ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES DEPARTMENT
OF INFORMATION SCIENCE AND SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF THE FEASBILITY OF USING TEXT MESSAGES AMONG ART FOLLOW-UP PATIENTS TO IMPROVE DRUG ADHERENCE IN SELECTED ART UNITS IN ADDIS ABABA CITY ADMINISTRATION.

ADDIS ABABA

By

TSEGA HAILU (B.sc)

ADVISOR: PROF.MESGANAW FANTAHUN (MD, MPH, PhD)

Thesis submitted to The Department of Health Informatics, Addis Ababa University in Partial Fulfillment of the Requirement for the Degree of Masters of Science in Health Informatics.

JUNE 2010

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APPROVED BY THE EXAMINING BOARD

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Chairman, department graduate committee signature

PROF.Mesganaw Fantahun

_____ _____

Advisor signature

_____ _____

Examiner signature

JUNE 2010

ADDIS ABABA

Declaration

I, the undersigned, declare that this thesis is my original work and that all sources of materials used for this thesis have been duly acknowledged.

Name: Tsega Hailu (Bsc, Public Health)

Signature: _____

Place: Addis Ababa University, Department of Information Science and School of Public Health.

Date of Submission_____

Approval of primary advisor

This thesis has been submitted for examination with my approval as the University advisor.

Name: Prof. Mesganaw Fantahun

Signature _____

Date: june.2010

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Table of contents

No **Contents** **pages**

List of tables

List of Annexes

List of Abbreviations

AAU	Addis Ababa University
AIDS	Acquired Immune Deficiency Syndrome
ART	Anti Retroviral Therapy
ARV	Anti Retroviral
CI	Confidence Interval
SPH	School of public Health
EPHA	Ethiopian Public Health Association
HAART	Highly Active Anti Retroviral Therapy
HBC	Home Base HIV Care
HIV	Human Immune Deficiency Virus
PLWHA	People Living With HIV/ AIDS
OR	Odds Ratio
SD	Standard Deviation
SMS	Short message System
SPSS	Originally, it is an acronym of Statistical Package for the Social Science but now it stands for Statistical Product and Service Solutions Statistical package for social sciences
USAID	United States Agency for International Development

Abstract

Back ground: PLWHA on ART follow –up individuals may or may not have mobile phones, ability to use text messages and willingness to receive text message reminders to take their drugs .But the extent of theses desires and how it varies by individual, social, health and demographic characteristics is not well understood.

Objective: to assess the feasibility of using text messages among ART follow up patients to improve drug adherence in selected ART units in Addis Ababa city administration

Method: The study was undertaken from March to April 2010, using quantitative cross-sectional study supplemented by qualitative in-depth interview on a sample of 461 PLWHA on ART follow up care for quantitative and 14 respondents for qualitative. Study subjects were selected using stratified random sampling method. A pre- tested structured questionnaire was used to collect data; Data were entered, cleaned, and analyzed using SPSS version 16

Result- One hundred twenty five (82.8%) male and ninety-three (79.5%) female over all 218 (81.3 %) of the total respondents PLWHA on ART follow-up in Addis Ababa were willing to receive (SMS) text message reminders. Of those who have willingness to receive text message reminders had disclosure of HIV status to their partner or family with (adjusted OR: 0.03, 95%CI :(0.01-0.08) times more likely willing to receive SMS text message reminders than those who did not disclose their HIV status. In addition, respondents who attended elementary school (adjusted OR: 8.21, 95% CI: 1.59-42.33) times more likely to receive text message than those who do not attended school and those who secondary school (adjusted OR: 58.65, 95% CI: 12.18-280.12) times more likely to receive text messages than those who did not attended school. One hundred forty eight (68.2%) of PLWHA on ART follow-up individuals wanted to receive text message reminders of time to take their drugs

Conclusion: High proportion of HIV positive individuals on ART follow-up wanted to receive text message reminders, of time to take their drugs. Their willingness to receive text message reminders of these people has implication to introduce or adoption (SMS) text message technology with designed special computer software program that automatically sends special message service (SMS) to improve drug adherence.

1 – Introduction

1.1 Back ground

Poor adherence to treatment compromises the efforts of the health care system, and policy makers in improving the health of populations. Poor adherence to treatment causes medical and psychological complications, reduces quality of life, increases the likelihood for development of drug resistance, wastes health care resources and erodes public confidence in health systems (1, 2).

Reviews of numerous studies revealed that 95% or greater adherence is necessary in order to achieve and maintain undetectable viral loads among most patients treated with highly active antiretroviral therapy (HAART). Among patients who do achieve this level of adherence, the virus is suppressed in 78%–100% after six to ten months of therapy (3).

A prospective study in south west Ethiopia Jimma University Specialized Hospital showed that the most important reasons for non adherence is simply forgetting, feeling sick or ill, being busy and running out of medication in more than 75% of the cases . The use of memory aids (OR, 3.29, 95%CI, 1.44, 7.51) was found to be independent predictor of adherence (4). And also in our country 90% of telecommunication services are in urban areas with 60% Addis Ababa and recent information from core system of Ethiopian telecommunication corporation (ETC) mobile coverage in Addis Ababa reaches 65.7%. In addition, net work coverage areas are continuously expanding. The reach of cellular networks; among HIV infected persons may be ever higher than the general population since both HIV and wireless net work coverage and preferences to areas of higher population densities such as urban areas and transport routes. Currently mobile phones are used intensely in personal lives and business transaction in the region there fore we feel that SMS text reminders will useful to improve drug adherence. In addition, this study will help as a baseline to use SMS text messages to improve drug adherence in our country (5).

1.2 Rationale of the study

Adherence to antiretroviral treatment (ART) is crucial in improving the health status of people living with HIV AIDS (PLWHA). It is also important to hold back HIV transmission. However, in our study population adherence is 81.2%, which is much lower than desired ≥ 95% (6). Reminders to take ART are supposed to improve antiretroviral treatment adherence and hence text messages can be useful in this regard, .Before implementing text message technology services, it is important to find out whether the target population is able to use text messages and willing to receive reminders. Hence, this study will form the basis for instituting text message as a reminder to take regular antiretroviral treatment (ARV) drugs. Addis Ababa is a city where accessibility of health care services and mobile accesses is much higher as compared to other parts of the country.

2. Literature review

2.1 Problems of poor adherence

Adherence to ART follow up patients need almost perfect adherence of at least 95 percent to keep viral load at undetectable levels as long as possible and to maintain the functionality of the immune system. A recent meta-analysis of adherence levels found that a pooled estimate of only 77% of people taking antiretroviral medications in sub-Saharan Africa adhered to the regimen. Overall, there are little data on the adherence levels reached at health facilities providing routine ART services (7-9).However other references give different estimates.

Understanding of risk factors determining poor adherence is crucial for success of scaling-up ART. Recently, drug resistant viruses in ART patients are increasingly common and a strong relationship between poor adherence and drug resistance has been found leading to a worse prognosis and increased mortality (10).

Different studies suggested that there is direct relationship between drug adherence and wellbeing of patients on long-term antiretroviral treatment patients.

A longitudinal study conducted in China revealed that participants reporting consistent adherence presented a low prevalence of opportunistic infections. The occurrence of opportunistic infections closely related to the virulence of the pathogens and the depression of the immune system. In addition, consistent adherence is associated with better outcome including good quality of life, higher CD4 counts and less cost (11).

Individuals living with HIV/AIDS in sub-Saharan Africa generally take more than 90% of prescribed doses of antiretroviral therapy (ART). This number exceeds the levels of adherence

observed in North America and dispels early scale-up concerns that adherence would be inadequate in settings of extreme poverty (12-14).

Failure to take the prescribed doses of antiretroviral drugs leads to ongoing viral replication in the presence of drug and the selection of drug-resistant HIV. This view forms the basis of domestic and international public health debates regarding the potential benefits and dangers of providing antiretroviral therapy to populations at risk for non-adherence (15, 16).

Longitudinal studies conducted in USA revealed that increasing adherence independently predicts the rate of accumulation of drug resistance mutations among patients with persistent detectable viraemia. A subsequent mathematical model based on these data estimated that population-level resistance occurred most frequently at 81% adherence and declines only modestly with perfect adherence (17).

Anti-retroviral therapy (ART) is a treatment for HIV/AIDS; it does not cure the disease. Rather, it aims to increase life expectancy, reduce opportunistic infections, and may potentially reduce the likelihood that an infected individual transmits the virus to another it still seems that the best-case estimate of ART's impact is that it saves (50-75%)of a year of life for each year of therapy. So patients must adhere to the regimen (18).

2.2 Measurement of adherence

Accurate measurement of adherence to ARV is very important but there is no single “gold standard” to ascertain the extent of the problem (2). There are several measures discussed in the literature but they are proxy measures of patient’s actual behavior. Some of the strategies that are used to measure adherence are asking providers and patients; standardized patient-administered questionnaires; counting of remaining dose; electronic monitoring device, which records time

and date when the medication container was opened; and checking when prescriptions are initially filled and refilled (2).

Each of these methods has its drawbacks and need to be used with caution. Both providers and patients tend to overestimate the extent of adherence. Similarly, use of an electronic monitoring device or counting of remaining tablets does not indicate that the patient has actually taken the medicines (2, 19).

With African health-care systems facing increasing demand for HIV care, reliable methods for assessing adherence and its influencing factors needed to guide effective public-health measures.

A study conducted in Cameroon evaluated individual patient characteristics determining antiretroviral treatment (ART) adherence and the predictive values of different measures of adherence on virological treatment failure in a cohort of patients in a routine-care setting. Pharmacy-refill adherence might consider as an alternative to CD4 count monitoring for identification of patients at risk of virological failure, especially in resources-scarce countries. The study confirmed the difficulty in demonstrating clear associations of individual patient factors and treatment outcomes. Pharmacy refill irregularity was the most powerful predictor (odds ratio 12.4; $P < 0.001$) of virological treatment failure, compared with CD4 cell count increase at 6 months (odds ratio 7.8; $P = 0.002$) or self-reported adherence at one month (odds ratio 1.1; $P = 0.85$) (20).

2.3 Factors influencing adherence

2.3.1 Adherence barriers

Three types of factors had identified as barriers to optimal ART adherence, namely, regimen characteristics, patient characteristics, and the relationship between the provider and patient regimen characteristics include dosage, the requirement of ingestion with specific foods, toxicity, and side effects.

Non-adherence to antiretroviral therapy in adult populations has been shown to range from 33%–88%. depending on how adherence is defined and evaluated (21). The systematic review to examine the concerns of HIV patients to maintain adherence was found that fear of disclosure, forgetfulness, lack of understanding of treatment benefits, complicated regimens, and being away from their medications were consistent barriers to adherence across developed and developing nations. More common to developing settings were issues of access, including financial constraints and disruption in access to medications (2).

A qualitative study conducted in Rwanda revealed that even though patients have a high level of commitment to medication adherence, economic factors in particular, the high cost of transportation for monthly clinic visits are an important challenge to sustained treatment success (22).

2.3.2 Motivators of adherence

Adherence facilitators in resource-scarce settings have received less attention than adherence barriers. Currently, home-based adherence "help" is emerging as an important resource to support adherence (23).

Short message service (SMS) technology is a communication service that uses standardized communications protocols to allow the interchange of short text messages between mobile telephone devices in medical treatment and intervention. Text message have been used to deliver smoking cessation advice and support to encourage the self-management of asthma and to improve attendance at outpatient clinic appointments (24-28).

2. 4 System design

The system will be designed special computer software program that automatically sends special message service (SMS). The initiative uses technology in a simple, cheap and flexible way: a

software application captures the patient's details into a database, a computer server reads the database, and then sends personalized messages to each patient and accessed by authenticated person only (29, 30).

The Millennium Development Goals (MDGs) acknowledge the centrality of health in reducing poverty and increasing human development. The role of mobile phones, as with other information and communication technologies (ICT), is under increasing scrutiny in the health arena, precisely because the stakes are so high and the potential gains from technology development so significant (31).

Patient reminding monitoring and support through short message services (SMS) is one less expensive and human resource intensive alternative or supplement to the DOTS program. Using mobile phones might also enable health workers to reach patient in extremely remote area as well as those who receive treatment at private clinics and ‘fall through the cracks. ‘ When they are not monitored closely by their care provider (23).

Mobile phones are popular, portable and convenient. Uses of mobile phones are increasing surprisingly worldwide. and net work coverage areas are continuously expanding .The best approach to use mobile technology and short message services (SMS) to improve health of PLWHA is unknown in sub-Saharan Africa where the greatest burden of HIV infection more than 8 million people could benefit from anti retroviral therapy (ART) (29).

3. Objectives

3.1 General objective

To assess the feasibility of using text messages among ART follow-up patients to improve drug adherence in selected ART units in Addis Ababa City Administration

3.2 Specific objectives

1 To determine ownership of mobile phone among ART follow up patients in Addis Ababa City Administration.

2 To explore history (habit) of using text message among ART follow up patients in Adds Ababa City Administration.

3 To assess the ability of writing and receiving (sending receiving) text message among ART follow-up patients in Addis Ababa City Administration.

4 To assess willingness of patients to receive text message reminder among ART follows-up in Addis Ababa City Administration.

4. METHODOLOGY

4.1 Study area and period

The study was undertaken from March 30 to April 15, 2010 in three ARV treatment units in selected government hospitals in Addis Ababa city administration Ethiopia.

4.2 Study design

A cross sectional study design that employed quantitative data collection method supplemented by qualitative in depth interview was carried out in Addis Ababa ARV treatment units.

4.3 Source and study population

4.3.1 The Source population

The source population was all PLWHA who were on follow up care in Addis Ababa ARV treatment units during the study period.

4.3.2 Study population

The study population was all PLWHA who had at least one visit to the selected hospitals ARV treatment units of Zewditu memorial Hospital, Yekatite 12 Referral Hospital and St.paul Referral Hospital during the study period.

Inclusion criteria

People living with HIV/AIDS:

- Had at list one visits to the selected hospital ARV treatment units
- Age greater than or equal to 18 years
- Not critically sick

Exclusion criteria

All PLWHA

- Who are not on ART care,
- Unable to hear, mentally disabled,

- § Seriously ill and younger than the age specified in inclusion criteria were excluded from the study.

4.4 Sample size calculation

4.4.1 Quantitative method

The sample size was determined by assuming 50% of text message usage rate, ART follow-up patient and 5 %marginal error and 95% confidence (CI).Based on this assumption, the actual sample size for the study was determined using the formula for single population proportion and calculated by Epi-Info 3.3.2 version statistical software.

$$n = \frac{(Z_{\alpha/2})^2 P (1-P)}{d2}$$

$$n = \frac{(1.96)^2 \times 0.5 (1-0.5)}{(0.05)2}$$

n =384

None response rate 20% = 77

77+384=461, required sample size

n= the required sample size

Z=Standard score corresponding to 95% confidence interval

p= Assumed proportion of text message usage 50%

d = the margin of error (precision) 5%

None response rate =20%

4.4.2 Qualitative method

For qualitative method, the minimum number of people planed to be interviewed was 10 (five females and five males). The selection continued until the point of redundancy and reached fourteen respondents, equal number of males and females were interviewed.

4.5- Sampling procedure

4.5.1-Quantitative study

For quantitative study, simple random sampling method was used to select the study health institution. Three public hospitals that provide free ARV treatment were included in the study. The calculated sample size was used to recruit study subjects from the selected ARV treatment units proportional to the unit's client size. Study subjects in the selected ARV treatment units stratified by sex and sample size for each stratum proportionally allocated. To select study subjects within each stratum systematic random sampling was use. First, the average numbers of clients who visit the ARV treatment units daily during data collection period was estimate based on the previous daily client flow of the units. This was obtaining by referring client registration book/ record for a month prior to data collection. Thus on average 30 clients visit the ARV treatment units daily. Every third clients were interview throughout the data collection period. 20 female and 20 male per day until the sample size fulfill.

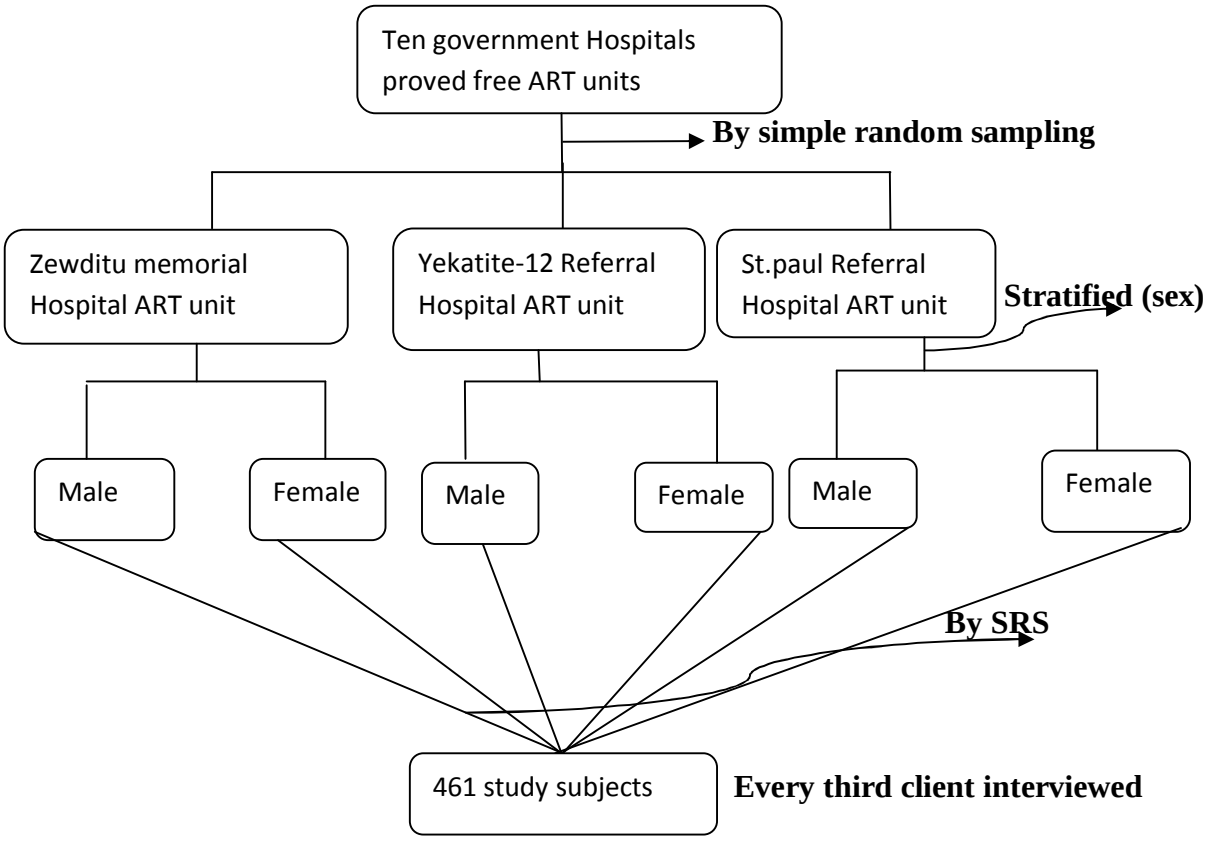

Figure 1.Schematic presentation of sampling procedure for quantitative method.

4.5.2 Qualitative study

For the in-depth interview, purposive sampling was used to select the study subjects based on socio demographic characteristics of participants i.e. sex, mobile phone ownership

4.6 Data collection instrument

A structured questionnaire was used for quantitative study. It was prepared in English, translated into Amharic and then translated back in to English to check for consistency. Main points included in the questionnaire were socio demographic characteristics, HIV and treatment conditions, and ownership of mobile phone, receiving and sending of short message services (SMS) In addition, an open-ended semi-structured interview guide was used for the qualitative study i.e. in depth interview. The main issue addressed was mobile phone services usage and importance of (SMS) short message services to improve drug adherence.

4.7- Pre-testing the questionnaire

The structured questionnaire was pre- tested in subjects out of the selected study ARV treatment units. The pre-test was done on 45 subjects about 10% of the total sample size. The questionnaire assessed for its clarity, length and completeness. Some skip patterns were then corrected.

4.8. Data collection

4.8.1. Quantitative data

The data were collected from, March 30 to, April 15, 2010. For administering the structured questionnaire, four nurses (Counselors) working in the ARV treatment units was recruited. Training was given for two days (including half day of pretest) on the objective, relevance of the study, confidentiality of information, respondent's right, informed consent and techniques of interview. Moreover classroom practical demonstration of the interview was carried out.

Two Supervisors who had fist degree in public health trained and supervised the data collection. They closely follow the data collection process throughout the data collection period along with

the principal investigator. All field questionnaires were reviewed each night, morning sessions were conducted every morning with the data collectors and errors were corrected.

4.8.2 Qualitative data

To compliment the quantitative study, 14 respondents were interviewed in all hospitals. Principal investigator carried out each interview. Field notes were taken.

4.9 Variables

The independent variables were

- Socio demographic characteristics (Age, Sex, Religion, Marital status, Occupation, Monthly income,Education, Ethnicity).
- Duration since HIV diagnosis,
- Information on ART
- Information on opportunistic infection
- Disclosure to partner or family
- psychosocial support

Dependent variables

- Ownership of mobile phones
- Willingness to receive text message reminders
- Ability to send and receive text message
- Usage of text messages.

4.10 Operational definition

ART drug Adherence: means in this study all patients need almost perfect adherence of above 95 % to keep viral load at undetectable levels as long as possible and to maintain the functionality of the immune system.

PLWHA on follow up care; in these study all PLWHA who had at least one visit to collect ARV treatment.

Ownership of mobile phone; in these study all PLWHA on ART follow-up those who have private (unshared) mobile phones.

4.11 Data quality assurance

To ensure data quality the data collectors and the supervisors were trained for two days. Data collectors used manuals prepared for fieldwork. Supervisors and principal investigator closely followed the data collection process. Filed questionnaires were check daily for completeness and errors were corrected. To ensure qualitative data quality privacy and confidentiality of the respondents as well as good interaction between respondent and interviewer was maintained Verification of text message ability by the interviewers was done.

4.12 Data analysis

Quantitative data were enter and analyzed using SPSS version 16-computer soft ware.
Errors related to inconsistency of data were checked and corrected during data cleaning. The descriptive analysis such as proportions, percentages, ratios, frequency distributions and appropriate tabular presentations besides measures of central tendency and measures of dispersion were used for describing data. Bivariate analysis of demographic, owner ship of mobile phone, able to receive text message and HIV disease factors associated with willingness to text message reminders were used. Then logistic regression model were employed to control confounding. Variables included in the model were restricted to those significantly related at least to one of the two out comes at the bivariate level and used 95% CI.
In the qualitative data all the interview were transcribed. The transcript then translated to English. The translated transcript reviewed and examined line by line and then categorized in to primary codes. Later data were reviewed and combined in to brooder concepts. The concepts were refined in to major themes.

4.13-Ethical consideration

Ethical approval of the research proposal was obtained from the Ethical Review Board of Medical faculty and joint academic commission of Addis Ababa University. A formal letter was written by the Department of Health Informatics to the Hospital administrator offices. To the Regional health bureau of Addis Ababa, city administration then wrote letters to the selected government Hospitals. After that Hospitals medical director offices permitted us to conduct the study. In addition, informed verbal consent was obtained from each respondent. Moreover, the same counselors working in ARV treatment units were trained as data collectors and filled questionnaires .Thus ensured confidentiality during data collection since respondents were not exposed to other person.

4.14 Dissemination of results

The study result will be presented at Addis Ababa University, and a copy will be given to ; Department of Health Informatics, Addis Ababa University, Ethiopian public Health Association, Addis Ababa Health Bureau and all other responsible bodies and publication of the findings will be considered.

5- Results

5.1 Quantitative study results

Out of 461 eligible clients seen in the ARV treatment units during the study period, all agreed to participate in the study, giving a total response rate of 100%. The majority, two hundred (43.4%) of the respondents were from Zewditu memorial Hospital ARV treatment unit, 150(32.5%) from Yekatite-12 Referral Hospital and the smallest number of Participants 111(24.0%) were from St Paul Referral Hospital.

5.1.1 Characteristics of the study subjects

Of all participants included in the study of these 230(49.9%) were female and 231(50.1%) were males. These were proportional to the average sex distribution of clients in the selected ARV treatment units. The age range of the study subjects were 19-69 years. In addition, one hundred nineteen (25.8%) were in the age group of 35-39 the mean age was 38 (SD =9) years. Near half (49.9%) of the respondents were married while 104(22.6%) were single or never married. Almost close to three-quarterly (73.6%) were followers of orthodox Christianity. Of all the respondents the majority 216(46.9%) had secondary school education while 31(6.7%) were unable to read and write. Regarding ethnic composition the respondents majority belongs to Amhara consisting of 259(56.3%).

The majority 274(59.5%) of the subjects were government or private employees, while 49(10.6%) were jobless. One hundred forty five (31.5%) subjects had monthly income less than 500ETB and the median monthly income of the participants was Birr 665.50

Above three-quarter of the study subjects 383(83.1%) disclosed their HIV status to their partner or family members. (Table1)

Table 1 Socio demographic Characteristics of PLWHA attending ARV treatment units in selected government hospitals Addis Ababa, Ethiopia, 2010.

Characteristics, n=461	N(%)
Age (years)	
19-24	16(3.5)
25-29	56(12.1)
30-34	88(19.1)
35-39	119(25.8)
40-44	75(16.3)
45-49	55(11.9)
50-54	23(5.0)
>55	29(6.3)
Mean ±SD	38±9
Sex	
Female	230(49.9)
Male	231(50.1)
Religion	
Orthodox	339(73.6)
Other Christians	85(18.4)
Muslim	37(8.0)
Educational status	
Unable to read and write	31(6.7)
Able to read and write	33(7.2)
elementary	73(15.8)
Secondary	216(46.9)
Post secondary	108(23.4)
Ethnicity	
Amhara	259 (56.3)
Oromo	103 (22.3)
Gurage	55 (11.9)
Tigri	44(9.5)
Estimated monthly income	
No income	59(12.8)
Don't know	50(10.8)
<500	145(31.5)
500-1000	100(21.7)
1001-1500	40(8.7)
1501-2000	32(6.9)
>2000	35(7.6)
Median ±SD	**665.5±968.3**

Relationship status	
Married / Non married partner	230(49.9)
Divorced / Widowed	127(27.5)
Never married	104(22.6)
Occupation /employment	
Government/privet employee	274(59.5)
House wife	54(11.7)
Jobless	49(10.6)
Merchants	38(8.2)
Daily laborers	26(5.6)
Others	20(4.4)
disclose to your partner/family	
yes	383(83.1)
No	78(16.9)

The median duration since HIV diagnosis was 4.5years, duration start receiving the treatment was 3.5years, 230(49.9%) of the respondents attended the ART unit for 1-3 years. and the median duration was 4 years.

Four hundred forty three (96.1%) described their health improved after the treatment. (Table 2)

Table 2 HIV /AIDS related characteristics of PLWHA attending ARV treatment units in selected government hospitals Addis Ababa, Ethiopia, 2010.

Characteristics, n=461	*N (%)*
HIV diagnosis duration	
<1year	23 (5.0)
1- 3y	169 (36.7)
4- 6y	171 (37.1)
>6y	98 (21.3)
Median ±SD	4.5±2.5
ARV treatment duration	
<1year	59(12.8)
1- 3y	244(52.9)
4- 6y	121(26.2)
>6y	37(8.0)
Median ±SD	3.5±1.7
ART unit attendance duration	
< 1 year	38(8.2)
1- 3y	230(49.9)
4.- 6y	160(34.7)
>6 y	33(7.2)
Median ±SD	4±1.7
overall health condition	
Improved	443(96.1)
not improved	18(3.9)

Three hundred twenty three (70.1%) of the respondents did not have psychosocial support.The source of support were mainly from relatives/friends and non-governmental organization 91(65.9%) and 41(29.7%) respectively, the most commonly received kind of support were home based care (HBC) and counseling 110(79.7%) followed by money 90(65.2%). (Table3)

Table 3 Psychosocial support related characteristics of PLWHA attending ARV treatment units in selected government hospitals Addis Ababa, Ethiopia, 2010.

Characteristics, n=461	*N (%)*
Psychosocial support from different community Groups	
Yes	**138(29.9)**
No	**323(70.1)**
Source of support	
Relatives/friends	**91(65.9)**
Nongovernmental organization	**41(29.7)**
Governmental organization	**20(14.5)**
Kinds of support	
Home based care(HBC)and counseling	**110(79.7)**
Money	**90(65.2)**
Food and health care	**61(44.2)**

The most common serious opportunistic infections or symptoms reported were HIV associated dementia and fatigue & fever 48(10.4%) and 47(10.2%) respectively. (Table 4)

Table 4 Opportunistic infections related characteristics of PLWHA attending ARV treatment units in selected government hospitals Addis Ababa, Ethiopia, 2010.

Characteristics, n=461	*N (%)*
Presence of Diseases /symptoms	
No Response (no symptoms)	**264(57.3)**
Fatigue and fever	**63(13.7)**
HIV associated dementia	**56(12.1)**
HIV associated wasting	**45(9.5)**
Chronic cough night sweet fever	**28(6.1)**
Candida sis(mouth sore)	**19(4.1)**
Herpes simplex	**19(4.1)**
Chest pain fever cough, dyspnea	**17(3.7)**
Chronic diarrhea >30 days	**10(2.2)**
Other	**15(3.3)**
Responses about the severity of symptoms/disease	
No Response (no symptoms)	**273(59.2)**
HIV associated dementia	**48(10.4)**
Fatigue and fever	**47(10.2)**
HIV associated wasting	**31(6.7)**
Chronic cough night sweet fever	**17(3.7)**
Candida sis(mouth sore)	**14(3.0)**
Chest pain fever cough, dyspnea	**14(3.0)**
Herpes simplex	**11(2.4)**
Chronic diarrhea >30 days	**9(2.0)**
Other	**15(3.3)**

Of all the respondents who participated in the study 370(80.3%) have had mobile phones. Out of those who have mobile phones 205(55.4) used to receive and send text messages, 165(44.6%) using for voice calls only and 112(30.3%) for other mobile services.

Of the respondents who were able to send text message above ninety percent 185(90.2%) have history of sending greeting while 50(24.4%) reminders. And history of sending text message when required or necessary giving a total of 167(81.5%)while once or more per day gives a total of18(8.8%).The respondents reported that the problem on receiving and sending were network and inadequacy of languages 157(76.6%), 41(20.0%) respectively. (Table5)

Table 5 Mobile phone ownership and usage related characteristics of PLWHA attending ARV treatment units in selected government hospitals Addis Ababa, Ethiopia, 2010.

Characteristics	*Number (%)*
Have mobile phone(n=461)	
Yes	**370(80.3)**
NO	**91(19.7)**
Usage of mobile phones (n=370)	
To talk and text message	**205(55.4)**
To talk only	**165(44.6)**
Radio	**56(15.1)**
Music	**55(14.9)**
Others	**1(0.3)**
Receive message (n=370)	
Yes	**268(72.4)**
No	**102(27.6)**
send a message (n=370)	
yes	**205(55.4)**
NO	**165(44.6)**
kind of messages (n=205)	
Greeting	**185(90.2)**
Message	**148(72.2)**
Reminders	**50(24.4)**
Reminders for others	**36(7.8)**
How often do you send message (n=205)	
When necessary or required	**167(81.5)**
More than once per day	**18(8.8)**
Every week	**10(4.9)**
One per day	**7(3.4)**
Every month	**3(1.5)**
How often do you receive message (n=205)	
When necessary or required	**163(79.5)**
More than once per day	**23(11.2)**
Every week	**10(4.9)**
One per day	**6(2.9)**
Every month	**3(1.5)**
problem on receive or send message (n=205)	
Net work	**157(76.6)**
Inadequacy of language	**23(11.20)**
Understanding the message	**18(8.80)**

Of the respondent who were able to receive text messages 81.3% have had willingness to receive text messages reminders .Of the respondents who were willing to receive (SMS) text message reminders148 (67.9%) were wanted to receive, reminders of time to take their drugs. In addition, most of these respondents 201(92.2%), wanted to get the message from health professionals and 67(30.7%) from computer. Above three-quarterly (86.7%) wanted to receive the SMS in Amharic. Of all the respondents 451(97.8%) were already using reminding tools to take their drugs. Majority 318(69.0%) the respondents were use their time watches and time announcement events on the radio as a reminding tools. (Table6)

Table 6 Willingness to receive text reminders related characteristics of PLWHA attending ARV treatment units in selected government hospitals Addis Ababa, Ethiopia, 2010.

Characteristics	N (%)
Willingness to receive message regarding your medicines /drugs (n=268)	
Yes	**218(81.3)**
No	**50(18.7)**
Type of messages want to receive (n=218)	
Guidance and advise	**164(75.2)**
Reminders of time to take drugs	**148(67.9)**
Reminders of appointment date	**101(46.3)**
From whom do you want to receive these messages (n=218)	
Health professionals	**201(92.2)**
Computer	**67(30.7)**
Family members and friends	**34(15.6)**
How often do you want them to send you these messages (n=218)	
When time to take my drugs	**142(65.1)**
On appointment date	**104(47.7)**
Every month	**44(20.2)**
Every week	**12(5.5)**
Every day	**8(3.7)**
others	**11(5.0)**
In what language(n=218)	
Amharic	**189(86.7)**
English	**115(52.8)**
Others	**12(5.5)**
use any reminding tool (n=461)	
Yes	**451(97.8)**
no	**10(2.2)**
Kinds of reminding tool (n=461)	
Time watch	**318(69.0)**
Alarm	**161(34.9)**
Family members and others	**56(12.1)**

5.1.2 Mobile owner ship

Two hundred five (88.7%) of male and 165 (71.7%) female respondents expressed they have their own mobile phones. Of the respondents the higher ownership of mobile phone was belongs to sex male , post secondary level of education, merchant and those who have psychosocial support.

In bivarate analysis sex, education, occupation, monthly income and psychosocial support have significant association with mobile ownership and in multivariate analysis; there is a significant association with all mentioned above except for sex and monthly income. (Table7)

Table7 ***Association of having mobile phone to selected socio demographic Characteristics,*** **among those who have mobile phones PLWHA on ART follow-up in Addis Ababa, Ethiopia, 2010.**

Variables	*No*	*yes*	*CrudOR:95% CI*	*AjustedOR:95% CI*
	Number (%)	***Number (%)***		
Age (years)				
19-34	32(20)	128(80.0)	1.0	
35-44	38(19.6)	156(80.4)	1.03(0.61-1.74)	----------
≥45	21(19.6)	86(80.4)	1.02(0.6-1.89)	
Sex				
Male	26(11.3)	205(88.7)	1.0	
female	65(28.3)	165(71.7)	0.32(0.2-053)*	0.66(0.35-1.25)
Level of education				
Not attended school	35(54.7)	29(45.3)	1.0	
Elementary	26(35.6)	47(64.4)	2.18(1.1-4.34)*	2.43(1.1-5.41)
Secondary	23(10.6)	193(89.4)	10.13(5.26-19.5)*	10.93(5.09-23.5)*
Post secondary	7(6.5)	101(93.1)	17.41(7.0-43.28)*	8.16(2.79-23.9)*
Current Occupation				
Jobless/unemployed	19(38.8)	30(61.2)	1.0	
Government private emp.	30(10.9)	244(89.1)	5.15(2.59-10.25)*	2.32(0.83-6.42)*
House wife	24(44.4)	30(55.6)	0.79(0.36-1.74)	0.93(0.33-2.56)
Merchant	2(5.3)	36(94.7)	11.4(2.46-52.9)*	16.56(2.95-92.52)*
Daily laborer /others	16(34.8)	30(65.2)	1.19(0.56-2.74)	1.30(0.47-3.56)
Monthly income				
No income/others	33(30.3)	76(69.7)	1.0	
<500	41(28.3)	104(71.7)	1.10(0.64-1.9)	0.63(0.29-1.38)
500-1500	16(11.4)	124(88.6)	3.37(1.74-6.52)*	1.01(0.39-2.62)
>1500	1(1.5)	66(98.5)	28.67(3.82-215.3)*	6.84(0.73-64.21)
Psychosocial support				
Yes	45(32.6)	93(67.4)	1.0	
No	46(14.2)	277(85.8)	2.92(1.84-4.68)*	1.92(1.06-3.48)*

Remark * Stands for significant associations.

5.1.3. Willingness to text message reminders

During the survey period one hundred twenty five (82.8%) males and 93 (79.5%) females of respondents were willing to receive (SMS)text message reminders giving a total of 218 (81.3%).while twenty-six (17.2%) males and 24(20.5%) females had not willingness to receive text message reminders giving a total of 50 (18.7%).

Out of those respondents where expressed willingness to receive text message reminders 148 (67.9%) wanted reminders of time to take their drugs. while seventeen (32.1%) wanted guidance and reminders of appointment date.

In bivaraite analysis, married or in relationship, disclosure of HIV status, duration start receive antiretroviral therapy (ART) and psychosocial support had significant association with willingness to receive text message reminders where as history of using reminding tools and history of receive text message have no association with willingness to receive text message reminders ($p>0.05$).

In multivariate analysis respondents who disclose their HIV status (OR: 0.03, 95% CI: 0.01-0.08) times more likely willing to receive (SMS) text message reminders than those who do not disclose their HIV status. ($p<0.001$) (Table 8)

Table 8.Association of willingness to text reminders selected socio demographic Characteristics, among those who able to receive text message PLWHA on ART follow-up in Addis Ababa, Ethiopia 2010.

Variables	*No*	*yes*	*CrudOR:95% CI*	*AjustedOR:95% CI*
	Number (%)	***Number (%)***		
Age(years)				
19-34	***23(24.5)***	***71(75.5)***	***1***	
35-44	***17(14.2)***	***103(85.8)***	***1.96(0.98-3.94)***	----------
≥45	***10(18.5)***	***44(81.5)***	***1.43(0.62-3.28)***	
Sex				
Male	***26(17.2)***	***125(82.8)***	***1***	
female	***24(20.5)***	***93(79.5)***	***0.81(0.44-1.49)***	----------
Religion				
Orthodox	***38(20.4)***	***148(79.6)***	***1***	
Other Cristiana	***9(13.8)***	***56(86.2)***	***1.60(0.73-3.52)***	----------
Muslim	***3(17.6)***	***14(82.4)***	***1.20(0.33-4.38)***	
Current Marital / relationship				
Married / on relationship	***14(10.6)***	***118(89.4)***	***1***	
Widowed /divorced	***14(23.0)***	***47(77.0)***	***0.4(0.18-0.9)****	***1.47(0.43-4.96)***
Never married	***22(29.3)***	***53(70.7)***	***0.29(0.14-0.6)****	***0.82(0.26-2.55)***
Current Occupation				
Jobless/unemployed1	***4(26.7)***	***11(73.3)***	***1***	
Government or private emp.	***36(18.3)***	***161(81.7)***	***1.62(0.49-5.4)***	
House wife	***0(0.0)***	***14(100)***	***5.87(0.000--)***	----------
Merchant	***5(26.3)***	***14(73.7)***	***1.02(0.22-4.72)***	
Daily laborer /others	***5(21.7)***	***18(78.3)***	***1.3(0.29-5.95)***	
Monthly income				
No income/others	***12(27.9)***	***31(72.1)***	***1***	
<500	***10(16.1)***	***52(83.9)***	***2.01(0.78-5.2)***	----------
500-1500	***15(14.9)***	***86(85.1)***	***2.22(0.94-5.26)***	
>1500	***13(21.0)***	***49(79.0)***	***1.46(0.59-3.61)***	
Do you disclose				
Yes	***12(5.7)***	***198(94.3)***	***1***	
No	***38(65.5)***	***20(34.5)***	***0.03(0.01-0.07)****	***0.03(0.01-0.08)****

Table9.Association of willingness to text reminders selected HIV related Characteristics, among **those who able to receive text message** PLWHA on ART follow-up in Addis Ababa, Ethiopia 2010.

Variables	**No**	**yes**	**CrudOR:95% CI**	**AjustedOR:95%CI**
	Number (%)	Number (%)		
Duration since HIV (Dx)				
<year	4(36.4)	7(63.6)	1	
>1year	46(17.9)	211(82.1)	2.62(0.74-9.33)	----------
Duration start ART				
<year	10(33.3)	20(66.7)	1	
>1year	40(16.8)	198(83.2)	2.48(1.08-5.69)*	1.47(0.39-5.57)
Duration attend in ART				
<year	7(31.5)	15(68.2)	1	
>1year	43(17.5)	203(82.5)	2.2(0.85-5.73)	0.96(0.13-7.34)
Overall health condition				
Improved	47(18.1)	212(81.9)	1	
Not improved	3(33.3)	6(66.7)	0.44(0.12-1.84)	----------
use of reminding tool				
yes	49(18.7)	213(81.3)	1	
no	1(16.7)	5(83.3)	1.5(1.13-10.06)	----------
History of receive Mess.				
When required	13(19.0)	132(81.0)	1	
Monthly/less	2(15.4)	11(84.6)	1.29(0.27-6.15)	----------
Once or more / day	5(17.2)	24(82.8)	1.13(0.4-3.2)	
Psychosocial support				
Yes	5(7.6%)	61.(92.4%)	1	
No	45(22.3%)	157(77.7%)	0.27(0.11-0.75)*	0.49(0.16-1.53)

5.1.4. Receive text messages

One hundred fifty one (73.7%) males and 117 (70.9%) females receive text messages giving a total of 268 (72.4%). while fifty-four males (28.3%) and 24 females (29.1%) giving a total of 78(21.1%) had not receive text message.

Out of the respondents two hundred sixty- eight (72.4%) who receive (SMS) text messages have history of receiving (SMS) text messages once or more per day giving a total of 29 (10.8%) while history of receiving (SMS) text message when required or necessarily giving a total of 163 (60.8%).

In bivarate analysis, level of education ,current occupation ,monthly in -come ,married or in relationship, disclose their HIV status have significant association with receive text message use ($p<0.05$) .

In multivariate analysis respondents who attended elementary school (OR: 8.21, 95% CI: 1.59-42.33) times more likely to receive text message than those who do not attended school and those who secondary school (OR: 58.65, 95% CI: 12.18-280.12) times more likely to receive text messages than those who did not attended school. (Table 10)

Table10.Association of receive text message selected Characteristics, among those who have mobile phones PLWHA on ART follow-up in Addis Ababa, Ethiopia 2010.

Variables	No	yes	CroudOR:95% CI	AjestedOR:95%CI
	Number (%)	Number (%)		
Age(years)				
19-34	34(26.6)	94(73.4)	1	
35-44	36(23.1)	120(76.9)	1.21(0.7-2.07)	
≥45	32(37.21)	54(62.8)	0.6(0.34-1.1)	----------
Sex				
Male	54(26.3)	151(73.7)	1	
female	48(29.1)	117(70.9)	0.87(0.55-1.38)	----------
Level of education				
Not attended school	27(93.1)	2(6.9)	1	
Elementary	32(68.1)	15(31.9)	6.35(1.35-30.17)*	8.21(1.59-42.33)*
Secondary	42(21.8)	151(78.2)	48.55(11.09-212.4)*	58.65(12.28-280.12)*
Post secondary	1(1.0)	100(99.0)	1.35E3(117.93-1.55E)*	1.22E3(87.84-1.70 E)*
Marital relationship				
Married / on relationship	54(29.0)	132(71.0)	1	
Widowed /divorced	35(36.5)	61(63.5)	0.71(0.42-1.2)	0.55(0.25-1.20)
Never married	13(14.8)	75(85.2)	2.36(1.21-4.61)*	1.40(0.53-3.68)
Current Occupation				
Jobless/unemployed	15(50.0)	15(50.0)	1	
Government/ private	47(19.3)	197(80.7)	4.19(1.94-9.17)*	2.11(0.59-7.55)
House wife	16(53.3)	14(46.7)	0.88(0.32-2.41)	0.49(0.13-1.93)
Merchant	17(47.2)	19(52.8)	1.12(0.42-2.95)	1.74(0.37-8.11)
Daily laborer /others	7(23.3)	23(76.7)	3.29(1.09-9.95)*	3.11(0.69-14.07)
Monthly income				
No income/others	33(43.4)	43(56.6)	1	
<500	42(40.4)	62(59.6)	1.13(0.62-2.06)	1.22(0.45-3.30)
500-1500	23(18.5)	101(81.5)	3.37(1.78-6.40)*	1.98(0.67-5.86)
>1500	4(6.1)	62(93.9)	11.9(3.93-36.03)*	3.27(0.56-18.97)
Do you disclose				
Yes	92(30.5)	210(69.5)	1	
No	10(14.7)	58(85.3)	2.54(1.24-5.19)*	1.58(0.58-4.29)
use of reminding tool				
yes	99(27.4)	262(72.6)	1	
no	3(33.3)	6(66.7)	0.76(0.19-3.08)	----------

5.2. Qualitative study result

Fourteen respondents, equal number of male and female, participated in the interview. The respondents age ranges from 25-59 years. Respondents educational status varied from illiterate to 12 th grade complete. Eight respondents were orthodox Christian from Amhara ethnic background.

5.2.1. Knowledge and usage of mobile services

Respondents knowledge on services provided by mobile phones was different (varied). Out of Fourteen respondents, 5 women and 6 men knew about text message. One male and two female respondents said, '*We know only that mobiles are used for answering and making calls. Do they really have any other services?'*

About half of those who knew about text messages only received messages sent to them and never actually wrote a message themselves. Moreover, three male and one female respondent indicate that they used it for communication, sending receiving text messages and other mobile services.

5.2.2. Ease of using the different mobile services

All of the fourteen respondents seven female and seven male responded that making call was the easiest of all the services, which is a matter of touching numbers only. They found making text message especially very difficult and time consuming. A 53 years old man stated *'We don't have experience of writing messages and have language problems. Even when I have some secret it is easier for me to go to a private place and talk on the phone rather than writing text messages.'*

5.2.3. Willingness to receive text message reminders

Nine out of all the respondents were willing to receive text message reminders while three female and two male respondents did not want to receive reminders mostly because they did not want friends, relatives, and their children etc to see the messages and find out that they are HIV positive.

One of the respondents willing to receive reminders said, *'I would be very happy if I get reminded by experts to take my drugs on time through text message. This would enable me not to forget taking drugs. I am sure that most of the positive people taking drugs would appreciate such an experience to put in to action so that the drug could be taken on time.'*

A 47 and another 43-year's female respondent indicate that it would be very important to be reminded through text message. They explained their heartfelt appreciation to such an action. However, they explained that nobody except their husbands knew the fact that they took drugs as a result, they suspect that their sons and daughters might understand their case when they operate the mobiles. This could happen because their sons and daughters knew how to operate mobile more than they did.

A 35 years old female respondent said, *'This idea is really good for people who do not care if anyone knows they are HIV positive. But I don't like it for myself as nobody else except my mother knows that I am HIV/AIDS patient, and I never forget taking the drugs on time without the need to reminded by others additionally.'*

Another 48-aged male participant said, *'Nobody is more concerned about taking the drug than me. I am the one who should remember the time when it is taken. I have been doing so for six years and I had been living and bringing up my children.'*

Another male who was 44 years old explained, *'I do not want to be reminded by anybody. I already adapted and knew how and when to take it I never forgot taking my drugs. Therefore, I dislike any kind of text message.'*

5.2.4. Credibility of text messages

Three participants, one male and two female, responded that they did not know how to make text massage, they did not attempt to make text message, therefore, it would be very difficult to make judgment.

Another six males and five female respondents indicated that the process could be credible as far as it only would reach to the concerned individual. It could not reach to all unlike the messages that are sent by Ethiopian Telecommunication Corporation in holidays and festivals. Therefore, it would be credible.

One 53 aged respondent answered, 'I *am sure that no one could see my message except Ethiopian telecommunication corporation and some security forces.'*

5.2.5. How to send message through mobile

Of fourteen participants or respondents ,it was only three of the males who followed the correct procedure of sending text message ,However the remaining participants didn't know how to do it.

5.2.6. Suggest some mechanisms of taking drug effectively

Five males and one female explained that there was nothing, which could be better than the one that was explained before. Hence, the government should encourage and support the above-explained mechanisms.

A 53 years old male said, *'I think that the only system of using text message could be enough, but there would be problems in action, I am sure it will not be implemented.'*

A 40 years old woman said, *'I think it is important to remind by nearby partner or family, alarms, than text message reminders.'*

A 35 years old female said, *'In addition to the above-mentioned mechanisms (text reminder) bringing about behavioral change on the part of the society not to stigmatize and discriminate against HIV/AIDS patients everybody should encourage us, so that we could feel comfortable and confident. Stigma and discrimination had been in various sectors and community members. Therefore, if this were to be avoided, we would take our drugs freely and with the help of others.' Let us tell you my experience I would not take my drugs in the presence of guests. Because I did not want to knew by others.' In addition, it is better if the government gave us a house with two class; this would enable us to take drugs in the one which wouldn't be occupied by guests; Therefore, I advised that every citizen including the government should fight against stigma and discrimination.'*

6. Discussions

The majority of the respondents are in the age groups of 30-39. This showed , that HIV infection has a high burden in the productive age group. On the other hand, this result might indicate that a high proportion of PLWHA in this age group were visiting ARV treatment units. In the context of this study, it is important since most of the study population has mobile phones and hence the potential for using sending receiving text messages and this will have an implication in designing programs to reach PLWHA for reminding, monitoring and support through short message services (SMS). This is a less expensive and less human resource intensive alternative or supplement to interventions like the DOTS program. Using mobile phones might also enable health workers to reach patients in extremely remote areas as well as those who receive treatment at private clinics and 'fall through the cracks'(23).

Nearly half of the respondents have completed their secondary school education, showing the high potential of the study population, to receive text message. Educational level was found to be significantly associated with ability to receive text message and the higher level of education was significantly associated with mobile ownership and ability to receive text messages. This implies that there is a fertile ground for introducing text messaging as a reminder for taking drugs and improve drug adherence. ART follow up patients need almost perfect adherence of at least 95 percent to keep viral load at undetectable levels as long as possible and to maintain the functionality of the immune system (7-9). However, this also implies that illiteracy is a barrier for using SMS technology and alternatives should be sought for covering people who cannot read and write.

The median duration since HIV diagnosis of the respondents is higher /greater than the anti retro viral therapy (ART) starting duration .This indicates that most of respondents have been diagnosed before they were critically ill or even eligible for ART. Also 96.1% of the respondents have reported improvement in their health status after starting ART. This may be because most were not critically ill before starting the ART. It may also be because they have good adherence. A longitudinal study conducted in China revealed that participants reporting consistent adherence presented a low prevalence of opportunistic infections. The occurrence of

opportunistic infections closely related to the virulence of the pathogens and the depression of the immune system. In addition, consistent adherence is associated with better outcome including good quality of life, higher CD4 counts and less cost (11).

Majority of the respondents 70.1% claimed that they did not receive psychosocial support from different groups. This may be due to different reasons first; it may be associated with disclosure of their HIV status to their partner or relatives because those who disclose their HIV status have high chance or probability of getting psychosocial support and vice versa. We will see the impact of disclosure on willingness to receive SMS text reminders latter on. The second reason may be their economic status. In this study, the median monthly income was found to be birr 665.50 and this might not qualify most of the respondents for the commonly available social support outlets.

The most common serious problems (symptoms) reported by the respondents (10.4%) were dementia. This was not found to have significant association with any of the dependent variables. However, it may need further studies as it as a serious implication on the need for reminder to take medications in order to insure ART Adherence.

The vast majority of the respondents have their own mobile phones and of this 74.2% have the capacity to receive SMS text messages this indicates that there is conducive /suitable condition to introduce SMS text message reminders.

Of the respondents, 90.2% used text message for greeting and 81.5% as necessary or required this implies that use of SMS text messages for reminders is not commonly used or practiced. This is may be due to low level of education, lack of experience on text messaging, and even in educated individuals, no habit of receiving sending text message this may be the one reason for decreasing willingness to receive text message reminders.

Twenty percent of the respondents reported that inadequacy of language and understanding the message were the main problems in receiving sending SMS text message. This shows that

language and education are the main barriers to use SMS technology because almost all mobile phones are operated in English. More than eighty-six percent of the respondents reported that they wanted to receive text message reminders in Amharic. This is also supported with result of qualitative study.

The majority of the respondents 81.3% were willing to receive SMS text reminders. Most these respondents 92.2% wanted to get message from health professionals while 30.7% from computer. This may be due to close relationship and trust with their caregivers/ART follow-up health professionals and may be due to lack of information or knowledge on the new technology for computerized text message reminders.

In bivarate analysis married or in relationship, duration since start receive ART, psychosocial support and disclosure of their HIV status to their partner or family have significant association with willingness to receive text message reminders but in multivariate analysis only disclosure had significant association with willingness to receive text message reminders. Different studies have shown that disclosure is one of the barriers to drug adherence in both developing and developed nations (2). The qualitative part of this study also indicated that PLWHA on ART follow –up individuals Who do not disclose their HIV status were not comfortable with the idea that receiving SMS text reminders indicative of HIV infection on treatment on their mobile phones. This is because their friends or family members may easily access their phones; this is especially true for elderly Women who are not very adept at operating their phones other than to take calls.

7. Strengths and limitations of the study

7.1 Strengths of the study

1. Our study is the first in exploring the willingness of SMS text reminders among HIV positive on ART follow –up individuals.
2. This study will help to introduce motivators of good adherence to improve Health status of PLWHA on ART follow-up and to prevent population-level resistance.
3. In all study areas were used qualitative method to supplement the result and explore factors that not addressed by quantitative survey.
4. The study used verification of text message receiving sending ability of the respondents

7.2 Limitations of the study

1 Selection bias-study participants recruited for visit to ART treatment units thus more adherent are more likely to be enrolled thus the result may not be generalized to all HIV positive on ART follow-up individuals.

2 The Study plan was to carryout in four health institutions /government hospitals. However, black lion is not included in the study because of the delaines of IRBS clearance.

3 Other studies on willingness to accept reminders for HIV drug adherence were not found.

8. Conclusion

1 The present study showed that a high proportion of HIV positive individuals on ART follow –up have their own mobile phones.

2 Majority of the respondents did not have habit of receiving sending text message.

3 High proportions of the respondents have ability to receive text message.

4 The present study showed that above 55% of HIV positive individuals on ART follow – up were able to sending receiving text message.

5 The present study showed that a high proportion of HIV positive individuals on ART follow –up have willingness to receive (SMS) text message reminders.

6 Willingness to receive text message reminders is highly dependent on disclosure status of sero positivity to family members and friend, because of fear of stigma and discriminations.

7 The willingness to receive SMS text reminders is mainly for reminders of time to take drugs.

9. Recommendations

Policy level

- Relevant stakeholders should be involved in automation of the ART system including use of automated reminders to improve follow-up and drug adherence.
- Consider alternatives (other methods of reminding tools) to prevent marginalization of illiterate.

Program level

- Psycho-social support for PLWHA should include adult literacy programs to allow them more access to information

Service level

- Psychosocial support should be expanded with more focus on psychological support and counseling services to fight against stigma and discrimination, and improve disclosure status as it has implication on drug adherence.

Furthermore, additional interventional studies should be conducted in different parts of the country to come up with programmatic recommendations.

10. References

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11. Annex 1 Questionnaire

Addis Ababa University Faculty of Medicine Department of Community Health.

This questionnaire is prepared in Addis Ababa city, for people living with HIV/AIDS (PLWHA) and those who are on anti retro viral therapy (ART) follow up patients. This is intended to know if they make use of mobile and how they use it.

Questionnaire number_____sudcity_____kebele_____

Interviewer's name_____signature_____

Supervisor name _____signature_____

Day of interview Date_____month_____year_____

INFORMATION SHEET

Good morning /afternoon, I am called _____. I am working together with Addis Ababa university study group. The main purpose of this interview is to assess PLWHA on ART follow –up individuals, if they use mobile and how they use it. We believe that mobile enables them to take their drugs properly by getting text message reminders .we would like to assure you your name will not mentioned here and the information that you are going to give us will be handled secretly and confidentially. It will only be used for study purpose .you may or may not participate in the interview .this depend on your willingness to do or not to do so. You may also terminate participating in the study whenever you like. However, your participation during the study counts a lot to the achievement of our study. This may also benefit those who PLWHA and who are on ART follow up patients this plays a significant role to them to improve drug adherence with the help of reminder through text message .

If you have any question you can contact the principal investigator at any time convenient for you using the following address:

Name of Principal Investigator- Tsega Hailu Desta

Address- Addis Ababa, Ethiopia

Cell phone: 09-13-04-55-38

E-mail: tsehame @yahoo.com

If you want additional information, you can contact Addis Ababa medical faculty institutional review board.

Po box 9086

Address Telephone 0115538734

E-mail: aaumfirb@yahoo.com

Addis Ababa University Faculty of Medicine Department of Community Health, Individual consent form for the study on assessment of feasibility using text message among ART follow up patients on selected ARV treatment units to improve drug adherence in Addis Ababa City Administration

Informed Consent Form

You have been already briefly informed about the study and clearly understand the objective.

Now please tell me if you agree to participate in the interview.

The Participant:

1. Agreed ☐

2. Did not agree ☐ ⟶ End the interview

Signature of interviewer which indicates that the respondent has consented to participate in the study:-

Interviewer Name: _____ Signature_____

|_____|_____| 2010.

Supervisor Name: _____ Signature_____

|_____|_____| 2010

Part I – Questions concerned on Socio-demographic characteristics

Ser No	Question	Responses	skip
Q101	How old are you?	------- Years (age in completed years)	
Q102	Sex	1. Male 2. Female	
Q103	What is your religion	1. Orthodox 2. Catholic 3. Muslim 4. Protestant 89. Others (specify) ----------	
Q104	What is the highest grade you completed?	---------- Grade completed 1. Able to read and write 2. Unable to read and write 3. Technical and voc.training 4. University college diploma 5. University college degree 6. Or Higher 89. Other (Specify) ----------	

Q105	What is your Ethnicity?	1. Oromo 2. Amhara 3. Gurage 4. Tigrai 89. Other (Specify) ----------	
Q106	What is your Current Marital / relationship status?	1. Currently Married 2. Not married 3. Widowed 4. Divorced 5. Living with a man 89. Other (Specify) ----------	
Q107	What is your current Occupation?	1. Unemployed 2. Student 3. House wife 4. House servant 5. Daily laborer 6. Merchant 7. Sex worker 8. Government employee 9. Private employee 89 Other (specify)) ----------	

Q108	What is your total Monthly income?	--------- Eth. Birr 1. No income 2. Don't know	
Q109	Do you disclose to your partner/ family?	1. Yes 2. No	

Part II- **Questions concerned on HIV /AIDS and treatment conditions**

Q110	How many year months since HIV diagnosis	--------- Months or ---------- years 1. Don't remember	
Q111	Did you start Receiving ARV treatment?	1. Yes 2. No	
Q112	When did you start receiving ARV treatment?	Before -------- month or------years 1. Don't remember	

Q113	How is your overall health condition after you Start receiving ARVT?	1. Improved 2. No change 3. Deteriorated	
Q114	How long did you attend in this ARV treatment unit?	---------- Months and ------- years 1. Don't remember	
Q115	Did you get support from different community Groups?	1. Yes 2. No	if no skip to Q118
Q116	From where did you get the support? More than one answer is possible	1. Relatives/neighbors and friends 2. NGO's 3. GO' s	
Q117	What kind of support did you get? More than one answer is possible	1. Money 2. HBC (Home Based Care) 3. Counseling 4. Food and Health care	
Q118	During the last 12 month, which of the following symptoms did you have? More than one answer is possible	1. Candida sis(mouth sore) 2. Herpes simplex with mucocutaneous ulcer >1month	

		3. HIV associated dementia 4. HIV associated wasting with involuntary loss of >10kgbody weight 5. Chronic diarrhea >30 days 6. Fatigue and fever 7. Chronic cough night sweet fever 8. Chest pain fever cough, dyspnea 99 No Response 89. Other (specify) ----------	
Q119	Of the symptoms mentioned above which one was very serious during your illness More than one answer is possible	1. Candida sis(mouth sore) 2. Herpes simplex with mucocutaneous ulcer>1month 3. HIV associated dementia 4. HIV associated wasting with involuntary loss of >10kgbody weight 5. Chronic diarrhea >30 days 6. Fatigue and fever 7. Chronic cough night sweet fever Chest pain fever 8. cough, dyspnea 99. No Response 89. Other (specify)	

Part III- Questions concerned on mobile phones.

Ser. No	question	Responses	
Q120	Do you have mobile phone	1. Yes 2. No	
Q121	Do you think mobile phone is useful?	1. Yes 2. No	
Q122	Do you know about the services provided by mobile phones?	1. Yes 2. N0	
Q123	Which of the services provided by mobile phones do you actually use? More than one answer is possible	1. To talk only 2. Sending and receiving message 3. Radio 4. Music 5. To talk and send message 99. No response 89. Others specify----------	
Q124	Can you receive message on mobile phones?	1. Yes 2. No 89. If yes please show us	
Q125	Can you send a message using mobile phones?	1. Yes 2. No	If no skip to Q130

		89. If yes demonstrate	
Q126	What kind of messages do you usually send on your mobile phones? More than one answer is possible	1. Greeting 2. Messages 3. Reminders 4. Reminders for other people	
Q127	How often do you send message on your mobile phones?	1. More than once per day 2. One per day 3. Every week 4. Every month 5. When necessary /required	
Q128	How often do you receive message on your mobile phones?	1. More than once per day 2. One per day 3. Every week 4. Every month 5. When necessary /required	
Q129	What problem do you face when you receive or send message on your mobile phones? More than one answer is possible	1. Net work accessibility problems 2. Understanding the message 3. Inadequacy of language	
Q130	Do you want to receive message regarding your medicines /drugs on your mobile phone?	1. Yes 2. No	If no skip to Q135

Q131	Which type of the following messages do you want to receive on your mobile phones? More than one answer is possible	1. Reminders of time to take your medication 2. Reminders of appointment date 3. Guidance and advices 99. No response 89. If others specify	
Q132	From whom do you want to receive these messages? More than one answer is possible	1. Health professionals 2. Friends 3. Family members 4. computer	
Q133	How often do you want them to send you these messages? More than one answer is possible	1. Every day 2. Every week 3. Every month 4. Whenever it is time to take my drugs/medicine 5. On appointment date 99. No response 89. If others specify----------	
Q134	In what language do you want to them to send you these messages?	1. English 2. Amharic 99. No response	

	More than one answer is possible	89.If others specify----------	
Q135	Do you use any reminding tool?	1. Yes 2. No-	
Q136	If yes ask Q135 What reminding tool do you use? More than one answer is possible	1. Alarm 2. Family members 3. Health professionals 4. Friends 5. Time watch 99. No response 89. If others specify----------	

Annex 2 በአዲስ አበባ ዩንቨርስቲ የህክምና ትምህርት ክፍል የህብረተሰብ ጤና ትምህርት ዘርፍ

በአዲስ አበባ ከተማ ከኤች.አይ.ቪ ቫይረስ ጋር የሚኖሩ እና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች የተንቀሳቃሽ ስልክ (ሞባይል) እንዳላቸውና አጠቃቀማቸውን ለማወቅ ለሚደረግ ጥናት የተዘጋጀ መጠይቅ፡፡

የመጠይቁ መለያ ቁጥር ----------ክ/ከተማ ---------ቀበሌ---------

የጠያቂው ስም ----------ፊርማ----------

የተቆጣጣሪው ስም ----------ፊርማ----------

ቃለ መጠይቅ የተካሄደበት ቀን----------ወር----------2002 ዓ.ም

ሰላምታ፡

ስሜ_____ይባላል፡፡ እኔ _____ከአዲስ አበባ ዩንቨርስቲ የጥናት ቡድን ጋር አብሬ እየሰራሁ ነው፡፡ አሁን በዚህ በ_____ሆስፒታል ከኤች አይ ቪ ቫይረስ ጋር ለሚኖሩና እና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች የተንቀሳቃሽ ስልክ (ሞባይል) እንዳላቸውና አጠቃቀማቸውን ለማጥናት ቃለመጠይቅ ለማድረግ ነው፡፡ ይህ ጥናት ከኤች አይ ቪ ጋር ለሚኖሩና እና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች በተንቀሳቃሽ ስልክ (ሞባይል)መልዕክት በመቀበል መድኃኒታቸውን በትክክል እንዲወስዱ ይረዳቸዋል ብለን እናምናለን:: ስምዎ በዚህ መጠይቅ ውስጥ የማይጠቀስ መሆኑንና በቃለ መጠይቁ የሚሰጡንን መረጃ ሁሉ በሚስጥር ተይዞ ለጥናት አገልግሎት ብቻ የሚውል መሆኑን ላረጋግጥልዎ እወዳለሁ፡፡ እርሰዎ በዚህ ጥናት ላይ የመሳተፍ ፣ ያለመሳተፍ ወይንም በማንኛውም ወቅት ቃለ መጠይቁን የማቋረጥ ሙሉ መብት አለዎት፡፡ ነገር ግን እርስዎ በጥናቱ ተሳትፈው የሚሰጡን መረጃ ጥናቱን ውጤታማ ለማድረግ እና ከኤች አይ ቪ ኤድስ ቫይረስ ጋር ለሚኖሩና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች የተንቀሳቃሽ ስልክ (ሞባይል) መልዕክት በመቀበል መድኃኒታቸውን በሰዓቱ መውሰድ እንዲችሉ ለማድረግ ከፍተኛ ጠቀሜታ አለው፡፡

ይህን በሚመለከት ጥያቄ አለዎት ?

ጥያቄ ካለዎት በማንኛውም ጊዜ ለጥናቱ ተመራማሪ ጥያቄዎን መጠየቅ ይችላሉ ?

<u>አድራሻ</u>

- የተመራማሪው ስም- ፀጋ ሐይሉ ደስታ
- አዲስ አበባ - ሞባይል ቁጥር- 0913- 04 55 38
- E-mail:- tsehame@yahoo.com
- ተጨማሪ ማብራሪያ ከፈለጉ አዲስ አበባ ዩኒቨርሲቲ የህክምና ትምህርት ክፍል እንስቲቲዩሽናል ሪቪዩ ቦርድን ይጠይቁ፡፡
- አድራሻ ስልክ 0115538734
  ፖስታ 9086
  ኢሜል aaumfirb@yahoo.co

የስምምነት ማረጋገጫ

የጥናቱ አላማና የሚኖረው ጥቅም በአጭሩ የተረዱ ይመስለኛል። በጥናቱ ለመሳተፍ ፍቃደኛ ነዎት?

1. አዎ _____ 2.አይደለም _____

መልሱ አዎን ከሆነ አመስግነው ቃለ መጠይቁን ያካሂዱ:

መልሱ አይደለም ከሆነ አመሰግነው ወደ ሌላ ተጠያቂ ይለፉ:

ግለሰቡን በመጠይቁ ለማሳተፍ ምንም ዓይነት ማስገደጃ ወይም ጫና ማድረግ የለቦትም።

የጠያቂው ፊርማ ተጠያቂው ጥናቱ ላይ ለመሳተፍ ፍቃደኛ መሆኑን ያመለክታል፡

ክፍል አንድ - ማ ህበራዊ ሁኔታን የሚ መለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄዎች	መልስ ሊሆኑ የሚችሉ ዝርዝሮች	ይለፉ
101	እድሜ ዎ ስንት ነው?	--------- አመት (እድሜ በሙሉ አመት ይገለፅ)	
102	ፆታ	1. ወንድ 2. ሴት	
103	ሐይማኖትዎ ምንድነው?	1. ኦርቶዶክስ 2. ካቶሊክ 3. ሙ ስሊም 4. ፕሮቴስታንት 5. ሌላ ካለ ይገለፅ	
104	ተምረው ያጠናቀቁት ከፍተኛው የትምህርት ደረጃ ስንት ነው?	-------- ክፍል ያጠናቀቀ 1. ማንበብና መፃፍ የሚችሉ 2. ማንበብና መፃፍ የማይችል 3. ቴክኒክና ሙያ ሥልጠና 4. ዩኒቨርሲቲ ኮሌጅ ዲፕሎማ 5. ዩኒቨርሲቲ ኮሌጅ ዲግሪ- 6. ከዛ በላይ	
105	ብሔርዎ ምንድነው?	1. ኦሮሞ 2. አማራ 3. ጉራጌ 4. ትግሬ	

		89. ሌላ ካለ ይገለፅ ----------	
106	በአሁኑ ወቅት የጋብቻ ሁኔታዎ እንዴት ነው?	1. ያገቡ 2. ያላገቡ 3. ባል/ሚስት የሞተባቸው 4. የተፋቱ 5. ያልተጋቡ ጥንዶች/የያጻ ጓደኛ ያላቸው 89 ሌላ ካለ ይገለፅ	
107	በአሁኑ ወቅት ያሉበት የስራ አይነት ምንድ ነው?	1. ስራ የሌለው 2. ተማሪ 3. የቤት እመቤት 4. የቤት ሰራተኛ 5. የቀን ሰራተኛ 6. ነጋዴ 7. የቡናቤት ሰራተኛ 8. የመንግስት ሰራተኛ 9. የግል ሠራተኛ 89 ሌላ ካለ ይግለፀ----------	
108	ጠቅላላ የወር ገቢ	----------የኢትዮጵያ ብር 1. ገቢ የሌለው 2. አላውቅም	
109	ስለበሽታዎ ለባለቤትዎ/ለቤተሰብዎ አሳውቀዋል?	1. አዎ 2. የለም	

ክፍል 2 ስለ ኤች አይ ቪ ኤድስ እና የህክምና ሁኔታ የሚመለከቱ ጥያቄዎች

110	የኤች አይ ቪ ኤድስ ቫይረስ እንዳለብዎ ተመርምረው ካወቁ ምን ያህል ጊዜ ሆንዎት?	----------ወር ----------አመት 1. አላስታውስም	
111	የፀረ ኤች አይ ቪ ኤድስ መድሃኒት መጠቀም ጀምረዋል ?	1. አዎን 2. አልጀመርኩም	
112	ለጥያቄ 111 መልሱ አዎን ከሆነ መቼ ነው? የፀረ ኤች አይ ቪ ኤድስ መድሃኒት መጠቀም የጀመሩት ?	ከ----------ወራት----------አመት በፊት 1. አላስታውስም	
113	በእርስዎ አመለካከት /ምዘና የፀረ ኤች አይ ቪ.ኤድስ መድሃኒት መጠቀም ከጀመሩ ጀምሮ በአጠቃላይ የጤናዎ ሁኔታ እንዴት ነው?	1. ተሻሽሎዋል 2. ምንም ለውጥ የለውም 3. እየተባባሰ ነው 89. ሌላ ካለ ይገለጽ ----------	
114	በዚህ የፀረ ኤች.አይቪ ኤድስ ህክምና መስጫ ጣቢያ ክትትል ሲያደርጉ ስንት ጊዜ ሆነዎት ?	----------ወር----------አመት 1. አላስታውስም	
115	ከተለያዩ የህብረተሰብ ክፍሎች ድጋፍ ይደረግሎዎታል?	1. አዎን 2. አይደረግልኝም	መልሱ 2 ከሆነ ወደ 118
116	ለጥያቄ 115 መልሱ አዎን ከሆነ ድጋፉን ከየት ነው የሚያገኙት? ከአንድ በላይ መልስ መስጠት ይቻላል።	1. ከዘመዶቼ 2. መንግስታዊ ከልሆኑ ተቋማት 3. መንግስታዊ ከሆኑ ተቋማት	

		89. ሌላ ካለ ይገለጽ ----------	
117	ምን አይነት ድጋፍ ነው የሚያገኙት ? ከአንድ በላይ መልስ መስጠት ይቻላል።	1. የገንዘብ 2. የቤት ውስጥ እንክብካቤ 3. የምክር 4. የምግብና የጤና አገልግሎት 89. ሌላ ካለ ይገለጽ----------	
118	ካለፉት አስራሁለት ወራት የሚከተሉት ምልክቶች ተከስተውብህ/ብሽ ያውቃሉ? ከአንድ በላይ መልስ መስጠት ይቻላል።	1. የውስጥ አፍ መቁሰል 2. ውሃ የመቋጠር ባህሪ ያለው ቁስል 3. የማስታወስ ችግር 4. ክብደት መቀነስ /መክሳት/ 5. ከአንድ ወር በላይ የቆየ ተቅማጥ 6. የጡንቻ መገጣጠሚያ ህመምና ትኩሳት 7. ለብዙ ጊዜ የቆየ ሳል፣ የለሊት ላብ እና ትኩሳት 8. ሳልና የእስትንፋስ እጥረት 99. መልስ የለም 89. ሌላ ካለ ይገለጽ ----------	
119	ከላይ ከተዘረዘሩት የህመም ስሜቶች የትኛው ይበልጥ የሰማዎታል (የሚብስቦት)? ከአንድ በላይ መልስ መስጠት ይቻላል።	1. የውስጥ አፍ መቁሰል 2. ውሃ የመቋጠር ባህሪ ያለው ቁስል	

		3. የማስታወስ ችግር 4. ክብደት መቀነስ /መክሳት/ 5. ከአንድ ወር በላይ የቆየ ተቅማጥ 6. የጡንቻ መገጣጠሚያ ህመምና ትኩሳት- 7. ለብዙ ጊዜ የቆየ ሳል፣ የለሊት ላብ እና ትኩሳት 8. ሳልና የእስትንፋስ እጥረት 99. መልስ የለም 89. ሌላ ካለ ይግለጹ ----------	

ክፍል: 3 ስለ ተንቀሳቃሽ ስልክ (ሞባይል)የሚመለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄዎች	መልስ ሊሆኑ የሚችሉ ዝርዝሮች	
120	ተንቀሳቃሽ ስልክ (ሞባይል) አለዎት?	1. አዎ 2. የለም	
121	ተንቀሳቃሽ ስልክ (ሞባይል) ጠቀሚ ነው ይላሉ?	1. አዎ 2. የለም	
122	ተንቀሳቃሽ ስልክ (ሞባይል) ስለሚሰጣቸው አገልግሎቶች ያውቃሉ?	1. አዎ 2. የለም	
123	ተንቀሳቃሽ ስልክ (ሞባይል) ከሚሰጣቸው አገልግሎቶች የትኞቹን ይጠቀማሉ?	1. ለመነጋገር ብቻ	

	ካንድ በላይ መልስ መስጠት ይቻላል፡፡	2. መልዕክት ለመቀበልና ለመላክ 3. ለሬድዮ 4. ሙዚቃ 5. ለመነጋገር እና መልክት ለመላክ 89. ሌላ ካለ ይጥቀሱ---------	
124	በተንቀሳቃሽ ስልክ (ሞባይል) መልዕክት መቀበል ይችላሉ?	1. አዎ 2. የለም አዎ ካሉ እባክዎ ያሳዩን	
125	በተንቀሳቃሽ ስልክ (ሞባይል) መልዕክት መላክ ይችላሉ?	1. አዎ 2. የለም አዎ ካሉ እባክዎ ያሳዩን	መልሱ 2 ከሆነ ወደ 130
126	በተንቀሳቃሽ ስልክ (ሞባይል) የሚልኩዋቸው መልእክቶች ምን ይዘት አላቸው? ካንድ በላይ መልስ መስጠት ይቻላል፡፡	1. ሰላምታ 2. መልእክት 3. ለማስታወስ 4. ለሌላ ሰው ለማስታወስ 89. ሌላ ካለ ይጥቀሱ--------	
127	በየስንት ጊዜው በተንቀሳቃሽ ስልክ (በሞባይል) መልእክት ይልካሉ?	1. በቀን ካንድ ጊዜ በላይ 2. በቀን አንድ ጊዜ 3. በየሳምንቱ 4. በየወሩ	

		5. እንዳስፈላጊነቱ 89. ሌላ ካለ ይጥቀሱ---------	
128	በየስንት ጊዜው በተንቀሳቃሽ ስልክ (ሞባይል) መልዕክት ይቀበላሉ?	1. በቀን ካንድ ጊዜ በላይ 2. በቀን አንድ ጊዜ 3. በየሳምንቱ 4. በየወሩ 5. እንዳስፈላጊነ 89. ሌላ ካለ ይጥቀሱ---------	
129	በሞባይል መልእክት በመላክና በመቀበል ላይ የሚያጋጥሙ ችግሮች ምን ምን ናቸው? ካንድ በላይ መልስ መስጠት ይቻላል።	1. የኔት ወርክ ችግር 2. መልዕክቱን የመረዳት ችግር 3. የቋንቋ ችግር 89. ሌላ ካለ ይጥቀሱ---------	
130	መድሃኒትዎን በተመለከተ በተንቀሳቃሽ ስልክዎ (ሞባይልዎ) መልእክት ቢላክልዎት ፈቃደኛ ነዎት?	1. አዎ.... 2. የለም..... አዎ ካሉ ከዚህ በታች ያሉትን ጥያቄዎች ይጠይቁ	መልሱ 2 ከሆነ ወደ 135
131	ከዚህ በታች ከተዘረዘሩት መልዕክቶች እርሶ በተንቀሳቃሽ ስልክዎ (ሞባይልዎ) እንዲላክልዎ የሚፈልጉት የትኛውን ነው? ካንድ በላይ መልስ መስጠት ይቻላል።	1. መድሀኒት የሚወስዱበትን ሰዓት እንድናስታውስዎ 2. የቀጠሮ ቀን እንድናስታውስዎ 3. መመሪያ እና ምክር እንድንሰጥዎ 89. ሌላ ካለ ይጥቀሱ---------	

132	መልዕክት በማን እንዲላክልሞ ይፈልጋሉ? ካንድ በላይ መልስ መስጠት ይቻላል።	1. በጤና ባለሙያ 2. በጓደኛ 3. በቤተሰብ 4. በኮምፒውተር 89. ሌላ ካለ ይጥቀሱ-	
133	በምን ያህል ጊዜ መልዕክቱ እንዲላክሎት ይፈልጋሉ? ካንድ በላይ መልስ መስጠት ይቻላል።	1. በየቀኑ 2. በየሳምንቱ 3. በየወሩ 4. በመድኃኒት መውሰጃ ሰዓት 5. በቀጠሮ ጊዜ 89. ሌላ ካለ ይጥቀሱ---------	
134	በምን ቋንቋ እንዲላክሎት ይፈልጋሉ? ካንድ በላይ መልስ መስጠት ይቻላል።	1. እንግሊዝኛ 2. አማርኛ 89. ሌላ ካለ ይጥቀሱ-------	
135	መድኃኒት መውሰጃ ሰዓትዎን ለማስታወስ የሚጠቀሙት ነገር አለ?	1. አዎ--------- 2. የለም------	
136	ለጥያቄ 135 መልሱ አዎን ከሆነ ከተዘረዘሩት ውስጥ የትኞቹን ይጠቀማሉ?	1. የጥሪ ደውል 2. ቤተሰብ 3. የጤና ባለሙያ	

	ካንድ በላይ መልስ መስጠት ይቻላል፡፡	4. ጓደኛ 5. ሰዓት በማየ 89. ሌላ ካለ ይግለፁ--------	

አመሰግናለሁ!!

Annex 3Addis Ababa University Faculty of Medicine Department of Community Health.

This questionnaire is prepared in Addis Ababa city, for people living with HIV/AIDS (PLWHA) and those who are on anti retro viral therapy (ART) follow up patients. This is intended to know if they make use of mobile and how they use it.

Questionnaire number_____sudcity_____kebele_____

Interviewer's name_____signature_____

Supervisor name _____signature_____

Day of interview Date_____month_____year_____

INFORMATION SHEET

Good morning /afternoon, I am called _____. I am working together with Addis Ababa university study group. The main purpose of this interview is to assess PLWHA on ART follow –up individuals, if they have mobile and how they use it. We believe that mobile enables them to take their drugs properly text message reminders .we would like to assure you your name will not mentioned here and the information that you are going to give us will be handled secretly and confidentially. It will only be used for study purpose .you may or may not participate in the interview .this depend on your willingness to do or not to do so. You may also terminate participating in the study whenever you like. However, your participation during the study counts a lot to the achievement of our study. This may also benefit those who PLWHA and who are on ART follow up patients this plays a significant role to them to improve drug adherence with the help of reminder through text message .

If you have any question you can contact the principal investigator at any time convenient for you using the following address:

Name of Principal Investigator- Tsega Hailu Desta

Address- Addis Ababa, Ethiopia

Cell phone: 09-13-04-55-38

E-mail: tsehame @yahoo.com

If you want additional information you can contact Addis Ababa medical faculty institutional review board.

Po box 9086

Address Telephone 0115538734

E-mail : aaumfirb@yahoo.com

Addis Ababa University Faculty of Medicine Department of Community Health, Individual consent form for the study on assessment of feasibility using text message among ART follow up patients on selected ARV treatment units to improve drug adherence in Addis Ababa City Administration

Informed Consent Form

You have been already briefly informed about the study and clearly understand the objective.

Now please tell me if you agree to participate in the interview.

The Participant:

1. Agreed ☐

2. Did not agree ☐ ——→ End the interview

Signature of interviewer which indicates that the respondent has consented to participate in the study:-

Interviewer Name: _____ Signature_____

|_____|_____| 2010.

Supervisor Name: _____ Signature_____

|_____|_____| 2010

Part IV qualitative questions (for those who have mobile phone)

How old are you?

Sex?

What is your religion?

What is the highest Educational level you completed?

What Ethnic group do you belong to?

What is your current marital status /relationships?

What is your current Occupation?

What is your total monthly income?

Do you disclose to your partner/ family?

V Information on mobile phone services and text message usage

Q1 How many types of mobile phone services do you know? Please list them for me

Q2 How many of them do you use? Please explain to me

Q 3which one is easy/more comfortable to use and why?

Q4 Do you think that if health professionals send you text message about your medication /drugs, it will help you to use /take the drugs in the right way and how?

Q5 Do you think that mobile phone message are safe (confidential) and why?

Q6 please can you tell me how to send messages using mobile phones?

Q7 Are there any other methods that you think will help people to take their drugs/medications correctly to improve drug adherence

Thanks!!

Annex 4 እዝል 3: በአዲስ አበባ ዩንቨርስቲ የህክምና ትምህርት ክፍል የህብረተሰብ ጤና ትምህርት ዘርፍ ከኤች.አይ.ቪ ቫይረስ ጋር የሚኖሩ እና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች የተንቀሳቃሽ ስልክ (ሞባይል) እንዳላቸውና አጠቃቀማቸውን ለማጥናት ጠለቅ ያለ ዳሰሳ ለማድረግ የግለሰቦቹን ፈቃደኝነት መጠየቂያ ፎርም::

ስሜ_____ይባላል:: እኔ _____ከአዲስ አበባ ዩንቨርስቲ የጥናት ቡድን ጋር አብሬ እየሰራሁ ነው:: አሁን በዚህ በ_____ክ/ከተማ ከኤች አይ ቪ ቫይረስ ጋር ለሚኖሩና እና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች የተንቀሳቃሽ ስልክ (ሞባይል) እንዳላቸውና አጠቃቀማቸውን ለማጥናት ቃለመጠይቅ ለማድረግ ነው:: ይህ ጥናት ከኤች አይ ቪ ጋር ለሚኖሩና እና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች በተንቀሳቃሽ ስልክ (ሞባይል)መልዕክት በመቀበል መድኃኒታቸውን በትክክል እንዲወስዱ ይረዳቸዋል ብለን እናምናለን:: ስምዎ በዚህ መጠይቅ ውስጥ የማይጠቀስ መሆኑንና በቃለ መጠይቁ የሚሰጡንን መረጃ ሁሉ በሚስጥር ተይዞ ለጥናት አገልግሎት ብቻ የሚውል መሆኑን ላረጋግጥልዎ እወዳለሁ:: እርሰዎ በዚህ ጥናት ላይ የመሳተፍ ፣ ያለመሳተፍ ወይንም በማንኛውም ወቅት ቃለ መጠይቁን የማቋረጥ ሙሉ መብት አለዎት:: ነገር ግን እርስዎ በጥናቱ ተሳትፈው የሚሰጡን መረጃ ጥናቱን ውጤታማ ለማድረግ እና ከኤች አይ ቪ ኤድስ ቫይረስ ጋር ለሚኖሩና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች የተንቀሳቃሽ ስልክ (ሞባይል) መልዕክት በመቀበል መድኃኒታቸውን በሰዓቱ መውሰድ እንዲችሉ ለማድረግ ከፍተኛ ጠቀሜታ አለው::

ይህን በሚመለከት ጥያቄ አለዎት ?

ጥያቄ ካለዎት በማንኛውም ጊዜ ለጥናቱ ተመራማሪ ጥያቄዎን መጠየቅ ይችላሉ ?

<u>አድራሻ</u>

- የተመራማሪው ስም- ፀጋ ሐይሉ ደስታ
- አዲስ አበባ - ሞባይል ቁጥር- 0913- 04 55 38
- E-mail:- tsehame@yahoo.com

ተጨማሪ ማብራሪያ ከፈለጉ የአዲስ አበባ ሜዲካል ፋካሊቲ ኢንስትቲውሽናል ሪቪው ቦርድ

ፖ.ሳ.ቁ. 9086

አድራሻ ስልክ 0115538734

ኢሜል : aaumfirb@yahoo.com

እዝል 4: በአዲስ አበባ ዩንቨርስቲ የህክምና ትምህርት ክፍል የህብረተሰብ ጤና ትምህርት ዘርፍ ከኤች አይ ቪ ቫይረስ ጋር የሚኖሩና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች የተንቀሳቃሽ ስልክ (ሞባይል) እንዳላቸውና አጠቃቀማቸውን ለማጥናት ጠለቅ ያለ ዳሰሳ ለማድረግ የግለሰቦች ውል መዋዋያ ፎርም፡፡

የጥናቱ አላማና የሚኖረው ጥቅም በአጭሩ የተረዱ ይመስለኛል፡፡

በጥናቱ ለመሳተፍ ፍቃደኛ ነዎት ?

1. አዎ _____ 2.አይደለም _____

መልሱ አዎን ከሆነ አመስግነው ቃለ መጠይቁን ያካሂዱ:

መልሱ አይደለም ከሆነ አመሰግነው ወደ ሌላ ተጠያቂ ይለፉ:

ግለሰቡን በመጠይቁ ለማሳተፍ ምንም ዓይነት ማስገደጃ ወይም ጫና ማድረግ የለቦትም፡፡

የጠያቂው ፊርማ ተጠያቂው ጥናቱ ላይ ለመሳተፍ ፍቃደኛ መሆኑን ያመለክታል፡

የጠያቂው ኮድ ----------ስም ----------ፊርማ----------

ቃለ መጠይቅ የተካሄደበት ቀን ----------ወር----------2002 ዓ.ም

ክፍል 4 ጠለቅ ያለ ዳሰሳ ስለ ሞባይል አጠቃቀም

በአዲስ አበባ ዩንቨርስቲ የህክምና ትምህርት ክፍል የህብረተሰብ ጤና ትምህርት ዘርፍ ከኤች አይ ቪ ቫይረስ ጋር የሚኖሩና የፀረ ኤች.አይ.ቪ መድኃኒት በመውሰድ ላይ የሚገኙ ታካሚዎች የተንቀሳቃሽ ስልክ (ሞባይል) እንዳላቸውና አጠቃቀማቸውን ለማጥናት ጠለቅ ያለ ዳሰሳ ለማድረግ የተዘጋጀ መመረያ::

ክፍል አንድ:- *መረጃ ስለ ማህበራዊ ሁኔታ*:

- እድሜዎት ስንት ነው? (በሙሉ አመት ይገለጽ)

-*ፆታ*

- ብሔርዎ ምንድነው?

- በአሁኑ ወቅት ያሉበት የጋብቻ ሁኔታ ምን ይመስላ?

- ሐይማኖትዎ ምንድ ነው ?

- ጠውላላ የወር ገቢዎ ስንት ነው ?

- ተምረው ያጠናቀቁት ከፍተኛ የትምህርት ደረጃ ስንት ነው ?

ስለበሽታዎ ለባለቤትዎ/ለቤተሰብዎ አሳውቀዋል?

ክፍል 2- *መረጃ ስለተንቀሳቃሽ ስልክ (ሞባይል)*

1. ስንት ዓይነት የሞባይል አገልግሎት ያውቃሉ? (ይዘርዝሩልኝ)

2. የትኞቹን እንደሚጠቀሙ ቢገልፁልኝ?

3. ለመጠቀም ምቹ የትኛው ነው ለምን?

4. በሞባይሎ በባለሙያ መልዕክት ቢላክሎት መድኃኒትዎን በትክክል ለመውሰድ ይረዳል

ብለው ያስባሉ? እንዴት?

5. በሞባይል የሚላክ መልእክት አስተማማኝ ነው ብለው ያስባሉ እንዴት?

6. የሞባይል መልዕክት እንዴት እንደሚላክ ያውቃሉ?ካወቁ ሊነግሩኝ ይችላሉ?.

7. መድኃኒት በትክክል ለመውሰድ ይጠቅማሉ የሚሉዋቸው ዘዴዎች ይኖራሉ?

አመሰግናለሁ!!