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CONTEXT BASED FACTORS THAT INFLUENCE THE COMMUNITY HEALTH VOLUNTEERS PERFORMANCE IN MATERNAL AND NEONATAL HEALTH OUTCOMES IN NYANDO SUB-COUNTY, KENYA.

Monyangi N.Norah

ABSTRACT

Introduction: World Health Organization (WHO) recommends use of Community Health Volunteers (CHVs) for community health service delivery. Kenya adopted the use of CHVs through Community Health Strategy program in 2006 with free maternal and child health services. Regardless of the efforts made women still die from preventable pregnancy related causes majorly due to unskilled attendance at birth. The context in which the CHVs deliver their health care services has been cited as a pivotal consideration for increasing the skilled attendance at birth. A few studies have been done on how context influences the CHVs performance but little is known on evidence based frameworks to overcome the barriers to CHVs performance improvement. Globally Maternal Mortality Ratio (MMR) is 216 per 100,000 live birth while Neonatal Mortality Ratio (NMR) is 19 per 1000 live births and all is attributed to unskilled birth attendant which is at 78% worldwide. These figures are higher at rural sub-Sahara Africa (510 MMR and 31 NMR). Kenya, the maternal and neonatal mortalities are at 366 and 22 respectively. Nyando Sub-County, the high (58%) unskilled attendance at birth is highly attributed to the NMR (28/1000) which surpasses that of the country (22/1000).

Objective: To establish CHVs contextual influences affecting the performance of CHVs on maternal and neonatal health outcomes in Nyando, Kenya.

Methods: Performance data was collected by use of Community Health Workers Assessment Improvement Matrix (CHW AIM) tool from 361 CHVs records at both baseline (retrospective) and end line (prospective) while a semi structured questionnaire and Focus Group Discussions (FGD) were used to collect data for individual CHVs Variables. Quantitative data was analyzed by Statistical Package for Social Science (SPSS) program version 22. Descriptive statistics, Chi-squire, multivariate regression and standardized coefficients analyses were used to examine relationship between socio demographic and individual characteristics versus CHVs performance. Significance of the results was evaluated at 95% level of confidence. For qualitative data, codes and themes were created and analyzed logically.

Results: Completed primary level education and above and belief on facility delivery benefits had a significant positive influence on performance level of CHVs (P-value<0.05) .Lack of means of identification of expectant women at households and large area of work emerged as a major barrier for their performance.

Conclusion and Recommendation: From the participatory planning session held by all stakeholders, it was agreed that there is a great need to have a framework on how to identify and track the expectant women within the community units by CHVs to be implemented and if possible be adopted by the policy makers in future .This will ensure that all expectant women would be identified earlier and be referred to health facility for Focused Antenatal Care Visits, Skilled delivery and Post-natal care Visits to achieve maximum performance and improve on maternal and neonatal health care outcome in Nyando and similar settings.

INTRODUCTION

Community Health Volunteers (CHVs) have taken an active role in the delivery of community-based primary healthcare interventions linked to the health facility, as posited by Alma Alta Conference agreement (WHO, 1978).A Community Health Volunteer (CHV) / Worker (CHW) is any health worker (paid or not paid) carrying out functions related to health care delivery at community level; trained in some way in the context of the intervention, and having no formal professional or paraprofessional certificate or degree in tertiary education (Lewin *et al.,* 2010). They play an integral role in primary health care service delivery at community level and globally recognized for their success in reducing morbidity and averting mortality in mothers, newborns and children. They also represent a strategic solution to address the shortages of highly skilled health workers to help meet the growing demands for health services among rural populations (Perry *et al.,* 2017).

Most countries rely on CHV programs as a core element in improving access to care and attaining universal health coverage objectives (Osborn *et al.,* 2015). The CHVs performance has been heterogeneous and at times context-specific based, and influenced by multiple factors which differ from one locality to the other (Blacklock *et al.,* 2016). This study identified the contextual characteristics influencing CHVs' performance, developed and implemented best practice framework to improve maternal and neonatal health outcome within Community Health Strategy (CHS) program in Nyando, Kenya. Nyando has high (28%) neonatal mortality rate which surpasses the national figure (22%) majorly due to high unskilled (58%) attendance at birth occurring in the community (Nyando SC Report, 2017).

Despite the existence of knowledge about simple strategies and techniques to reduce maternal and newborn deaths, the interventions are not up to scale in Kenya as elsewhere in SSA due various reasons including work context barriers and pervasive poverty. Improving maternal, neonatal and child survival remain major aspirations for many countries in sub-Saharan Africa (SSA) including Kenya. These regions contribute to over ninety per cent (90%) of the global deaths due to maternal and child-related deaths which are preventable with existing cost-effective interventions **(**Zureick-Brown *et al*., 2013; Liu *et al*., 2010).

RESULTS

Introduction

This section covers response rate, demographic information, diagnostic tests, descriptive statistics and the performance of CHVs in Nyando Sub County,Kenya. The analysis was guided by the three research tools which were CHVs Questionnaire, CHW AIM tool for CHVs performance and FGD guide for CHVs. The chapter also presents and interprets the results of the data analysis using tables and figures.

Response Rate

Census was done since the study population is only 410 CHVs. As per the CHVs, only 361 participated in responding to both CHVs questionnaire and CHV performance. This gave a response rate of 88.05% which is a high and adequate rate for this study. A response rate of 65% is acceptable for such studies (Awino, 2011). This is also affirmed by Tomaskovic- Devey, Leiter and Thompson (2014) who aver that any response rate of about 15.4% is considered as yielding a relatively high response rate considering the demands of the CHVs in the community.

Demographic information

The demographic information of the respondents were discussed as shown in the subsections below to help in understanding the respondents in the study.

Age

The CHVs were asked about their age during interview and they responded as shown in the table;

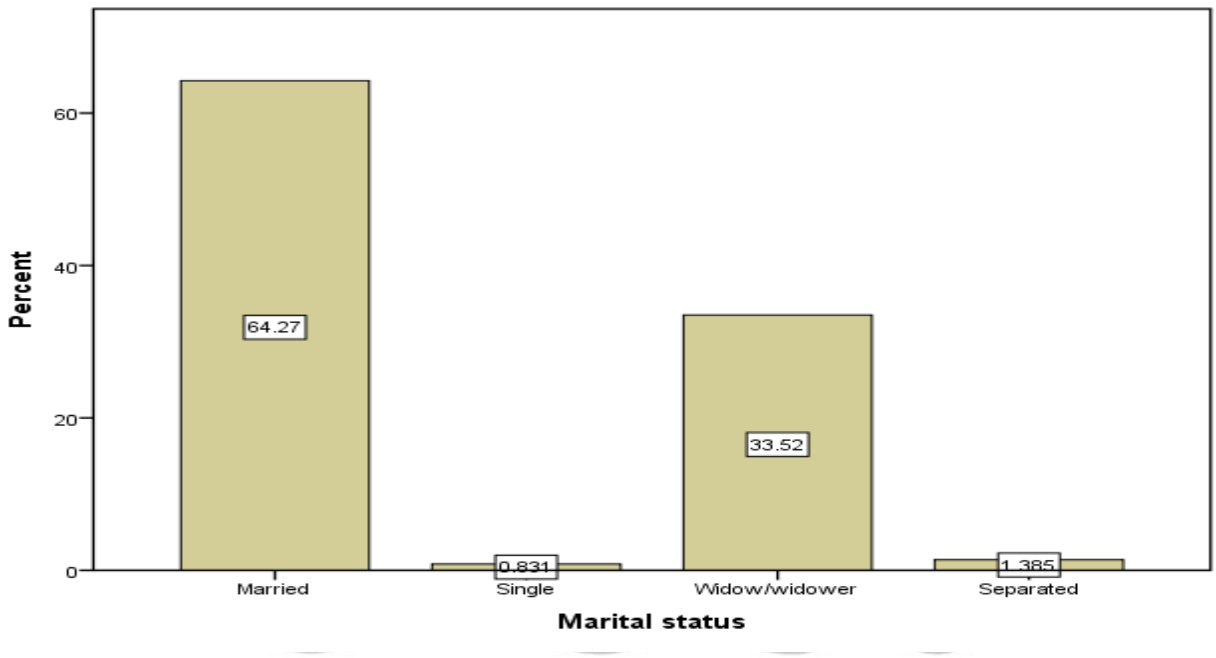
Table1. Age of the CHVS

Years	Frequency	Percent
21-30	8.0	2.2%
31-40	79	21.9%
41-50	139.0	38.5%
51-60	125	34.6%
61-70	9.0	2.5%
Above 70	1.0	0.3%
Total	361.0	100.0%

From table 1, majority of the CHVS were of age between 41-50 years of age, these were about 38.5%.For those who were about 51-60 years of age, these were about 34.6%.For those who were of age between 31-40 years were about 21.9%, 61-70 years were about 2.5%,21-30 years of age were about 2.2% and those who were above 70 years were only 0.3%.This indicates that many of the respondents were above 40 years of age they have experience with both maternal and neonatal health outcomes in Nyando.

Figure 1. Marital Status

The CHVs were asked about their marital status during interview and they responded as shown in the bar-chart as shown

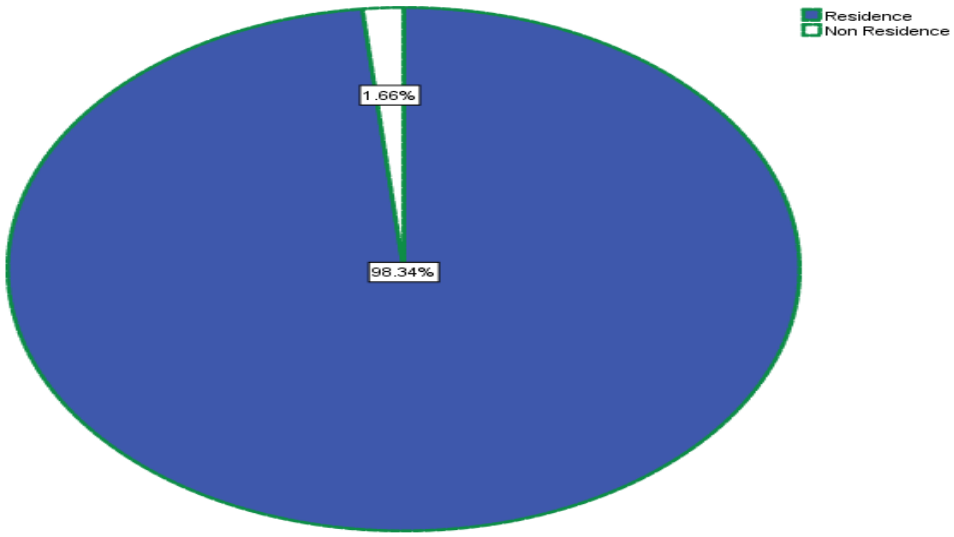


Marital status

From figure.1, 64.27% who were majority of the respondents were married, 33.52% were widow/widower, 1.385% had separated and 0.831 were singles

Figure 2.Residence

The CHVs were asked about their residence during interview and they responded as shown in the pie –chart.

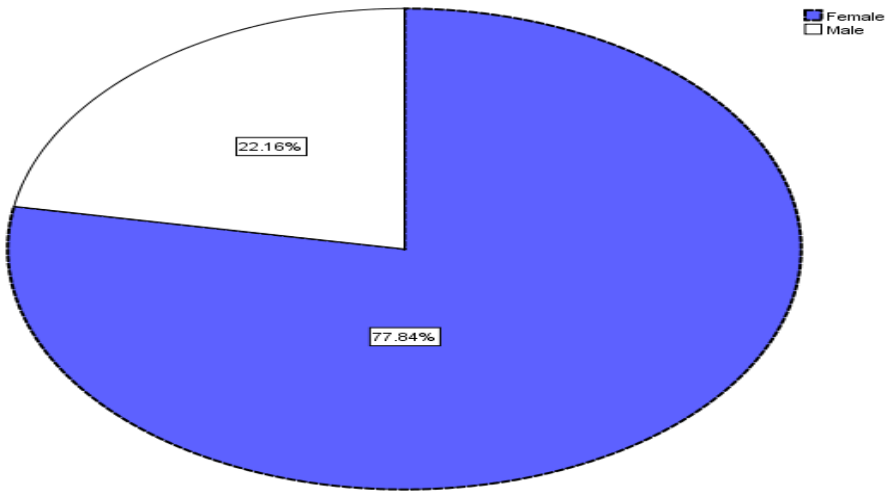


Residence

From figure 2, majority about 98.34% were residence of Nyando. While only 1.66% were not residence of Nyando.

Figure 3. Gender

The CHVs were asked about their gender during interview and they responded as shown in the pie –chart.

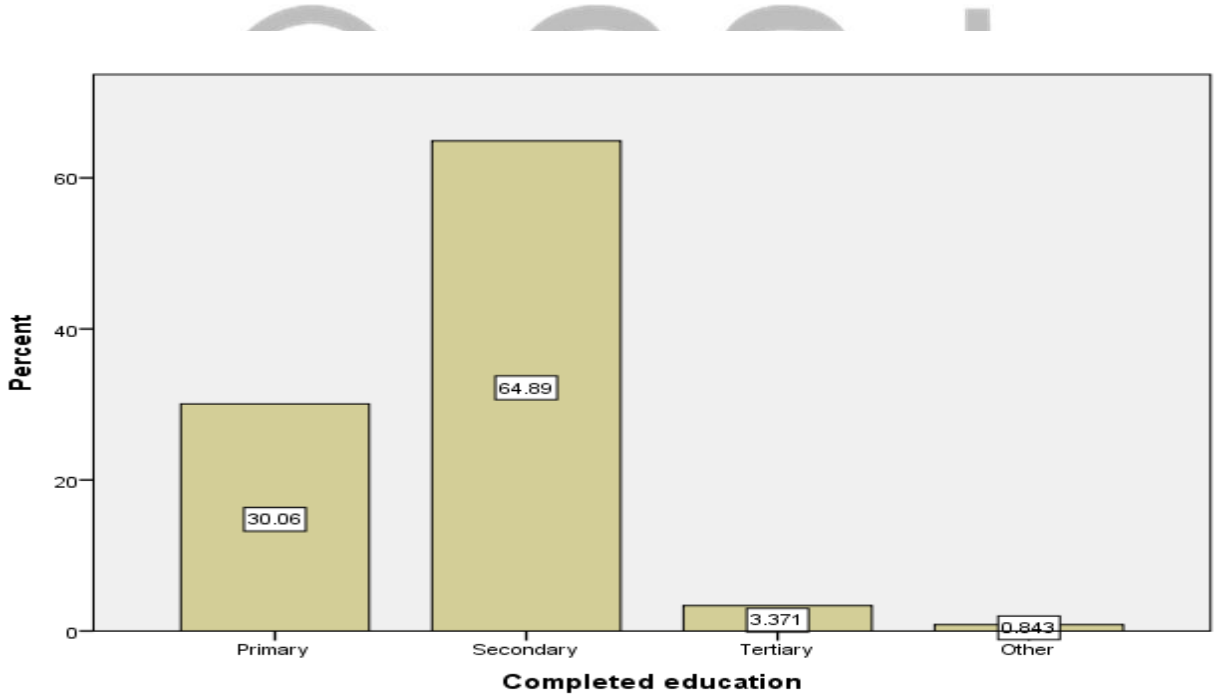


Gender

From figure 3, majority about 77.84% were female and only 22.16% of the respondents were male.

Figure 4. Education

The CHVs were asked about their gender during interview and they responded as shown in the bar –chart.



Completed Education

From figure 4, majority about 64.89% had completed secondary level of education. About 30.06% had completed primary, 3.371% had completed tertiary level of education and only 0.843% had completed other levels of education.

Diagnostic Tests

These included statistical tests that were performed to test the reliability, validity, normality, linearity and multicollinearity of the variables in this study. These were discussed as explained in the sections below:

Reliability

Based on the feedback from the pilot test, the questionnaire was modified and a final one developed and further interpretation of overall Cronbach's Alpha values was determined for the main variables in the study. The reliability was tested for two research tools. The research tools were CHVs questionnaire and CHW AIM tool for CHVs performance .The CHVs questionnaire tool had the Socio-demographic characteristics, CHV knowledge on maternal and neonatal health outcome variables included institutional factors, Environmental Factors, Challenges encountered as a CHV in Nyando Sub-County , and Suggested changes needed to help CHVs perform their task variables. The CHW AIM tool had only three variable which were FANC, Skilled Birth Attendant at the health facility and PNC. The results for Cronbach's Alpha based on standardized items were displayed as shown in the table below:

Table 2. Cronbach's Alpha and Reliability Statistics for CHV Questionnaire

Items	Cronbach's Alpha Based on Standardized Items	Meaning
Socio-demographic characteristics	0.804	Acceptable
CHV knowledge on maternal and neonatal health outcome	0.738	Acceptable
Environmental Factors	0.907	Acceptable
Challenges encountered as a CHV in Nyando Sub-County	0.956	Acceptable
Suggested changes needed to help CHVs perform their task	0.933	Acceptable

From Table 2. the Cronbach's Alpha value based on all standardized items greater than 0.7 which is within a good reliability range. Hence this indicates that the research study tool for CHVs was reliable.

Table 3. Cronbach's Alpha and Reliability Statistics for CHW AIM tool

Items	Cronbach's Alpha Based on Standardized Items	Meaning
FANC	0.973	Acceptable
Skilled Birth Attendant at the health facility	0.742	Acceptable
PNC	0.764	Acceptable

From Table 3, the Cronbach's Alpha value based on all standardized items greater than 0.7 which is within a good reliability range. Hence this indicates that the research study tool for CHW aim tool was reliable.

Validity

Content validity was carried out to check how well the instrument was used to measure the Socio-demographic, CHV knowledge on maternal and neonatal health outcome, Environmental Factors, Challenges encountered as a CHV in Nyando Sub-County, Suggested changes needed to help CHVs perform their task,FANC, Skilled Birth Attendant at the health facility and PNC to focus on the development of community health volunteer contextual framework for improving maternal and neonatal health outcomes in Nyando, Kenya. Content validity was carried out by use of a structured questionnaire to measure a theoretical construct for each key indicator that was used to measure the development of community health volunteer contextual framework for improving maternal and neonatal health outcomes in Nyando, Kenya. This was used to measures how well some test items or questions measured particular characteristics or variables in the relation model. Pre-test was carried out by use of 10 research questionnaire for each tool from the study to test the construct validity.

Normality

Normality was tested by Shapiro-Wilk test. The normality for each variable to eliminate biasness during inclusion of respondents in the sample size and data collection is discussed in the following sections:

Socio-demographic characteristics

The response in this variable was collected based on CHVs personal information who participated in this study. The test for normality on this response was carried out and the results were displayed as shown in the table below:

Table 4. Normality Test for Socio-demographic characteristics

	Shapiro-Wilk		
Demographic Information	Statistics	df	Sig.
Completed years	.343	5	.220
Marital status	.385	3	.079
Residence	.306	1	.328
Sex	.260	1	.089
Completed education	.385	3	.720
Beliefs on facility delivery	.374	1	.520
Beliefs on EBF	.331	1	.230

From Table 4. based on the Shapiro-Wilk tests, the significance value for all of the demographic information is not significant since *p*-value > 0.05 for Shapiro-Wilk tests. This indicates probability values greater than 0.05 for inclusion of respondent in the sample size to enhance objectivity of data collection and hence this means the data collected on this variable is normal. The application of Shapiro-Wilk test is because sample size was greater than 50.

Knowledge on maternal and neonatal health outcome

The response in this variable was collected different indicators. The test for normality on this response was carried out and the results were displayed as shown in the table below:

Table 5 Normality Test for CHV knowledge on maternal and neonatal health outcome

	Shapiro-Wilk		
Knowledge	Statistics	df	Sig.
How to identify a pregnant woman in working area	.443	2	.420
When should a pregnant mother start ANC clinic	.275	2	.061
What is the minimum ANC visits required	.234	3	.671
What is the recommended period for the four visits	.617	4	.072
What are the danger signs in pregnancy	.134	7	.201
Risks of unskilled delivery	.254	4	.379
What are the danger signs in a neonate	.207	9	.028
Risks of not attending PNC visits	.361	4	.187
Awareness of vaccines to be given at birth	.281	3	.127
Awareness of exclusive breastfeeding initiation period	.304	3	.420

From Table 5, the significance value for all of the CHV knowledge on maternal and neonatal health outcome is not significant, since the *p*-value > 0.05 for Shapiro-Wilk tests. This indicates that the probabilities are greater than 0.05 for inclusion of respondent in the sample size to enhance objectivity of data collection. Hence this means the data collected on this variable was normal.

Table 6.Independent CHVs factors on CHVs performance levels

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.205	.092		13.056	.000
	Completed years	.001	.001	.024	.396	.003
	Marital status	-.014	.011	-.077	-1.204	.029
	Residence	-.013	.077	-.010	-.171	.005
	Sex	-.031	.027	-.073	-1.131	.009
	Completed education	.006	.009	.039	.683	.005
	Beliefs on EBF	.004	.005	.041	.746	.056
	Beliefs on facility delivery	.031	.021	.086	1.497	.035
a. Dependent Variable: Performance Level						

From table 6, using the standardized coefficients of independent CHVS factors on the performance level of the CHvs, completed years by CHv, completed education, belief on EBf and belief on facility delivery had a positive influence on performance level of CHVs. This influence was significant at P-value<0.05 except for belief on EBF which was insignificant at p-value<0.05.This implies that as you increases on this factors based on the Likert scale used of the indicators, performance level also increases and this improves the outcome of maternal and neonatal health outcomes and vice-versa. On other hand marital status, residence, sex had a negative influence on performance level of CHVs. This means that based on the Likert scale as you decreases the levels of these variables, performance level of the CHVs increases and hence there is improvement in maternal and neonatal health outcomes and vice-versa. This influence is significant at P-value<0.05.

Discussion

According to WHO (2019), approximately every day 830 women die from preventable causes related to pregnancy and childbirth globally, 99% of all the deaths occur in developing countries and yet evidence reveals that 78% of all live births benefited from skilled care at birth. Nearly 100% of global maternal deaths occur in developing countries with more than half of these deaths occurring in Sub Sahara Africa particularly from rural settings (WHO, 2019). Giving birth is a natural normal process where loss of life is not expected, unfortunately kenya MMR and NMR is 362/100,000 and 22 deaths per 1000 live births respectively, (KDHS 2014/15). In Nyando sub-county, 58 per cent deliveries remain unskilled with Neonatal Mortality of 28 deaths per 1000 live births which mainly occur in the community because of unskilled attendance at child birth (Nyando SC Report, 2017).

Glenton (2013) global search and Kok *et al.,* (2015) studies in LMICs systematic reviews on CHWs show significant factors associated with the CHVs' task performance. For instance, older CHVs are more likely to remain in their jobs compared to the younger ones who would leave when they get more promising careers. In addition, the higher the level of education of the CHVs the more likely they are to perform better, with women being more dedicated as a result of gender roles in the communities. In a review of literature on effectiveness of community health programs to improve adherence to antiretroviral reported that building trust is a key ingredient to successfully conduct CHVs programs. High workload in terms of population increases loss to follow up and poor performance among CHVs and those who serve communities in which they live in were reported to be more trusted by the community. (Kok *et al*., 2015).

Explorative cross sectional study done in Malawi to find out CHVs performance motivators (Kok and Muula, 2013), a cross sectional study on factors motivating CHVs services in neonatal care intervention in Bangladesh (Rahman *et al.,* 2010), retrospective data study to find out factors motivating CHVs task completion in Uganda (Alamo *et al*. 2012),a systematic review to assess factors influencing performance of CHVs in Sub -Sahara Africa (Mwai, 2013) and a cross sectional study done to assess contextual factors influencing CHVs performance in Nyanza, Kenya

(Kawakatsu, 2015) reveals that CHVs' performance may suffer from low motivation due to high workload resulting from high CHVs population ratio and distance.

Kok MC. (2014) did systematic reviews by quantitative, qualitative, and mixed methods studies on how community context influence CHWs performance while delivering primary health care services in LMICs. It included CHWs, their clients and their families/ carers and CHW supervisors. The studies show that socio-cultural factors - social and cultural norms, values, practices and beliefs, gender roles and norms, safety and security determines the CHVs performance in terms of tasks completed and health care seeking practices.

Callaghan-Koru (2012) conducted a qualitative study to explore health workers' and managers' perceptions about Community Case Management (CCM) provided by Community Health Workers during the program's first year in Malawi. The results show that large distance to cover hampers CHW reaching all the households as well as floods hinders mobility of CHVs and feeling unsafe by CHVs would reduce their movement for service delivery.

Agrawal (2012) did a cross sectional study to explore on relationship between the knowledge of community health workers and auxiliary nurse midwives and their antenatal home visit coverage and effectiveness of the visits, in terms of essential newborn health care practices at the household level in rural India. He used data from 302 CHWs and 86 community nurse midwife and data from recently delivered women (n=13,023) from within CHW catchment areas and gave birth to a singleton live baby. Using principal component analysis, knowledge scores for preventive care and danger signs were computed. A multivariate logistic regression model was used to estimate the adjusted effect of knowledge level. The results show that coverage of antenatal home visits and newborn care practices were positively correlated with the knowledge level of CHWs and Nurse Midwife.

Initiation of breastfeeding in the first hour of life (odds ratio 1.97; 95% confidence interval (CI): 1.55-2.49 for CHWs, and odds ratio 1.62; 95% CI: 1.25-2.09 for Nurse midwife), clean cord care (odds ratio 2.03; 95% CI: 1.64-2.52 for CHWs, and odds ratio 1.43; 95% CI: 1.17-1.75 for Nurse midwife) were significantly higher among women visited by CHWs or Nurse midwife who had better knowledge compared with those with poor knowledge.

These studies did not conduct the actual performance assessment of CHVs at their work place by using a special CHW AIM tool to come up with an evidence based strategy to improve the CHVs

performance in maternal and neonatal health outcome. Establishing the actual CHVs performance by the CHW AIM tool will enable stakeholders to identify context specific weaknesses and develop an action plan to be tested and possibly be adopted to improve CHVs performance on maternal and neonatal health outcome in Nyando

Conclusion and Recommendation

Some of the individual CHV context based factors such as being part of the residence where you serve motivates CHVS and can increase their performance. Major hindrances for CHVs performance which emerged include: unable to identify expectant mothers within the community to refer them to health facility for appropriate services and long distances to cover due to shortage of CHVs. From the participatory planning session held by all stakeholders, it was agreed that there is a great need to have a framework on how to identify and track the expectant mothers within the community units by CHVs to be tested and if possible be adopted by the policy makers in future within Nyando and similar settings.

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