Role of Health System Practice on Performance of Community Health Workers in Lurambi Sub-County, Kenya

Wachuga James Ndaraiya[1], Cholo Wilberforce[2]

[1]*Kakamega County Public Health Office, Kenya*
[2]*Department of Public Health; Masinde Muliro University of Science and Technology, Kenya*

Abstract: - The use of community health workers has been identified as one strategy to address the growing shortage of health workers, particularly in low income countries. Evaluation of community health workers 'performance in general, is the focus of much attention at this time, as many countries invest in them as a strategy for the achievement of the sustainable development goals. The effectiveness of Community Health workers (CHWs) has been demonstrated in some studies for example, a CHW programme in India resulted in significant reduction of low birth weight, preterm births and neonatal sepsis. Understanding health system practice and policies context in which CHW interventions operate is an important precondition for the design of successful interventions. The implementation of the CHWs concept in Kenya is marked by unanswered questions of long term sustainability and program effectiveness. Despite the vast experience of CHWs the burden of disease continues to increase in magnitude and diversity and relatively little scientific evidence is available to answer basic questions notably the role of health system factors on the performance of CHW. The objectives of the study were to determine demographic factors in relation to CHWs Performance at level one and to assess the influence of health system practice and policy on the performance of CHWs in Lurambi sub-county. A descriptive Cross sectional design using both quantitative and qualitative data collection methods were used. Using systematic sampling, structured questionnaire was administered to a sample of 195 community health workers. Qualitative data were collected from community health management team (CHMT), clients (households) and community health extension workers (CHEWs). Data were analyzed using descriptive statistics to obtain frequencies, mean and standard deviation while inferential statistics were computed using regression and correlation. The majority of the participants 135 (69.2%) were females (88.7%) married, and 93.8% were Christians. Gender was statistically significant in relation to the performance of CHW in delivery of level one of health services (χ^2=11.0; p=0. 04).All the key targets of CHWs Performance at level one rated below average in Lurambi Sub County (number of 51 households visited 40%, number of Baraza's 35%, health education 28% and referral of patients 23%) while the target of attending CHW meetings rated lowest at 19%. Financial constraints (85%), lack of supplies (82%), lack of transport (65%), inadequate support (85%) and lack of supervision were highlighted by the respondents as daily challenges.

Key words: Community Health Worker, Lurambi, Health System, Extension worker

I. INTRODUCTION

Countries across the globe are striving to achieve universal health coverage. There is a massive shortage of 4.25 million health workers in Africa and Asia, while the distribution of existing health workers within countries is inequitable. The principle of Primary Health Care (PHC) was introduced in the Declaration of Alma-Ata.[1] PHC had already been promulgated for over three decades as a global strategy for ensuring essential health care for all people. The 2006 World Health Organization report recognized shortages of professional health workers as one of the key ingredients in the growing crisis of providing health services, particularly in low income countries.[2]

The severe healthcare worker shortage in many parts of the world is among the barriers that need to be addressed to improve primary health services.[3]

The global policy of providing primary level care was initiated with the 1978 Alma Ata Declaration. The countries signatory to the declaration considered the establishment of a Community Health Worker (CHW) programme as synonymous with the primary health care (PHC) approach. Shortages in human resources for health and evidence that CHWs can significantly contribute to the health of the population by effectively delivering key interventions in primary and community health care have led to a renewed interest in CHW programmes in Low and Middle Income Countries (LMICs).[4] Community Health Workers (CHWs) can make a valuable contribution to community development, and more specifically can improve access to and coverage of basic health services to communities. The use of CHW has also been one of the strategies to 2 address the shortage of health workers, particularly in low income countries.[5] However, the review by[6] showed that although there are some trends, global generalizations about the performances of community health workers are difficult as the topic area and program profiles, structures, focus areas and implementation arrangement are extensive and diverse. The role of CHWs in sub-Saharan Africa has evolved over time in response to changing health care priorities, disease burdens and shortages of human resources for health (Health Systems Report, 2008).[7]The Health Systems Report[8] further demonstrate that

evidence on CHWs from Gambia, South Africa, Tanzania, Zambia, Madagascar and Ghana were not only cost-effective, but enhanced the performance of community level health programmes. Kenya, like many countries in sub-Saharan Africa, suffers from a critical shortage of health care workers. Kenya has responded to the shortage by developing the Kenya Community Strategy for Health MOH[9] a strategy that utilizes lay volunteers CHWs as the foundation for promoting behavior change through health education, earlier case identification, and timely referral to trained health care providers. In choosing this approach Kenya builds on evidence that task sharing is both possible and effective in promoting health behaviors at the community level[10] In Kenya, CHWs play a big role in enhancing primary health care services including family planning services. The majority of CHWs in Kenya had been trained by non-governmental organizations (NGOs) in the context of primary health care from the early 80s. However, there has been minimal government support and recognition for this mainly to NGOs.

The commitment to improve community based health interventions was made with the establishment of the Community Strategy during the implementation of Strategic Plan 113, 2005-2010 whose objective was to provide health care services for all life cohorts and socio-economic groups at household and community level. The community strategy places the CHWs as the first level of health care providers. Their main activities include health promotion, disease prevention and provision of basic health care services including Family Planning in the community. CHWs form an entry point into multiple social networks, networks that are essential in order to build the requisite trust and momentum for any type of change in health behaviors.

The sub county has 120 Health Workers.

II. MATERIAL AND METHODS

Study Area

Lurambi Sub County is in the Southern part of Kakamega County and among the twelve sub counties, it has approximate population of 1,808,072 according to 1999 o population census. The sub county is sub divided into two divisions that is township and Lurambi division. It has six wards namely, Shieywe, Shirere, Mahiakalo, Central Butsotso, South Butsotso and the East Butsotso. The main crops in the sub county are finger millet, sorghum, maize, cassava, beans. Maize is the staple food. The temperature ranges between $180^{o}C$ and $290^{o}C$. The sub county has 32 health facilities, County Referral Hospital, Two Health Centres, 29 dispensaries. The sub county has 120 Health Workers.

Research design

Research design refers to the way a study is planned and conducted. It entails choosing the subjects who participate in the study. The techniques and approaches for collecting data

for the subject and the procedures.[11]The study was descriptive research design. According to Kothari, descriptive research is used when the problem has been well designed. On the quantitative dimension, structured questionnaires were used to survey, socio-cultural, health system, economic and environmental factors. The approach was considered most appropriate for the study because of its ability to elicit a diverse range of baseline information.[12] On the qualitative dimension, key informants interviews was obtained from opinion of the DHMTs, public health officers, CHEWs and clients (community) on the determinants affecting their performance. The approach was used because of its ability to elicit in-depth opinion that qualified quantitative data source from the CHWs.

Target Population

The target population for this study constituted of community Health Workers in Lurambi Sub County. There are approximately 400 Community Health Workers in Lurambi Sub County. There are 80 CHWs in Shieywe ward, 80 in Sichirai, 30 in Mahiakalo, 80 in Butsotso Central, 80 in South Butsotso and 50 in East Butsotso

Sample size determination

The sample size was calculated using a formula for determining sample size for single population not exceeding 10,000 as used by fisher et al as explained by.[12]

To determine the sample size

$$n = \frac{Z^2pq}{d^2}$$

Where; n = desired sample

Z = standard normal deviation at the required confidence level.

(Usually set at 1.196).

p = the proportional of the CHW practicing.

q = characteristics of no interest 1-p

d = the level of statistical set usually at (0.05)

$$=. \quad \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} \quad = \frac{1.96 \times 1.96 \times 0.5 \times 0.5}{0.05 \times 0.5}$$

$$= \quad \frac{0.9604}{0.0025} = 384.16$$

Therefore, 384 was the calculated sample size. But because the target population was less than ten thousand that is 400CHW, the above formular was used where the population is greater than 10,000, therefore, the below formular used to determine the sample size.

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

Where,

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

n = desired sample size (when the population is more than 10,000)

N = the estimated population target.

1 = a constant

Therefore

nf $=$ $\dfrac{n}{1+\left\{\dfrac{n}{N}\right\}}$

$= \dfrac{384}{1+\dfrac{384}{400}}$

$= \dfrac{384}{1+0.96}$

$= 195$

Sample techniques and procedure

Sampling is the that part of a statistical practice which concerns the selection of individual observations intended to yield some knowledge about a population of concern, especially for the purposes of statistical inference.[13]

The most straight forward type of frame is a list of elements of the population preferably the entire population with appropriate contact information. According to Kothari (2006),[14] sampling provides a valid alternative to a whole population because surveying an entire population may lead to budget, time constraints and delay result analysis. All CHWs in sub-county were stratified into three (3) strata as per the wards. Thereafter a stratified simple random selection was done from each stratum.

The 195 Community Health Workers in six wards with forty (40) community units were selected through cluster samplings. Systematic sampling method was used to identify the respondents.

A systematic sampling was applied to every 2nd CHW. A register of CHWs was obtained from the DMOHs office. The respondents were distributed per the 6 wards

$$\dfrac{195}{6} = 33$$

33 CHWs were derived from a register at randomly selected.

A table of random numbers was used to identify the 1st respondent and thereafter every 2nd CHW from the register was interviewed until 33 respondents per ward.

Table 1: Sampling Criteria

No.	Ward	Trained CHW	Selected Sample size	Sampling interval
1	Shieywe	80	33	2
2.	Shirere	80	33	2
3.	Mahiakalo	30	33	2
4.	Butsotso Central	80	33	2
5.	South Butsotso	80	33	2
6.	East Butsotso	50	33	2
	TOTAL	400	195	12

Research Instruments

Primary data was collected by using structured questionnaires with open and close ended questions which was written in English.

Questions were asked on socio demographic characteristics whereby age, marital status, and level of education was gathered from the respondents, then information on performance related factors was corrected through structured questionnaires whereby respondents were asked on the social –cultural , and environmental, and economic, and heath system factors.

Pilot Study

According to,[15] a pilot study is often defined as a smaller version of a proposed study, and is conducted to refine the methodology. A pilot study allows the researcher to test the prospective study and is done on a small number of people having characteristics similar to those of the target respondents. The pilot study helped to identify possible problems in the proposed study and allowed the researcher to revise the methods and instruments before the actual study, in other words to improved the success and effectiveness of the study (De Vos et al 2005). The pre test questionnaires were administered to 6 nurses and 65 clinical Officers in Shieywe ward. After pre-testing the tools, data was collected and reviewed and where necessary modifications were made.

Validity

Validity refers to the degree to which an instrument measures what it is supposed to be measuring. In other words, a valid instrument actually measures the concept it is supposed to measure[16] three main approaches for assessing the validity of instruments designed to collect quantitative data are content validity, criterion-related validity and construct validity. In this study, construct and content validity was used to assess the validity of the instruments by means of assessing the adequacy, appropriateness, inclusiveness and relevancy of the questions to the subject under study was assessed. Expertise of the supervisor and professionals from the medical field was sought to judge whether or not the instruments reflects the known content and it was found to measure to standard.

Reliability

According to[16] ―reliability is the consistency with which the instrument measures the target attribute‖. This means that administering the same instrument by various researchers will provide the same results under comparable conditions.[17]*Reliability* of an instrument can be equated to clarity, quality, stability, consistency, adequacy and accuracy of the measuring tool.[18]

According to Garson (2006a:1) reliability can be estimated in one of the following four ways which is *internal consistency*, *split-half reliability*, *test-retest reliability* and *inter-rater reliability*. In this study, reliability of the instruments will be tested by means of the Cronbachs (Alpha).

Alpha which is the most common means of testing internal consistency of the items, using the SPSS package. Internal consistency reliability refers to the extent to which all the sub-parts of an instrument will measure the identified attributes. By rule a lenient cut-off of .60 is common in exploratory research; the alpha should be at least .70 or higher to retain an item in an adequate scale.[19]

Data Collection Methods

i. *Structured Interview questionnaire*

The quantitative data was collected using a structured interviewer guide administered to CHWs. The guide covered sections on socio-cultural factors, health system factors, economic factors as well as environmental factors. The interviews were conducted informally in a relaxed atmosphere. The research assistants checked the questionnaire for consistency from the responses at the end of each day,

ii. *Focused Group Discussions*

Qualitative data was collected from random selected household to validate the information from CHWs and confirm services rendered to the community. This was captured the client satisfaction on the services offered by CHWs. FGD was held in a private setting to facilitate freedom of expression.

iii. *Key Informant Guide*

This tool was used for key informants who included community Health Extension Workers, One District community strategy focal person DHMT members include information on cultural and economic factors influencing provision of health services offered by CHWs.

Data analysis

The quantitative data was cleaned, entered into a computer, coded and analyzed using statistical package for social scientists (SPSS) version 20. The results were presented descriptively and inferentially using frequency distributions and percentages. Tables and bar charts were used in data presentations while inferential statistics was computed.

Qualitative data was analyzed using R statistical package version 3.4.3 to determine performance of CHWs.

Ethical Considerations

The researcher observed ethics in the process of data collection and presentation. The researcher explained the purpose and objective of study to respondents. The data collection tools was administered in a conducive environment. The respondents were assured of total confidentiality and that the information collected will only be for research purpose.

III. RESULTS

Demographic characteristic of the respondents

The total number of CHWs interviewed was 195.The demographic characteristics of the study population are as shown in Table 1

Table 1: Demographic characteristics of respondent (n=195)

Characteristics	No. (n)	Percentage (%)
Age		
<20 yrs	None	0
20 – 29 yrs	25	12.8%
30 – 39 yrs	65	33.3%
40 – 49 yrs	75	38.5%
>50 yrs	30	15.4%
Gender		
Male	60	30.8%
Female	135	69.2%
Marital status		
Single	None	0
Married	173	88.7%
Widowed/separated	22	11.3%
Education		
Primary	54	27.7%
Secondary	133	68.2%
Tertiary	8	4.1%
Religion		
Christian	183	93.8%
Muslim	12	6.2%
Hindu	None	0
Indigenous	None	0
Occupation		
Business		
None		
Farmer	23	11.8%
Employed	172	88.2%
Independent	149	76.4%
Supported by families	46	23.5%
Monthly Income		
<Ksh. 2500	126	64.6%
Kshs. 2501 – 5500	40	20.5%
>Ksh. 5501	29	14.9%

The median age for CHWs was 35years (IQR30-39). None of the respondents were less than 20 years and over 50 years had 15.4% (30) while the age bracket of 20-29, 30-39 and 40-49 were 12.8%, 33.3% and 38.5% respectively. The majority of the study participants 135 (69.2%) were females and on marital status, 173 (88.7%) were married, none were single

while 22 (11.3%) were either widowed or separated. 183 of the respondents (93.8%) were Christians while Muslim, Hindu, and the Indigenous were minority 12 (6.2%), 0 (0%), and 0 (0%) in descending order. In education, 133 (68.2%) had completed secondary education while 54 (27.7%) had completed primary and Only 8 (4.1%) had tertiary education. None of the respondents were employed, among the non-employed 11.8% were business people and 88.2% were farmers. While the majority of the respondents were independent, a significant 46 (24%) of the respondents were supported by their families. Most respondents 126 (64.6%) earned a monthly income less than Kshs. 2500, 20.5% earned between Kshs 2501 to Kshs. 5500 and only 14.9% earned above Kshs. 5501 as shown in figure 1 below.
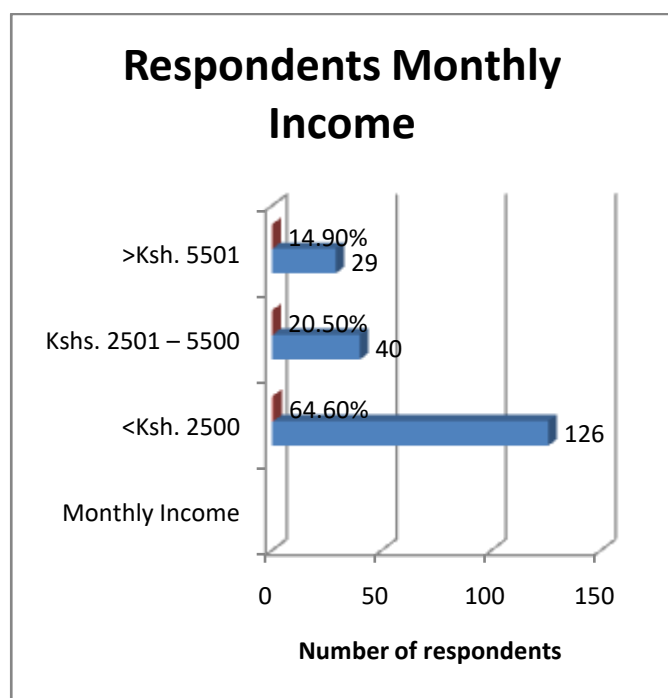

Fig .1

Demographic factors in relation to CHWs Performance at level one

The demographic characteristics were determined by age, gender, level of education, occupation, income and source of income, marital status and religion. Gender was statistically significant in relation to the performance of CHW in delivery of level one of health services (χ^2.1623, df=1, p=0.1414). Only 18 (30%) male respondents were associated with high performance compared to 26 (19%) females Figure 1.

There was no association in respondent's average monthly income ($\chi2$=6. 0384 df=4, p=0. 1963) and performance with majority CHWs who earned between 3501-4500 being associated with non-performance (P<0.045).

Table 2: Association of selected demographic factors with performance of CHWs

Demographic Factors	Performance (n=195)		Bivariate analysis	
	Yes n (%)	No n (%)	OR	P value
Age				
<20yrs	0	0	0	0.000
20-29 yrs	13 (52)	12(48)	747	0.012
30-39yrs	24 (37)	41(63)	3.47	0.075
40-49yrs	29(39)	46(61)	1.597	0.050
>50 yrs	10 (33)	20(67)		0.038
Gender				
Male	18 (30)	42 (70)	0.289	0.228
Female	26 (19)	109 (81)		0.000
Marital status				
single	0	0		
married	81 (47)	92 (53)	1.272	0.403
widowed/separated	9 (41)	13 (59)		0.0438
Education				
Primary	19 (35)	35(70.3)	0.626	0.029
Secondary	50(39.7)	76(60.3)	0.477	0.021
Tertiary	6 (24.0)	19 (76.0)		0.009
Religion				
Christian	68 (34.2)	131 (65.8)	0.513	0.000
Muslim	7 (50.0)	7 (50.0)	0.257	1.000
Occupation				
None	28 (31.5)	61 (68.5)	1.576	0.000
Business	28 (35.9)	50 (64.1)	1.169	0.013
Employed	6 (33.3)	12 (66.7)	1.333	0.157
Farmer	16 (40.0)	24 (60)		0.206
Source of income				
Salaried	4 (28.6)	10 (71.4)	1.273	0.109
Farmer	14 (22.2)	14 (77.8)	1.724	1.000
Self employed	31 (32.9)	64 (67.1)	1.250	0.691
Casual labor	27 (47.4)	30 (52.6)	2.096	0.008
Family support	12 (29.3)	29(70.7)		
Average monthly income				
<2500	44(34.9)	82(65.1)	1.510	0.001
2500-3500	13(40.6)	19(59.6)	1.239	0.289
3501-4500	6(19.4)	25(80.6)	4.775	0.001
4501-5500	8(53.3)	7(46.7)	0.506	0.796
>5500	7(33.4)	14(66.7)		0.127

The influence of health system factors in CHWs performance

The study also sought to determine health system factors that influence performance of CHWs in the delivery of level one health services. These factors included training, type of training, period of training, supplies, seminars as refresher courses, support supervision, payments as rewards and use of feedback information. Type of training ($\chi2$=0.043, df=1, p=0.835) in general had no statistical significance to performance as shown in table 3. The period of community strategy training was statistically significant ($\chi2$=6.502, df=2, p=0.039) to performance. Refresher course ($\chi2$=7.087, df=4, p=0.131) and period of refresher ($\chi2$=5.22, df=3, p=0.156) were not significant.

Table 3: Health system factors in relation to performance (n=195)

Factors	Performance of CHWs(n=195)		Bivariate analysis
Yes (%)	No (%)		χ2 df P
Day of CHWs training 2wks	140 (72)	55 (28)	6.502 2 0.039
Refresher course HBC PMTCT TB Malaria Case management	166(85) 160 (82) 146 (75) 160(81)	29 (15) 35 (18) 34 (25) 35 (19)	7.087 ; 0.131
Period of refresher <1wk >1wk	148 (76) 164 (84)	47 (24) 31 (16)	5.222 ; 0.0156

Information is power therefore this study looked at how the CHWs write reports, the reporting structure, period of reporting, feedback reports and how the CHWs use the feedback information in relation to the performance of CHWs in the delivery health service at level one. Majority of the community health workers (80%) wrote reports. There was no statistical significance with report writing ($\chi2=3.180$ df=1, p=0.075), reporting structures ($\chi2=5.291$, df=4, p=0.259), means of reporting ($\chi2=8.871$, df=5, p=0.114) period of reporting and feedback reports but how the CHW applied the feedback information was significant ($\chi2=12.429$, df=3, p=0.006).

Table 4: Reporting in relation to performance (n=195)

Factors	Performance of CHWs (n=195)		Bivariate analysis
	Yes (%)	No (%)	χ2 P
Report writing Yes	156 (80)	39 (20)	3.180 ; 0.075
Reporting structure CHEW Health facility All the above	185 (95) 170 (87) 162(83)	10 (5) 25 (13) 33 (17)	5.297 ; 0.259
Feedback reports Yes No	119(61) 23 (12)	76 (39) 172 (88)	9.442 ; 0.017

The other health systems factors including supplies ($\chi2=0.335$, df=1, p=0.563), received supplies timely($\chi^2=2.286$, df=2, p=0.319), payment reward($\chi^2=0.490$, df=1, p=0.484), were not statistically associated with the performance of CHWs while supervision ($\chi^2=7.610$, df=4, p=0.0107) and frequency of supervision ($\chi^2=6.91$, df=4, p=0.02) were statistically associated with the performance of CHWs (table 4.).

Table 5: Health System Factors and CHW Performance

	Performance (n=195)		Bivariate analysis	
	Yes n (%) *(%)	No n	OR	P value
Type of Training as CHW Trained Not trained	71 (36.4) 7 (3.6)	124 (63.6) 188 (96.4)	0.680	0.604
Seminar as refresher Hbc Pmtct Rh Disability No refresher	12(61.5) 40 (20.5) 2(1.03) 2(1.03) 10 (5.12)	183(38.5) 155(79.5) 193(98.9) 193(1.03) 185 (94.8)	1.691 1.879 1.240 0.620	0.304 0.129 0.814 0.576
Supervision per month None Once Twice Thrice	29 (15) 150 (77) 70(36) 27(14)	166(85) 70(23) 125(64) 168(86)	1.746 1.182 2.187 1.570	0.495 0.836
Payment Salary Stipend allowance	0 107 (55)	0 88(45)	0.29	0.677 0.566
Received any Supplies Yes No	53 (27) 70 (36)	142(73) 125(64)	1.801	0.233
Reporting Daily Weekly Monthly and plus None	0 0 187 (96) 0	0 0 102 (8) 0	1.168 0.145 0.394	0.898 0.089 0.260
Feedback use Planning gaps All the above None	156 (80) 3719) 60 (31)	39(20) 158(81) 135 (69)	0.689 0.727	0.689 0.672

One twenty three (55%) of the CHWSs were trained by ministry of health while (102) 45% by NGOs. There was no significant relationship between ($\chi2=1.917$, df=2, p=0.383) the person who trained the respondent and respondents' performance with 76 (62%) and 70 (69%) among those trained by G0K and NGOs not performing respectively as shown in table 6.

Table 6: Training in relation to performance (n=195)

Characteristics	Performance of CHWs (n=195)		Bivariate analysis
	Yes No		χ2 df P
Training GoK NGOs	59 (30) 137 (70)	136 (70) 58 (30)	1.505; 1 0.220

Most 194 (86%) of the respondents said they accepted to be CHWs to help the community, 8 (4%) forced by community, 6 (3%) enticed by family members and 14 (6%) fancied the medical profession. One hundred and thirty one (58%) of the respondent reported the training is not adequate and 73 (32%)

requested that the training period be increased, another (71) 32% requested the training contents be enhanced while a significant (51) 22% requested for more refresher courses and (30) 13% urged for training on basic curative services training to enable them offer basic care as first aid**.** There was no significant association in respondents requested area of training ($\chi2$=0.844, df=3, p=0.839); training adequacy ($\chi2$=4.607, df=2, p=0.100) and performance.

Table 7: Areas of training in relation to performance (n=195)

Characteristics	Performance of CHWs (n=195)		Bivariate analysis		
	Yes	No	$\chi2$	df	P
Training Training duration Content of training Curative services Refresher course	10 25 20 7	185 170 175 188		0.844 3 0.839		

Table 8: Overall CHWs Performance at level one in Lurambi Sub County (n=195)

Targets	Performance in percentage (%)	
	Yes	No
Overall performance of CHWs'	146 (75%)	49 (25%)
Achieved targeted HH to visit	78 (40%)	117 (60%)
Held expected no. of *Baraza's*	68 (35 %)	127 (65%)
Conducted expected no. of health education	55 (28%)	140 (72%)
Referred expected no. of patients	45 (23%)	150 (77%)
Attended an expected number of CHW meetings	37 (19%)	158 (81%)

165 of the respondents understood their roles clearly and among this group, 15% (30) did not perform. A Significant (72) 22% of the respondents were not satisfied with CHW work. On the other hand 123 (18%) were satisfied. Financial constraints (85%), lack of supplies (82%), lack of transport (65%), inadequate support (85%) and lack of supervision were highlighted by the respondents as daily challenges. Constraints had no statistical significance ($\chi2$=302.56, df=4, p=2.2e-16) in relation to performance, with 15% of those who lacked supervision only performing as shown in table 9

Table 9: Chi-square values of constraint parameters with performance (n=195)

Characteristics	Performance of CHWs (n) (%) All (n=195)		Bivariate analysis		
	Yes	No	x2	df	P
Constraints Lack of supplies lack of transport Lack of supervision Community support financial constraints	35 (18) 68 (35%) 35 (18%) 29 (15%) 166(85%)	160 (82%) 127 (65%) 160 (82%) 165 (85%) 29 (15%)	302	4	0.003

IV. DISCUSSION

Overall Performance of CHWs in the Delivery of Level One Health Services

Apparently from the study findings the performances of community health workers in Lurambi Sub County Kenya in the delivery of level one health service was below average. Against One hundred and ninety five Community Health workers (195) who participated in the study, 25% (49 CHWs) were rated as performing poorly in the delivery of level one health services. This trend of poor performance was replicated across all the community units which participated in the study. Performance rates were also poor in four level one health services per month (house hold visited, community *barazas*, CHWs meetings and number of referred patients) except overall performance of the CHWs which registered 75% performance. Since CHWs offer more preventive services such awareness during household visit and during *baraza* than curative services. According to Salmen, [20] this approach may reduce the confidence of the community on CHWs which in-turn reduce effectiveness in attaining targets of referring patients and visiting house.

Influence of Demographic factors in CHWs performance

This study found out that female CHWs, age categories of 20-29 and above 50 years, Christians were associated with better performance. Monthly income, occupation, education, years in services and source of income did not influence performance of CHWs.

Age did not affect the performance of CHWs however young individuals (20-29) and elderly CHWs (over 50 years) rated highly in performance than the middle aged. This finding on older age performance concurs with[21] in a cross sectional survey on factors influencing the performance of community health workers in Kisumu West, Kenya who concluded that older CHWs were likely to perform well. This implies that old people have no competing tasks hence are committed and are respected in the community therefore find it easy to work while young people are enthusiastic and eager to perform in the first job assignments. The middle aged CHWs are busy taking care of their young families, struggling to achieve high ambitions, address social issues and other community demands. However this contradicts with a study by[22] in Busia on Social demographic determinants of CHWs performance where CHWs aged 30-40 years were more active.

Gender was related to good performance at level one health services. Majority of the CHWs were females and were more active than males counterparts in all community units except *Silanga* and *Gitarimarigu Community unit*. This finding concurs with[24] in a systematic search of literature review of concepts, practice and policy on Community Health Workers reports that female CHW workers are able to deliver care more effectively than male workers at community level in both developing and developed countries. This is probably because females are passionate about family and children

welfare despite having many other tasks in the households and community level than males. On the other hand gender factors may facilitate the entry of female CHWs into the society since they are trusted, believed and welcomed than their male colleagues [25]. This contrasts with the Uganda study[26] which found that sex had no relationship with performance. CHW's level of education had no statistical association with CHWs performance. CHWs with tertiary education and above were less performing compared to those with secondary level of education and below. The trend was the same across all community units and divisions. This conforms to a study from Uganda which showed education is inconsequential on CHWs ability to perform[26] in studies which have explained that CHWs with higher educational qualifications have dreams for alternative higher employment and therefore their commitment may not be hundred percent. On the other hand CHWs with lower education could learn and enhance their skills in the management of common illness [27]and thereby deliver better care to the community. Therefore career prospects for CHWs and their aspirations do influence their performance. However this contrast with some studies from the Unite States of America[28] which reported a significant drop out of CHWs due to lack of career prospects. This finding implies that low literacy or illiterate community members should not be discriminated against during selection agreeing with the Sarididi study[29] in which education was not a selection criterion for CHWs. Despite marital status being not significant in relation to CHWs performance, widows and separated CHWs were more associated with performance than singles and married. This finding concurs with Ndedda, [30]in a Cross-Sectional Study in Busia District, Kenya on "Effects of Selected Socio-Demographic Characteristics of Community Health Workers on Performance of home Visits during Pregnancy" which did not find any relationship of marital status with performance. Religion was not a significant factor however CHWs who were Christians were rated better in performance than Muslims. The importance of religion was also discussed by Gilson et al., who found that, although religion was a significant factor, it was difficult to keep track of the direct role of CHWs religion in performance.[31]

Affiliation to institution nominating the CHWs for recruitment was not significant but those selected by government of Kenya performed more than those nominated by NGOs. This concurs with[32]who found in her study of the literature available in 1983 that "turn-over of CHWs is high for a number of reasons, the most important being poor selection and affiliation". Respondent's main source of income, occupation and monthly average income were not important statistically with middle income CHWs' earners associated with non performance. This can be attributed to the fact that the study was carried in urban setting where all CHW have source of income or are supported by families for their upkeep or do other tasks to supplement their livelihoods.

Role of Health Systems factors in Delivery of Level One Health Services

Training, type of training, period of training, supplies, seminars as refresher courses, support supervision, payments as rewards and use of feedback information were the variables taken into consideration in measuring this factor. Supplies elicited significant statistics with delivery of level one health services. Training and type of training in general had no statistical value in the performance of CHWs but the period of training was important. Performance increased with period of training. Those who had attended refresher courses for more than three weeks were six percent less likely to perform compared to those who had trained for more than four weeks. The argument is supported by another study done in Malawi and Uganda on non-randomized community trials.[33]Payments as an incentive to performance was not statistically significant; however stipend induced the CHWs to perform better. Two thirds of those who received stipend scored highly in the delivery of level one health services. This agrees with a WHO article ID: BLT.11.086710. Motivation was the key challenge hindering the delivery of level one service among the CHWs. However this contrasts a study in Nigeria by[34] on reasons for high CHWs turnover as due to; low salaries, lack of support for personal development and poor supervision. The issue of motivation may be the reason why CHWs scored poorly in targets requiring personnel input and scored highly in targets with public input such as health education forums.

Constant receipt of supplies had no statistical significance in delivery of level one health services with equal proportion of those who received constant supplies and those who did not, not performing. This may justify the poor rate of performance since supplies facilitate service delivery and at the same time explain why services based on knowledge dissemination are rated highly than supply based. This may be because the CHWs use home visit to deliver personal and private services while public messages are relayed through different channels. Reporting was statistically significant and the use of feedback information was. Studies for example in Columbia have also shown that "feedback and rewards from the community" are more significant in the overall motivation and performance of CHWs. However this feedback was technically based since it was reported to supervisors but the role of the community remains critical trust and confidence issues, which this study could not conclusively address due to methodology challenges and scope of the study.

Supervision and number of supervisory visits per month had no significant value in relation to delivery of level one health services. Both none supervised and supervised CHWs rated equal in performance However support supervision increased CHWs morale and confidence. This concurs with a study on Community based Distributors of contraceptives in Ethiopia.[35]

V. CONCLUSION

The study findings indicate that the performances of community health workers in Lurambi Sub County in the

delivery of level one health service were below average. The performance was low in four parameters that is- referral of patients; number of houses visited; CHWs meetings; number of *Baraza*. There was however positive results in the overall performance of CHWs.

From this study, CHWs of young and old age; female gender; Christian religion; those widowed/separated and long serving performed better.

- In Community factors- communication, community reception, acceptability, accessibility, safety, clients' stability, nepotism, religious practices and perceptions, cultural norms & beliefs, complimentary medicine, diversity, lifestyle and social class were positively associated with CHWs' performance in this study.
- The Period of training, type of refresher course, field allowance as motivation, reporting monthly and use of feedback information were found to be key health factors in the performance CHWs in the study.

AUTHORS' CONTRIBUTIONS

Wachuga James Ndaraiya, and Wilberforce Cholo contributed equally to this work.

COMPETING INTERESTS

The authors declare that they have no competing interests.

REFERENCES

[1]. Declaration at Alma. Ata. Geneva: WHO; 1978
[2]. WHO (2006).The global shortage of Health Workers and its impact fact sheet (April) No. 3002 World Health Organization, Geneva.
[3]. Kobet K. Van Dammo W; (2004)-Barmers that need to improve Primary Health Care Service 204.
[4]. Bhutta ZA, Lassi ZS, Pariyo G, Huicho L, (2010). Global experience of community health workers for delivery of health-related millennium development goals: a systematic review, country case studies.
[5]. Lehmann and Sanders (2007): World Health Organization copyright page 41.
[6]. Lehmann (2007). Community Health Workers. What do we know about them report Geneva,.Page 2. and 3.
[7]. Health system report (2008): MOH/HM/S Annual Report 2008.
[8]. Community Strategy Guidelines (2006). MOH Kenya.
[9]. Kumsa(2011); Statistics and data interpretation for social work (electronic resource
[10]. MugendaGitau Abel. (2008) Social Science Research Kijabe, Printing Press.
[11]. Garson (2006): Research Communication Reliability.
[12]. Goshi(2002): Statistical inference in research.
[13]. C.R.Kothari Research Methodology – Methods and Techniques 2006.
[14]. Burns and grove (2003:195) Research design.
[15]. Peter Ngau, AsfawKumssa – Statistics and data interpretation for social work and (electronic resource) (2011).
[16]. Polit&Hungler 1989 – the process of selecting a portion of the population to represent entire population.
[17]. Devosetetal 2005 – Testing validity and reliability. Journal of nursing scholarship, vol 39 no.2. pp.155-164. De Vos.A.
[18]. Polite and Beck 2004 – Design Decisions in Research – OBSSR.
[19]. Garson, 2006- Testing the validity and reliability of the levels of self concept scale in the hospital industry
[20]. Muraleedharan 2007 – The context of Community Health Workers. The global policy of providing Primary level care.
[21]. Salmen(2002): Community Health Workers; a review of concepts, practice and policy concerns.
[22]. Ndeda Crispin, AnnahWamae(2012):Kenya Service Provision Assessment Survey 2010 - unfpa
[23]. Pariyo, Katharina Hermann ,Wim Van Damme, George W Pariyo, Erik Schouten, Yibeltal Assefa, Anna Cirera and William Massavon (2006): Community Health Workers for ART in Sub-Saharan Africa: Learning from experience.
[24]. Ande, oladepo&Brieger(2004): Increasing Community Health Worker productivity and effectiveness: a review of the influence of the work environment.
[25]. KasejeDan C. O. Esther K.N. Sempebwa(1987):Characteristics and function at Community Health Workers.Pathogens and Global Health 81 Suppl 1(sup1):56-66
[26]. OfusuAmaah, V. (1983). National experience in the use of Community Heath Workers. A review of current issues and problems.
[27]. Khan M A, Sullivan S, Khan M, Sachs S, Singh P(2011): Community Health Workers in Global Health scale and scalability.Mt Sinai J Med.:78(3):419-35. doi: 10.1002/msj.20260
[28]. WHO (2009): Non-randomized controlled trial journal of epidemiology and community Health 2007; 61:699-703.
[29]. Community based contraceptives in Ethiopia.
[30]. YoshitoKawakatsu ,TomohikoSugishita , Sumihisa HondaJackson Kioko (2012): Factors influencing performance of community workers in Kisumu. Primary Health Care Research & Development 13(4):294-300
[31]. Prasad and muraleedharan(2007): Outline for community Health Workers literature Review – CHW Central.
[32]. Perez M, Findley SE, Mejia M, Martinez J (2006): The impact of community Health Workers training and programs in NYC-.J Health Care Poor Underserved.;17(1 Suppl):26-43.
[33]. Lehmann U, Sanders DKalladar(2006): Community Health Workers, what do we know about them. The State of the Evidence on Programmes, Activities, Costs an Impact on Health Outcomes of Using Community Health Workers
[34]. Ballester, (*2005)*;Scott& Wilson, (2006): Role of Community Health Workers.
[35]. Bhutta ZA, Lassi ZS, Pariyo G, Huicho L, (2010). Global experience of community health workers for delivery of health-related millennium development goals: a systematic review, country case studies
[36]. Gilson etal 1989 – the revival of Community Health Workers in National System.