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RESEARCH ARTICLE

COMMUNITY HEALTH WORKERS PROFILE, KNOWLEDGE AND EXPERIENCE TOWARDS DEMAND CREATION FOR SKILLED MATERNAL HEALTHCARE SERVICES IN SIAYA COUNTY.

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Abstract

Background: Community health workers (CHWs) are increasingly identified as a potential vehicle for creating demand and expanding access to maternal health care services. However, despite their engagement to create demand for skilled maternal healthcare services in Siaya County, utilization has remained low while mothers continue to die from preventable maternal conditions. The aim of this study was to assess the CHWs profile, knowledge and perception towards demand creation for skilled maternal healthcare services in Siaya County.

Methods: The study was a descriptive cross sectional study involving 123 community health workers. The study used both quantitative and qualitative data collection methods. Statistical tests including independent sample t-test, chi-square test, bivariate and multivariate logistic regression analysis were used to test the association between research variables.

Results: The results revealed that Married CHWs; (aOR=1.16, 95% CI: 3.21–3.27), Widowed (aOR=1.37, 95% CI: 4.32–2.74), those with secondary (aOR 1.12 CI: 4.33-4.58), Tertiary education (aOR 1.43 CI: 2.87-4.63), and those with ≤ 100 households (aOR 1.65 CI: 1.27-2.60) were more likely to create demand for skilled maternal healthcare services that their other counterparts. The majority of CHWs had inadequate knowledge on maternal health and danger signs.

Conclusion: Empowering Community health workers (CHWs) with adequate knowledge on maternal health would enhance their competency in maternal health while assigning fewer households would enable them intensify demand creation for skilled maternal healthcare services in Siaya County.

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Introduction:-

Evidence has shown that utilization of skilled maternal healthcare during pregnancy, during delivery and postnatal period are key factors in reducing the risk of maternal death in both developed and developing countries (Graham, Moodley, & Selipsky, 2012; Wang et al., 2010; WHO, ICM, & FIGO, 2004), particularly in sub-Saharan Africa, where 99% of maternal deaths occur (WHO, UNICEF, UNFPA, & WB, 2012). Sadly, the use of maternal health services antenatal care, skilled care at delivery and postpartum is limited especially in Kenya where maternal mortality ratio (MMR) has remained high at about 365 per 100 000 live births (KDHS, 2014) with variations existing amongst Counties. As enshrined in the Kampala declaration and the Agenda for Global Action (Bhutta et al., 2010), Scaling up community health workers is one of the strategies for increasing access to healthcare services. Mounting evidence from previous studies and reviews have demonstrated the positive potential of community health workers in improving equitable access to care and that the services offered by CHWs have helped in the decline of maternal and child mortality rates (Bhutta et al., 2010; Lewin et al., 2010).

Health systems in many African and Asian countries currently utilize community health workers (CHWs) to deliver community healthcare services and create demand for skilled healthcare services at the health facilities; (Beam & Tessaro, 1994; Bhutta, Lassi, Pariyo, & Huicho, 2010; Haines et al., 2007). Previous findings revealed that knowledge is crucial in service delivery at community level and that coverage of home visits are positively correlated with knowledge levels of lay health workers (Agrawal, 2012). According to WHO 2006, Community health workers (CHWs) have the potential to be part of the solution to the human resource crisis affecting many countries. A study by (Crispin et al., 2012) found out that community health strategy is an effective approach to delivering community-based interventions.

In Kenya, the National Health Sector Strategic Plan 2 (KNHSSP 11) outlined interventions for improving the health indicators in Kenya including community health strategy whose aim was to deliver Kenya essential package of health (KEPH) to the Kenyan population with the community health workers (CHWs) as the main services providers at the community. Although the use of community health workers in Siaya County began after the Alma Ata declaration in 1970s, the engagement was further intensified in 2006 in line with the Kenya National Health Sector Strategic Plan 11 to reverse the poor health indicators in the Country (Ministry of Health Kenya, 2005; Ministry of Health Kenya, 2006). Siaya County being one of the top ten Counties in Kenya with the largest number of maternal deaths (691/100,000 live births) which surpass the Country (KDHS, 2014; MICS4, 2011), has made efforts to invest in community health services as a means to create demand and increase uptake of skilled maternal healthcare services. Moreover, due to shortage of skilled healthcare providers in Siaya County (C. G. o. Siaya, 2013), CHWs are central in mobilizing communities to engage in health prevention and promotion activities.

Owing to the shortage of skilled health care personnel in Siaya County and the desire to increase access to skilled healthcare services, the County Government invested in scaling up community health services in the whole county with a view to increasing access to healthcare services and intensifying demand creation for skilled healthcare services (M. o. H. Siaya, 2013). However, although some indicators have shown some improvement, utilization of skilled maternal healthcare services have remained low (Department, 2014; UNICEF, 2011). The proportion of mothers attending antenatal visits four times as per WHO recommendation still remain as low as 45% and postnatal care within two days of delivery at 30%. Moreover, unskilled persons attend to about 52% of deliveries by Siaya women (Software, 2014). Therefore as recommended by previous scholars, understanding how socio demographic factors affect CHWs effectiveness is of importance (Lehmann U, 2007).

The use of community health works in Siaya County began after the Alama ata declaration in 1978. However, after devolution of health services in 2013, the County government of Siaya has invested massively in community health services including payment of honoraria to all the community health workers (Department, 2014) in the county with an aim of enhancing their retention and motivation as recommended in previous reports (Bhattacharyya, Winch, Leban, & Tien, 2001; Glenton et al., 2010; Singh, Negin, Otim, Orach, & Cumming, 2015). It was envisioned that with the provision of the honoraria, the community health workers (CHWs) would be motivated to intensify demand creation for skilled healthcare services, refer pregnant mothers for skilled services and ultimately contribute to reduction of maternal mortality which has not been the case. However, although several trials have shown the efficacy of community health workers (CHWs) in reducing maternal and newborn morbidity and mortality (Bang, Bang, Reddy, Deshmukh, & Baitule, 2005; Tomlinson, 2014), this has not been the case in Siaya County (Software, 2014). The low uptake of skilled maternal healthcare services in Siaya County raises concerns about the implications of CHW efforts to increase demand for skilled maternal healthcare services. Taken together the above observations

and the need to identify the bottlenecks hindering the success of demand creation for skilled maternal healthcare services, it was necessary to carry out a study to unveil the dynamics affecting demand creation for skilled maternal health care services in Siaya County. Hence this study aimed at assessing the community health volunteer's profile, knowledge and perception towards demand creation for skilled maternal healthcare services in Siaya County.

Community health services in Kenya

In Kenya, the lay health workers hereby referred to as Community Health Workers (CHWs) are assigned to serve approximately 100 households (approximately 5000 people). They are members of the community identified by the community and trained on basic community health services module to serve the same communities they come from. After the initial training, they are also trained on technical modules based on the context of the intervention that they are assigned to undertake (MOH, 2006). With regard to demand creation for skilled maternal healthcare services, the CHWs are tasked to disseminate key messages to support safe pregnancy & delivery of a healthy new born, advocate for community leadership support for safe pregnancy and delivery of a healthy newborn, promote safe delivery through pregnancy monitoring and timely referral (Ministry of Health , 2006)

Statement of the problem:-

Studies have shown that community health workers (CHWs) referred to in this study as community health workers (CHWs) are a potential vehicle for creating demand and expanding access to maternal health care services (Lewin et al., 2010), and With the limited budget allocation for healthcare services in Siaya County, the personnel to serve the health care needs of the population cannot be met and thus it is critical that more cost effective delivery strategies are identified to optimize the use of the available health care services especially skilled maternal healthcare.

Even though Siaya county government has invested in community health workers (CHWs) as a measure to create demand for skilled healthcare services, very minimal gains have been realized with regard to demand creation for skilled maternal health services. It was envisioned that with the provision of the stipend to the CHWs would motivate them to further intensify demand creation for skilled healthcare and ultimately contribute to the reduction of maternal mortality. However, the uptake of skilled maternal healthcare services is still low in Siaya County (Siaya County Annual Performance Report and Plan 2015/16) thus calling for a study to identify the dynamics in demand creation for skilled maternal healthcare services in the county.

Justification of the study:-

Given the shortage of skilled providers in Siaya County, establishing the bottleneck affecting CHWs performance and identification of context specific evidence based strategies to intensify demand creation for skilled maternal healthcare services would go a long way in increasing uptake of maternal healthcare services which will lead to reduction of maternal mortality in Siaya County.

The findings of this study will equip policy makers, stakeholders and program managers with information for designing context specific evidence based intervention to increase utilization of skilled maternal healthcare services in Siaya County.

Research Questions:-

In order to achieve the objectives of this study, the following questions were formulated:

1. What are the effects of CHWs profile on demand creation for skilled maternal healthcare in Siaya County?
2. What the effects of knowledge of CHWs on demand creation for skilled maternal healthcare in Siaya County?
3. What are the effects of CHWs experience on demand creation for skilled maternal healthcare in Siaya County?
4. What are the context specific interventions for increasing demand for skilled maternal healthcare services in Siaya County?

Research Objectives:-

General objective: To determine the CHWs profile , knowledge and experience towards demand creation for maternal healthcare services in Siaya County.

Specific objectives:-

1. To find out the effects of CHWs profile on demand creation for skilled maternal healthcare in Siaya County
2. To determine the effects of knowledge of CHWs on demand creation for skilled maternal healthcare in Siaya County
3. To assess the effects of CHWs experience on demand creation for skilled maternal healthcare in Siaya County

4. To identify context specific evidence based interventions for increasing demand for skilled maternal healthcare services in Siaya County

Methods:-

Study site:-

The cross sectional study was conducted in Siaya County in selected community Units. Siaya County is one of the 47 counties that make the Republic of Kenya. It has 6 sub-counties, 179 sub-locations, 198 Community Units and 30 administrative wards. It has a total population of ~ 955,000. The predominant inhabitants are Luo speaking River Lake Nilotes. The study focused on assessment of CHWs knowledge and perception towards demand creation for skilled maternal healthcare within Siaya County.

Sample size Determination:-

The sample size was determined using purposive sampling methodology whereby all the 123 CHWs serving within the community units linked to the selected health facility were given chance to participate.

Sampling procedure:-

The study used a multi-stage simple random sampling method to select 123 respondents. The study was part of the baseline survey that was carried out to establish the status of utilization of skilled maternal healthcare services in Siaya County. As such, from a sampling frame of all health facilities per Sub County, the health facilities to be included in the study had been selected. The Community units were then selected on the basis of their link to the eight (8) selected health facilities followed by selection of community health workers (CHWs) from all the selected community units. At least one health provider drawn from the health facilities where the selected community units were linked participated as key informant.

Data Analysis:-

Data was cleaned and entered into SPSS version 18 software for analysis. Descriptive statistics were computed and relationships and significant tests determined using Chi square and Odds Ratios (ORs). Statistical tests including independent sample t-test, chi-square test, bivariate and multivariate logistic regression analysis were used to test the association between research variables. Finally, multiple regression analysis was done to identify independent variables that were useful to demand creation for skilled maternal healthcare services. Qualitative data was analyzed using themes and used to back the quantitative data.

Ethical approval:-

The study received approval from Baraton University of Eastern and Central Africa Research and Ethics committee. Another letter allowing the researcher to proceed with the field work was also received from Siaya County Health Research Committee.

Results:-

The data used in this study was drawn from the population of 123 CHWs drawn from 8 community health units linked to 8 public health facilities in Siaya County. 14 Health providers of each facility also formed part of the study population. The sampled respondents were 123 CHWs (n=123) and 14 Health providers (n=14). The return rate from the 14 Health providers' respondents was 100%. Given that the questionnaires were administered personally by the researcher, it was noted that 100% of the questionnaires were appropriately filled while qualitative data were also obtained from the 14 key informants.

Profile of the respondents:-

The first objective of the study was to assess the influence of CHWs profile on demand creation skilled maternal healthcare services in Siaya County. The findings are summarized below. Table 1 shows the percentage distribution of the CHWs respondents.

Age of the CHWs:-

The results showed that the majority of the CHWs totaling to (74.8 %) were aged between 30-49 years each, while only 3.2% of them were aged below 30 years and the rest (10.57%) aged 50 years and above. The above results

revealed highly significant ($p < 0.05$) positive relationship between age of the respondents and the maternal health services provision in Siaya County.

“I think the mature age may be attributed to the fact that younger people still want income to develop themselves and they do shy away from this responsibility and they therefore leave the work to the adults population” (nurse – Akalla health centre)

Sex of the CHWs:-

The exploratory data analysis revealed that more female CHWs (85.37%) took part in the study than their male counterparts (14.63%) giving a gender distribution ratio of about 1:3.

“The majority of the CHWs are females because most people in the community view the role of CHWs to be mostly suitable for women” (Nurse at Sikalame dispensary).

“Most males engage in jobs that give them money because, in the community unit linked to the facility where I work, for several years the majority of the CHWs were females until the time when Millennium villages project came and the CHWs were being paid allowances of Ksh. 5000. Many young people especially the men got engaged in the CHWs work so as to earn money” (nurse – Midhine dispensary)

Marital status of CHWs:-

The descriptive statistics on cross tabulations indicated that the majority of the CHWs in Siaya County are married at 88.62% while 1.63% and 9.76% of the respondents are single and widowed respectively. None of the respondents were separated. The results also indicated that female respondents were either married or widow at 85.37% whereas male respondents were either married or single at 14.63%. None of the female CHWs were single. Similarly, none of the male respondents were widow. The results revealed highly significant ($p < 0.05$) positive relationship between marital status and the maternal health services provision in Siaya County.

“The community members prefer selecting married women or widows who are grounded in the community to volunteer as CHWs because they are rooted in the community” (nurse – Umalla dispensary)”

CHWs level of Education:-

The findings presented in table 4.1 established that most of the respondents (CHWs) at 54.5% were at secondary school level of education, followed by those with primary level of education (41.5%), those with tertiary level of education accounted for 4.1%. Moreover, the results revealed highly significant ($p < 0.05$) positive relationship between level of education and the demand creation for skilled maternal health services in Siaya County.

Sometimes it is difficult to teach the CHWs with education below secondary because most of the training materials are written in English and also the reporting tools are also in English” (nurse – Bondo hospital)

The study also sought to establish the number of households covered by the CHWs. This was necessary since it showed the workload experienced by the CHWs in the community. The results showed that majority of the CHWs respondents at 69.92% covered between 101-150 households each followed by 29.27% of the CHWs respondents who covered less than 100 households. Moreover, 0.81% of the CHWs respondents only covered 100 households. The study established whether there is association between household covered and packages delivered to the mothers. The analysis revealed highly significant ($p < 0.05$) positive relationship between household covered and packages delivered to the mothers.

“Some of our CHWs have too many households that they cannot cover especially on monthly basis and they therefore sometimes avoid households visitations and so they are unable to know when a woman is pregnant until very late” (nurse – Ligala dispensary)

“Apart from having too many households to visit, they also have too many tasks to perform in those household making it too difficult for the CHV to manage even though they are willing to do the work” (nurse- Gongo dispensary)

Table 1:- Summary of Socio – Demographic characteristics of respondents (N = 123) in Siaya County.

Respondent Category	Total, n (%)		P value
Age of the respondents at interview	Female, (n %)	Male, n (%)	0.002
20-24	2 (1.6%)	1 (0.01%)	
25-29	2 (1.6%)	2 (1.6%)	
30-34	27 (22.0%)	2 (1.6%)	
35-39	17 (13.8%)	1 (0.01%)	
40-44	30 (24.4%)	5 (4.1%)	
45-49	18 (14.6%)	3 (2.4%)	
50-54	2 (1.6%)	1 (0.01%)	
55-59	3 (2.4%)	1 (0.01%)	
60-64	3 (2.4%)	1 (0.01%)	
65+	1 (0.01%)	1 (0.01%)	
Total	105 (85.37%)	18 (14.63%)	
Gender			0.005
Male	18 (14.63%)		
Female	105 (85.37%)		
Households covered by CHWs			0.001
100	1 (0.81%)		
101 to 150	86 (69.92%)		
Less than 100	36 (29.27%)		
Marital status	Female, (n %)	Male, n (%)	0.003
Married	93 (75.6%)	16 (13.0%)	
Single	0	2 (1.6%)	
Widow	12 (9.8%)	0	
Level of education	Female, (n %)	Male, n (%)	0.0001
Primary	45 (36.6)	6 (4.9)	
Secondary	56 (45.5)	11 (8.9)	
Tertiary	4 (3.2)	1 (0.01)	

aValues in parentheses indicate % of total (n = 123). B Indicates row percentage. C Indicates Chi-square test of association between maternal health services provision and other group. Bold font indicates “significantly associated at $p < 0.05$ ”.

Table 1.2:- Multivariate logistic regression of Socio- Demographic Characteristics and creating demand for the utilization of Maternal Health care Services

Variables	Yes, n (%)	Unadjusted odds ratio (95%CI)	Adjusted odds ratio (95%CI)
Gender			
Male	18 (14.63%)	1.00	1.00
Female	105 (85.37%)	1.24 (0.37–6.12)*	1.21 (0.42–7.63)*
Marital status			
Married	109 (88.60%)	1.21 (3.25–2.50)**	1.16 (3.21–3.27)**
Single	2 (1.6%)	1.00	1.00
Widow	12 (9.8%)	2.23 (5.41–8.13)**	1.37 (4.32–2.74)**
Level of education			
Primary	51 (41.5)	1.00	1.00
Secondary	67 (54.4)	1.23 (3.15–6.51)**	1.12 (4.33–4.58)**
Tertiary	5 (3.21)	2.05 (3.25–4.50)**	1.43 (2.87–4.63)**
Number of Households covered by CHWs			
100	1 (0.81%)	1.00	1.00
101 to 150	86 (69.92%)	1.00	1.00
Less than 100	36 (29.27%)	2.19 (2.99–2.61)*	1.65 (1.27–2.60)*

Findings of multivariate analysis of CHWs profile in table 2 above also showed that; female respondents (AOR=1.21, 95% CI: 0.42– 7.63) were 1.21 times more likely to create demand for the utilization of maternal healthcare services in Siaya County as compared to male respondents. The study further established how gender differences influence CHVs' MHS in Siaya County.

Table 1.2.1:- Descriptive statistics

	Gender	n	mean	std. deviation	std. error mean
MHS	Male	18	14.6	10.6759	1.1253
	Female	105	85.4	13.1855	1.4835

Table 1.2.2:- Independent t samples test

		MHS	
		equal variances assumed	equal variances not assumed
levene's test for equality of variances	f sig.	3.374 0.021	
t-test for equality of means	t	.104	.111
	df.	119	97.262
	sig.(2-tailed)	.002	.002
	mean difference	.027	.027
	std. error difference	.264	.246
	95% confidence interval of the difference	upper lower	.550 -.495

The above independent sample t-test in table 1.2.2 was done to compare demand creation for MHS between the genders of the CHWs. As shown in the table 1.2.1 findings were that the female CHWs had a higher mean of MHS score of 85.4, with a standard deviation of 13.1855 and standard error of 1.4835 than the male CHVs who had a mean of 14.6, with a standard deviation of 10.6759 and standard error of 1.125. Given that the Levene's Test for Equality of Variances was significant ($p = .021 < .05$) we did not assume equal variances, this mean that the variances were significantly different; the assumption of homogeneity of variances was violated. Hence the readings of test statistics was taken from the row labeled Equal variance not assumed, indicating P Value $< .05$. Therefore the findings of the study indicate that on average the female MHS score ($M=85.4$, $SE=1.4835$), was significantly higher than the male MHS score ($M= 14.6$, $SE=1.125$), $t(119) = 97.262$, $p = .002$. Hence from the results of the study, it was credible to conclude that gender has significant influence on demand creation for MHS in Siaya County.

The married respondents and widowed; (AOR=1.16, 95% CI: 3.21–3.27) and (AOR=1.37, 95% CI: 4.32–2.74) were 1.16 and 1.37 times respectively more likely to create demand for the utilization of maternal healthcare services in Siaya County as compared to the respondents who were single. In addition, the findings established that the respondents whose highest level of education was secondary (AOR=1.12, 95% CI: 4.33–4.58) and those with tertiary level of education (AOR=1.43, 95% CI: 2.87–4.63) were 1.12 and 1.43 times more likely to create demand for the utilization of maternal healthcare services in Siaya County as compared to those respondents whose level of education is primary. Moreover, the findings indicated that the CHWs respondents who covered less than 100 households (AOR=1.65, 95% CI: 1.27-2.60) were 1.65 times more likely to create demand for the utilization of maternal healthcare than those with more households.

Effect of CHWs knowledge on demand creation for skilled maternal health care:-

The second objective of the study was to establish the effect of knowledge on demand creation for skilled maternal healthcare. To address this research objective, questions were carefully developed; the first group were the questions seeking the knowledge of the CHWs and the second were the questions seeking to establish the effect of knowledge on demand creation for skilled maternal healthcare services.

Knowledge on antenatal, postnatal care and maternal health danger signs;-

On the knowledge on maternal health danger signs, the researcher designed questions to collect respondents view on the same. The Knowledge on danger signs was assessed using a question with 9 key danger signs on maternal healthcare. Knowledge scores for individuals were then categorised into adequate if it was equal to or above five, while anything below the five was rated as inadequate.

Table 2:- Knowledge on maternal healthcare services

Statements	Frequencies	Percentages
When should a pregnant mother start receiving ANC		
1= <16 weeks	37	30.6
2= 16-28 weeks	54	24.4
3= 28-32 weeks	23	18.7
4= 32-40 weeks	9	7.3
When should a woman be visited after delivery		
After:		
1=48 hours	82	66.7
2= 1 week	14	11.4
3= 1 month	11	8.9
4= 6 weeks +	16	13.0
When did you last offer service to a pregnant mother or Postpartum mother at the HH		
1= Last one month	85	69.1
2= 1-2 months ago	20	16.3
3= 3months +	18	14.6
Knowledge of maternal health danger signs		
Yes	39	31.7
No	84	68.3

Table 2 shows that only 30.6% of the CHWs knew when a pregnant mother should start receiving ANC (less than 16 weeks) while the remaining 69.4% did not know the correct timing. Furthermore, the CHWs who knew the exact time (within 48 hours) when a woman should be visited after delivery were 66.7% while the remaining 33.3% were on the opinion of one week and above. Moreover only 30.6% of the CHWs knew when a pregnant mother should start receiving ANC (less than 16 weeks) while the remaining 69.4% did not know the correct timing. Interestingly, the study also revealed that only 31.7% of the CHWs had adequate knowledge of the maternal health danger signs while 68.3% had inadequate knowledge of the danger signs.

“The CHWs do not have adequate knowledge on maternal health although when they come to the health facility we do try to teach them” (nurse – Umala dispensary)”

Trainings attended by CHVs:-

All CHWs are required to undergo a basic training on community health strategy before being engaged in demand creation activities. The findings of this study however established that even though all the CHVs were expected to create demand for skilled maternal healthcare services, only 101 out of 123 had undergone the training. In order to establish whether the basic community health strategy has influence on demand creation for skilled maternal healthcare services, a multivariate analysis was done.

Table 3:- Trainings attended by CHVs

CHV's attendance of trainings	Yes, n (%)	No, n (%)	0.003
Community Health Strategy (CHS)	101 (82.1)	22 (17.9)	
Community Maternal Health Services (MHS)	58 (47.2)	65 (52.8)	
Community Case Management (CCM)	91 (74.0)	32 (26.0)	
Integrated Community Case Management (ICCM)	115 (93.5)	8 (6.5)	
Family Planning (FP)	58 (47.2)	65 (52.8)	

AValues in parentheses indicate % of total (n = 123). BIndicates row percentage. CIndicates Chi-square test of association between maternal health services provision and other group. Bold font indicates “significantly associated at $p < 0.05$ ”.

According to the findings in table 3 above, majority of the CHWs at 93.5% have attended trainings on Integrated Community case management (ICCM) followed by 82.1% who had attended trainings on Community Health Strategy (CHS). In addition, trainings on Community Case Management (CCM) had been attended by 74.0% of the CHWs respondents while only 47.2% had attended trainings on Community Maternal healthcare services (MHS). The results revealed highly significant ($p < 0.05$) between the CHV’s attendance of trainings and demand creation for skilled maternal health services in Siaya County.

Effect of training attended on demand creation for skilled maternal healthcare services:-

Table 3.1:- Multivariate logistic regression of trainings attended and demand creation for skilled maternal healthcare services

Variables	Yes, n (%)	Unadjusted odds ratio (95%CI)	Adjusted odds ratio (95%CI)
Received Basic training on community health strategy			
Yes	101 (82.01)	3.16 (4.21–2.87)**	2.24 (3.97–1.82)**
No	22 (17.91)	1.00	1.00

Furthermore, the findings of multivariate analysis above indicated that the CHWs had been trained on community health strategy (AOR=2.24, 95% CI: 3.97–1.82) were 2.24 times more likely to create demand for skilled maternal healthcare services in Siaya County as compared to those CHWs respondents who had not attended the training.

“CHWs are trying their best although for effective mobilization of mothers for skilled maternal healthcare services, the CHWs should be trained on the maternal health module” (clinician – Akala dispensary)

“These CHWs have not been trained on the community maternal healthcare technical module and they are only relying on the scanty knowledge they received during the basic community strategy training” (clinician – Sikalame dispensary).

Consistent with previous studies, the above findings also showed that for CHWs to be effective, they need to be properly trained in whatever intervention they are to implement, (Ashworth, 2006; Gallos et al., 2011; Senarath, Fernando, & Rodrigo, 2007)

CHWs experience in demand creation for skilled maternal healthcare services:-

The third objective of the study was to establish the CHWs experience on demand creation for skilled maternal healthcare.

Table 4:- CHWs experience in demand creation for skilled maternal healthcare services among the CHWs

Variables	Total, n (%)	P value
Time serving as a CHV		0.0001
Less than 1 year	9 (7.3)	
More than a year	114 (92.7)	
Demand creation activities carried out by CHWs		0.0001
Refer of women for skilled maternal health care	119 (96.7)	
Follow up of clients	90 (73.2)	
Community dialogue	31 (25.2)	
Action days	15 (12.2)	
Frequency of visits to the health facility		0.002
Weekly	71 (57.7)	
Monthly	10 (8.1)	
Whenever necessary	39 (31.7)	
Quarterly	3 (2.4)	

Challenges faced by CHWs		0.005
Negative staff attitude	95(77.2)	
Lack of Recognition	78 (63.4)	
Inadequate staff	98 (79.7)	
Lack of Technical support	81 (65.9)	
Inadequate meetings	61 (49.6)	
Inadequate resources (commodities)	101 (82.1)	
Referral mechanisms for maternal health care services		0.0001
Use referral notes	13 (10.6)	
Accompany the client	84 (68.3)	
Verbal referral	108 (87.8)	

AValues in parentheses indicate % of total (n = 123). BIndicates row percentage. CIndicates Chi-square test of association between maternal health services provision and other group. Bold font indicates “significantly associated at $p < 0.05$ ”.

Experience contributes and enhances knowledge on demand creation. The study found that majority of the respondents at 92.7% cumulatively had taken more than a year offering demand creation services. The results revealed highly significant ($p < 0.05$) positive relationship between the number of years that the respondents have taken to be CHWs and demand creation for skilled maternal health services in Siaya County.

“One thing about most of our CHWs is that they have adequate experience. Some have been CHWs since I started working in this facility and I have worked for 8 years now” (nurse – Bondo hospital)

With regard to demand creation services provided by CHWs, the findings showed that the services offered by CHWs at the community included; making referrals to the health facility, follow up of clients, community dialogue and action days which were accounted to by 96.7%, 73.2%, 25.2% and 12.2% respectively. The analysis revealed highly significant ($p < 0.05$) positive relationship in the CHWs practice and demand creation for skilled maternal health services in Siaya County.

Effect of CHWs experience on demand creation for skilled maternal healthcare services:-

Multivariate analysis in table 4.1 below shows that, CHWs respondents who had taken more than one year serving as a CHV (AOR=1.79, 95% CI: 4.39–2.41) were 1.79 times more likely to provide maternal healthcare services in Siaya County as compared to those CHWs respondents who had taken less than a year serving as a CHV

Table 4.1:- Multivariate logistic regression of CHWs years of experience and demand creation for skilled maternal healthcare services

Variables	Yes, n (%)	Unadjusted odds ratio (95%CI)	Adjusted odds ratio (95%CI)
Time serving as a CHV			
Less than 1 year	9 (7.3)	1.00	1.00
More than a year	114 (92.7)	2.41 (2.51–3.41)**	1.79 (4.39–2.41)**

Similar to findings in other studies, the findings revealed a strong relationship between the challenges facing CHWs and their performance in demand creation for skilled maternal healthcare services (Iyer, 2013; Sanghvi et al., 2010). The findings above also concur with other findings which showed that shortages of commodities and necessary supplies affect CHWs performance (Beltman, 2013; Gebrehiwot, San Sebastian, Edin, & Goicolea, 2014; Javanparast, Baum, Labonte, & Sanders, 2011; Ndou, Van Zyl, Hlahane, & Goudge, 2013; Scott & Shanker, 2010).

Discussions:-

CHWs Socio- Demographic Characteristics and demand creation for Maternal Health care Services:-

The above findings are closely similar to findings of a previous studies which showed that the optimal age range of CHWs was 30 to 40years and that age, gender, marital status and education of CHWs had influence on performance (Crispin et al., 2012; Kok et al., 2015). Whereas the selection criterion for selection of CHWs in Kenya does not favour a particular gender, consistent with previous findings, this study also revealed that female community health workers are more engaged in the demand creation work than the males (Crispin et al., 2012; Viswanathan et al.,

2012). The results of this study are also in concurrence with previous studies which found out that females dominated the work of CHWs (Bang et al., 2005; Briend, Hasan, Aziz, & Hoque, 1989; Brown, R., Zumaran, & Miranda, 2006; Fauveau, Stewart, Khan, & Chakraborty, 1991; Hailu & Kebede, 1994).

Contrary to findings by (Crispin et al., 2012) that CHWs with lower literacy levels were able to satisfy and enable their clients effectively ; this study found out that compared to CHWs with lower literacy levels, those with higher level of education performed better. The findings on influence of workload on demand creation also conform to previous studies which indicated that for CHWs to be effective, they should cover certain optimal population size with an optimal range of services (Heunis et al., 2011; Kalyango et al., 2012; Prasad & Muraleedharan, 2007; Vichayanrat, Steckler, & Tanasugarn, 2013; Yan, Liu, Gruber, He, & Congdon, 2012)

Effect of CHWs knowledge on demand creation for skilled maternal health care:-

Knowledge of CHWs on maternal health was found to be varying greatly regarding different aspects of maternal health. Contrary to the recommendations from previous studies that CHWs should possess some basic knowledge with certain core skills to enable them execute their roles effectively (Haq, Iqbal, & Rahman, 2008; WHO, 2007), the findings showed that although the CHWs in Siaya County were expected to create demand for skilled maternal healthcare services, the majority had not been trained on maternal healthcare module. Consistent with previous findings, the low uptake of skilled maternal healthcare in Siaya County could be attributed to the knowledge gap amongst CHWs which could be compromising their ability to create demand for the skilled maternal healthcare services (Agrawal, 2012; Butawa, Tukur, Idris, Adiri, & Taylor, 2010; Chattopadhyay, 2004; Haq et al., 2008; Kok et al., 2015; Prata, Weidert, Fraser, & Gessesew, 2013; WHO, 2007). As noted in (Kasl & Cobb, 2002), exposure to factors that prompt action and confidence in their ability to successfully perform an action influences peoples decisions and therefore the fact that the majority of the CHWs had inadequate knowledge on maternal health clearly indicates that they are also unable to coerce women to take up some important decisions on why skilled maternal health care is important.

CHWs experience in demand creation for skilled maternal healthcare services:-

The above findings also established that there were no schedules for facility visits and therefore each CHV decided individually on when to make a visit. Although 57.7% and 8.1% visited the health facility weekly and monthly respectively, the remaining 31.7% and 2.4% visited the health facility whenever necessary or quarterly respectively. The results on frequency of contact with the facility have revealed highly significant ($p < 0.05$) positive relationship between frequency of facility visits and demand creation for skilled maternal health care services.

According to the above findings, it emerged that inadequate resource such as commodities is the greatest challenge faced by CHWs working with health providers at the link health facility. This was backed up by 82.1% of the CHWs respondents. Moreover, inadequate staff (79.7%) and negative staff attitude (77.2%) were also challenges faced by CHWs. Furthermore, lack of technical support was cited by 65.9% of the respondents while lack of recognition was cited by 63.4% of the CHWs. However, inadequate meetings was the least cited by 49.6% of the respondents. In addition, the results has established significant ($p < 0.05$) positive relationship between the challenges faced by CHWs working with health providers at the link health facility and demand creation for skilled maternal health care services.

Although it is well stated in the community health services manual that CHWs should use referral notes, the findings of this study showed that there was no uniformity in ways in which CHWS do referrals for maternal health care services with only a small percentage using the recommended referral notes (10.6%) while the rest either accompanying the client (68.3%) or using verbal referral (87.8%). Moreover, there was a significant ($p < 0.05$) positive relationship between the ways in which CHWS make referrals for maternal health care services and demand creation for skilled maternal health care services.

Conclusion:-

The findings of this study have shown very strong positive association between Knowledge, households covered (workload), CHWs practice and demand creation for skilled maternal healthcare services in Siaya County. In view of the above findings, strategies to increase demand creation for skilled maternal healthcare services are a priority for Siaya County. While initial basic training of CHWs on community health strategy may address the anticipated demand creation activities, over time the increasing scope of activities and tasks assigned to CHWs may lead to gaps in knowledge and incompetency in delivering specified tasks such as demand creation for skilled maternal

healthcare services. Therefore investment in ongoing training of CHWs in maternal health coupled with periodic mentorship and evidence based performance monitoring both at the health facility and the community would go along way in ensuring that CHWs have adequate knowledge and conform to set standards of practice while creating demand for skilled maternal healthcare services in Siaya County.

The evidence gathered by this study also suggests that individual work load has implication on performance and therefore reviewing the nature and workload of CHWs and instituting evidence based mechanisms for monitoring CHWs performance at household level would enhance their effectiveness in demand creation for skilled maternal healthcare services. The findings have implications on context specific evidence based programming for maternal health care in Siaya County and highlight the need for adopting multiple context specific interventions if utilization of skilled maternal healthcare services is to be optimized in Siaya County.

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Ethical considerations:-

Ethical clearance was obtained from Research Ethics Committee of University of Eastern Africa, Baraton, Eldoret (REC: UEAB /05/02/2015). The research assistants were trained on research ethics. Informed written consent from the study participants was obtained and the objective of the study was explained to them. Privacy and confidentiality of collected information was ensured at all levels.

Consent to publish:-

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Competing interests:-

The authors declare that there are no competing interests.

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Author Contributions:-

OEO conceptualized the paper, searched literature, and wrote the manuscript draft. ASO contributed to the design of the study and provided advice regarding data interpretation. FAA helped develop the data analysis framework and also helped train field researchers for data collection. OEO and ASO analyzed the qualitative data. AK made critical revisions to the paper and provided advice regarding data interpretation. OSO participated in data collection and helped write the results and discussion sections. All authors read and approved the final manuscript.

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