College of Medicine

Facilitators and Barriers of Same-Day Linkage to ART Care of Newly Diagnosed HIV Adults in Health Facilities: A Cross Sectional Study from Primary Health Facilities in Urban Malawi

By

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DECLARATION

I, Rachel Chihana, hereby declare that this dissertation is my original work and has not been presented for any other awards at the University of Malawi or any other university.

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CERTIFICATE OF APPROVAL

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DEDICATION

This thesis is dedicated to my children, Mzati and Mthaski, who endured my absence while I attended to the academic needs that came with this master's course.

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ABSTRACT

The Malawi national HIV guidelines recommend same-day antiretroviral therapy (ART) initiation. In Malawi, only 88.6 % of those that tested HIV positive are on ART(1). Factors that facilitate and hinder successful linkage to ART among newly-diagnosed HIV-positive individuals have not been fully described. The study described client based, health system and health facility infrastructural factors of successful same-day ART initiation at two health centers in Blantyre, Malawi. A cross-sectional study was conducted at South Lunzu (semi-urban) and Limbe (urban), in Blantyre City, from March to July 2020. Eligibility criteria included: recently diagnosed HIV infection and age ≥18 years. A structured questionnaire and checklist were used for data collection. The study outcome was same day ART initiation which was verified by checking health passport books of study participants. About 321 participants gave informed consent. Their mean age (standard deviation) was 33(10) and 59% were females. Of these participants, 315 (98.2%) were successfully initiated on same day ART. Four of the six participants who failed to initiate ART reported that they were not mentally prepared to do so. Most study participants had very positive views of the service delivery and infrastructure at the facilities which may have facilitated linkage to care. Primary health facilities supported by expert clients successfully linked to ART newly diagnosed HIV positive clients. Mental unpreparedness likely contributed to unsuccessful linkage to ART. Good health facility service delivery and conducive infrastructure appeared to facilitate linkage to ART.

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ABBREVIATIONS AND ACRONYMS

ART	Antiretroviral Therapy
CDC	Centre for Disease Control
COMREC	College of Medicine Research Ethics Committee
EC	Expert Client
GCP	Good Clinical Practice
HMIS	Health Management Information System
HIV	Human Immunodeficiency Virus
HSP	Human Subject Protection
HTC	HIV Testing and Counselling
HCW	Health Care Worker
ODK	Open Data Kit
SSA	Sub Saharan Africa
UNAIDS	United Nations programme on HIV/AIDS
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

1.1 Statement of Problem

1.1.1 Global and National Burden of HIV

World Health Organization (WHO) African region has the highest Human Immunodeficiency Virus (HIV) burden. According to United Nations programme on HIV/Acquired Deficiency Syndrome (UNAIDS) estimates, in 2020, there were an estimated 25·6 million (68%) people living with HIV in the WHO African region, of a total of 37.7 million people living with HIV globally (2). In this year, of the estimated 1·3 million incident HIV infections among individuals aged 15–49, 750,000 (59 %) were in the WHO African region (3).

In Malawi, HIV prevalence among adults aged 15- 64 years is 10.6 %. (1) The annual incidence of HIV among adults of this same age group is at 0.37%. Prevalence of HIV varies geographically and is highest in Blantyre district ,an urban city in Malawi and is at 18.2% (1).

1.1.2 Efforts by Malawi Government to Combat HIV

The Malawi Government has put in place HIV testing and counselling, antiretroviral therapy (ART) and viral load testing services. It has also put in place strategies to achieve the 95-95-95 UNAIDS goals by the year 2030 which entails that, 95 % of HIV positive people should have an HIV test, 95% of those that are HIV positive should be on sustained ART and 95% of those on ART should be virologicaly suppressed (4). Malawi also adopted the HIV Test and Treat Approach in 2016 after its recommendation by WHO in September 2015. This recommendation followed results of the START trial which showed that starting ART when CD4 count is high reduces morbidity and mortality significantly (5).

Malawi Government, with funding support from Centre for Disease Control (CDC) deployed expert clients (ECs) in 29 health facilities in Blantyre district. ECs are individuals who are HIV-positive, lay people, open to disclosing their HIV status and have good records of ART adherence. They are trained to provide counselling and they work as volunteers. ECs provide the unique approach offered by a peer from within the same community, using their own experience of living with HIV (8). ECs talk to other HIV positive people on their experience of living positively with HIV, hence providing them with a better understanding of the disease and less fear of disclosure (6). At the health facilities where these ECs are deployed, some of their roles include provision of extra posttest counselling and assistance with directing and/or escorting patients (navigation assistance) to the different rooms providing HIV related services.

The shifting of tasks from highly skilled personnel, in this case health care workers (HCW) in HIV, to less skilled personnel, in this case ECs, is a feasible alternative for improving HIV service delivery in resource-constrained settings like Malawi (8). The EC model provides extra help to the overburdened health workers by supplementing to the posttest counselling done by the HIV testing and counselling providers (HTC). Evidence of EC model comes from Swaziland, Zambia, Botswana, Uganda and South Africa (7). In Malawi, before ECs were deployed at health facilities in Blantyre district, the model was implemented on a pilot basis in Balaka and Machinga, rural districts in southern region of Malawi, and was successful (6).

1.2 Literature Review

Several studies have been done in Africa and elsewhere to investigate rates of same-day initiation of ART. Early ART reduces risk of disease progression and prevents HIV transmission (5). Even

if this is the case, studies in Taiwan showed initiation of ART rate of 33.8% in 2014 which increased to 68.3% in 2017 (8). Similarly, in San Diego,26% of newly diagnosed HIV positive individuals started ART on same day (9).Studies in sub-Saharan Africa (SSA) have found that same day ART initiation ranges from 41.9% to 54.2% (10). In Malawi, data is only available for same day ART initiation studies done on pregnant women in 2016 which found a rate of 63% (11). Studies in Malawi and elsewhere have investigated causes of non-linkage. A Study done in Lilongwe, Malawi at Light House (12) and another in South Africa (13) found that structural reasons for non-linkage included distance to health facility while behavioral reasons included fear of side effects, religious and cultural beliefs, lack of disclosure to partners and feeling healthy at the time of diagnosis. A study in Kenya showed that lack of adequate time for post-test counseling was a barrier to linkage as well as facility factors like access to health facilities, stigma associated with health facility, poor service efficiency, poor patient-provider interactions, poor quality of posttest counselling and poor testing and HIV care coordination were barriers to linkage(14). These studies have described factors that affect linkage to ART care rather than same day ART initiation.

1.3 Rationale/Justification

Malawi has failed to achieve the second 95% of the UNAIDS goals in 2020 as only 88.6 % of those that tested HIV positive are on anti- retroviral therapy(ART) (1). This means that about 12% of HIV positive people are not on treatment, posing a risk of morbidity and mortality in these individuals and HIV transmission to others. Thus there is need to identify the factors associated with sub optimal linkage to ART care. The understanding of these determinants would strengthen efforts to link HIV positive patients to ART care and therefore enable the country to attain the 95%

ART linkage by 2030.This will assist with reducing HIV associated morbidity and mortality and the risk of HIV transmission.

CHAPTER 2: OBJECTIVES

2.1 Main Objective

To assess same day ART linkage rates and explore factors influencing same day linkage to ART care of HIV positive adults in primary health care facilities supported by expert clients in Blantyre district, Malawi.

2.1.1 Specific Objectives

1. To assess same day linkage rate of newly diagnosed HIV adults to ART care at Limbe and South Lunzu health facilities.
2. To describe personal factors that facilitate or hinder same day linkage to ART.
3. To describe health centre infrastructural factors that facilitate or hinder same day linkage to ART
4. To describe health system factors that facilitate or hinder same day linkage ART. Three health system blocks will be assessed through this objective as follows: health service delivery, health workforce and access to essential medicine.

2.2 Hypothesis

Linkage rate to ART will be high. Some personal, health centre infrastructural and health system factors will facilitate same day linkage to ART while others will hinder it.

CHAPTER 3: METHODOLOGY

3.1 Study Design

This was a quantitative descriptive cross sectional study design.

3. Study Setting

The study was conducted at South Lunzu and Limbe Health facilities within Blantyre district, Malawi. Blantyre district is located in the southern region of Malawi. It covers an area of 220 square kilometres and has a population of 932,000 (15). It is Malawi's second largest city and the largest commercial and industrial city in the country (15). Figure 1 below is a map of Malawi with the location of Blantyre highlighted.

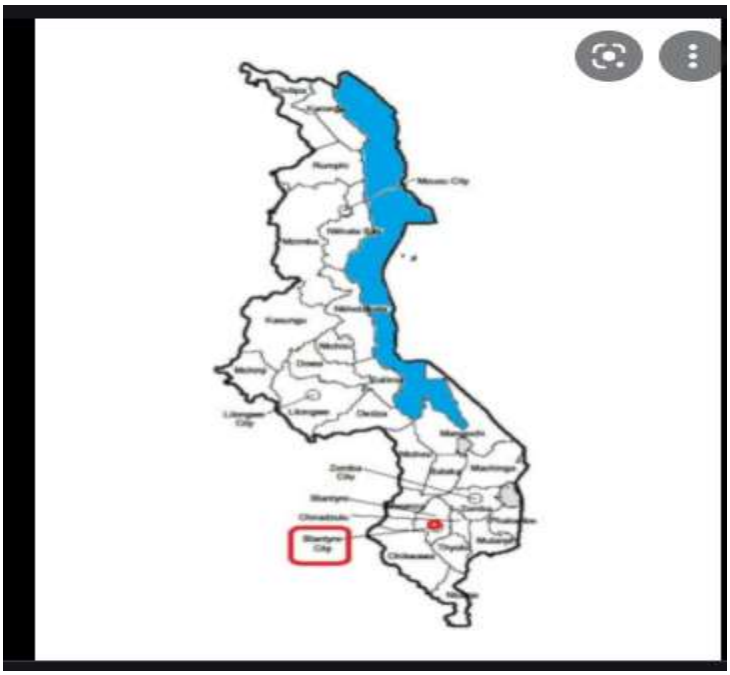

Figure 1:Map of Malawi

Figure 2: Map of Malawi

Source*: www.millennium-cities/blantyre-malawi/blantyre-maps-and-population*

South Lunzu and Limbe primary health care facilities are located in semi urban and urban areas of Blantyre district respectively. According to health management information system (HMIS) data, Limbe provides care to an average of about 100 new HIV infected people per month while South Lunzu takes care of about 35. These facilities were selected for convenience because they are busy facilities and hence the sample size was easily achieved. South Lunzu and Limbe health facilities were selected to represent semi urban and urban populations respectively. The facilities have HIV testing and counselling (HTC) clinics where the following services are provided: (1) group counselling (2) pre-test counselling and (3) testing and (4) posttest counselling. All these services are conducted in a separate counselling room, by an HTC provider. Patients that are newly diagnosed with HIV are then referred to ART clinic to commence ART. At this point, patients may accept or decline the referral. However, irrespective of this, they are asked to pass by an EC room where they receive extra counselling. Those willing to start ART on the same day do so.

3.3 Study Population

The first study population, to address specific objectives 1,2, 3 and part of 4 included all HIV newly diagnosed adults from Limbe and South Lunzu health facilities. The inclusion criteria were: adults of over 18 years of age, newly diagnosed of HIV, provided with extra counselling by an EC and willing to provide written informed consent. Under the objective that assessed health system factors, this study population provided information on the health service delivery and health workforce blocks. The participants from this population were consecutively recruited.

The second study population were health facility leaders of Limbe and South Lunzu health facilities. These health care workers lead all activities at the health facility. There is one leader for

each health facility. This study population provided information on health systems blocks of health work force and access to essential medicine of objective number 4.

3.4 Sample Size

The sample size for HIV clients was determined using a single population formula(11). The first objective of the study was used to make the calculation. There is no same day ART linkage rate available for the country so prevalence of same day ART initiation (63%) was used from the Malawian study which was conducted on pregnant women (11). The margin error of precision of 5.5 % was considered. The calculated sample size was 298 participants. By adding a 10% non-response rate, the sample size was arrived at 328.

The formula below provides further details of the calculations used.

$$n = \frac{(Z)^2 * (p)(q)}{(d)^2}$$

n= Desired sample size

Z=1.96

p= expected same day ART initiation based on previous research was 63%

q= (1-0.63)

d= margin error of precision (in our study it was 5.5%)

n= 298

n= 298 + 30(considering 10% non-response rate) = 328

The sample size for lead health workers was only two, one for each health facility.

3.5 Study Period

The study was conducted from December 2018 to June 2021. Table 1 shows the key activities implemented to accomplish the study.

Table 1 Gantt Chart Outlining Study Activities

Activity	Dec 18 – Aug 19	Aug 19 – Feb 20	Mar 20 – Jul 20	Jul 20- Nov 20	Nov 20- Mar 21	Apr 21 – Jun 21
1.IRB submissions						
2.Hiring and training personnel						
3.Study tools formulation						
4.Data Collection						
5.Data transcribing and Entry						
6.Data Analysis						
7.Manuscript writing						
8.Study dissemination						

3.6 Data Collection

In our study, adults were approached on study participation after their session with the EC. For those that had refused referral to ART clinic by the HTC provider, after the EC counselling session, they were asked if there was a change in mind to start ART, and they were referred for ART initiation if they were willing. Those not willing at this point left the clinic for their homes. Figure 1 below is a flow chart showing the flow of patients in the HTC clinic.

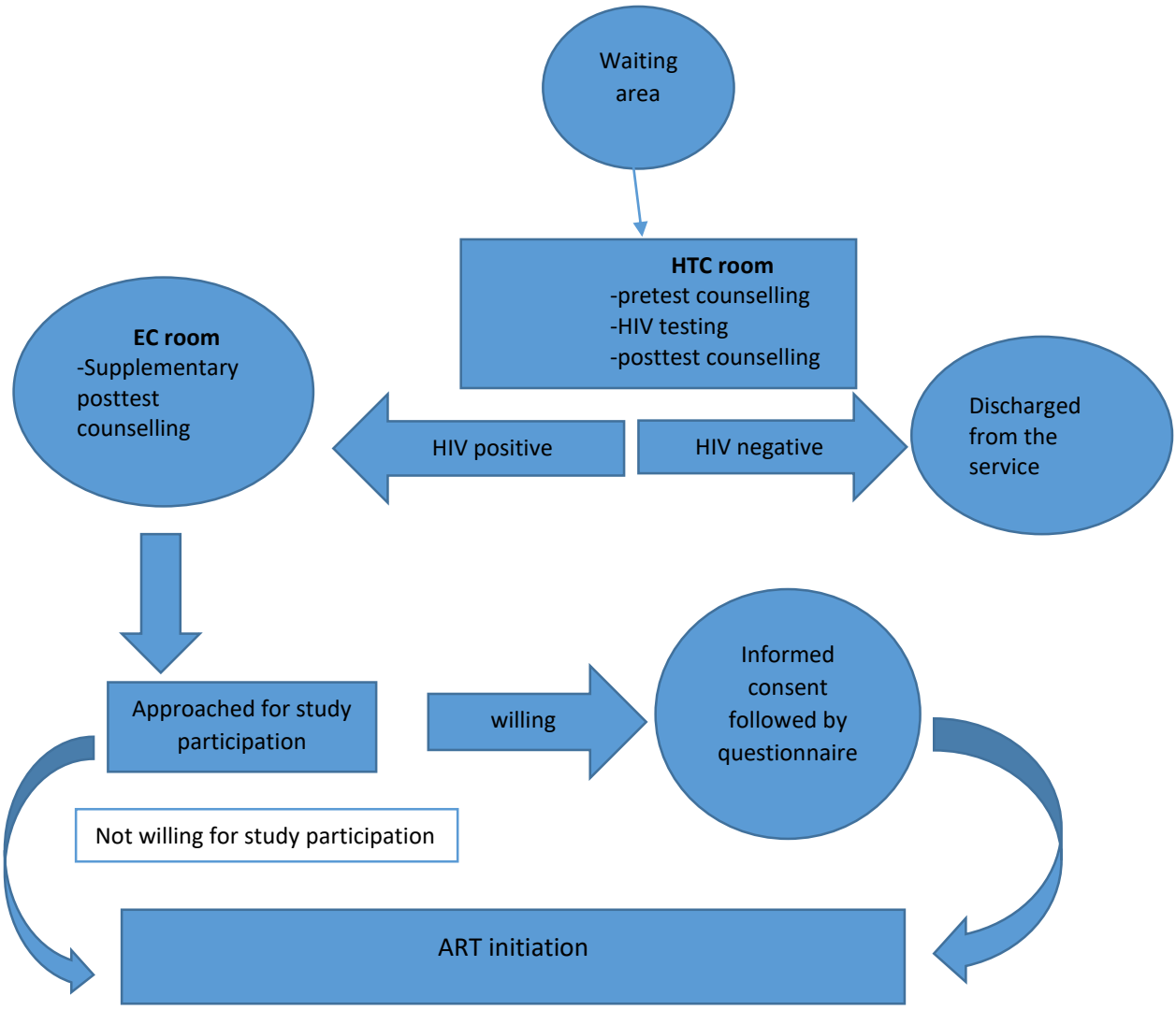

Figure 3 :Flow Chart Describing Flow of Patients At HTC Clinic

Data was collected by 2 data collectors at each health facility who were trained on study protocol implementation, good clinical practice (GCP) and human subject protection (HSP). Their tasks involved obtaining informed consent which was followed by conducting interviews.

3.6.1 Study Variables

The dependent variable was linkage to ART care which was defined as same-day ART initiation with categorical response of (Yes, No). Linkage to ART care was considered to have occurred if ART initiation was documented by a trained provider in the participants' health passport books and verified by study staff. The independent variables were grouped into three, namely personal variables, health facility infrastructural variables and health systems variables.

a) Personal Study Variables

Under this category, the following were collected: age, sex, religion, marital status, location, distance between their home and health facility, number of their sexual partners, their source of income, the source of lighting in their homes, source of water in their homes, their cooking mode, type of toilet that they use, the mode of transport used from their homes to the health facility, their education status and whether they smoked or took alcohol within a period of 30 days before the interview. The following factors were also assessed under personal variables: if the clients knew someone on ART, if they had fear of stigma, if the HIV test was on voluntary basis or provider initiated and if they accepted their results of the HIV test or not.

b) Health Systems Variables

Our study only assessed 3 out of the 6 building blocks of health systems namely: health service delivery, health work force and access to essential medicines. This study concentrated on these 3 health systems blocks in their relation to the HIV/ART services provided at the health facilities. The health work force was assessed by the availability of health workers and the quality of work they provided. Under this block, participants, using Likert scale that was embedded in the

questionnaire (appendix 1), rated the quality of counselling provided by ECs and HTC providers. The participants also rated the quality of interaction they had with these same health workers. The availability of health workers was assessed through the checklist (appendix 2) which assessed how many health workers were available for HIV related services at the health facility and also how many of them provided services on one particular day. The health service delivery was assessed through an understanding of how the services at the HTC clinic were integrated and coordinated. The study assessed how timely the services were delivered by having the participants describe the waiting time at the HTC clinic before they were assisted. It assessed if participants received assistance of direction or escort to the rooms providing different services at the HTC clinic (navigation assistance) and it also assessed if there was an existent referral system of participants to other ART providing health facilities. The block of access to essential medicine was assessed by checking availability of health supplies and how often they had been out of stock in the quarter 1 of 2020.

c) Health Infrastructural Variables

The heath infrastructural characteristics included the following: accessibility of health facilities, conduciveness of the distance between HTC clinic, EC and ART provider rooms and the privacy offered by these rooms.

3.6.2 Data Collection Instruments

a) Questionnaire

A structured questionnaire (appendix 1) was administered to HIV positive clients. The questionnaire collected data on personal factors, health facility infrastructural factors and health service delivery as well as health work force blocks of the health system.

b) Checklist

A checklist (appendix 2) was used to collect more information on health system factors of health work force and also access to essential medicines. This checklist was administered to a health worker who was the leader at each health facility.

3.7 Data Management

The questionnaire was used on a software called Open Data Kit (ODK). Each questionnaire was saved and at the end of each day, all questionnaires administered were sent electronically to a local server for storage. Data was transferred to excel from ODK for cleaning. The data was then imported into STATA version 14.2 for analysis. The data from the checklist was also transferred to excel for cleaning and was later added to the data analyzed through STATA.

3.7.1 Data Analysis

Using STATA, descriptive data was summarized using proportions and means of the whole study sample, those linked to ART and those not linked to ART where appropriate. The outcome of the study was linkage (described as same day ART initiation) of study participants to ART.

3.8 Ethical Considerations

Ethical approval to conduct the study was sought from College of Medicine Ethics Committee (COMREC). Signed Informed Consent was sought from all study participants. Privacy and confidentiality was ensured by conducting all study procedures in a private and quiet room. Study participation was voluntary with decision to do so made by the participant him/herself. Participants were made aware that they were free to withdraw from the study anytime without giving a reason. All study documents were kept in lockable cabinets only accessible by study staff.

CHAPTER FOUR: RESULTS

4.1 Study Enrolment Process

Figure 3 summarizes the study enrollment process. A total of 333 participants were approached to take part in the study, however 321 accepted study participation. About 161 participants were enrolled from Limbe Health Centre and 160 from South Lunzu Health Centre. 8 out of 12 (67%) of those that did not accept study participation were from Limbe Health Centre while 4 (37%) were from South Lunzu. Reasons for non-participation included the following: 8 had no interest of joining the study, 3 were in a hurry and 1 wanted husband consent.

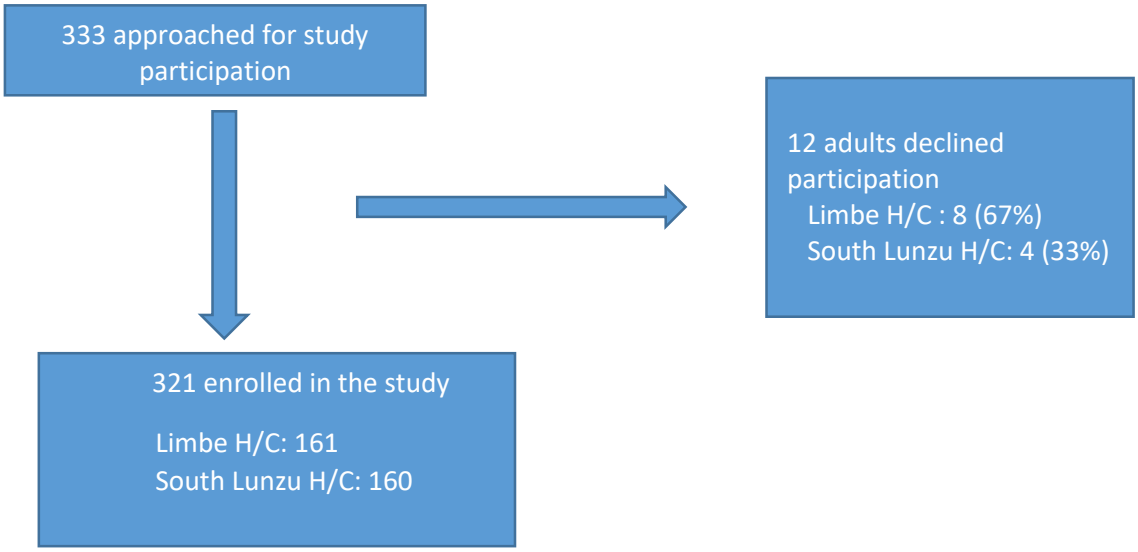

Figure 3: Flow Chart of Participants Approached, Enrolled and Not Enrolled in the Study

4.2 Characteristics of Study Participants

The mean age (standard deviation) of study participants was 33 years (10), were predominantly female (59%, n= 189) and the majority had a source of income (67%, n= 215).

Table 2 Descriptive Socio Demographic Characteristics of Study Participants

Variable	Total N=321 , n(%)
Age (years), mean (SD)	33(10)
Gender	
females	189(59)
males	132(41)
Source of Lighting	
electricity	177(55)
lamp/candle	144(45)
none	0 (0)
Source of water	
tap	221(69)
Borehole	96 (30)
River/stream	4 (1)
Cooking mode	
electricity	26(8)
charcoal	250(78)
Firewood	45(14)
Sanitary Facility	
flush	35(11)
pit latrine	286(89)
Mode of transport	
walked	71(22)
public transport	244(76)
private transport	6(2)
Smoking:	
yes	29(09)
no	292(91)
Alcohol:	
yes	64(20)
no	257(80)
Education Status	
no formal education	23 (7)
Primary school level	156(49)
Secondary school level	125(39)
Tertiary level	17(5)
Religion	
Christian	285(89)
non-Christian	36(11)
Location	
<5km	202(63)
>5km	119(37)
Distance in KM, mean(SD)	4.3 (1.9)
Number of sexual partners	
No partner	26 (8)
1 partner	207(65)
>1 partner	88(27)

SD: - standard deviation; KM: - kilometers

Majority of the study participants had the HIV test on voluntary basis (66%, n=211) as opposed to the test being provider initiated and majority of these participants accepted their HIV results (99%, n=318).

Table 3 below describes other non socio demographic personal related characteristics of study participants.

Table 3 Non Socio Demographic Characteristics of Study Participants

Variable	Total N=321, n(%)
Type of HIV test, n (%)	
Voluntary	211(66)
Provider initiated	110(34)
Acceptance of HIV test results, n (%)	
Yes	318(99)
No	3(1)
Knowledge of someone on ART, n (%)	
Yes	246 (77)
No	75(23)
Fear of stigma, n (%)	
Yes	17 (5)
No	304 (95)

4.3 Rate of Linkage to ART

There were 315 out of 321 participants that were linked to ART, this represents a total linkage rate of 98.2%. Linkage rate for Limbe health facility was 97.5% while that of South Lunzu was 99%. There were 6 people that were not linked to ART, and this was due to the following reasons: 67% (n=4) were not ready to start ART immediately,17%(n=1) wanted to use herbal medicine and another 17% (n=1) was afraid of stigma. The mean age (standard deviation) in the group that was not linked to ART was 32(7), were predominantly females (67%, n=4) and had no source of income (83%, n=5)

4.4 Views of Health Care Workers and Clients Regarding Performance of Health Systems on ART

4.4.1 Health Workforce

4.4.1.1 Availability of Health Care Workers, As Reported by Health Facility Leaders

Through the checklist, the leaders of the health facilities reported that Limbe had 18 HTC counsellors, 35 ART providers and 10 ECs who worked 8 hours a day while South Lunzu had 9, 31 and 7, respectively. At South Lunzu health facility, on a single day, there are 3 HTC providers,4 ART providers and 7 ECs providing services while for Limbe health facility there are on average 10 HTC counsellors,10 ART providers and 10 ECs. For both health facilities, there was no single day in the first quarter of 2020 that HTC, ART and ECs services were not available.

4.4.1.2 Quality of Work of Health Care Workers as Rated by Study Participants

About 40% of study participants rated the quality of counselling and interaction with health care workers as excellent. Tables 4, 5,6 and 7 below present the proportions of study participants according to the rating of counselling services provided by HCWs and the quality of interaction they had with these HCWs.

Table 4 : Rating of Counselling Services Provided by Expert Clients

Rate score	Excellent	Good	Average	Bad	Total
%(n) of participants who rated the score	39.56 (127)	59.50 (191)	0.62(2)	0.31 (1)	100(321)

Table 5: Rating of Quality of Interaction Between ECS and Study Participants

Rate score	Excellent	Good	Average	Bad	Total
%(n) of participants who rated the score	41.74 (134)	57.63(185)	0.62(2)	0(0)	100(321)

Table 6: Rating of Counselling Services Provided by HTC Providers

Rate	Excellent	Good	Average	Bad	Total
%(n) of participants who rated the score	34.89(112)	64.49(207)	0.62(2)	0 (0)	100(321)

Table 7: Rating of Quality of Interaction Between HTC Providers and Study Participants

Rate	Excellent	Good	Average	Bad	Total
%(n) of participants who rated the score	38.94(125)	60.44(194)	0.62(2)	0(0)	100(321)

4.4.2 Health Service Delivery

4.4.2.1 Waiting Time Spent by Study Participants, Before They Were Assisted at The VCT

The majority (74%, n=238) of participants indicated that they waited for less than 1 hour before they received services at the VCT clinic. Table 8 below presents proportions of study participants according to their descriptions of their waiting time.

Table 8: Description by Study Participants, of Time They Spent in the Waiting Room, at the VCT, Before They Were Assisted

Participant's description	Less than 1 hour	Between 1 and 2 hours	Between 2 and 4 hours	More than 4 hours	Total
%(n) of participants who rated the score	73.52(236)	22.12(71)	4.05(13)	0.31(1)	321(100%)

4.4.2.2.1 Referral System at Health Facility as Described by Health Care Leaders

There is an established referral system of patients who get diagnosed at one facility but would like to receive their ART from another. Both health facilities initiate ART on same day of diagnosis and provide referral to another health facility for continuation of the ART.

4.4.2.3 Provision of Assistance with Directions and/or Escort (Navigation Assistance) By EC, to Study Participants

There were 97% (n=311) of all participants that indicated that they had received assistance, by EC, with directions and/or escort (navigation assistance) to the rooms that provided the different services e.g. ART room.

Table 9: Proportions of Study Participants Who Received Navigation Assistance and Those Who Did Not

Was navigation assistance provided	Yes	No	Total
%(n) of participants who rated the score	96.26(309)	3.74(12)	100(321)

4.4.3 Access to Essential Medicines

a) ***Availability of ART and Medical Supplies, As Described by Health Worker Leaders***

There was no single time in the first quarter of 2020 that there were stock outs of HIV testing materials as well as ART drugs for both health facilities.

4.5 Description of Health Facility Infrastructural Characteristics by Study Participants

The majority of study participants described infrastructural characteristics of health facilities as conducive. These characteristics included health facility accessibility, privacy in accessing art services and conduciveness of the distances and location of some rooms where HTC services were provided.

Table 10: Proportions of Study Participants According to Their Description of Health Facility Infrastructure

	Yes (%,n)	No (%,n)	Total
Health facility characteristics			
1.Was the health facility accessible to you?	99% (318)	1% (3)	100%(321)
2.Was there privacy in accessing ART?	91.25% (292)	8.75%(28)	100%(321)
3.Did you find distance between ART room and HTC clinic conducive?	85.36 %,(274)	14.64%(47)	100%(321)
4.Did you find location of EC in the HTC room conducive?	95.33%, (306)	4.67%(15)	100%(321)

CHAPTER FIVE: DISCUSSION

In this study which was conducted in primary health facilities in Blantyre district of Malawi, we found that same-day linkage of newly diagnosed HIV positive adults was very high (98.2%). We also found that most participants had very positive views of the service delivery and infrastructure at the facilities which may have facilitated linkage to care.

The high same day ART initiation rate found in our study is in sharp contrast with findings from previous studies in SSA which found linkage rate ranging from 41.9%- 54.2%(10). The discrepancy observed between these findings could be because, unlike in the previous studies, our facilities were supported with lay health workers (ECs) who were trained to counsel the positive individuals soon after diagnosis and guide them on where to access the treatment. Additionally, the present study setting was only primary healthcare facilities, while previous studies included primary and secondary healthcare facilities (10). It must be noted that patients who present to primary healthcare facilities are more likely to have uncomplicated clinical presentation making it easier for health workers to commence them on same day ART, unlike in a secondary health care facility, where health care workers may have to wait to conduct other investigations or stabilize the patient before ART is commenced (10). This is also in line with other studies that found that patients without opportunistic infections were two times more likely to initiate same-day ART compared with patients with one or more opportunistic infections (10). Similarly, a study in South Africa reported that patients who presented with less advanced clinical disease were more likely to accept same-day ART initiation (16). However, such findings are in contrast with several qualitative studies that had reported the absence of symptoms or signs of ill health, as a major reason for differing same-day ART (11). In situations where newly diagnosed HIV positive

patients require referral to another health facility for supply of their ART, Limbe and South Lunzu health facilities have an existent referral system whereby they would commence the patient on ART first and refer to another health facility for continuation of supply of ART. This may have contributed to the high linkage rate compared to previous studies that found low linkage rate. This observed contrast is likely because in the previous studies, in some instances, newly diagnosed HIV positive patients were tested at another facility and subsequently referred to another for ART (10). This occurred if the patient requested so or if the testing facility did not offer ART. The low same day ART linkage rate in these studies was due to the time needed to transfer from the original HIV testing site to the actual health facility rendering ART service (10) .Studies have shown that participants who are tested in a health facility in which they are linked to ART service are two times more likely to initiate same-day ART compared with those tested HIV positive from another health facility and subsequently referred (10). Other studies have also suggested similar reasoning as a cause of low same day ART linkage rate in HIV testing conducted in a community setting where ART services are not readily available after the test (17). The existent referral system at Limbe and South Lunzu emphasizes the importance of strategic referral mechanism between two ART clinics but also the importance of having ART available at an HIV testing site.

The finding that four out of six participants who were not linked to ART did so because they were mentally not ready is consisted with findings of a study conducted in eastern and southern parts of Africa (7). This study highlighted the fact that the process of HIV status acceptance takes time (7). The ‘test and treat’ approach has significantly removed the psychological component where one is required time to digest the news of their new HIV status and make their decision on ART (7).Our study findings are also consistent with findings of a study in Lesotho where 2.2% of study

participants indicated that they were not ready to start ART on the same day of their HIV diagnosis (18). It must be acknowledged that these participants who were not linked to ART might have initiated ART in the days, weeks or months that followed.

The finding that the majority of the participants had positive views on the quality of service delivery is consistent with findings from previous studies conducted in Malawi and other countries in SSA which found that overall barriers to ART initiation reflect on patients' satisfaction with the quality of services, patient- health worker relationships, time efficiency at the facility, good coordination of the different services at the HTC clinic, availability of staff and supplies, and accessibility of health facilities (8-9).The difference between our study and others is that ours further revealed that the majority of study participants were content with the proximity of the HTC, EC and ART rooms. Unfavorable distance between these rooms can instill fear of inadvertent disclosure of HIV status and therefore have an impact on ART linkage rates.

Our study provides insight on multi-dimensional factors associated with ART linkage in the two health facilities that may be used to develop appropriate interventions. However, our study is not without limitations. This study did not explore on community factors like family or community support structures that might affect same day ART initiation. The study participants described the length of waiting time before they were assisted. This was a subjective rather than an objective way of assessment and likely to have been a source of social desirability bias. Assessment of availability of health care workers, HIV supplies and ART drugs was by word of mouth provided by the leader of the health facility. Study staff did not verify this information in the health care worker schedules, pharmacy and medical stores records. 12 HIV positive adults who were

approached by study staff to participate in the study refused. The linkage outcome to ART of these individuals is not known. It is important to note that there is potential for selection bias if the linkage outcome of these 12 individuals is similar.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

Our findings suggest that despite resource constraints, primary health facilities supported by lay health workers (expert clients) successfully linked to ART newly diagnosed HIV positive clients. Our findings also suggest that participants' satisfaction with health services delivery and infrastructural characteristics may favour linkage to ART. Participants mental unpreparedness may contribute to unsuccessful linkage to ART. We recommend that the EC model be scaled up to all health facilities in Blantyre and other districts in the country. We also recommend that heath facilities must be supported with the human resource, medical drugs and supplies and appropriately designed infrastructure in order to continue with good service delivery. Health facilities must be accessible and be designed in a manner that encourage privacy. We also recommend that more research be conducted in order to find out how counselling can improve mental preparedness of newly diagnosed patients.

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APPENDICES

Appendix 1: Questionnaire

Expert Client facilitated linkage to ART Program of newly diagnosed HIV adults. A comparison of Limbe and South Lunzu health centers Participant questionnaire

PID: **Date:**

QUESTIONS AND INSTRUCTIONS	**RESPONSE**	**CODE**
Time arrived at the clinic: ___: ____hrs. (24-hour clock) Nthawi yofikira pachipatala: : Maola (wotchi ya maola 24) -		
Time left clinic: ___:___hrs. (24 hr. clock) .Nthawi yochokera pachipatala : : (wotchi ya maola 24)		
Where do you live?		

Mumakhala kuti?		
How did you travel from home to the clinic (mode of transport)? Munayenda bwanji kuchokera kwanu kudzafika ku chipatala (Njira ya mayende)	On foot pansi	1
	Public transport Galimoto/ Njinga yolipila	2
	Private transport Pagalimoto/ Njinga yanu	3
Gender of the person interviewed	Female Mkazi	1
	If female Pregnant	Yes
		No

	Male mwamuma	2
Age of the person interviewed or date of birth Zaka za munthu amene akufunsidwa mafunso kapena Tsiku lobadwa	……**years** **……./……./…..** **…….** **Zaka** **……../……./……**	
Highest level of education completed Pa mapeto amaphunziro	No formal education Sinapite ku sukulu ya mkalasi	1
	Primary School Sukulu ya pulayimale	2
	Secondary School Sekondare sukulu	3
	Tertiary Koleji	4
	Adult literacy Suluku ya kwacha	5
What is your religion?	Christian chikhirisitu	1
	Islam	2

	chisilamu	
Ndinu achipembedzo chanji?	African Traditional Religion Chipembezo cha makolo	3
	None Palibe	4
	Others (specify)…… …….. zina Tchulani…….	99
Marital status Ndinu okwatira kapena osakwatira?	Married okwatira	1
	Single/never married osakwatira	2
	Divorced Banja linatha	3

	Widowed anamwalira	4
	Others (specify)…… ……. Zina Tchulani……..	99
Number of sexual partners Chiwerengero cha abwenzi ogonana nawo	…….	
What is your occupation Mumagwira ntchito yanji?	Unemployed Sindimagwira ntchito	1
	Self employed Ndili pantchito yodzilemba ndekha	2
	Employed Ndili pantchito yolembedwa	3
	Business Bizinesi	4
	Casual labour	5

	maganyu	
	Skilled work Ntchito za manja	6
	Student	7
Source of water Gwelo la madzi	Borehole mjigo	**1**
	Tap water Madzi apa mpopi	**2**
	Public tap Mpopi wa chitukuko	**3**
	River / Stream mtsinje	**4**
Source of lighting Gwelo la kuwala	Electricity magetsi	**1**
	Lamp/ Candles Nyali / kandulo	**2**
	None palibe	**3**
Type of toilet	Flush toilet	**1**

Mtundu wa chimbudzi	Cha madzi (chogejemura)	
	Pit latrine chokumba	**2**
	None palibe	**3**
Main Mode of cooking used Njirayodalilika imene mumagwilitsa nchito pophika	Electricity Magetsi	**1**
	Charcoal makala	**2**
	Firewood nkhuni	**3**
Do you drink alcohol? Mumamwa zolezeretsa?	Yes Eya	**1**
	No ayi	**2**
If Yes, number of bottles per day Ngati inde, kuchuluka kwa zakumwa zolezeretsa pa tsiku	……..	**1**
		2

Do you smoke? Mumasuta?	Yes Eya	**1**
	No ayi	
If Yes, number of cigarettes per day? Ngati inde, kuchuluka kwa ndudu zomwe mumasuta pa tsiku?	…….	**1**
		2
Acceptance of HIV status **Kuvomereza za kachilombo ka HIV.**		
		2
Did you voluntarily undergo HIV test or were you requested by a health worker to have HIV test?	Voluntarily Mwakufuna kwanga	1

Munapita koyezetsa magazi mwakufuna kwanu kapena munachita kuwuzidwa ndi achipatala kuti muyezedwe magazi?		
	Requested ndinapemphedwa	2
	Others (specify)…… …… zina (tchulani)…… …….	99
Did you fully accept the results of your test? Kodi munavomereza kwathuthu zotsatira za zoyesa zanu?	Yes eya	1
	No ayi	2
Did you receive counselling before and after HIV test at HTC clinic ?	Yes eya	1

Munalandira uphungu musanayezetse komanso mutayezetsa HIV koyezetsera magazi?		
	No ayi	2
How would you rate the pretest and posttest counselling you received from the HTC counsellor? Kodi uphungu umene munalandira musanayedzetse komanso mutayezedwa magazi kuchokera kwa mphungu oyeza magazi mungaufotokoze bwanji/ unali otani?	Excellent Wabwino kwambiri	1
	Good wabwino	2
	Average Wapakati kati	3
	Bad	5

	wosakhala bwino	
If the answer for 28 is bad probe for the reasons. Ngati yankho la funso 28, linali ‘wosakhala bwino’, perekani zifukwa	……	
How would you rate the counselling you received from the expert Client? Kodi uphungu umene munalandira mutayezedwa magazi kuchokera kwa akatswiri mungaufotokoze bwanji/ unali otani?	Excellent Wabwino kwambiri	1
	Good wabwino	2
	Average Wapakati kati	3
	bad wosakhala bwino	5
If answer for 30 is bad probe for the reasons Ngati yankho la funso 30 ndi ‘wosakhala bwino’ perekani zifukwa	…… …….	

How can you describe your interaction (relationship) with the HTC counselor during the process? Mungafotokoze bwanji za ubale wanu ndi munthu opereka uphungu?	Excellent Wabwino kwambiri	1
	Good wabwino	2
	Average Wapakati kati	3
	Bad Wosakhala bwino	4
If the answer 35, is Bad probe Ngati ndi wosakhala bwino pa yankho 35, funsitsitsani.	…….	
How can describe your interaction (relationship) with the Expert Client counselor during this process?	Excellent Wabwino kwambiri	1

Mungafokoze bwanji za machezedwe anu (ubale) ndi kadaulo wa uphungu.		
	Good wabwino	2
	Average Wapakati kati	3
	Bad Wosakhala bwino	4
If the answer to 37 is bad probe Ngati ndi wosakhala bwino pa yankho 37, funsitsitsani.	……	
Do you think that you are going to be treated differently in the society because you are HIV positive? mukuganiza kuti anthu a mdera lanu azakhalananu mosiyana ndi mmene amakuonerani chifukwa choti muli ndi ka chilombo ka HIV?	Yes Eya	1

	No ayi	2
If answer to 41 is yes, in what way? Ngati yankho ndi eya pa 41, munjira yanji?	……	
Do you know anyone who was found HIV positive and he/she is on ART? Kodi mukudziwa aliyense amene anapezeka ndi kachilombo ka HIV ndipo pano akulandila mankhwala ama ARV?	Yes Eya	1
	No Ayi	2
Are you ready to start ART today? Ndinu okonzeka kuyamba ma ARV lero?	Yes Eya	1
	No ayi	2
IF No to 45, state the reasons for not starting ART		

Ngati ndi ayi pa 45, tchulani zifukwa zomwe simukuyambira ma ARV.	

Fear of stigma Kuopa kusalidwa	1
Fear of side effects Kuopa zoipa zama ARV	2
Feeling healthy Ndikuzimva wa thanzi	3
Fear of status disclosure Ndikuopa kuulura za mmene ndiliri	4
Religious beliefs Zikhulupiliro za mpingo	5
Cultural beliefs Zikhulupiliro za chikhalidwe	6
Other (specify)……. Zina (tchulani)……..	99

Is this health facility accessible for you to receive services when needed? Kodi chipatala chino ndichofikirika kwa inu pozalandirako chithandizo chikafunika?	Yes Eya	1
	No ayi	2
Do you think there is privacy in accessibility of ART at this health facility? Kodi mukuganiza kuti pali chisinsi pa kalandiridwe kama ARV pa chipatala pano?	Yes Eya	1
	No ayi	2
Do you find the distance between the HTC clinic and ART clinic is favorable to you? Kodi katalikidwe pakati pa koyezera magazi ndi kuchipatala cha ma ARV ndi za bwino kwa inu?	Yes Eya	1
	NO	2

	ayi	
Do you find the location of Expert client in the HTC clinic Helpful / favorable to you? Kodi malo omwe kadaulo wa uphungu akupezeka kumalo oyezera magazi ndi a bwino kwa inu?	Yes Eya	1
	No ayi	2
Did you find any Navigation assistance at this clinic? Kodi munapeza aliyense okulondolerani pa chipatala pano?	Yes Eya	1
	No ayi	2
	……	

Appendix 2 - Checklist

Heath Centre:

_____

_____

Date of Inspection:

_____

_____

Location (e.g. General Assistant's Area/Workroom/Art room):

_____

NO	OBSERVATION	RESPONSE	COMMENT
1	Number HTS counsellors at the facility		
2	Number of ART providers at this facility		
3	Number of experts' clients at this facility		
4	Duration (in hours) of expert clients service operation in a day		
5	What time do the facility open?		
6	Time facility closes		

12	Number of Counselling rooms in at this facility		
17	Availability of Navigators at this facility		
18	Number of Navigators available at the facility		
19	Are patients not willing to start ART at the diagnosing facility referred to their preferred site after or before same day ART initiation		
19	Number of times in the last quarter HIV testing materials have been out of stock.		
20	Number of times ART drugs went out of stock at this facility in the last quarter		

21	Number of times in a quarter the HTC counsellor was not available at the health facility		
22	Number of times in a quarter, the expert client was not available to offer the service at the facility		
23	Number of times in a quarter the ART provider was not available in to offer the service to the new positives		

Appendix 3: Certificate of Approval of Study from COMREC

CERTIFICATE OF ETHICS APPROVAL

This is to certify that the College of Medicine Research and Ethics Committee (COMREC) has reviewed and approved a study entitled:

P.06/18/2423 - Peer based approach for enhancing linkage to HIV Care among adults newly HIV diagnosed at Blantyre based Health facilities, Voluntary Testing and Counseling Clinic, In the Era of 'Test and Treat' by Dr. Rachel Kawalazira

On 28-Jan-19

As you proceed with the implementation of your study, we would like you to adhere to international ethical guidelines, national guidelines and all requirements by COMREC some of which are indicated on the next page for your study

28-Jan-19

Dr. YB. Mlombe - Chairperson (COMREC) — Date