ADDIS ABABA UNIVERSITY POSTGRADUATE STUDIES FACULITY OF MEDICINE AND INFORMATICS HEALTH INFORMATICS PROGRAM

Assessment of access to health information resources among health professionals working in HIV/AIDS and family health units of public health centers in Addis Ababa, Ethiopia

By

ISRAEL LEMMA

A thesis submitted to school of graduate studies of Addis Ababa University, program of health informatics, in partial fulfillment of the requirement of degree of masters in health informatics.

Addis Ababa, Ethiopia

JUNE 2009

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ACRONYMS

AACAHB- Addis Ababa City Administration Health Bureau

AIDS- Acquired Immuno-Deficiency Syndrome

ANC- Antenatal care

AOR-Adjusted Odds Ratio

ARC-AIDS Resource Center

ART- Anti Retroviral Therapy

BMJ-British Medical Journal

COR-Crude Odds Ratio

FP-Family Planning

HI-Health Information

HINARI- Health Internet work Access to Research Initiative

HIV- Human Immunodeficiency Virus

IMNCI- Integrated Management of Neonatal and Childhood Illnesses

INASP-International Network for the Availability of Scientific Publications

NGOS-Non-Governmental Organizations

MCH- Maternal and Child Health

MSH- Management Science for Health

PHC-Primary Health Care

PLWHA- People Leaving With HIV/AIDS

PMTCT- Prevention of Mother- TO- Child Transmission

RH-Reproductive Health

UK- United Kingdom

VCT- Voluntary Counseling and Testing

WHO- World Health Organization

Assessment of access to health information resources among health professionals working in HIV/AIDS and family health units of public health centers in Addis Ababa

ABSTRACT

Background: Universal access to information for health professionals is a prerequisite for meeting the Millennium development Goals and achieving Health for All. In developing countries, a large proportion of the population, including health professionals, has no or only poor access to HI outlets. The problem is much serious in those working in Primary Health Care (PHC) settings. This study was conducted to assess level of access to HI resources by health workers working in public health centers in Addis Ababa.

Objective: To assess HI access among health professionals working in HIV/AIDS related programmes and family health clinics at primary public health institution in Addis Ababa.

Methods: A cross-sectional quantitative and qualitative (in-depth interview) study designs were employed. Health professionals working on VCT/ART and family health at Addis Ababa public health centres were study subjects. Self administered questionnaire were used on 169 subjects to assess the level of access to HI resources

Results: The majority (94.8%) of respondents reported that they seek information when a need arises. Seventy one(46.7%) of the respondents reported being computer literate and only 33.8% of the respondents reported to have access to the internet from any source and internet access, have shown no statistically significant association($p>0.05$) with the variables . Access to different HI resources to the health workers is limited; local or international journals (12%), library service (25.5%) and training (58.8%). The over all HI access were observed by six types of resources where half (50.6%) of the respondents were found to have satisfactory access to HI resources . working program were observed to have association with access level. Those working in HIV/AIDS unit were found to have a 2.5 times better likely hood of getting satisfactory HI sources as compared to those working in family health clinic COR=2.66, with 95% CI(1.35, 5.23) and AOR= 2.5(1.2, 5.2).

Conclusion: Most study subjects have limited access to many of the HI resources; internet, journals, library service with printed materials, and training. Therefore, more efforts has to be made to ensure a sustainable HI access points to help those working in the ever changing health contexts in order to maximize evidence based patient quality care.

1. INTRODUCTION

1.1 BACKGROUND

"Universal access to information for health professionals is a prerequisite for meeting the Millennium Development Goals and achieving Health for All" (1).

In the 'era' of globalization distance has become less relevant with increasing use of internet and other information communication services to access up to date information (2). But benefits of globalization are not a reality in developing countries (3). According to International Network for the Availability of Scientific Publications (INASP), despite many successful initiatives during the past 10 years, most healthcare providers in developing countries continue to lack access to the information they need to deliver safe, effective healthcare with available resources (4).

World Health Organization (WHO) states in developing countries, a large proportion of the population, including health professionals, has no or only poor access to HI resources such as; the Internet. Even printed materials; such as up-to-date books, current periodicals, and newspapers, are scarce (5). However, providing access to reliable HI for health workers in developing countries is potentially the single most cost-effective and achievable strategy for sustainable improvement of health care in these countries (6).

Studies suggested that there is an association between availability of health care information or lack of it and knowledge or quality of health care. Thus the availability of HI provides confidence in clinical decision-making, improves practical skills and attitudes to care. Serious and widespread deficiencies in the existing knowledge and practice of health practitioners is a reminder of the crucial importance of improving the availability of relevant, reliable health care information – and its potential to radically improve health care worldwide .However there is an existing disparity of availability of HI across the different parts of the world which might attribute to several factors, such as unequal distribution of internet connectivity, and also a failure of international "information for development" policies and initiatives, which have tended to focus on "innovative" Internet-based approaches for Higher-level health professionals and

researchers while ignoring, relatively speaking, other approaches that remain essential for the vast majority of primary and district health workers (7,8).

The information and training needs of health workers are fundamental. It is only by addressing these needs that we can hope to achieve the Millennium Development Goals (7).

Recently, international agencies, non-governmental organizations, publishers, libraries, training schools, and others—all are seeking to improve access to information for healthcare workers. Collectively they bring a wealth of skills, but their overall effectiveness has been limited by, ironically, lack of communication (9).

1.2 RATIONALE OF THE STUDY

There are no studies done in our country related to HI access to the health professionals. This study tries to determine the available HI resources for the health professionals' use for evidence based decision. In addition the study tries to investigate the potential challenges and opportunities in accessing HI access.

The study result might be used by policy makers and other stake holders to formulate a plan based on the findings. Moreover the findings of this study will be used as a base line study by the upcoming researchers interested in the area.

2. LITERATURE REVIEW

Health information access by health workers in developing country.

Information access described by Packenham-Walsh and colleagues, "is the sine qua non of the professional development of all health workers—the most vital asset of any healthcare system" (10). And the development of the Internet has brought hope that access to HI might one day become universal. Access to online databases gives users the opportunity to retrieve a wealth of relevant and up-to-date information. Everyday, health-related books, research, and other articles are retrieved from the Internet, which has led to a worldwide information revolution. However, where poor access is prevailing professionals are obliged to rely on the knowledge acquired during their original training to care for patients, to prevent disease, and to promote health (3).

The editor of British Medical Journal (BMJ) noted "If one is forced to work in the rural areas in developing countries, this might result in being isolated –professionally and physically". THIs in turn more likely result in continued medical ignorance, a disease with a particularly High prevalence in the rural health professional, characterized by loss of morale, lack of enthusiasm, and poor performance, caused largely by chronic deficiency of information (8).

A multicentre study carried out in 21 hospitals (in Bangladesh, Dominican Republic, Ethiopia, Indonesia, Philippines, Tanzania and Uganda) assessed knowledge of five important clinical problems: pneumonia, diarrhea with dehydration, sepsis, severe malnutrition and hypoglycemia. Three fourths of the doctors had inadequate knowledge in at least one area, compared with 91% of nurses and medical assistants. Knowledge was much better among doctors in teaching hospitals than doctors in district hospitals, but nurses and medical assistants had poor knowledge in both district and teaching hospitals (11).

Although universal access to information for health professionals is a prerequisite for meeting the Millennium Development Goals and achieving Health for All (1), lack of access to information remains a major barrier to knowledge-based health care in developing countries for rural primary health care in particular. This holds true for the majority of health workers in Ethiopia who lack access to reliable, relevant and usable information (12). In India it was found

that access to information for health professionals is constrained primarily by two factors - the lack of adequate access channels for individual users and the lack of information that is both readily available and reliable. The first factor is demonstrated by the fact that the majority of health professionals in India do not have everyday access to the Internet, and very few of the health care institutions that employ them can afford to provide this access to them (13).

Online access to HI

It has been argued that inequity in access to the internet is greater than any other inequity globally (14). The '10/90 gap' assigned for 10% of health research funding is targeted at the health problems that account for 90% of the global disease burden translates into a '1/99 gap' in HI (1). Access to online HI resources continues to vary a cross different parts of the world. Access to internet to the health care providers across the world is highly variable.

A survey undertaken in United Kingdom (UK) for professional development amongst nurses revealed that, 19% of respondents stated that they never use the Internet in relation to their work and fewer than half of respondents stated that they could always get access to the Internet at work when they needed it (15). Another study in UK shown varying access to the Internet; 13 (48%) of the 27 nurses that were interviewed had access to the Internet at both work and home; six (22%) had access only at work; and seven (26%) had access only at home. There was little sense of the Internet as a tool for gaining answers to clinical questions, with the Internet rarely being used within consultations. However practice nurses were found to use the Internet to access information on clinical conditions, to access information for patients, and to keep up to date, drawing on a number of trusted sites (16). The number of Internet users in the African health sector remains unknown, although it is clearly high in tertiary centers: a recent study in Ghana found that 95% of College of Health Science faculty uses the Internet (17).

A study done in Nigeria on HI access among physicians respondents' computer literacy levels and Internet usage showed, 93% of the respondents were computer literate. Of the 7% that were not computer literate, 33.3% said they did not have the time to learn it, 33.3% said they had no access to a computer, 8.4% had no interest. Of those who use computers virtually all the

respondents (98%) had used the Internet; of this number, 67.3% claimed they used it during the week preceding the study. Respondents' were also asked if they had personal access to the Internet; approximately one-third (36%) reported having Internet access while two-thirds (64%) had no access. Respondents were asked which outlet they used in accessing the Internet the last time; majority (76%) said they did so from cyber cafes. Respondents were also asked the main reason they used the Internet the last time; communication by email (65.2%) tops the list of reasons cited. Also 90% of the respondents claimed they had obtained HI from the Internet for patient care (84.1%) (18).

A study done in Nigerian university among medical and nursing students showed that, overall 42.6% of the entire sample could use the computer, 57.4% could not. While more than half (58%) of the medical students are computer literate, majority (75.9%) of the student nurses are not. About 61% of the entire students had ever used the internet, 33.9% had not. E-mail was the most popular of internet services used by the students (76.4%) and the cyber café was the common place where students had accessed these services (19).

On a survey done on current efforts and potentials in application of telemedicine in Ethiopia an assessment was made on internet access by private hospitals in Ethiopia and the study result showed that Internet connection seems common in the private hospitals. Majority (87.5%) of them reported that they have a dial up Internet connection, of course mainly used by people close to administration, provided by the Ethiopian Telecommunications Corporation. Only 12.5% reported not having Internet connection. In those hospitals with Internet connection, the popular application (85.7%) used was Internet sending and receiving E-mail messages. Use of the Internet for web browsing and electronic document searching is reported by 57.1% and 28.5% of the hospitals respectively (20).

“Providing access to reliable HI for health workers in developing countries is potentially the single most cost effective and achievable strategy for sustainable improvement in health care” (21). So far, the most successful initiative to bridge this gap is the Health Internet Network Access to Research Initiative (HINARI) (22). More than 3500 journals from more than 70 scientific publishers are currently available free of charge through HINARI (23). HINARI is an

initiative by WHO and provide free access to low income countries .Ethiopia is one of the eligible country and among the countries with Highest registered institutions for free access(14)

HI access related investigations have been sought evidence based practice to strongly associated with access to literature based scientific evidences (access to medical library, use of local journals and local and western textbooks)". A quote from an East African surgeon states, "Laparoscopic surgery is fast developing and textbooks are not able to keep up with it. Before doing a complex laparoscopic surgery I read all the material on the subject available in the journals through this account and then make my plan, frequently you will find descriptions and tips which are not in books" (7).

The problems that specifically limit access to online medical journals in developing countries include the following: (i) inadequate and cost-prohibitive electronic access to medical journals, (ii) slow Internet access speeds, and (iii) the high cost of Internet access. HINARI is an initiative by WHO and provide free access to low income countries. Ethiopia is one of the eligible country and among the countries with highest registered institutions for free access (14).

In a survey conducted by the WHO in 2000, researchers and academics in developing countries ranked access to subscription-based journals as one of their most pressing problems; in countries with annual incomes of US 1000 dollars and less per person, 56% of institutions surveyed had no current subscriptions to international journals (24).

Due to the poor status of bibliographic control of biomedical literature in Africa, and lack of a well organized health-information system, relevant research findings that can uplift the efficiency of the health care delivery system are not diffused readily among the health professionals. Accessibility to the various sources of health literature is very poor. Furthermore, the high subscriptions charged by publishers limit access to journals and discourage scientists from submitting their work to editors whose publications seem to make no effort to appeal to resource-poor region (25,26,27).

Macrorie.R. editor of BMJ reported, that INASP and others seeking to empower the medical workforce in developing countries will not limit themselves to availability, simply giving access to western literature as its authors see fit. Rather, we need to distribute the control of access to

databases to the users, enabling them to initiate searches and determine end points, seeking answers to their own questions. We might also do more to enable medical practitioners from developing countries to contribute more to the published literature from their own discoveries, reactions, and experiences, giving them the confidence to share their perspectives. Only then can an "international network" have real meaning (28).

Most frequently used resources

A study done in Uganda among health practitioner's and health planners revealed that the most often used sources of information included; discussions with colleagues (89%), doctors' statements (85%) and text books (77%). The least frequently used sources were the internet and the library (29).

Other HI sources

In addition to information resources mentioned above health care professionals use other sources to up to date among these one is the 'warmline' telephone consultation service organized by the AIDS Resource Center (ARC) in Addis Ababa. THIs was an initiative to implement a telephone consultation service, or 'warmline', that provides clinical information and advice to clinicians caring for people leaving with HIV/AIDS(PLWHA) (30).

The 'Warmline' service is said to be staffed by a multidisciplinary team of HIV/AIDS experts providing consultation to the health workers. It was reported that the 'Warmline' has fielded some 16,000 calls - mostly from mobile phones -and six e-mail queries since its launch last spring (2008), an average of about 400 calls a week is received for consultation these days. Half of which originate in Addis Ababa. The remainders come from more remote outlying regions; most of the queries asked were focusing on the complex issues surrounding the provision of antiretroviral therapy. The warm line staffs believed many health-care providers lack telephone and Internet connectivity, which of course affects their ability to access the warm line's services (31).

3. Objective

3.1 General objective

- To assess access of health information by health workers in HIV/AIDS and family health units of public health centers in Addis Ababa

3.2 Specific objectives

- To assess magnitude of accessibility of HI to health care providers in Addis Ababa health centers
- To identify HI resources accessible to health care providers in Addis Ababa health centers
- To assess challenges and opportunities to HI access to the health care providers in Addis Ababa health centers

4. Methodology

4.1 Study design

The study used was a cross-sectional survey using both quantitative and qualitative approaches. Self-administered questionnaire and in-depth interview were employed to see the accessibility of HI sources and the potential challenge and opportunities existing to access HI resources across the selected units.

4.2 Study area and period

The study was conducted from April 1 to May 15 in Addis Ababa. Addis Ababa is the capital city of Ethiopia with population size of 2,738,248 (32). Addis Ababa City Administration Health Bureau (AACAHB) is the regulatory body of the health system in Addis Ababa. There are 30 hospitals; 9 governmental and 26 private, and 24 governmental health centers in Addis Ababa providing both HIV/AIDS and family health related services.

4.3 Study population

4.3.1. Source population

- health workers working in public health centers in Addis Ababa

4.3.2. Study subjects

- health workers working in HIV/AIDS and family health units in the studied governmental health centers

4.3.3. Inclusion criteria

- Those health professionals who have a direct involvement in client care
- Those professionals who are recently working in VCT/ART/PMTCT and who are recently working in family health clinics (FP/ANC/immunization/IMNCI).

4.3.4. Exclusion criteria

- Those who are not voluntary to participate

4.3.5 Sample size and sampling procedure

All health professionals fulfilling the inclusion criteria were included in the study, 'take all' strategy was employed. In each health center in the above mentioned units on average about eight staffs were found. A total of 169 study subjects from the 22 health centers were given the self administered questionnaire.

Two unit heads (one ART unit head and one MCH unit head) from each studied facility were interviewed for the qualitative study. In six health centers, health center heads were included in the interview because the unit heads in those institutions couldn't figure out the potential challenges and opportunities of HI access, making a total of 50 subjects for the qualitative study.

4.4 Data collection procedure

- The instrument (the tool) for the quantitative study was adopted from different literatures and modifications were made to meet to our context and the study objective.

- The instrument was constructed into two parts: quantitative and qualitative. The quantitative part comprises; questions assessing socio demographic characteristics, questions assessing HI seeking behaviour, and questions assessing HI resources access.

- Pretesting of the questionnaire was made on about 10% of the total studied population, who have similar characteristics with study subjects. Some confusions and defects were corrected before the actual data collection was started.

- For qualitative study interview guide was prepared and notes were taken during interview

Twenty two health centers in Addis Ababa were included in the study because two of them were used for pretesting purpose. Health professionals working in HIV/AIDS units; Volunteer Counselling and Testing (VCT), Anti Retroviral Therapy (ART) as well as those working in the family health clinics, Antenatal care (ANC) , Family Planning (FP), Immunization, Prevention of mother to child transmission (PMTCT), Integrated management of newborn and childhood illness (IMNCI) were included in the study.

Data was collected from study subjects, using pre-tested and structured self-administered questionnaire. In-depth interview of key informants was used to assess the information resource infrastructure using a predetermined set of check lists and using semi-structured interview guide.

Data collectors who are diploma nurses were recruited from the respective institutions to organize the data collection process. One supervisor who has an experience working in health center was used. Training on the desired data collection techniques and assurance of data quality were given both to the data collectors and the supervisor. Data collectors were frequently alerted to have a close follow up of responses from the study subjects. The subjects were given the questionnaire to fill at his/her comfortable time. The questionnaire were given to the respondent and reminded at least three to five times before considered as a non response. In-depth interview were made by the principal investigator.

4.5. Study variables

Dependent variable

- access to HI (access to internet, journals, printed materials, training)

Independent variables

- age
- sex
- professional category
- monthly income
- years of experience
- Type of program.
- type of service unit
- HI resource preference
- computer literacy
- Reported seeking behaviour

4.6. Operational definitions

- **Evidence-based practice**- to refer to the best available evidence that is both credible and of the highest known quality.
- **HI Access-** access to HI resources for improving information based decision making in the health care practice
    - Satisfactory access –a respondent who has access to at least to three or more HI resources
    - unsatisfactory access- a respondent who has access to two or less number of HI resources
- **Computer literate-**one who can work on basic desktop publishing applications and browse the Internet.
- **HI seeking-**searching for available information from any source to get answer for questions we have during practice.
- **Journal access-** when there exists mechanism to regularly receive(locally produced or international) journal related to a type of medical practice, subscribed or donated regularly(excluding occasional bulletins)
- **Clinical mentor**- Usually a physician hired by NGO's to provide technical assistance pertaining to client care for those working on HIV/AIDS related care and support

4.7 Data Quality Control

The quality of data was assured by:

- Data was collected using a pretested questionnaire, training for data collectors as well as supervisor on the data collection tool and how data collection be conducted.
- Continuous supervision had been made to control the data collection procedure
- Checking for completeness was done each day after data collection & on the field
- Data was cleaned and looked for consistency intensively before analysis

4.8. Data processing and analysis

The data obtained from each study participants was cleaned, edited and entered to a computer using EPI INFO 3.3.2 and data was analyzed using SPSS 15.0 version software package. Frequency distributions and cross tabulations were made for the variables. Associations for the selected variables were computed for statistical significant at P-value <0.05 and 95% confidence interval and logistic regression model was used to identify predictor variables. Content analysis was used where different themes of responses of the in-depth interview were drawn and analyzed

4.9. Ethical consideration

Ethical clearance to conduct the study was obtained from Addis Ababa University medical faculty and Informatics faculty joint Review committee. Letter of support was obtained from Addis Ababa health bureau. Informed verbal consent from each study institutions and written consent from qualitative study participants were sought after clear explanation about the purpose of the study was made. The study subjects were assured for the confidentiality of their responses by anonymity of the responses.

4.10. Dissemination of results

Study results will be communicated to Addis Ababa University, School Of Public Health and informatics for partial fulfilment of Masters of Science in health informatics and potential stakeholders for possible intervention. Furthermore all attempts will be made for presentation on annual conference and possible publication.

5. Results

5.1. Quantitative results

One hundred sixty nine (169) self administered questionnaire were distributed across the 22 health centers in Addis Ababa out of which 154 questionnaires were returned completed making a response rate of the quantitative study 91.1%. The rest 15(8.9%) were non responses for the mentioned reasons of lack of time on the respondents side, unavailability after receiving the questionnaire for long time and lack of interest.

5.1.1. Socio-demographic characteristics of the study subjects

Out of the total respondents, 102 (66.2%) were females and 101 (65.6%) of them were with age less than or equal to 30 years old. One hundred nineteen (77.3%) of the respondents were diploma nurses followed by 17 (11%) health officers and 5 (3.2%) of them were physicians. Among the respondents 96 (62.3%) of them work in different units of family health services such as; FP 21(13.6%), ANC 19 (12.3%), IMNCI 19 (12.3%), immunization 15 (9.7%) and PMTCT 16 (10.4%) where as the rest 58 (37.7%) work in (ART, VCT) units.

One hundred twenty four (80%) of the respondents had a monthly income of below 1500 out of which 69 (44.8%) had 500-1000 birr and 56 (36.4%) had an income of 1000-1500 birr. Seventy five (49.0%) of the respondents had a work experience of below six years out of which 38 (24.7%) had a two-four years work experience (Table 1).

Table 1. Socio Demographic Characteristics of health workers at public heath centers in Addis Ababa, May,2009 (n=154)

Characteristics	Number	%
Sex		
Male	52	33.8
Female	102	66.2
Age in years		
< 30	101	65.6
31-35	32	20.8
41-45	21	13.6
Educational Category		
MD	5	3.2
Health officer	17	11
BSc Nurse	7	4.5
Diploma N.	119	77.3
Others	6	3.9
Working Program		
HIV/AIDS	58	37.7
Family health	96	62.3
Current status		
ART initiator	40	26
Adherence counselor	12	7.8
VCT counselor	6	3.9
PMTCT counselor	16	10.4
FP Counselor	21	13.6
ANC provider	19	12.3
Immunization	15	9.7
IMCI	19	12.3
Other	6	3.9
Monthly income		
500-1000	69	44.8
1001-1500	56	36.4
1501-2000	18	11.7
>2000	11	7.1
Work experience		
Less than two years	24	15.6
Two to four years	38	24.7
Four to six years	13	8.4
Six to eight years	14	9.1
Eight to ten years	17	11.0
>10	47	30.5

5.1.2. The health professionals reported HI seeking behaviour

Among the participants 146(94.8%) reported that they seek information when a need arises (Table 2). Respondents were asked about their perceived evaluation of the service they are providing to their clients, 76 (49.4%) of the participants perceived that the quality of service they are providing to their clients is very good and another 40(26%) reported that they believe they provide an excellent service to their clients. Furthermore when asked about their perceived confidence level on their clinical performance 71(46.4) respondents reported as being very confident, 44.2% as confident and only two (1.3%) replied as not confident (Table 2).

Table 2. HI seeking and self evaluation of clinical performance among health workers at public health centers in Addis Ababa, May, 2009 (n=154)

Variables	**Number**	**%**
Do you seek HI when a need arises		
Yes	146	94.8
No	8	5.2
Self evaluation of service provided to clients at Heath Center		
Excellent	40	26.0
Very good	76	49.4
Good	32	20.8
Bad	6	3.8
Perceived level of confidence on clinical competence		
Very confident	71	46.1
Confident	68	44.4
Fairly confident	11	7.2.
Not confident	2	1.2
Don't know	1	0.7

The frequently mentioned reasons among those who reported not seeking HI were unavailability of information source (5 respondents) followed by 2 respondents who felt to have adequate knowledge for their work (Not tabulated).

Respondents were asked about the knowledge areas on which they frequently seek information. Those working on HIV/AIDS programs reported that the most frequent knowledge area for which they seek information were TB/HIV co-infection management 41 (58.6%) followed by ART 33 (47.1%). Whereas those working in family health program reported for seeking most frequently on IMCI issues 40 (50.6%) and focused ANC 37 (46.8%) (Table3).

Table 3. Knowledge areas for which health professionals frequently seek for HI among health workers at public health centres in Addis Ababa April- 15 May 2009

Knowledge Areas	**Number**	**(%)**
HIV/AIDS Knowledge area frequently seek for		
Epidemiology of HIV/AIDS (n=68)	19	27.1
Immunology of HIV/AIDS (n=68)	26	38.2
Virology of HIV/AIDS (n=68)	14	20.5
Clinical manifestation of HIV/AIDS(n=70)	18	25.7
Counselling and testing (n=70)	16	22.9
Discordant couples (n=70)	15	21.4
PMTCT (n=70)	16	22.9
ART (n=70)	33	47.1
Paediatric HIV (n=70)	24	34.3
Nutrition for PLWHA (n=70)	28	40.0
TB/HIV co-infection management (n=70)	41	58.6
Other (n=69)	26	37.7
Family health knowledge area(n=79)		
Contraceptive side effects	36	45.6
Growth monitoring protocols	27	34.2
Focused ANC	37	46.8
Immunization	29	36.7
Child hood illness	40	50.6

5.1.3 HI resources access pattern

Among the participants 71(46.7%) reported being computer literate and 81 (53.3%) of the respondents as not literate. The major mentioned reasons for not being computer literate were lack of access to a computer system 59(74.7%) and lack of time to learn it 17(21.3%)(Table 4)

Table 4. Computer literacy among health professionals working at public health centers in Addis Ababa, May, 2009

Variables	**Number**	**%**
Computer literate (n=152)		
Yes	71	46.7
No	81	53.3
Reason for not being computer literate		
Don't have the time to learn it(n=80)	17	21.3
Have no access to computer system(n=79)	59	74

Among the participants 102(66.2%) said that they can access protocol manual to get HI to support their work, 96 (64.9%) of them use books and 78 (52.7%) of them have access to in-service training. Only 26 (17.6%) reported to use electronic resources as a source of HI (Table 5).

Table 5 HI resources accessed by health professionals working at public health centers in Addis Ababa, May, 2009

Access to HI resources	Number	%
Books (n=148)		
Yes	96	64.9
No	52	35.1
Journals (n=147)		
Yes	20	13.6
No	127	86.4
Protocol manuals (n=153)		
Yes	102	66.2
No	51	33.1
Consultation of senior staff (n=148)		
Yes	67	45.2
No	81	54.8
In service training (n=148)		
Yes	78	52.7
NO	70	47.1
Electronic resources eg. internet (n=148)		
Yes	26	17.6
No	122	82.4

The majority of respondents 103 (69.1%,) preferred on job training as a source of HI followed by paper based references 91 (60.7%,). Four (2.6%) of the respondents have reported no preference over the resources (Table 6).

Table 6**.** Preference of HI resource to use among health professionals at public health centers in Addis Ababa, April 2009

HI resources preferred	**Number**	%
paper (eg. books journals)(n=150)		
Yes	91	60.7
NO	59	39.3
Electronic resources (eg. Internet)(n=150)		
Yes	80	53.3
No	70	46.7
In service training(n=150)		
Yes	90	60.0
No	60	40.0
On job training(n=149)		
Yes	103	69.1
No	46	30.9
Colleagues (n=150)		
Yes	67	44.7
No	83	55.3
Senior Staff(n=151)		
Yes	73	48.3
No	78	51.7
No preference(n=151)		
Yes	4	2.6
No	147	97.4

Among the respondents 52(33.8%) have access to the internet at work area, home or internet cafe. From those who have internet access the majority access it from internet cafe 38 (74.5%). Seven (11.5%) respondents reported getting their access from their work area (Fig 1).

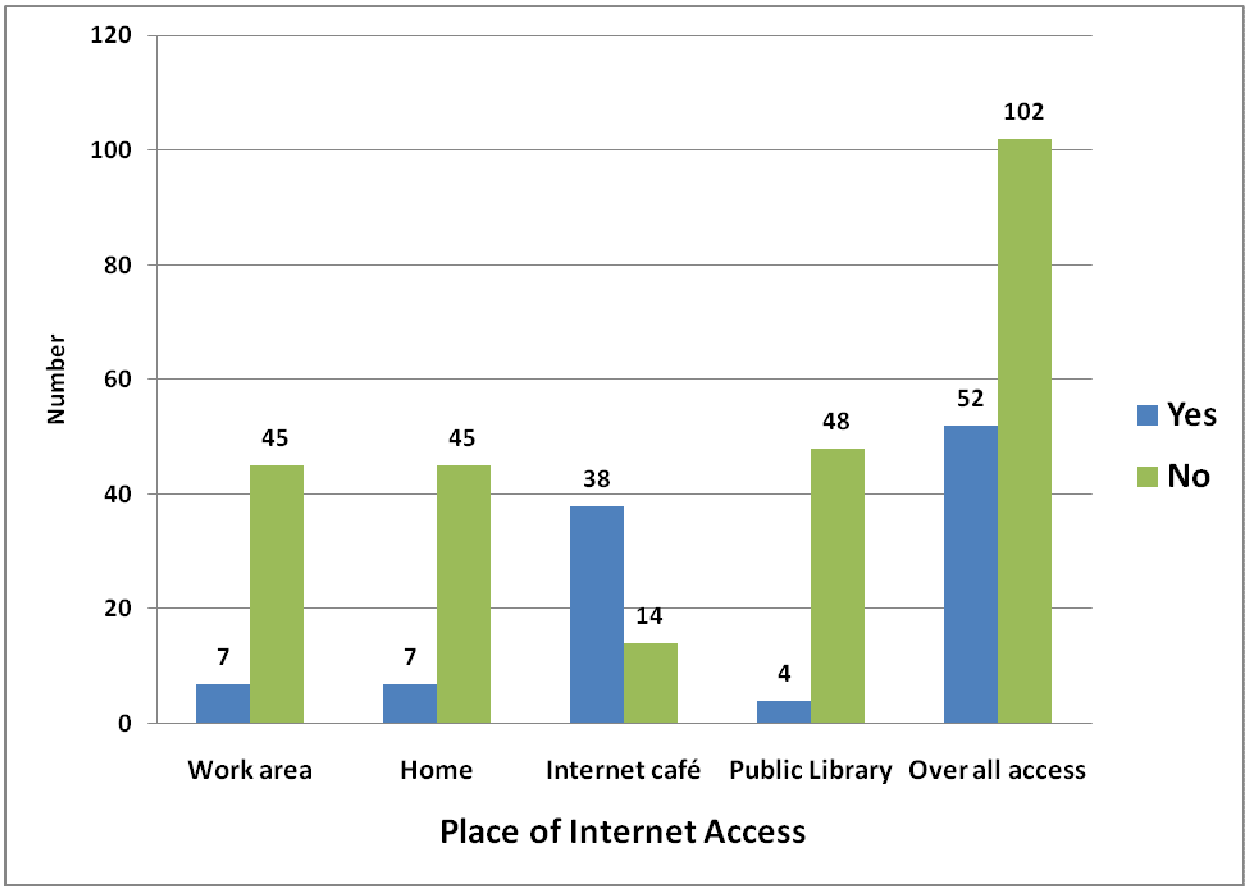

Figure 1. Internet access among health professionals working in public health centers in Addis Ababa, May, 2009

Association between internet access and other variables was observed. In the crude analysis, younger age group < 30 years of age have higher likelyhood of accessing internet compared to those workers who have age >40 years, OR=3.93, 95% CI (1.08, 14.23). Access to internet was higher among health professionals with work experience =< 6 years compared to those with work experience above 6 years, OR=2.48**,** 95% CI (1.25, 4.94). Similarly access to internet was higher for those who were computer literate compared to those who were illiterate, OR=2.83 ,95% CI (1.42,5.67). However Sex, educational category, working program, monthly income and preference to use computer as HI resource did not shown statistically significant association.

When adjusted for other variables, those who were computer literate shown about 2 times a higher likelyhood of access to internet compared to those who were computer illiterate, AOR=. 2.42 95% CI (1.07, 5.45) (Table 7).

Table 7 Association of internet access with variables among health professionals working in Addis Ababa public health centers, April-15 May 2009

Variables	**Internet access**		**COR(95%CI)**	**AOR(95% CI)**
	Yes (%)	**No (%)**		
Age <30 31-40 >40	 40(39.6%) 9(28.1%) 3(14.3%)	 61(60.4%) 23(71.9%) 18(85.7%)	 **3.93[1.08, 14.23]*** 2.35[0.55, 9.96] 1	 2.5[0.5,12.6] 1.8[0.37, 9.05]
Sex male Female	22(42.3%) 30(29.4)	30(57.7%) 72(70.6%)	1.76[0.88, 3.53] 1	2.24[0.93, 5.36]
Educational category BSC Others	 14(48.3%) 38(30.4%)	 15(51.7%) 87(69.6%	 2.14[0.94, 4.86] 1	 1.07[0.3, 3.8]
Working program HIV/AIDS Family Health	 24(41.4%) 28(29.2%	 34(58.6%) 68(70.4%)	 1.71[0.87, 3.40] 1	 0.89[0.38, 2.08]
Income <=1500 >1500	 39(31.2%) 13(44.8%)	 86(68.8%) 16(55.2%)	 0.56, [0.25, 1.27] 1	 1.02[0.29, 3.57]
Work experience <=6 years > 6 years	 33(44.0%) 19(24.1%)	 42(65.0%) 60(75.9%)	 **2.48[1.25, 4.94]*** 1	 2.03[0.77,5.33]
Computer literate Yes No	 33(46.5%) 19(23.1%)	 38(53.5%) 76.5%)	 **2.83[1.42,5.67]*** 1	 **2.42[1.07, 5.45]***
HI resource preference(computer) Yes No	 33(40.7) 19(27.1%)	 59.3%) 51(72.9%)	 1.84[0.93,3.67] **1**	 1.96[0.88, 4.35]

Among the respondents 14 (26.9%) reported to have internet access two-three times per month and the same segment of the respondents (26.9%) replied that they don't know the frequency of their internet access. Four (7.7%) of respondents have a daily access to the internet(fig.2).

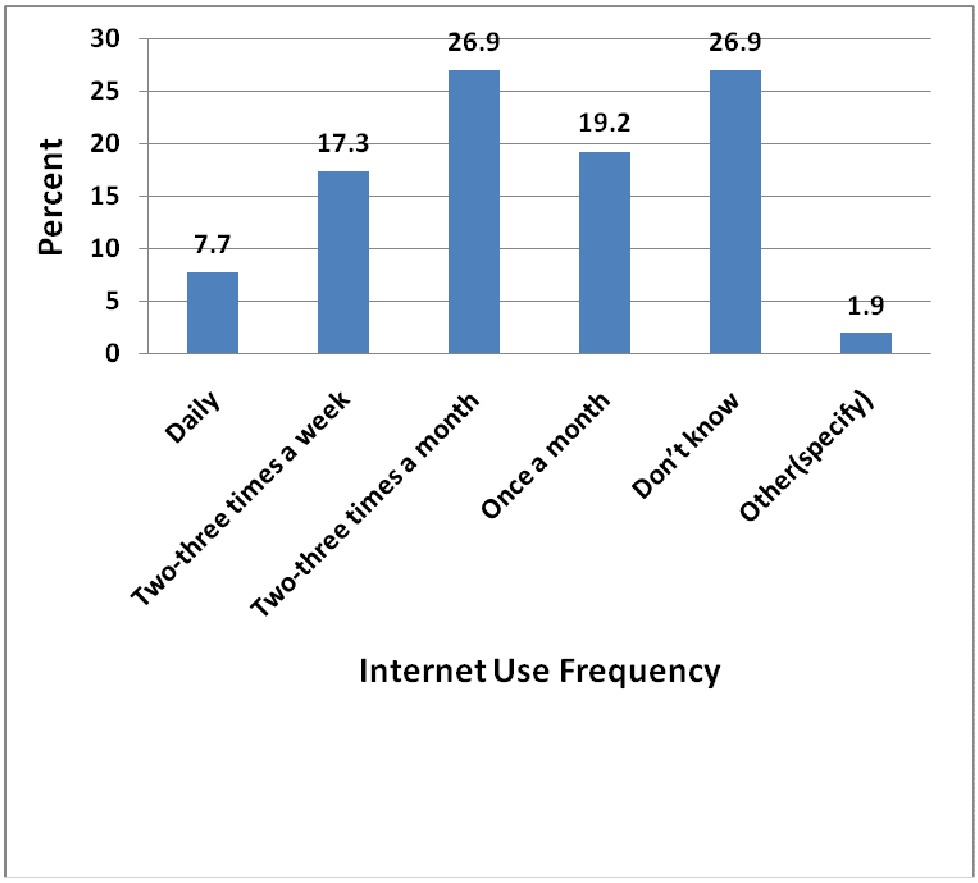

Fig 2 . Internet use frequency among health professionals in public health centers inAddis Ababa, May 2009

The most frequent reason to use internet among the participants were for e-mail (75%, N=52), and (36.5%) for drug information as shown in table 8.

Table 8 Purposes to use internet among health professionals working at public health centers in Addis Ababa , April- May 15 2009(n=52)

Purposes to use internet	Number	%
E-mail		
Yes	39	75.0
NO	13	25.0
Research		
Yes	7	13.5
No	45	86.5
Drug Information		
Yes	19	36.5
No	33	63.5
Patient information		
Yes	17	32.7
No	35	67.3
Business		
Yes	17	32.7
No	35	67.3

Regarding problems related to searching information through the internet 39(75%) of the respondents who used to use internet reported to have problems related to information searching. The major mentioned problem was slow internet connection 31(73.8%) and cost of internet 24(57.1%) respectively (Table 9).

Table 9. Internet searching related problems encountered by health professionals working at public health centers in Addis Ababa, April-15 May 2009

Internet searching problems(N=52)	**Yes** **Number (%)**	**No** **Number (%)**
Did you encounter searching problem(N=52)	39(75.0)	13(25.0)
Is slow internet connection (N=42)	31(73.8)	11(26.2)
To much information (N=42)	5(11.9)	37(88.1)
Cost of internet access (N=42)	24(57.1)	18(42.9)
Don't know where to find information (N=42)	6(14.3)	36(85.7)

Among the respondents 39(25.5%) of them have reported to have library service on their work area. Of those who reported to have library service on their work area 25 (64.1%) of them reported being least satisfied by the service they get from their library and(33.3%) partially satisfied, no one was found to be fully satisfied (not tabulated).

Among the respondents 40 (26.1%) know about 'warm line' telephone service. From those who reported to now the 'warm line' service 15(37.5%) of them reported the number to call to the service to be '932', another 15 respondents (37.5%) answered as '952' (Table 10).

Twenty one (52.5 %) of the respondents who knows about the service experienced calling to the 'warm line' service among which 12(48%) were partially satisfied by the answers given to them after calling. Eight (32%) of the respondents were fully satisfied by the responses given to them.

Among the respondents 18 (12.0%) reported to have journal access. Ten (66.2%) says the journals they access are partially useful to them. Only 1(6.7%) of the respondents said the journals are fully useful (table10)

Table10. Access to library, Journals and 'warmline' utilization among health professionals working at public health centers in Addis Ababa, May, 2009

Variable	Number	%
Library access at work area(n=153)		
Yes	39	25.5
No	114	74.5
Know Warmline service (n=151)		
Yes	40	26.1
No	111	73.9
Ever call to Warmline (n=40)		
Yes	21	52.5
No	19	47.5
Number suggested to be warmline calling number(n=32)		
10	1	3.1
905	1	3.1
932	15	46.9
952	15	46.9
Work area journal access (n=150)		
Yes	18	12.0
No	132	88.0
Perceived usefulness of the accessed Journals(n=15)		
Fully useful	1	6.7
Partially useful	10	66.7
Least useful	4	26.6

Eighty seven (58.8%) of the respondents reported having an ongoing in service training in the past and 28(30.1%) of them got the training before 12 months period. Five (5.4%) of the respondents do not remember when they take the training. One hundred thirty two (88%) of the respondents have requested for further training. The most frequently taken trainings in the past were ART 22(28.2%, n=78) and PMTCT (19.2%) and the top three requested trainings for the future were again ART 34 (26.4%,n=129) PMTCT (17.1) and VCT (8.5%).

Table 11. Reported In-service training availability among health professionals working at public health centers in Addis Ababa, April 15 May 2009

Variables	Number	%
How do you been assigned to tHIs unit(n=142)		
Randomly	22	15.5
After a training	102	71.8
I don't know	18	12.7
Do you have ongoing in service training(n=148)		
Yes	87	58.8
No	61	41.2
When did you have the last training(n=93)		
Within the last 12 months	21	22.6
Within the last 6 months	19	20.4
Within the last 3 months	20	21.5
More than 12 months	28	30.1
Don't remember	5	5.4
Do you think you need further training(n=150)		
Yes	132	88.0
No	18	12.o

5.1.3. HI resources over all access level

Over all HI access level of the health care providers studied was analyzed using six variable (books journals, protocol manuals, in-service training, consultation of senior staff, and electronic sources) where counts were made for how many of the resources each individual have access. It was found that 37(24%) of the respondents have access to two HI resources out of the six resources and 31(20.1%) to four resources. Eight respondents have access to all the six resources where as 6 respondents reported to have access to none of the resources (fig 3). The access level was evaluated where 78(50.6%) of the respondents were found to have access to at least 3 HI resources out of the six resources (a value which is greater than or equal to the median number of sources accessed by the studied health care providers).

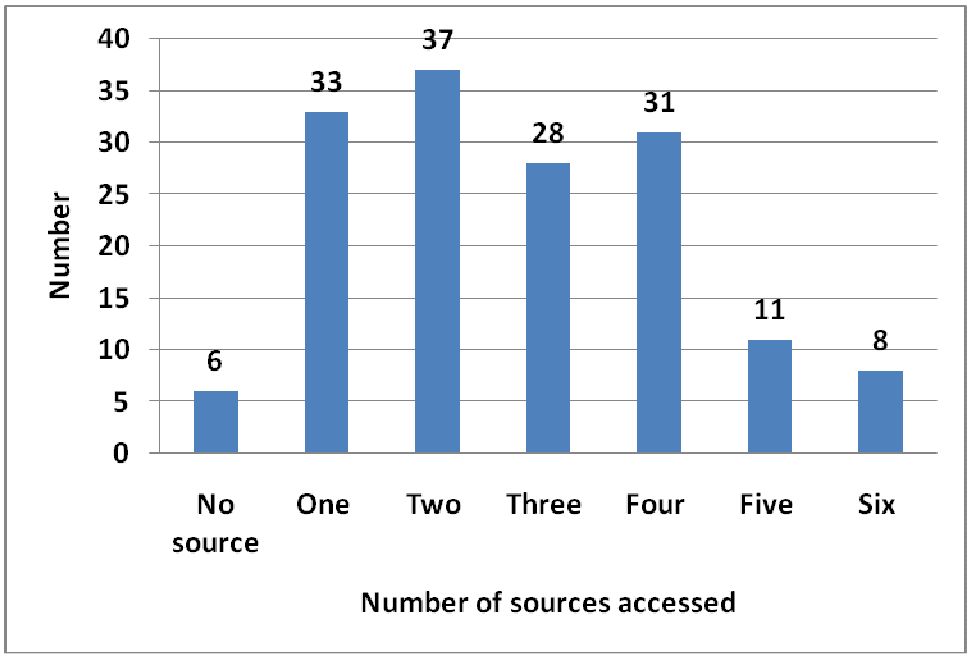

Figure 3. The number of HI sources accessed among health workers at public health centers in Addis Ababa, April-15 May 2009

Association between number of access to HI resources and study variables was observed and it was found that access level was associated with working program where the odds of getting satisfactory HI sources was 2.5 times likely for those working in HIV/AIDS units compared to those health care providers working in family health programs COR =2.66, 95% CI (1.35, 5.23) and AOR=2.5, 95% CI (1.2, 5.2). The variables sex, age, educational category, and income were not associated.

Table 12. Relationship between number of HI access and study variables Addis Ababa May 2009

Variables	Access to HI resources		COR (95% CI)	AOR(95% CI)
	Satisfactory	Unsatisfactory		
Age				
<30 years	49(48.5%)	52(51.5%)	0.47[0.18,1.27]	0.39[0.19,1.1]
30-40 years	15(46.9%)	17(53.1%)	0.44[0.14,1.38]	0.27[0.12,1.29]
>40 years	14(66.7%)	7(33.7%)	1	
Sex				
Male	30(57.7%)	22(42.3%)	1.5[0.78,3.0]	1.14[0.55,2.4]
Female	48(47.1%)	54(52.9%)	1	
Educational category				
BSC	19(65.5%)	10(34.5%)	2.12[0.92,4.9]	1.72[0.54,5.5]
Others	59(47.2%	66(52.8%)	1	
Working program				
HIV/AIDS	38(65.5%)	20(34.5%)	**2.66[1.35,5.23]***	**2.5[1.2,5.2]***
Family Health	40(41.7%)	56(58.3%)	1	
Monthly Income				
<1500	60(48.0%)	65(52.0%)	1	
>1500	18(62.1%)	11(37.9%)	1.7[0.77, 4.06]	0.92[0.3,2.9]

*= p<0.05

5.2. Qualitative analysis result

In-depth interview were conducted among unit heads of ART clinic and MCH clinic in 22 public health centers in Addis Ababa about the potential challenges and opportunities of access to HI resources. In addition they were asked about how really they get HI and their comments on their over all HI resources and access. Fifty individuals were interviewed one ART head and one MCH head from the 22 facilities plus six health center heads were included. The six health center heads were included on the basis on inadequate response from the respective unit coordinators about challenges and opportunities of HI access.

5.2.1 Challenges and opportunities among HIV/AIDS and family health units to access HI resources (internet, library service, journals, training)

In most of the health centers there is no access to the internet; only 4 health centers out of 22 health centers were having any source of internet connection across the institution. Among those who have internet connection only two of them allow staff utilization. However this availability to staff in turn is limited to those working in ART units. One of the institutions using the connection at the medical director office only, and the other isolated to those staffs who work in the project that set the connection (Tuberculosis control project).

In the institutions where internet connection was available the connection was networked to only one or two desktop personal computers. This was among the mentioned reasons for the in accessibility of the internet service to those staffs working in other departments other than where the internet is built. The other reason was that the connected computers were found in the working units where spaces are not adequate.

The most mentioned challenges of access to the internet include lack of budget line, and low initiatives particularly from the administrative bodies. Shortage of computers were found to be a serious problem in the studied institutions, in one of the institutions it was found that they have already received the internet password and got the line but no computer in the institution so that they cannot use the internet line.

Asked about the challenges for not having an internet connection one of the respondent who was ART head of the institution said:

> *"In times when we run out of simple drugs like pain killers and some basic equipment for our routines asking for internet might seem a luxury".*

The opportunities perceived as to how internet is accessed were varying across the facilities. ART department heads and the institution heads in the majority of the institutions were optimist in getting internet connection in the near future. One of the respondent who was ART head noticed;

> "*Management Science for Health* (*MSH) one of the NGO working on health programs is planning to provide us with computers, who knows another party will help us with the connection, we hope"*

Some others say we don't have any idea weather internet is a possibility in the near future or not. Asked about weather internet is useful for their work, those who have already got internet connection said, "it is much useful because when questions come to our mind we have the potential to search for answer immediately" compared to the pre-internet time. They reported that challenges they have had is lack of time to search because they are busy during business hours; fear of excess bill for the consumption and slow connection taking much time.

On the in depth interview it was found that Global fund, MSH, Serving In Mission (SIM) in collaboration with AACAHB are among the facilitating bodies for internet access to the health centers investigated.

Regarding Availability of library service, none of the institutions have a defined library service. The majority of the institutions have almost no initiative to have library in their institution, but few institutions are found to have the initiative to have the service. Only one health center among the 22 health centers have a 3 meters by 3 meters unit with a small shelf having a few text books (donated) and some other Information Education Communication (IEC) materials (leaflets, posters video cassettes). But the above mentioned health center do not have either a librarian or a constant budget line to purchase books on regular bases. The majority of health

centers have a small number of printed materials but no library as a result the materials were commonly kept in the medical director office, or in a nominated staff office or else in the store.

The culture of keeping reference materials such as; text books, bulletins and protocol manuals were found to be very poor. Despite the fact that the sources for these resources were scarce, the materials are poorly owned by the institution. The materials are usually kept in the routine work units which might result in loss of the property. The overall sources of the reference materials mentioned were reported to be AACAHB, few NGO's and the trainees themselves because they bring protocol manuals that they received after a training. Therefore the collections as well as the utilization mechanism of these materials were found to be a haphazard resulting in poor retention of even donated materials.

The major challenges noted related to access to library services were lack of clear policy or procedure manifested by lack of budget; to purchase books and hire a librarian, and lack of space (unit). Business process Re-engineering (BPR) was reported to be a potential opportunity which is claimed to providing them more space by restructuring some process units. Another reported opportunity by one of the institution head was:

> *" The fact that globalization is persuading peoples to have an up to date information; library service is becoming highly questioned issue by every staff ,subsequently the initiative we have is improving and the government and NGO's ,I think will support the concern"*

Regarding training access most of the health professionals working in the units of the assessed health centers have at least one basic training. Some of the mentioned trainings given to health professionals working in the ART units include; ART training (comprehensive ART, Pediatric ART, Adherence, PMTCT, Provider Initiated Counseling and Testing (PICT), condom promotion, training for case manager on nutrition, ART prophylaxis, VCT, refreshment courses) .

Among stake holders 'MSH' is the most mentioned contributor in collaboration with AACAHB in facilitating trainings and logistics supply particularly to ART units. Some other

stake holders include; Clinton foundation, United States Agency for International Development (USAID), WHO, Medicine San Frontier's (MSF), and International Training and Education Center on HIV (ITECH). When the training access pattern was assessed training opportunities appear irregularly and occasionally. Furthermore, in some institutions training opportunities were reported to be unfairly provided to a single person. It was also reported that refreshment courses were not frequently available.

5.2.2 Other important HI resources reported to be available for health professionals in supporting their work.

There were reportedly important HI sources for the health care providers studied. These sources were mainly available to those working in the HIV/AIDS units. These sources include: Clinical mentor consultation, review meeting, interdisciplinary team discussion (one repotted case), medical director meeting (one reported case),and 'Fitun warm line'.

Different Comments were given on the availability, challenges and opportunities of the above mentioned information sources. Clinical consultation provided by Clinical mentors was reported by the majority of respondents to be one of the best and available HI resources for those working on ART program. Nevertheless this source was reported to be inconsistent because of high attrition rates of the professionals working as clinical mentors, usually physicians. The other reason mentioned for the inconsistent assistant from the mentors was their being busy in other activities. When available the mentors are said to provide consultation satisfactorily. It was noted that in some institutions mentors were not seen for the last 3 months for the reasons they couldn't mention, subsequently the respective unit heads reflected their concern of losing their most 'reliable' information sources. one of the respondent said that :

> *"We are very happy working here because we have these mentors who respond timely and adequately to our questions. For sure it is very good that we have them."*

Review meeting was reported to be the other important learning forum for those who are working on ART program. The meeting was said to be facilitated by AACAHB in collaboration

with NGO's mainly 'MSH'. The review meeting is arranged to share knowledge through (case presentation/ case study, experience sharing on difficult client scenarios, and updating on new information like new emerging drugs). Similar to the mentor ship this program was also reported by some respondents to have irregularity, which normally is intended to be attended every month for health care providers working on ART. Others said that the review meeting some times to be attended by inappropriate person working out of ART unit.

The big segment of respondents commented on their overall HI access as they are still lagging behind in this 'information age'. Yet they appreciated the availability of the mentors, review meeting and trainings as an essential tool of information sources. One of the respondents said:

> *"Had it not been for the review meeting and the mentor-ship we had and of course some guide lines, it would have been much difficult to cope up with the challenging questions from our clients. This is because some of our patients are in a far better access to HI resources than we have eg. Internet access and printed materials, even journals"*

Therefore it was inferred that the clinical mentor-ship and the review meeting facilitated by AACAHB and the NGO's were the most available HI resource to those working on ART program.

There was no one unit accessing internet in Maternal and Child Health (MCH) department across the facilities investigated. Almost no computer was available as well. Most heads of the MCH reported that, access for an internet is not a frequently asked question by the staff because they know some other serious priorities are even unmet. One of the respondents who is MCH head said :

> "*Internet access is unthinkable for us! let alone internet we don't have the basic utility sinks."*

Another respondent on the same issue said:

> *"If I ask for the internet I am sure the administrative staffs will laugh at me!-because this is purely a 'luxury' and they might consider me getting crazy!"*

Library and journal access were found to more dictated by the institutions than the studied units, therefore the same effects were applying to both units (ART & MCH). Of course the difference might be very few protocol guidelines reach MCH clinic than with the ART clinic. Some MCH unit heads reported that Federal ministry of Health (FMOH) and few donating institutions have provided them some related literatures but kept in the store or on one's shelf.

The commonest mentioned trainings provide under the MCH units were on (Immunization, FP, Emergency Obstetrics and Newborn Care, surveillance, Post Abortion Care). AACAHB in collaboration with number of NGO's are among the facilitating bodies for these trainings.

Regarding comments given on HI resources available to those working in MCH units. The majority reported having very poor access to HI and that they lack satisfaction by their HI access pattern. They claimed that there exist few refreshment programs.

Two respondents who were MCH department head noted the following respectively.

> *"Most of our practice is by relying on our basic training and on what our experience thought us!"*
>
> *"Had it not been some trainings are present getting information in this set up, would have been unthinkable"*

6. Discussion

This study was designed to examine access to HI of health professionals working in primary health care settings, which is important to provide evidence based quality health care.

In this study majority of participants (94.8%) claimed that they seek information when a need arises. THIs finding is in line with what was found by a study in USA, where high proportion of information seeking has been observed (2). However in-depth interview participants in our study have witnessed the practice of HI seeking among the health professionals to be poor. Unavailability of HI resources was mentioned to be the important reason for the observed poor HI seeking behaviour, which was similarly observed in a study conducted in Uganda (29).

Protocol manuals were reported to be the frequently (66.2%) used HI sources to support the health service provision followed by books (64.9%) and in service training (52.7%), whereas electronic sources were the least used sources (17.6%). THIs finding was not similar with the study done in Uganda (8) where the frequently used HI resource was personal experience followed by discussion with colleagues and use of guide lines. Colleague's discussion was less used (32.4%) in our study which might be attributed to the effect of cultural difference across the two populations where lack of open discussion among friends might prevail in our study population.

The most important HI source reported during in-depth interview by the respondents working in HIV/AIDS units was review meeting which was similar with a study conducted in US where, medical meetings were among the most frequently used resources(2). Colleagues, journals, book, and libraries which were mentioned in this study as a source were less compared to the study in US, which might be attributed to access difference between the two populations. Internet use was among the least used information sources used in our study as well as in the study done in Uganda (8).

In this study HI seeking behavior of participants for different knowledge areas; for those working in HIV/AIDS program, revealed that the most searched knowledge area to be TB/HIV co-infection management (58.6%), followed by issues related to ART drugs (47.1%) and the least searched area was about virology of HIV/AIDS and discordant couples. This finding was

consistent with the 'warm line' report (31) where the most knowledge area for which consultation was sought had been the complex issues surrounding the provision of antiretroviral therapy. But for those respondents who were working in family health units issues of IMNCI (50.6%) tops the most searched knowledge areas followed by family planning particularly side effects of family planning products (45.6%).

In this "era of globalization" it is agreed that ICT is a 'leapfrogging' strategy to ensure technology based solutions to problems in the health sector.. In this study it was observed that (46.7%) of the respondents were computer literate which was lower compared to the study done in Ibadan, Nigeria where 93% of the physicians were computer literate. And the most mentioned reason for not being a computer literate in our study was lack of access to a computer system (74.7 %,) followed by lack of time to learn it (21.3%). THIs finding in turn was not similar with the finding of the study done in Ibadan, Nigeria where lack of access to computer system contributed to 33.3% of failure to learn computer (18).

Access to research information for health professionals is a key component in developing evidence-based healthcare. As nurses take on extended roles and work more autonomously, it is assumed that they will take increasing advantage of these technologies (15). However, majority of our respondents lack electronic resources. Regarding internet access our study finding showed that internet was accessible to only 33.8% of the respondents. And among those who can access internet 74.5% of them access it from internet café and only seven respondents have internet access at their work place. Regarding internet access the finding of the current study was similar with the study in Ibadan, Nigeria study where 36% of the respondents reported having access to the internet .But not similar with the study done in Ethiopia, where 87% of them reported to have dial up internet connection. THIs difference might be attributed to the difference in the study setups where the former study was conducted in private hospitals. However as to where internet was accessed both studies(the current study and the study done in Nigeria) revealed internet café to be the most used source, but personal access and work area access was poor as compared to the study in UK(16).

Moreover all of the respondents who reported to have work area internet access were from the ART unit workers showing a relative 'better' access in ART units than for those working in

MCH units. Likewise the in-depth interview revealed that in those institutions where internet is available, it was found only to the ART department. The most popular purpose of internet use was found to be for email (75%) which is in agreement with the findings of different studies where e-mail was found to be the main reason for internet searching (18, 19 and 20)

Only four respondents have an internet access on daily bases where as the majority of respondents have either two to three times a month or once a month access. This finding is consistent with the report from India where most health professionals do not have internet access on a daily bases (13). This finding might describe how much internet use is limited for evidence based patient care. Moreover the most mentioned searching problems for those who have access were slow internet connection and cost of the internet. This finding was in line with what Aronson B. had described about challenges of access to medical information for low income countries through the internet (14).

The finding on 'warm line" hotline service utilization among the participants showed that only 26.% reported knowing about the service, in contrary only 15 of them identified the correct number to dial to the service center. A recent report from the staff of a 'warm line' service unit identified that 400 calls per week were received by their unit, out of which half of them were coming from Addis Ababa (31). However, the reported number of callers from health centers in Addis Ababa in this study was small. This might be related to the short period when the service was started and inadequate promotional activity done on the availability of the service to the target users.

Although Ethiopia is one of the eligible country and among the countries with highest registered institutions for free access of the HINARI journals (14), none of the institutions assessed by the study was registered for subscription. During the in-depth interview it was noted that lack of initiatives at the department or institutional level were reasons for not subscribing neither western nor local journal. But literatures underlined that tips and findings from local or international journals have a wide application in implementing evidence based decision making (7). However; lack of institutional subscription is common in most institutions in developing countries (24).

Regarding availability of in-service training options for the health professionals, 58.8% of them replied having in-service training in the past. Different stake holders particularly the NGO's in collaboration with AACAHB were reported to be the facilitating bodies of the trainings. But the training scheme was reported to be much irregular and was found to be prone to subjectivity where selection of a candidate for a specific training was made by some other attributes than being working in the appropriate unit for the required training. In this study when subjects were asked about what further training they require to support their work, the majority of respondents requested trainings supporting outside of their recent placement, particularly trainings on HIV/AIDS programs (ART, PMTCT). This could probably be explained by the assumptions that being trained in these program areas may take them to better paying jobs.

Two important HI sources were identified by the study subjects of the ART unit during the in-depth interview. These sources were review meeting and clinical mentors' consultation, which were emphasized to be the most valuable sources. But these sources were not without limitation, where the provisions of these resources were highly irregular across the studied institutions. Clinical mentors' being busy and their high attrition rates were the major reported reasons for the inconsistent provision of the consultation. Regarding the review meeting some respondents reported that they have passed 'some months' since they participated on the meeting for the reasons that they couldn't mention. Therefore the continuity of these two seemingly important sources should be sought closely as the respondents believed the sessions to be a 'real learning forum'.

The overall HI access level was evaluated where 78 (50.6%) of the respondents were found to have access to at least 3 HI resources out of six resources (books journals, protocol manuals, in-service training consultation of senior staff, and electronic sources). Furthermore it was found that working program as being a predictor for better HI resources access where the odds of having access to three or more HI resource(satisfactory access) was 2.5 times more likely for those working in HIV/AIDS program as compared to those working in Family health units . This might elucidates the fact that more attention is given to the HIV/AIDS program.

In situations where poor knowledge level of the professionals might potentially prevail (11), a chronic shortage of updating mechanism for those working in the primary health care setting

might be a serious threat to the quality of care being provided. In our study the majority (79.8%) of respondents were diploma level health workers where poor knowledge is a potential threat to knowledge based decision making requiring optimum level of support.

The argument; '10/90 gap' , "10% of health research funding is targeted at the health problems that account for 90% of the global disease burden translates into a '1/99 gap' in HI" (10) seems to be the huge challenge to the HI access even to the highly donated program, HIV/AIDS . However there are strong optimism towards potential opportunities to improve HI accessing mechanisms targeted at resource sharing to address the demand of HI access to health care providers. The other opportunity mentioned were demands of globalization, the fact that there is an initiative to implement Information Communication Technology (ICT) solution for all development sectors at country level and the emphasis given to information as an important tool for development.

7. Strengths and Limitations of the study

7.1 Strengths of the study

- As to our knowledge the study is the first attempt in the area so that the upcoming researchers might use the results as a base line data.
- The study used both qualitative and quantitative approaches

7.2 Limitation of the study

- Some interviewees reported 'research fatigue', that is fatigue about being the subject of research with hardly any tangible personal benefits accruing at the end of the exercise. This could have affected the quality of data collected from such individuals.
- THIs study is limited to governmental health centers with limitation to compare the scenario in private and nongovernmental facilities and higher governmental facilities.
- The study used non-random selection of subjects
- Literatures are limited

8. Conclusion and Recommendation

8.1 Conclusion

- Most study subjects have limited access to many of the HI resources; internet ,journals, library service with printed materials, and in-service training
- Large percentages of respondents in our study were found to be computer illiterate.
- Majority of health workers in the studied institutions either have got some basic program specific training, or they will be relying on their past experiences or else on their acquired knowledge during their pre-service training.
- The overall attention provided for HI access to professionals working in the studied units in Addis Ababa health centers seems low.
- Library service was the least initiated HI resource across the studied institutions.
- The most accessible information sources available recently for those working on ART program were review meeting and consultation by clinical mentors'. And protocol manuals to both working in the units.
- Although the 'warm line' hotline service is a newly initiated and cheapest information resource available recently especially for those working on HIV/AIDs program, it appears as a seldom used resource requiring attention of promoting the service.
- When compared HI access across the studied units (HIV/AIDS and family health), HIV/AIDS program appears to have a relative better HI access opportunities than the family health units.

8.2 Recommendation

- Establishing HI resource infrastructures at institution level eg. Library establishments should be considered by the government and other stakeholders.

- AACAHB and the collaborating NGO's should further work in parallel with their recent programs for attaining capacity building on an enduring type of HI infrastructure eg.ICT based infrastructure and capacity building on their utilization (particularly training on computer skill)

- Mentorship and review meeting activities should be monitored closely by the facilitating bodies to ensure consistency.

- Stakeholders working on reproductive health should give attention how HI be accessed on reproductive health issues to those health care providers working in PHC setting.

- AIDS Resource Centre should work more to announce the 'warm line' service so that the health care providers can utilize the resource.

- More studies in the area particularly on HI seeking behaviour and use is needs to be done. Also, studies on access level at higher level institutions have to be sought.

- Finally it is important that all stakeholders struggle to ensure a sustainable HI access points to help those working in the ever changing health contexts so that evidence based quality care be maximized.

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Annex

Addis Ababa University

School of Public Health

Department of community health

Questionnaire for staffs at HIV/AIDS programs and family health

Facility code ----------

Checked by investigator: signature----------date ----------

General information

THIs self administered questionnaire was prepared on behalf of MoH and Addis Ababa University, to assist the government in improving its capacity in obtaining information on HI access among health professionals. Your facility was selected in this study because all health centers in AA are involved in the study. You will find some questions asking you about HI access available at your health institution. The information you provide us will be completely confidential will not be shared with anyone else without your consent. No one else working in this facility or involved in this study will know what information you gave us. The information you provide us is extremely important and valuable as it will help the governmental and nongovernmental organizations or facilities involved in interventions for ensuring adequate HI access to health professionals will use it, furthermore study result might help formulation of policy .

Consent form

I undersigned have been informed that the interview is conducted to gather information about HI access I have to support my work. I also agree about the confidentiality of the response to be at the highest possible level.

1. Socio Demographic Characteristics of the Study Subject

No	Questioners	Responsese		Code	Skip
101.	Sex	Male Female	1 2		
102.	Age in year	15-20 21-25 26-30 31-35 36-40 41-45 46	1 2 3 4 5 6 7		
103.	Professional category	MD Health officer BSc Nurse Diploma N. Midwife diploma Others (specify	1 2 3 4 5 6		
104.	Program you / are working in currently	HIV/AIDS Family health	1 2		
105.	Your current status in the unit	ART initiator Adherence counselor VCT counselor PMTCT counselor FP counselor ANC provider			

No	Questioners	Responsese		Code	Skip
		Immunization IMCI Other (specify)			
106.	Your monthly income	500-1000 1000-1500 1501-2000 2001-2500 2501-3000 >3000	1 2 3 4 5 6		
107	Work experience	Less that two year Two to four years Four to six years- Six to eight years Eight to ten years >10	1 2 3 4 5 6		

2. Questions related to information seeking behavior

No	Questioners	Responsese	Code	Skip

No	Questioners	Responsese		Code	Skip
201.	How do you evaluate the service you are proving to your clients	Excellent Very good Good Fair Bad Don't know	1 2 3 4 5 6		
202.	Please rate Your confidence in your clinical performance.	Very confident Confident Fairly confident Not confident Don't know	1 2 3 4 5		
203.	Do you seek HI to support your work	Yes No	1 2		If yes skip to 205
204.	what is your reason for not seeking	Because I have adequate knowledge for my work. Because there is no source Because I don't have interest in my work No reason other specify	yes ☐ ☐ ☐ ☐ ☐	no ☐ ☐ ☐ ☐ ☐	

N.B Information seeking refers to searching for an answer from any source when questions arises related to your work

No	Questioners	Responsese		Code	Skip
206	For what proportion of your information needs you seek information	For all	1		
		For 75%	2		
		For 50%	3		
		For 25%	4		
		I cant estimate	5		
		For none of my info need	6		
		Other(specify)	7		
207.	For which of the following knowledge areas where you seeking information (only for those working in VCT/PMTCT/ART)	Epidemiology of HIV/AIDS	yes ☐	no ☐	
		Immunology of HIV/AIDS	☐	☐	
		Virology of HIV/AIDS	☐	☐	
		Clinical manifestation of HIV/AIDS	☐	☐	
		Counseling and testing	☐	☐	
		Discordant couples	☐	☐	
		Prevention of mother to child transmission (PMTCT)	☐	☐	
		Antiretroviral therapy (ART)	☐	☐	
		Pediatrics HIV	☐	☐	
		Nutrition for PLWHA	☐	☐	
		TB/HIV co-infection management	☐	☐	
		Opportunistic infection management	☐	☐	

No	Questioners	Responsese		Code	Skip
		Other(specify)			
208.	For which of the following knowledge areas where you seeking information (for those working in family health clinics)	Contraceptive side effect Growth monitoring protocols Focused ANC Immunization Child hood illnesses Other(specify)	yes ☐ ☐ ☐ ☐ ☐ ☐	no ☐ ☐ ☐ ☐ ☐ ☐	

3. Question Related to HI Resource Access

No	Questiones	Response		Code	Skip
301.	Are you computer literate	Yes No	1 2		If yes skip to 303
302.	Why are you not computer literate?		yes	no	
		I don't have the time to learn it	☐	☐	
		I have no access to a computer system	☐	☐	
		I'm not interested	☐	☐	
		It is not useful to me	☐	☐	
		others, specify	☐	☐	
303.	Which of the following do you access to get HI to support your work?		yes	no	
		Books	☐	☐	
		Journals	☐	☐	
		Protocol manuals	☐	☐	
		Library	☐	☐	
		Colleagues	☐	☐	
		Senior staff	☐	☐	
		In-service training	☐	☐	
		Electronic Resources	☐	☐	
		Others (specify	☐	☐	

N.B **Computer literate**

one who can work on basic desktop publishing applications and browse the Internet

No	Questiones	Response		Code	Skip
304.	Which of the following do you prefer to use to get HI?		yes	no	
		Paper (eg. Books and Journals)	☐	☐	
		Computer (Internet and electronic journals)	☐	☐	
		In-service training	☐	☐	
		On job training	☐	☐	
		Collogues	☐	☐	
		Senior staff	☐	☐	
		No preference	☐	☐	
		Other(specify)			
305.	Do you have access to the internet	Yes	1		
		No	2		If No skip to 313
306.	If you have access to the internet please indicate where		yes	no	
		Work area	☐	☐	
		Home	☐	☐	
		Internet cafe	☐	☐	
		Public library	☐	☐	
		Others (specify	☐	☐	

No	Questiones	Response		Code	Skip
307.	How often do use an internet to get HI to support your work	Daily Two times a week Two three time a month Once a month Don't know Others (specify	1 2 3 4 5 6		
308.	For what purpose do use the internet		yes	no	
		E-mail	☐	☐	
		Research	☐	☐	
		Drug information	☐	☐	
		Patient care information	☐	☐	
		Business	☐	☐	
		Others (specify	☐	☐	

No	Questiones	Response		Code	Skip
309.	Up to what extent are you satisfied with the internet facilities provided in your organization	Fully Partially Least satisfied I have no access No comments	1 2 3 4 5		
310.	What specific HI did you obtain from the internet the last time you did?	A etiology of health condition Diagnosis Treatment prognosis Others (specify	yes ☐ ☐ ☐ ☐ ☐ ☐	no ☐ ☐ ☐ ☐ ☐ ☐	
311.	Did you encounter any problem in searching for information on the internet	Yes No	1 2		If No skip to313
312.	What measure problem did you encounter	Slow internet connection To much information Cost of internet access Don't know where to find information	yes ☐ ☐ ☐ ☐	no ☐ ☐ ☐ ☐	

No	Questiones	Response		Code	Skip
313.	Do you have library services in your work area	Yes No	1 2		If no skip to315
314	Are you satisfied by the collections in your library related to your work	Fully Partially Least satisfied I have no access No comments	1 2 3 4 5		
315	Do you know the 'warm line' service(only to those working on HIV/AIDS) programs	Yes No	1 2		If no skip to 317
316	What is the number to call to the 'warm line' service	Write the number			
317	Have you ever called to the 'warm line 'service to seek HI	Yes No	1 2		If No go to 319
318	Were you satisfied by the response to your question	Fully Partially Least satisfied I have no access No comments	1 2 3 4 5		
319	Do your organization subscribe	Yes	1		

No	Questiones	Response		Code	Skip
	journals related to your work (Local /International)	No	2		
320	Are these journals up to date and useful to you	Fully useful Partially useful Least useful Not useful Others (specify	1 2 3 4 5		
321	How do you been assigned to this unit	Randomly After a training By punishment I' don't know	1 2 3 4		
322	Do you have follow up (an on going) in service training in the past	Yes No	1 2		
323	If yes when did you have the last training	With in last 12 months With in last 6 months With in last 3 months More than 12 months Don't remember	1 2 3 4 5		
324	What was the name of the training				

No	Questiones	Response		Code	Skip
	that you took				
325	Do you think you need further training	Yes No	1 2		
326	If yes on which specific area				

ADDIS ABABA UNIVERSITY

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF COMMUNITY HEALTH

QUESTIONS FOR INTERVIEWING THE KEY INFORMANTS (unit heads at HIV/AIDS programs and family health)

FACILITY CODE ----------**unit code ----------**

Checked by investigator: signature----------date ----------

General Information

THIs interview questionnaire was prepared on behalf of MoH and Addis Ababa University, to assist the government in improving its capacity in obtaining information on HI access among health professionals. Your facility was selected in this study because all health centers in AA are involved in the study . You will find some questions asking you about HI access available at your health institution. The information you provide us will be completely confidential will not be shared with anyone else without your consent. No one else working in this facility or involved in this study will know what information you gave us. The information you provide us is extremely important and valuable as it will help the governmental and nongovernmental organizations or facilities involved in interventions for ensuring adequate HI access to health professionals will use it, furthermore study result might help formulation of policy .

Consent Form

I undersigned have been informed that the interview is conducted to gather information about HI access my unit workers have to support our work. I also agree about the confidentiality of the response to be at the highest possible level.

401. IS internet available in this institution (Yes/No)

- Is found in separate room where all staffs can access it, if not where is it built
  _____
  _____
  _____

- How many desk top PCS give these service_____
- when is the recent working schedule of the computer unit_____
- is accessible to all staffs (if not accessible why?)
  _____
- who built you the internet
  _____
  _____
  _____

402. If journals are subscribed(local/international) (Yes/No)
   - The list of the journals
     _____
   - Where are the journals kept
   - Who sponsored the subscription

403. Are there books and manuals owned by the institution (Yes/No)

   Is there a library service in your facility (yes/no)

   - Where do any reference materials kept
     _____
   - List some of the groups of the materials
     _____
   - Who provide you this materials
     _____
     _____

404. Do professionals in your unit get in service training related to their duty(yes/NO) (list the type of training given in the last one year /average duration to have a training
_____
_____
_____
_____

405. Who facilitate these trainings)

_____
_____
_____
_____

406. what other information resources do you think you have

_____
_____
_____

407. what major challenges and opportunities are their related to accessing HI resources

_____
_____
_____
_____

408. General comment on your HI resources and access

_____
_____
_____
_____