



The Effectiveness of Health Volunteers in Community Based Tuberculosis Care in Meru County, Kenya

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Summary

BACKGROUND

Community Health Volunteers(CHVs) are an integral human resource in Health Care System specifically in resource limited settings. Despite the adoption of the concept of Community Based Tuberculosis Care(CBTC) in 1994, lack of meaningful involvement of the affected communities using their own resource people in implementing all aspects of CBTC had often lead to unacceptable targets in Meru County community tuberculosis response [6].

OBJECTIVES

The general objective of the study was to assess the effectiveness of household visits by CHVs on Community Based Tuberculosis Care in Meru County, Kenya. That was a descriptive cross sectional study to collect quantitative data influencing Community Based Tuberculosis Care implementation for 3 months from March 2018 to May 2018.

METHODOLOGY

A semi - structured questionnaire was used to collect data from 345 sampled respondents in Meru County by research assistants, who were trained on the study objectives. Semi-structured questionnaire was used to collect data on demographic characteristic of respondents and the role of Community Health Volunteers which influenced the effectiveness of Community Based Tuberculosis Care. Data was analyzed using *SPSS version 24.0* and *STATA version 13.0* statistical packages. The study findings were presented in form of tables and figures.

Majority of the 345 respondents who were included in the study were; male 267(77.4%) and female 78(22.6%). Most of the respondents 240(69.75%) resided in rural areas and 120(29.25%) resided in urban areas. Majority of the respondents were aged between 18-36 years 195(56.5%).

RESULTS

The number of respondents who were visited by the Community Health Volunteers after a month of initiation of treatment was 142(41.2%). The quality of health education offered by the CHVs was acceptable by majority of the respondents 334(96.8%). Most of them were aware of Community Based Tuberculosis Care 233(67.5%) and the community was mainly engaged during National Tuberculosis day 207(88.9%). The association between Community Based Care and Community Outreach Services did not show a strong association ($p=0.055$). The effectiveness of CBTC increased with the frequency of Outreach Services on monthly basis became more effective at OR-1.00 compared to quarterly and annually at OR -0.29,OR-0.21 respectively at a confidence interval of 95% (CI 0.04-1.90). Capacity building at the community level was to empower the community with individual household taking responsibility of their own health.



CONCLUSION

Community based tuberculosis care can be more effective with increased frequency of outreach services at the community level. Community Health Volunteers can help bridge the gap between community and health care systems. Training of more community health volunteers on community based tuberculosis can help reach more households members to create awareness on tuberculosis.

RECOMMENDATION

Strategies of retention of Community Health Volunteers should be put in place to ensure sustainability. Training of CHVs involved in community activities on basic modules of community based tuberculosis care can improve effectiveness

Keywords: Community Health Volunteer, effectiveness, household visits.

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Introduction

Kenya ranking number 15 out of 22 is one of the highly burden tuberculosis countries that accounts together for more than 80% of the worlds TB cases. The estimated 9,500 deaths due to tuberculosis make it the fourth leading cause of mortality in the country [6].

DOTS strategy was started in Kenya in 1993 and achieved 100% geographical coverage by the year 1997. It involved patients monitored when they take their drugs by either household members, a health worker or a Community Health Worker (CHW). In 2005, Kenya achieved the 1993 World Health Assembly (WHA) global tuberculosis target of 70% detection of infected cases and cure rate of 85% of all detected cases [14].

Meru county was ranked 4th in terms of TB burden with low community case notification of less than 9% and treatment success rate of less than <90% [15]. Meru County had eight tuberculosis control zones at the sub-county levels. There were seventy nine diagnostic sites and eighty nine treatment sites which offered tuberculosis services.

Study Side

Meru County had a total population of 1,197,856 with a proportion of 59.3% males. Urban population at 12% and the area was densely populated 173 persons per square kilometre. The doctor population ratio was 1:38,000 nurse population ratio of 1:1,609 and health

facility population ratio of 1:3897. A literacy level of 57.3% and the main economic activity were farming. Meru County had one tuberculosis diagnostic site for a population of 100,000 persons and seven treatment sites for 100,000 persons [5].

The high burden tuberculosis control zones include: Imenti South, Igembe North, Igembe South and Tigania East. The low burden tuberculosis control zones includes: Tigania West, Imenti North, Imenti Central and Buuri [15].

Community Health Volunteers (CHVs) were an integral human resource in health care systems, particularly in resource limited settings. Despite the adoption of the concept of Community Based Tuberculosis Care (CBTC) in 1994, lack of meaningful involvement of the affected communities by using their own resource people in implementing all aspects of CBTC has often lead to unacceptable targets in Meru County Community Tuberculosis response [6].

Globally, Community Health Volunteers (CHVs) are recognized as an important aspect in addressing the critical shortage of human resource for health [3]. Community Health Volunteers who manage patients at the community level, reside within the community and receive a stipend for the work done during the households visits [11].



They have limited training, mainly in-service often provided by health care provider and partners who work within the communities [2]. The concept of Community Based Health Volunteer system has gained its popularity in developing countries to overcome the increasing demand for health care services and the shortage of formal health care providers [4].

In line with the Alma Ata declaration of Primary Health Care Concept (PHC), all community health strategies designed must address community needs at the local level and be led by the community members themselves. They should believe that health problems cannot be solved by distance policymakers and health planners but, require the involvement of communities to mobilize local resources for optimal health [1].

Community Health Volunteers have been major players in the implementation of primary healthcare since the 1980s. They still continue to play a major role in mobilizing communities in taking care of their health, while providing basic healthcare at community level. To enable CHVs be more effective and efficient, there is need for appropriate training, not only in community mobilization but also in the assessment of health-related issues, and identification of appropriate actions at that level [5].

More to that, Community Health Volunteers play an important role by extending a helping hand to the health care system through intensive health education, community outreach, supporting high risk groups especially those with multi-drug resistance tuberculosis and administering of tuberculosis treatment at the household level [10,13]. However, the services they offer are rarely recognized in the health care system.

In Kenya, Community Health Volunteers are arguably some of the most important and useful cadres of health service providers because:

1. They live within the community and regularly interact with the community members that they serve.
2. They gather data at the community level. The data they collect is used to make decisions at higher levels.
3. They complement the low ratio of doctors to patients/clients especially in Sub-Saharan Africa.

4. They live within the community and regularly interact with the community members that they serve.
5. While they carry out the household visits, they have a firsthand opportunity to pick up on issues being faced by the community and addressing them early enough before they get to a point of care and treatment.
6. Community health volunteers generate data at the lower level which feeds to the facility, sub County, County and national level health information systems. Their data is used to make informed decision on health priorities or focus [7].

Problem Statement

In Kenya, Community Based Tuberculosis Care was launched officially in 1994 with the introduction of Community Health Volunteers in order to facilitate case finding, case holding and health promotion activities at the community level in collaboration with the ministry of health [6].

The concept had been in place for a very longtime but lack of community involvement and participation during the development had contributed to little understanding of the critical role the community was supposed to play in order to increase effectiveness of CBTC. More so, lack of meaningful involvement of affected communities in implementing all aspects of CBTC had often lead to unacceptable targets in county TB response[12].

Justification

Effectiveness of Community Based Tuberculosis Care should be centered on patient based approach which is acceptable culturally instead of adopting a central theme which is standardized for all patients all over the world. The choice of treatment caregiver and other related factors to treatment should be suitable with the region and cultural context of the community set up.

Capacity building at the community level will empower the community and individual household will take responsibility of their own health. Based on the available data the disease burden still remains high and there was a gap in case detection and treatment outcome which was below the set WHO standards of 70% and 88% respectively.



The findings and recommendations of the study will enhance acceleration of combating TB in order to achieve Sustainable Development Goals (SGD) target 3.3 which states that by year 2030 it will end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.

Significance of The Study

The findings of the study will help the Ministry of health managers through community members, partners and service providers of the program to improve Community Based Tuberculosis Care activities.

Broad Objective

To assess the effectiveness of household visit by community health volunteers on community based tuberculosis care in Meru County, Kenya.

Specific objective includes:

- Demographic characteristics of the study respondents
- Role of community health volunteers that influenced effectiveness of community based tuberculosis care

Materials and Methodology

The study was a descriptive cross sectional study designed to collect quantitative data on effectiveness of Community Based Tuberculosis Care. The study was carried out in Imenti South and Imenti Central Sub-counties which are high burden tuberculosis control and low burden tuberculosis zone in Meru County over a period of 3 months from March 2018 to May 2018. Ethical approval was sought from Meru University ethical review committee. Permission was also sought from County health managers and individual respondents.

Study Area

The study was conducted in Imenti South and Central, Meru County health facilities implementing Community Based Tuberculosis Care. Meru County is located on the Eastern slopes of Mt. Kenya. It shares its border with five other counties which includes: Isiolo to the North, Nyeri to the South West, Tharaka Nithi to the South West and Laikipia to the West. It covers an area of 6,936 square kilometres; with a population of 1,365,301 people (KNBS, 2009).

The mapped area of the study was Imenti South and Imenti central Sub-counties which are high burden and low burden TB control zones respectively.

Study Population and Sample Size

The target population was tuberculosis patients attending health facilities implementing Community Based Tuberculosis Care in Imenti South and Imenti Central, Meru County, Kenya and had resided in the area for more than 6 months. The sample size was calculated using Fisher et al, (1998) formula.

$$n = z^2 pq = 1.96^2 \times 0.5 \times 0.5 = 384$$

$$\frac{\quad}{d^2} \quad \frac{\quad}{0.05^2}$$

Where n = sample size.

Z^2 = coefficient of interval, 1.96

q = 0.5.

d = margin of error, 0.05.

P = 0.5

Sample size was 384

The population of the patients registered under TB program in Meru county was 3,358 (NTLD, 2013)

Since the target population is 3,358 which is less than 10,000 correction formula by Mugenda and Mugenda, 2003)

$$nf = \frac{n}{1 + \frac{n}{N}}$$

Where nf = the desired sample size (when the target population is less than 10,000).

n = the minimal sample size by (fisher et al, 1998)

N = the estimated of the population size

$$nf = 384$$

$$\frac{\quad}{1 + 384}$$

$$\frac{\quad}{3358}$$

$$nf = 345.$$



Sampling Method

Multi-stage sampling method was applied. Since majority of the health facilities involved with community based tuberculosis care were government facilities(60%) in both tuberculosis control zones, 40% mainly faith based facilities. In order to cover for the population that did not utilize government facilities, at least one faith based facility was included in each tuberculosis control zone (SPA,2010).

At the TB control zones, level twelve health facilities were selected using simple random sampling

method. A table of random numbers was used to draw the number of health facilities in both government health facilities and faith based health facilities respectively. Six health facilities were selected from both high volume TB control zones and low volume TB control zones respectively. Proportionate sampling was used to identify the number of respondents to participate in each facility as shown in (*Table 1.*)

At the facilities respondents were identified using simple random sampling method using the patient register at the facility level as the patients came for re-supply of drugs.

Table 1: Sample Size

Health Facility	Sampling Frame	Sample Size
Imenti South		
Kanyakine Hospital	155	65
Consolata Hospital	205	86
Mitunguu health Centre	120	50
Kirogine Dispensary	20	8
Nkubu G.K Dispensary	35	15
Kieni Kia Ndege Dispensary	15	6
Imenti Central		
Githongo Hospital	50	20
Gatimbi Health Centre	07	44
Kaongo Dispensary	32	13
Mujwa Dispensary	21	9
Cottolengo Hospital	62	25
Kijja Dispensary	10	4
Data source annual report , 2017.		

Data Collection Procedures, Analysis and Management

Semi-structured pre-tested questionnaire were used to collect data on effectiveness of community based tuberculosis care the data collected during the

study was analyzed using SPSS version 24.0 and STATA version 13.0 statistical packages. The research study findings were presented using tables and figures.



RESULTS

4.0 Demographic Characteristic of The Respondents

Overall 345 respondents were recruited to participate in the study. Majority of the respondents were males 267(77.4%) and only 78(22.6%) were females.

Most of the respondents were residing in rural areas 240(69.75%) and only 105(30.25%) of the respondents were residing in peri-urban areas as shown in *Table 4.1*

Table 4.1: Demographic Characteristics of The Respondents

Variable	Frequency (n=345)	Percentage (%)
Gender		
Male	267	77.4
Female	78	22.6
Area of residence		
Rural	240	69.75
Peri-urban	105	30.25

4.1.1 Age Distribution of The Respondents

The mean age group of the respondents was 37.12 years, with a median of 35.0 years and a standard deviation of 12.488. Most of the study respondents were

aged between 18-36years, 195(56.5%). The rest were aged 36-50 years, 103(29.9%) and those aged 50 years and above were 47(13.6%), as shown in *Table 4.1.1*

Table 4.1.1: Age Distribution of The Respondents

Variables	Frequency n= 345	Percentages (%)
Age in complete years		
18-36	195	56.5
36-50	103	29.9
50+	47	13.6

The role of Community Health Volunteers (CHVs) is essential for the effectiveness of community based tuberculosis care. Household visit by CHVs helps in health education, screening of a family members and referrals for those with signs and symptoms of TB. The

households which were visited by the CHVs after one month of initiation of treatment were 142(41.2%) but 203(58.8%) were not visited by any CHVs. Majority of the respondents 334(96.8%), were satisfied with the quality of health education offered by the CHVs during



household visits at the facility level. Only a minority 11(3.2%) felt that, the quality of health education offered by CHVs was below their expected standards. Majority of the respondents 233(67.5%) were aware of Community Based Tuberculosis Care services in their communities and only 112(32.5%) had never heard of any Outreach Community Based Tuberculosis Care

services in their community. The frequency of outreach services was annually, especially on the National TB day 207(88.9%) out of 233 respondents. 19(5.5%) said they had quarterly outreach services and only 7(3.0%) had outreach services on monthly basis, as shown in (Table 4.2.)

Table 4.2: Role of Community Health Volunteers

Variables	Frequency (n=345)	Percentage (%)
Household Visit		
None	203	58.8
After a month	142	41.2
Quality of Health Education		
Disagree	11	3.2
Agree	334	96.8
Outreach		
Yes	233	67.5
No	112	32.5
Frequency of Outreach		
Monthly	7	2.0
Quarterly	19	8.1
Yearly	207	88.9

The participants whose household were not visited by CHVs showed that community based tuberculosis was more effective (OR –1.0) compared to those household visited by CHVs after a month of initiation of TB treatment (OR- 0.65) at a confidence interval of 95% (CI 0.41-1.01).The role of CHVs its

effects showed there was no strong association at p-value. 0.055 at a confidence interval of 95%.

Community Based Tuberculosis was less effective to those who agreed that, quality of health education offered was good (OR- 0.52) at confidence interval of 95% (CI 0.03-1.78).



Community based tuberculosis was more effective to those who did not have outreach services (OR-1.57) at a confidence interval of 95% (CI 0.99-2.48). The association between outreach services and effectiveness of community based tuberculosis was not strong at p-value 0.055.

The effectiveness of community based tuberculosis care increased with the frequency of outreach services.

Having Outreach services on monthly basis was more effective at OR -1.00 compared to quarterly and annually at OR -0.29,OR-0.21 respectively at a confidence interval of 95% (CI 0.04-1.90). There was no association between frequency of outreach services and effectiveness of community based tuberculosis care at p-value 0.197 and p-value 0.065 for quarterly and monthly respectively, as shown in (**Table 4.3**) next.

Table 4.3: Role of Community Health Volunteers and Effectiveness of Community Based Tuberculosis Care

Variables	Effectiveness		OR	95% CI		P-value
	Fred/%			Lower	Upper	
	Yes	No.				
Household Visit						
<i>None</i>	84(43.3)%	115(56.7)%	1.00	REF		
<i>After a month</i>	47(33.1)%	95 (66.9)%	0.65	0.41	1.01	0.055
Health education						
<i>Disagree</i>	6(54.5)%	5(45.5)%	1.00	REF		
<i>Agree</i>	129(38.6)%	205(61.4)%	0.52	0.03	1.78	0.295
Outreach						
<i>Yes</i>	83(35.6)%	150(64.4)%	1.00	REF		
<i>No</i>	52(46.4)%	60(53.6)%	1.57	0.99	2.48	0.055
Frequency						
<i>Monthly</i>	5(71.4)%	2(28.6)%	1.00	REF		
<i>Quarterly</i>	8(42.1)%	11(57.9)%	0.29	0.04	1.90	0.197
<i>Yearly</i>	71(34.3)%	136(65.7)%	0.21	0.04	1.10	0.065



Discussion

Community Based Tuberculosis Care delivery for TB treatment could be feasible and effective for case detection and treatment if community healthcare workers are familiar with the community mapping and have community members' trust which healthcare officials have to develop.

Moreover, a community based approach helps empower each community to deal with its own problems and also provide patients with a greater degree of autonomy and satisfaction with the treatment regime [12].

Community Health Volunteers play a very crucial role in reaching out to the community members at the household level during the course of treatment. The study findings shows that, 203(58.8%) of the respondents' household were visited by a community health volunteer during the course of treatment in order to screen other household members for TB and refer those with signs and symptoms to the facility. These findings collaborate with a study done in Western Kenya where 240(85.71%) were visited by community health volunteers [9].

The Community Health Volunteers play an effective role in creating awareness about TB at the community level. The study findings showed that 334(96.8%) of the respondents who received health education from the volunteers were satisfied with the quality of knowledge they received. These findings corroborate with a study done in Bungoma which reported that, 246 (86%) of the respondents were satisfied with the quality of the health education given to them [9].

In addition, a qualitative study done in Western province reported that, CHVs provide adequate health education during household visits and relay relevant information about the disease [8].

Community Health Volunteers played a very significant role in promoting primary health care services while creating awareness on Community Based Tuberculosis Care through outreach services in remote areas. The study reported that, frequency of household visits had improved the effectiveness of CBTC. These findings collaborated with a qualitative study done in the same region earlier which had

made regular household visits an improvement to health care results of the patients [8].

Conclusion

Community Health Volunteers can help bridge the gap between community and health care systems. Community Health Volunteers play an essential role in promoting primary health care and create awareness on Community Based Tuberculosis Care through outreach services in remote areas.

Training of more Community Health Volunteers on Community Based Tuberculosis Care can help reach more household members to create awareness of TB.

Periodic refresher training for Community Health Volunteers can help improve the quality of services they get and give.

Recommendations

Strategies of retention of Community Health Volunteers should be put in place to ensure sustainability and continuity.

Training of community health volunteers involved in community activities on basic modules of CBTC to be improved for effectiveness.

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Author's Contribution

Jane K. Mberia; study conception and implementation, data collection, data entry, data analysis and interpretation manuscript drafting.

Robert M. Kei: study conception and implementation, read and approved the manuscript for publication.

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