqaarka			
	J.Ursasho (neef ku qadasho)			
	X. Hadi ay jiran kuwo kale.			
18.11	Nooca loo diyaarsho daawada	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)
	B. Buudo ahaan			
	J. sharaab ahaan			
	X. Mirid			
	Kh. nooca shaaha oo kale			
18.12.	Cabbirka daawada la siiyo bukaanka	Ku qoor jaawabta	Ku qoor jaawabta	Ku qoor jaawabta
	B. cabbirka			

	T. imisa waqti aya daawada la isticmalayaa			
	X. mudada uu cayiman daaweynta			
18.13.	Qofka miya loo xadida cunada iyo wax kale oo looga digo majiran			
18.14	Xiliga daawada la qaadanayo dhibato aay kento majirta			
18.15	Maxase lagu daaweya dhibatoyinka aan loo bahneyin			
18.16	cida laga mamunacay isticmaalida daawada	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)

	B. caruurta			
	T. qofka uurka leh			
	J. hooyada naaska nujiisa			
	X. qof wayeel			
	KH. Xanuno jira awuugeed (sheeg xanunadas)			
18.17.	Qabka loo kaydiyo iyo mudada laistcmalikaro	Ku qoor jaawabta	Ku qoor jaawabta	Ku qoor jaawabta

	B. Noca alabta lagurido dawada			
	T. halkee lagu kaydiya			
	J. Mudada wayku dhacayso (khayisayso) dawadu			
	X. Maxa dhici hadii laisticmalo dawadii oo adhacday			
18.18	Maxad samayni Haadii lagu cafimadiwayo daawadii			

Lifaaqa II: Suáalo loo diyaarshay dabiibyada dawo dhaqameedka si loo soo uruuriyo xog ku saabsan isticmaalka iyo isku daawaynta geedo dhaqameedka ee Dagmada Jigjiga

Tilmaamaha uu gaar ka ah xog ururiyaasha **:-**

- Fadlan waa in aad marka hore salaam u soo jeediso cida aad wareeysanayo sida uu waafaqsan dhaqanka soomaalidda .
- Faah faahin ka bixi muhiimada uu gaarka ah cilimi baadhistan & faa'iidada uu leeyaha bulshada .
- Hamooganin in aad dhageysato qofka aad wareeysanayso .
- Hawsha wareeysiga waa in aad ka fuliso goobta ugu habboon cida su'aalaha loo jeedinayo.
- Weydi qofka aad wareeysanayso in uu ku tuuso geedaha daawo dhaqameedka . Magaca qofka wareeysiga soo jeedinayo_____Taariikhda_____

Qaybta 1/aad :- su'aalaha ku saabsan bulshada & tirakoobka .jawaabta qofka la wareeysanayo waa in aad geliso calaamada ." ✓".

1. Lab/ dheddiga qofka la wareeys

B. Lab ☐ T. dheddiga b ☐

2. Da'da :_____

3. xilka / masuuliyada aan ka haysato qoyska dhexdisa

B. sayga ☐ T. xaas ☐

4. Ciwaanka degananshaha

B. Degmada ___ T. qabalaha _____

5. Diinta

B. muslin ☐ T. ortodhoges ☐ J. barooteestantiiga ☐

X. kuwo kale haddii ay yihiin caddeyn ka bixi ._____

6. Xaalada waxbarashada

B. male ☐ T, waxbarashada dadkawawayin ☐ J. waxbarashada islaamka ☐

X. faslaka 1- 6 /aad ☐ Kh. Fasalka 7- 8/aad ☐ D. fasalka 9-10/aad ☐

R. fasalka 11- 12/aad ☐ S. ka sareeya fasalka 12/aad ☐

7. khibrad sanadeedka dabiib aad ahayd_____

8. , xageed ka heshaa aqoonta daawo- dhaqameedka ?

B. xubno qoyskayga ka mid ka ah ☐

J. xirfadlayasha daawo- dhaqameedka ku daweya ☐

T . saaxibaday ☐ X.Diinta ☐ Kh.Dhaqanka ☐

D ,kuwo kale hadi ay jiraan sheeg_____

9. qaabka aad u shaqaysid

A. Waqti buuxa ☐ B. waqtiga dheeraadka ☐

10. Todobaadkii imisa bukaan ayaad dawaysaa?_____

11. waa imisa dakhliga bileedka ee dawo dhaqameedka(dabiibnimada) kaligii kaa soogala?(riyaal ahaan)_____

12. maad leedahay lacag goan ood kudaawayso dadka? A. Haa ☐ Maya ☐

Jawaabtaadu haday haa tahay waa imisa iskucelcelis daawaynta halka qof?_____

Jawaabtaadu maya haday tahay qaabkeed uga qaadaa lacagta?_____
_____
_____

13. Xanuunada uu daawaeeyo dawo dhaqameedluhu; hadii ay jiraan wax kabadan 11 xanuun oo uu dawo dhaqameedluhu(dabiibku) daawaeeyo, waxaan isticmaali kartaa xaga dambe ee warqadan suáalaha si aad ugu diiwaangaliso.

S.N	Magaca xanuunka	Astaamaha xanuunka	Waxa sababa xanuunka	Qaabka uu u gudbo xanuunku
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

14. daawadiina ilaha aad ka heshiin maxay yihiin?

A. Geedaha ☐ B. Xayawaanka ☐

C. Macdanta ☐ D. Meelo kale, Hadii ay jirto_____

15.Geedaha daawo ahaan aad u isticmaashaan maad ii sheegi kartaa?

1.	Nooca su'aasha	Dhirta 1/aad	Dhirta 2/aad
	A .Geed		
	B .Geed yar		
	C .geedaha caleentoodooda iyo caraftoooda daawo lo isticmaalo		
	D .Geedaha yaryar ee kuwa kale qabsada markay baxayaan		
	E .Parasite plant		
	F .Geedaha biyaha kadhaxbaxa		
	Qaar kale, Sheeg_____		
3.	If parasite what is the host?		
4.	Hadii geed yihii, qeex dherarka iyo jidhiftiisa		
5.	Hadii ubax tahay, noociisa(kalarka) sheeg		
6.	Mudho qeex haday jirto		
7.	Carafta ubaxa, hadii ay jirto		
8.	Qaybaha ka mid ka ah dhirta ee laisticmalo	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)

	B. Caleenta		
	T. jirridka geedka		
	J. Diirka geedka		
	X. Xidiidka		
	KH. Seedka[mirah]		
	KH. Khudrada		
	D. Dhamaan geedka R.Caleenta &jirridka geedka		
	Qaybaha ka mid ka ah dhirta ee laisticmalo		
	B. Caleenta		
	S. Xiidiidka & caleenta		
	SH. Ubaxa		
9.	Qaabka isticimaalida	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)
	B. Sidaada loosogoyo		
	T. Ingeejin		
	J. Labadaba		
	Waqtiga la so goynayo	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)
	B.Aas madoobaad		
	T. Duhurka		
	G. Galabta		
10.	Maalinka geedaha lasoo guro	Ku caalamade (sida ✓) meesha banana	Ku caalamade (sida ✓) meesha banaan
	A .maalin go'an, hadii ay jirto sheeg		
	B .maalin kaste oo todobaadka ka mid ah		
11.	Ma jirtaa qaab cayiman oo laraaco marka lasoo gurayo	Ku caalamade (sida ✓) meesha banaan	Ku caalamade (sida ✓) meesha banaan

	geedaha?			
12.	Hadii jawaabtaadu haa tahay S.11 A .fadlan qeex qaabka/ falsamaynta laraaco marka lsoo gurayo			
`	B .sabab kadambayso in qaabkaa la raaco/ lamaro			
13.	Waqtigee ayaa geedaha lasoo guraa?	Ku caalamade (sida ✓) meesha banaan	Ku caalamade (sida ✓) meesha banaan	
	A .Summer Xagaa			
	B .Winter Gu’			
	C .Autumn dayr			
	D .Spring Jiilaal			
14.	Magaca cadiga loo yaqaano isticmalka			
	B.			
	T.			
	J.			
15.	Daawada (geedka) daawo kale(geed kale) amaba wax kale maku dax laaqdaan			
16.	Hadii jawaabtu tahay haa (aad isku laaqdaan) Ku Buuxi qeexida geedka warqada suáalaha oo gooni ah kadibna ku dhaji lifaaqa			
17.	Hadii jawaabtaada S. 16 haa tahay, fadlan waxa lagu laaqo iyo faaaídadooda loogu laaqayo sheeg			
	B.Waxyaalaha lagu laaqo			

	T . daawooyinka			
18.	Nooca loo diyaarsho daawada	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)	
	B. Buudo ahaan			
	T. sharaab ahaan			
	J. Mirid			
	X. shaaha oo kale			
	Kh. hadi ay jiran kuwo kale_____			
19.	Fadlan kabixi qaab cad ee loo diyaarsho daawo dhaqameedka (geed kaste goonidiisa)			
20.	Maxay tahay sababka ka dambeeya meesha daawada laga siiyay qofka?			
21.	Maxaad u malayn qaabka daawada u shaqayso sida ay tahay			
22.	Maxad samayni Haadii lagu cafimadiwayo daawadii			
23.	Maad leedahay weelal aad ku kaydsatid daawooyinka aad diyaarsatay?			
24.	Cimilada iyo xaalada ugu wacan ee lagu taliyo in lagu kaydiyo maxay tahay?			

25.	Mudo intee leeg ayay raagi kartaa daawada aad diyaarisay iyadoon xumaanin		
26.	Majirtaa wax isla falgal(iska hor imaatin) oo daawo dhaqameedka ah marka la isla qaato?		
27.	Hadii haa tahay jawaabta S Q.26 qeex isla falgalkaas		
28.	Majirtaa wax isla falgal(iska hor imaatin) oo daawo dhaqameedka iyo ta casriga?		
29.	Hadii jawaabtaada S. 28 eey tahay Haa, fadlan sheeg isla falgal(iska hor imaatin)		
30.	Majirtaa wax isla falgal(iska hor imaatin) oo daawo dhaqameedka iyo cuntada?		
31.	Hadii jawaabtaada S. 30 eey tahay Haa, fadlan sheeg isla falgal(iska hor imaatin)		
32.	Cabbirka daawada la siiyo bukaanka	Ku qoor jaawabta	Ku qoor jaawabta
	B. cabbirka		
	T. imisa waqti aya daawada la isticmalayaa		
	X. mudada uu cayiman daaweynta		
33.	Qofka miya loo xadida cunada iyo wax kale oo looga digo majiran		
34.	Xiliga daawada la qaadanayo dhibato aay kento majirta		
35.	Maxase lagu daaweya dhibatoyinka aan loo bahneyin		

36.	cida laga mamunacay isticmaalida daawada	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)	Qaaybta aay isticimalan caalamade (sida ✓)
	B. caruurta			
	T. qofka uurka leh			
	J. hooyada naaska nujiisa			
	X. qof wayeel			

	KH. Xanuno jira awgeed (sheeg xanunadas)			
37.	Maad ii sheegi kartaa cabbirka qiyaasta iyo mudada eey dawada qaadanayaan bukaanadan soo socda?	Qor waxa aay kuu sheegaan	Qor waxa aay kuu sheegaan	Qor waxa aay kuu sheegaan
	A. Qofka dhalinyarta			
	B. Caruurta			
	C. Waayeelka			

Lifaaqa III. Suáalo loo diyaarshay xog ururinta qiimaha suuqa ee DAAWO dhaqameedka Dagmada Jigjiga

Jiho siin xog uruuriyaasha

Hadii xogta suuqa laga soo uruurinayo la waydiinayo dabiibka daawo dhaqameedka, isaga bood qaybta I ee ah suáalo guud oo waydii qaybta labaad suáalaha kuyaala. Laakin qafka iibiya ah haduusan ahayn dabiib waydii dhamaan suáalaha.

Qaybta I. Suáala guud

Magaca qofka waraysanaya_____Taariikhda la waraystay_____

Jiho: Ku qor calaamadan "✓ " meelaha ka dooroda ah

1. Da'da: _____
2. Jinsiga jawaab bixiyaha:

   A. Lab ☐ B. Dhidig ☐
3. Ciwaanka:

   Degmada_____ Qabalaha_____
4. Diinta:

   A. Muslim ☐ B. Ortoodhoks kiristian ☐

   C. Burotistaant ☐ D. Wax kale ☐
5. Heerka wax barasho:

   A. Aan wax baran ☐ B. wax barashada ololaha ☐

   C. waxbarashada diinta ☐ D. Fasalka 1-6 ☐

   E. fasalka 7-8 ☐ F. Fasalka 9-10 ☐

   G. fasalka 11-12 ☐ H. kasareeya fasalka 12 ☐
6. Xaalada dhaqaale:

6.1. Celcelis ahaan dakhligaaga bisha (birr ahaan) waa imisa, hadaad garan? _____

7. Qaabka aad u shaqaysid:

   A. Waqti buuxa(maalin oo dhan) ☐ B. waqtiyada qaarkood ☐
8. Maalinkiiba imisa dawo ayaad bixisaa? _____
9. Dakhliga kaasoo galo daawo dhaqameedka kaliya bishiiba waa imisa(birr ahaan)?_____
10. lacag goán (cayiman) oo daawaynta ka qaadid miyuu jiraa? A. Haa ☐ B. Maya ☐

    Hadii uu jiro, waa imisa celcelis kharashka halkii daawaynba? _____

Hadii aysan jirin lacag goán sided bookaankaaga uga qaadaa lacagtaa daawaynta?

11. Daawada qaabkee u samaysan ayay bukaankaagu jecelyihiin(mudnaanta siiyaan)?

A. Kuwa laliqo ee adag ☐ B. Kuwa dareeraha ee la cabo C. kuwa lamarsado

12. Xageed ka hesha daawo dhaqameedkan aad ku dawaysid

A. Dabiibyada daawo dhaqameedka ☐ B. Dukaanada ☐ C. Anaa meelaha ay ka baxaan ka soo uruursada ☐ D.Anaa beerta ☐ Meel kale(Qeex)_____

Qaybta II. Su'aalo ku saabsan qiimaha suuqa ee geedaha daawo dhaqameedka

Tir ada	Magaca cudurka	Geedka magaciisa goobtaas looga yaqaano	Qaybta geedka ee la isticmaalo iyo daawada ku jirta	Kharashka isdaawaynta
1.				
2.				
3.				
4.				
5.				
6.				