Can Community Health Officer Midwives-Effectively Integrate Skilled Birth Attendance in Rural Areas? Evidence from Northern Ghana

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Abstract

Background: The burden of maternal mortality in sub-Saharan Africa is enormous. In Ghana maternal mortality ratio was 350 per 100,000 live births in 2012. Skilled birth attendance has been shown to reduce maternal mortality and morbidity, yet in 2008 only 55% of mothers in Ghana gave birth with the assistance of skilled birth attendants. In 2005, the Ghana Health Service piloted a strategy that involved using the integrated Community-Based Health Planning and Services (CHPS) program and training Community Health Officers (CHOs) as midwives, to address the gap in skilled attendance in rural Upper East Region (UER). The study assesses the extent to which the skilled delivery program has been implemented as an integrated component of the existing CHPS, and documents the benefits and challenges of the program.

Method: We employed an intrinsic case study design with a qualitative methodology. We conducted 41 in-depth interviews with health professionals and community stakeholders. We used a purposive sampling technique to identify and interview our respondents.

Results: The CHO-midwives provide integrated services that include skilled delivery in CHPS zones. The CHO-midwives collaborate with District Assemblies, Non-Governmental Organizations (NGOs) and communities to offer skilled delivery services in rural communities. They refer pregnant women with complications to district hospitals and health centres for care, and there has been observed improvement in the referral system. Stakeholders perceived improved skilled deliveries, health education, antenatal attendance, postnatal care and reduced maternal deaths in rural communities. The CHO-midwives are provided with financial and non-financial incentives to motivate them for optimal work performance. The primary challenges that remain include inadequate numbers of CHO-Midwives, insufficient transportation, and infrastructure weaknesses.

Conclusion: Our study demonstrates that CHOs can be successfully trained as midwives and deployed to provide skilled delivery services at the doorsteps of rural households. The integration of the skilled delivery program with the CHPS program appears to be an effective model for improving access to skilled birth attendance in rural communities of the Upper East Region of Ghana.

Keywords: Community-Based Health Planning and Services; Ghana; Maternal mortality; Skilled Attendants at Birth

Introduction

High maternal mortality is a grave concern worldwide. The global burden of maternal death[a] is enormous, especially in less developed countries.[1] According to WHO, UNICEF, UNFPA, and The World Bank, the number of maternal deaths globally in 2010 was 287,000-- a decrease of 47% from the 1990 levels.[2] However, 56% of global maternal deaths occur in sub-Saharan Africa.[3] Further, more than 60 million women worldwide suffer from poor reproductive health and serious pregnancy-related illnesses or disability such as fistulae, uterine prolapse, and infertility.[4] Ghana is among the countries in sub-Saharan Africa with a high maternal mortality ratio (MM Ratio) at 350 maternal deaths per 100,000 live births in 2012.[2] In the Kassena-Nakana District the maternal mortality ratio for the period 1995–1996 was 637 maternal deaths per 100,000 live births, but reduced to 373 maternal deaths per 100,000 live births from 2002–2004, indicating a 40% reduction of maternal deaths in the district.[5] The WHO and UNFPA have recommended a number of strategies such as improved family planning, safe abortion or adequate post-abortion care, improved coverage and quality of skilled attendance at birth, and access to emergency obstetric care to address maternal mortality. [6, 7]Experts agree that access to skilled attendants at birth is one way to improve maternal health, and this access should be available to women in rural areas as well as urban areas.[6, 7] Skilled birth attendance is defined as "the availability of health professionals with midwifery skills to promote utilization, conduct normal deliveries and provide first aid, the enabling environment of health policy and system, drugs, equipment, supplies, and transportation, knowledge and skills to refer from one level of skilled attendance to another and the demand for skilled care by community as evidenced by utilization."[8, 9] Indeed, the proportion of births with skilled attendants is one of the key indicators for gauging progress towards the achievement of MDG 5.

[a] Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental cause.

However progress in achieving the MDGs is still slow in sub-Saharan Africa.[3] In sub-Saharan Africa, only half of women delivered with the assistance of skilled attendants.[3] In Ghana, it is much higher at 68%. However, there is wide disparity between urban (88%) and rural (54%) areas in Ghana. [5]In rural areas of the UER, which is the focus of this paper, the level is higher (67%) than in other rural areas in Ghana.[5]

The term "*skilled attendant*" is defined as an accredited health professional—such as a midwife, doctor or nurse—who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns.[10] The fifth Millennium Development Goal (MDG) focused on improving access to skilled attendance at birth, but the ratio of nursing and midwifery staff in Africa is only 11 per 10,000 populations, compared with 79 per 10,000 in Europe.[1] In Ghana; attrition of health personnel to more developed countries continues to diminish the supply of providers available to meet the population demands in the country. [11] In view of these constrains, human resources need to be employed most effectively and new health workers need to be recruited. A range of strategies referred to as "task delegation", "task shifting" or "task sharing", "skills substitution" and improving use of available skills are considered a practical response to the skill shortages in the developing world[12], which are likely to result in efficiencies.[13] Evidence has shown that lower level cadres of healthcare staff can substitute for highly trained health professionals such as doctors for the performance of specific tasks that are in high demand.[14–16] Following the trend towards task delegation in Ghana, Community Health Officers (CHOs) have been trained to provide skilled delivery care to women in rural areas through the Community-Based Health Planning and Services (CHPS) program. This

program may serve as an alternative strategy to improve access to skilled attendants at delivery in rural areas of Ghana.

The CHPS program, established in 2000, aimed to improve access and quality of health care and family planning services in all the districts of Ghana.[17] The CHPS Initiative emanated from the Navrongo experiment known as the Community Health and Family Planning (CHFP) project designed as a community-based model for primary health care in rural communities. The project examined the demographic impact of two experimental arms of activities: organizing traditional social institutions for community leadership and participating in program operations which constituted the *Zurugelu*[b] component; and Reorienting the normal MOH, health care system to community-based services. Ten years after community-based interventions, the project demonstrated a 15% reduction in fertility, equivalent to one birth in the general population, in the cell where both the health sector and community volunteers provided health services including family planning services. [18] The experiences and lessons of the 'Navrongo Experiment' serve as the basis for the establishment of the CHPS program. The CHPS program is jointly implemented by the Ghana Health Service and rural communities in Ghana. The communities collaborate with the health sector in areas such as provision of land and labor for building CHPS compounds.[17]Community members also assist in providing basic health services to the people in their communities. Volunteers participate in providing health education and basic health services for minor ailments.[17] The Ghana Health Service began training a subset of middle level health care providers known as CHOs to collaborate with community members to provide skilled attendance at delivery to women in rural areas through the CHPS program. If the CHPS program is effective in

[b] *Zurugelu* is a term in Kasem that literally means 'togetherness.' It is a traditional social cooperation used to mobilize support for community health and family planning services

promoting skilled attendants at delivery, it may address the human resource gap that exists for skilled delivery care in rural communities in Ghana and increase the number of women who seek and receive skilled delivery care. The study assessed how and to what extent the CHO-midwifery program has been integrated into the existing CHPS. In so doing, we describe the benefits and challenges of the integrated program, based on the perspectives of multiple stakeholders.

Study setting

The study was conducted in the Kassena-Nankana East (KNE), Kassena-Nankana West (KNW), and Bongo Districts of the UER of Ghana. These districts were the first districts to provide skilled delivery as part of the CHPS program. The UER population estimate from the 2010 census was 1,046,545. The KNE district had an estimated population of 109,944[19] whereas the KNW district, newly carved out of the Kassena-Nankana District in the Upper East Region, had an estimated population of 70,667 in 2012. Bongo district's 2010 estimated census population was 84,545.[19]

Methods

We employed an intrinsic case study design with a qualitative methodology. We conducted in-depth interviews with key informants such as chiefs, traditional birth attendants (TBAs), community volunteers, women leaders and elders, CHO-midwives, tutors of the midwifery school and the Navrongo Community Nurses School, the CHPS Coordinator, official of the Maternal and Child Health Unit, District Directors of Health Services for the KNE, KNW and Bongo Districts.

Sample Size and Sampling

We employed purposive sampling to select 41 stakeholders for in-depth interviews: 10 CHO-midwives, 6 CHO-Midwives supervisors, three District Directors of Health Services, heads of maternity wards of the Navrongo hospital, Bongo health centre, and Paga health centres, two tutors

of the community health nurses and midwifery schools, two health professionals from the Regional Directorate of the Ghana Health Services, 15 community leaders and residents(a chief, an elder, a TBA, a community volunteer, and a woman leader from each of the three districts). We selected the program implementers based on their role in the CHPS program and recruited the community stakeholders who were most knowledgeable about the CHPS program.

The questions focused on the range of health services including skilled delivery services provided by CHO-midwives, how the work of skilled birth attendance is integrated with other community health services, and the successes and challenges of the new program.

Data Collection

Two research assistants were recruited from the Upper East Region and trained for the in-depth interviews. They translated the interview guides into the local languages of the three districts. They were also instructed to use tape recorders and to moderate the interviews, and they were introduced to the instructions developed for the data collection procedure. They were coached to ask questions, probe for more answers and prompt respondents for clarifications. The research assistants recorded interviews on audiotape, and a transcriber, who did not participate in interviewing, translated and transcribed the data in English.

Data analysis

The analysis of narrative data on similar topics from multiple sources allows for comparison of perspectives and triangulation of reports.

Members of the team (the Principal Investigator and the two Research Assistants) began the analysis by reading all interviews multiple times and discussing broad themes that emerged across respondents and areas of inquiry (integration and benefits/challenges). The team developed a coding scheme that reflected these areas and the sub-themes within each, and proceeded to code each transcript using the qualitative data software (QSR NVIVO software version 8). We produced reports on each of the broad and specific themes, which allowed us to synthesize key findings and compare responses within and between groups (e.g., community stakeholders and health professionals).

Ethics approval

We obtained ethical approval from the Navrongo Health Research Centre and the Boston University (BU) Institutional Review Boards (BU IRB reference number H-31245).

Results

Integrated services of CHO-Midwives

The CHO-Midwives report engagement in a wide range of services, including antenatal care, skilled delivery and postnatal care, health education, counseling, family planning services, child welfare clinics for nursing mothers, and treatment of minor ailments. They collaboratively provide these services with other nurses, community members, District Assemblies and NGO workers; yet if alone at their post, one CHO-Midwife can provide all of the services on her own. Community leaders confirmed a range of services the CHO-Midwives and other professionals provide in their rural communities. One district chief put it this way:

….."*There is a trained midwife who assists women to deliver, there are also nurses, who take care of sick people, they also trained elderly women who were already delivering women to counsel pregnant women and nursing mothers and to refer pregnant women to them for deliveries."* **(Chief, KNE District)**

The CHO Midwives themselves spoke with pride especially about the range of pregnancy and birth-related services they were now able to provide:

"*I attend to OPD clients, I attend to the ANC mothers, I conduct deliveries and postnatal; when they deliver, I ask them to go and come back in a week's time. Then I examine them to see whether the lucia is normal or not and I advise her to exclusively breastfeed the child."* **(CHO-Midwife, KNW District)**

CHO-Midwives emphasized the value of the team approach to the integrated service model, as exemplified in the words of one interviewee:

……."*You know, we work together, we work as a team. I am not alone, I have CHOs with me; so if I am here running antenatal or consulting, they will be doing home visiting or the school health or even the outreaches, they run. So I do not do it alone, we work hand in hand. We work as a team."* **(CHO-Midwife, KNE District***)*

The CHO-Midwives spoke thoughtfully about each aspect of care they are now able to provide.

Health education

According to the CHO-midwives, the health education is usually focused on a wide range of topics such as skilled delivery, antenatal and postnatal care, disease prevention, environmental cleanliness, personal hygiene, nutrition and medication. These health topics are crucial for improved health and development of mothers and children. The midwives said they usually target families, mothers, traditional leaders, TBAs, community volunteers, men and women and other stakeholders in the communities. This excerpt shows how the midwives describe their methods of health education:

….."*The community members come out for the health education and even next week we are going to have health education with the community. We have been conducting Saturday classes for the pregnant women. We tell them, you have to attend antenatal clinics, go to the clinic to deliver and go for postnatal care. We also tell them the risks involved in delivering at home, which includes bleeding. And if you deliver, we tell you to do exclusive breastfeeding; we educate you on how to take care of yourself so that you will not get infected. We tell you the foods that you should eat so that you will be well and healthy. We tell you how to position yourself and breastfeed the baby.*" **(CHO-Midwife, Bongo District)**

Community stakeholders also highlighted the health information and education they received from health professionals, including health talks on pregnancy, delivery, food consumption and nutrition:

…"*They go round to talk to us, they tell us that pregnant women should not do too much work; they also tell us the foods a pregnant woman should eat to make the mother and the baby in the womb healthy. They also encourage us to bring pregnant women to deliver in the small hospital* [CHPS Compound]*, They tell us all these and when they go to the hospital, the nurses give the pregnant women food, children who are sent to the hospital are also given food that will make them healthy."* **(Elder, KNW District)**

Skilled birth attendance

The CHO-midwives confirmed that the CHO-midwives offer maternity services that include skilled delivery to women in rural communities.

….*"We offer skilled delivery services to pregnant women in this community. It is part of our job schedule and we are doing that. We are happy that we are timely intervening to prevent maternal deaths and injuries."* **(CHO-Midwife, KNE District)**

….*"The maternity program here is a whole package that includes antenatal services, skilled delivery and post-natal care. When I was just a CHO, I used to provide only antenatal services and postnatal care and refer delivery cases to the health centres/hospitals. But now that I have been trained as a midwife, I supervise women to deliver and also provide other basic health services to pregnant women and other community members in my catchment area."* **(CHO-Midwife, Bongo District)**

Community stakeholders acknowledged and commended the CHO-midwives for providing skilled delivery services in their communities:

…*"The midwives supervise skilled deliveries in this community. We do not need to go far to seek skilled care anymore. They are working hard to ensure that we all give birth safely and we are grateful about that. We will continue to support their work."* **(Women Leader, Bongo District)**

Antenatal services

The CHO-midwives narrated how they encouraged pregnant women to patronize the antenatal services.

…..*"Women now come for antenatal care and I have been able to counsel people; education has improved and people's attitudes have changed. First when I came here a woman won't come to clinic; when it was left with one month for her to deliver, then you would see her coming. Now we have educated them, when a woman misses her period she has to come to the clinic for antenatal care."* **(CHO-Midwife, KNE District)**

Postpartum care

Interviews with health officials revealed that the CHO-Midwives provide postnatal care to women and the newborns.

…..*"When a woman delivers, the CHO-midwife follows-up to ensure that the mother is healthy and able to take care of her newborn. The midwife equips her with all the information about breastfeeding, reproductive health and family planning and how to adjust to life. The midwife also educates the mother about good nutrition. These are all necessary for the good health of the mother and child. "* **(CHPS Coordinator)**

Referrals to health facilities

The CHO-Midwives conduct normal deliveries, but they are supposed to refer pregnant women with complications, such as prolonged labor, underweight women, hypertensive cases, women with previous caesarean section, and women with multiple births to the next level for care. The CHO-midwives confirmed that they were given cell phones, motorbikes and fuel for easy communication and contact with the health centers or district hospitals staff. The CHO-midwives and supervisors indicated that a referral system has been put in place to handle obstetric emergencies. The midwives reported that there were ambulances and ready staff to convey clients/patients to health centers and district hospitals. All of the CHO-Midwives and their supervisors stated that they do refer pregnant women with conditions that are beyond their expertise to the health centers or district hospitals for prompt care. One CHO-Midwife stated it this way:

….."*No, normally at our level, if the labor is prolonged, you are supposed to refer to the next level; you are not supposed to manage the person at your level. We have some women, the normal hours they take, zero hour to the next twelve hours, the person should deliver, but after twelve hours if you see that the labor is not progressing you have to refer to the next level. Since I came I have referred only four labor cases and those ones, two were prolonged labor, one was underweight, below one fifty (150) and the other one was hypertensive because she had general oedema and the blood pressure was very high. I had to refer those cases because they were not my cases.*" **(CHO-Midwife, KNE District)**

The midwives reported a referral system in place, but they also said the reality is that there are few, if any, ambulances to convey pregnant women from remote villages to the health centres or district hospitals. They stated that the insufficiency of transport is a major barrier to skilled birth attendance in these villages.

Perceptions of Health Professionals about the use of CHO-Midwives for skilled birth attendance

All the district directors, heads of the units of the regional directorate of the Ghana Health Service and tutors of the midwifery training school stated that it was remarkable to have CHO-Midwives reside and provide midwifery services to rural women. The health professionals believe that incorporating the maternal health services into the CHPS program "sort of fills in the gaps", especially in communities where trained midwives were non-existent, reduces the burden of pregnant women having to travel long distances to seek health care, decreases the workload of health staff in the hospitals and health centers, and contributes significantly to reduce maternal mortality and morbidity in rural areas. The views of health professionals are exemplified in these quotes from their interviews:

…."The skilled delivery program in rural areas is very, very important, we need to increase the number of CHO-Midwives because as I mentioned earlier, they are saving a lot of lives. Because they are available when the woman is in labor she is easily attended to. Unlike when they were not there, when a woman was in labor, she had to walk ten miles and even deliver on the way. Anything could happen to the mother and the baby. But now with the midwives, staying in the communities, in the CHPS compounds and conducting the deliveries, it has reduced maternal and child mortality and other hazards which the child would have had." **(CHPS Coordinator)**

*….."It is good; it minimizes complications because when the CHPS centers were not there, before they got to us conditions would have worsened. May be the baby may go into distress and by the time you go to the theater; you bring out a dead baby. But with the CHPS program, the midwives easily get to us because they have our phone numbers and when they need help like means of transport, they call us and we send a lorry with a midwife to bring the client. So it is actually helping; unlike the TBAs who did not have phones, and so, they cannot even reach us.***" (Midwife in-charge of District Health Center, Bongo District)**

…..."My impression is that it is a very good concept that they are training CHOs as midwives to provide the services in rural areas: Formerly they were not trained in obstetrics or midwifery, so in the rural areas where they were posted, pregnant mothers were referred to the next level, but now they are given the extra skills and knowledge in obstetrics, they are able to carry out the normal deliveries and which goes to reduce the burden of the pregnant mothers travelling long distances to a higher level". **(Tutor, Navrongo Community Nurses Training School)**

Factors contributing to effective integration

Incentives for the CHO-Midwives

The Ghana Health Services has instituted an incentive scheme to reward CHO-Midwives for their services in rural communities. The CHO-Midwives revealed that they are given paid leave; in-service training; promotion and feedback from supervisors as non-financial incentives to motivate them to continue to reside and work in remote areas. The KNE District Health Administration has started sponsoring the training of two community health nurses/officers in midwifery every year. Interviews with health professionals revealed that the CHO-Midwives are given money, study and paid leave as incentives to motivate them to continue to stay and work in rural communities. A health professional offered this view about incentives for the CHO-Midwives:

..... "*We are trying to motivate them by giving them 10% of the funds they generate from every delivery because they are working under trying conditions. The incentives are necessary to motivate them to continue to stay and work in remote areas. As I said early, it is also important to provide them with incentives because they work under harsh conditions"* **(CHPS Official, Regional Directorate of Ghana Health Service)**

A supervisor suggested that the midwives should be given incentives, awards, transfers, and logistics to work as a motivation for them to continue to reside and provide the services in rural communities.

……. "*They should motivate the midwives, giving them incentives and awards; those who perform well they should give them awards. I also think they should be changing them from time to time, may be if they work in the villages for some time, one or two years, they should be sent to town and others will also go to the communities. They should motivate them; the managers do not see, they do not motivate people; they do not come to visit you from time to time to see your problems. Even if you have problems, the other time we had a meeting and they talked of how some of them do not even have disinfectant, something like bleach and gloves, that people were referring patients to health centers and hospitals because they do not have gloves. I am trying my best to work and you won't supply me with the logistics to work with. So the motivation is even in the things that you work with; if you are working and all the things you need are there, you are motivated. You are in a situation in which you are working and then you need certain things to work with and you are not getting as if it is your property. Sometimes you are compelled to use your money to buy because you want to save life".* **(CHPS Coordinator)**

One Midwife-in-charge noted another kind of incentive for CHO-midwives—the provision of compound furnishings and social amenities to enable them stay and work in rural areas in comfort:

…..*"You know in some places like down south they furnish the CHPS compounds for the midwife: there is a TV, a fridge, even this Multi TV. At least if you are comfortable enough, certain times if it is not all that far where your children can go to school, you can conveniently take them along. But our situation here is different. We have to be motivated to stay here."* (**Midwife In-Charge, KNW District)**

Communities have observed the efforts these midwives are making to bring health services to their doorsteps. Many believe that if the CHO-Midwives are provided with the necessary tools and comfort, they will stay and deliver better services in the CHPS zones. A traditional leader also emphasized the need to motivate the midwives for optimal performance, and suggested motorbikes as an incentive that would also help them do their work more efficiently:

……*"If the nurses are working and nobody seems to see what they are doing they will not be happy; so I think they should be motivated to stay and work. There should be means of transport such as motorbikes. There is only one motorbike for the nurses; this one has to go there and another one wants to go somewhere else. If there are two motorbikes it will help them to work better and that will be a motivation to them."* **(Chief, Bongo District)**

Upgrading of the CHO-midwives certificates to diplomas

The CHO-Midwives and other health professionals proposed that a CHO-Midwife, who has a certificate in midwifery with many years of work, should be given top-up courses to receive the diploma in midwifery. This will improve their skills and serve as an incentive for many more CHOs to enter the profession. They argued that some of the CHOs prefer the mental health or the health promotion programs to the midwifery program for the reason that they will obtain a diploma after they complete the former. A CHO-midwife highlighted these points:

…"*Most of the community health nurses know that if they go for midwifery, they will be given a certificate so they prefer going to do mental health or health promotion to get a diploma" They could give CHO-Midwives with long service top-ups courses to receive the diploma in midwifery."* **(CHO-Midwife, KNE District)**

Perspectives on Program Benefits

Increased skilled deliveries

It is crucial to know the successes CHO-Midwives achieved in providing maternal and other services to rural communities. The health professionals and the community stakeholders revealed that the CHPS program has helped to improve skilled deliveries in rural areas. Respondents noted this overall achievement of the CHO-Midwives:

….."*When the CHPS concept was brought into the district, we only had community health nurses at the various CHPS compounds. You know the district is not so large but it is somehow large because when a woman is in labor she cannot walk the distance to the health facility where there is a midwife to deliver her. Initially we had a great number of home deliveries so we decided that we would try to post midwives to some of the CHPS compounds. In fact, they are capturing those women who would have delivered at home by untrained TBAs in their various communities. In fact, they have actually helped to increase the number of skilled deliveries in the district"* **(District Health Management Team Official, Bongo District)**

A CHO-Midwife explained that through the efforts of midwives and community support groups, they have improved skilled deliveries in rural communities.

…..*"It is about three years. I started being a CHO- midwife in August 2010 and when I came, I realized that most of the women were delivering at home. So I started by telling them and giving my phone number to the volunteers that any woman who is in labor should go to the volunteer to call me; either I go myself and pick the woman or she will come. Some of them do not know they are in labor, she will come and tell you she has stomach pains and before you realize, she is in labor. So through health education, home visits and then mother-to-mother support groups we have been able to educate them. So because of that they now come to deliver, since December 2011 we have not had any home delivery"* **(CHO-Midwife, Bongo District)**

Contribution to decline in maternal mortality

Interviews with CHO-Midwives revealed that they believe that the skilled delivery program has accelerated the reduction of maternal mortality in rural communities.

……"*I think they should compare maternal mortality rate in the past years, when midwives were not deployed into the communities and the present time that midwives are in the various communities. If they compare the two, they will come out with a policy that will help. I think the midwives and the community health nurses are doing very well. If you actually compare this, you will see that there is much improvement. Maternal mortality is coming down; there is much improvement. Cases that cannot be handled they refer unlike when they were not there, these cases will be in their various homes, and they wait until it is so bad before they send the case to the hospital. But now when they bring a case and it's beyond our expertise we refer promptly so that measures can be taken and their lives are being saved. So they should train more of the staff, if they are there and we are many we will catch most of the women and reduce maternal deaths and disabilities.*" (**CHO-Midwife, KNE District)**

Community stakeholders also express the belief that the CHPS program has helped improve the safety of women during delivery and averted many deaths. Communities' perspective about the skilled delivery program will encourage many more women and their families to seek skilled care at birth, and reduce maternal mortality in the country. As one community volunteer expressed it:

….."*The biggest benefit is, women used to die during labor, but now because of the help they get from this CHPS program, women no more die during delivery because once the nurses get there, by God's grace the baby comes out without any problem. It is a benefit, they save lives."* **(Community Volunteer, KNW District)**

Increased healthy births

Our interviews with community stakeholders convey the commonly held belief that mothers and babies are now healthy due to the implementation of the skilled delivery program. A community respondent had this to say:

…."*Since the midwife delivers women in this community, the women are healthy; the nurse gives pregnant women medicine so they deliver safely without any problem. At first it was not so, pregnant women used to suffer during delivery. Now if a woman delivers, they give her and her baby medicine so they are healthy."* **(TBA, KNE District)**

Increased antenatal attendance

All the district directors, heads of the units of the regional directorate of the Ghana Health Service, the CHO-Midwives and their supervisors reported that there was improved antenatal attendance in the communities. Health professionals explained that the success in attendance was due to

community members' proximity to health facilities and availability of midwives in rural communities. Health professionals described the success in antenatal attendance in these terms:

…*"The successes achieved, I will talk of increases in antenatal especially first time registration because the midwives are nearby. Immediately the woman realizes that she is pregnant, she reports to the nearby clinic."* **(District Health Management Team, Bongo District)**

Improved health education

We inquired among CHO-Midwives, the extent to which they were able to educate their clients about all aspects of available maternity services. The large majority felt that such education was a large part of their job and that they had been able to do so successfully. In the words of one CHO-Midwife:

…. "*I have been able to counsel people. Education in the communities has improved and people's attitudes have changed. First when I came here a woman would not come to clinic; when it was left with one month for her to deliver, then you would see her coming. Now we have educated them, when a woman misses her period she come to the clinic for ANC."* **(CHO-Midwife, KNE District)**

Perspectives on challenges of the CHO-midwives skilled delivery program

Human Resources

Health professionals in our study reinforced the well-known fact that midwives and other category of nurses are in short supply in rural communities. They mentioned ageing midwives, who will soon be going on retirement, as one of the human resources problems confronted by the Ghana Health Service. One CHO-midwife expressed the dilemma in this way:

..."*I think more midwives should be deployed into the communities; we have CHCs without midwives even though others may like to actually deliver in the facility, there is no midwife and the places are far. When we take Gia, Pindaa, for instance, a woman being in labor, she will actually like to go to a health facility for delivery, but you can imagine the distance. Then transportation, if Pindaa had a vehicle, a woman in labor could be transported to a health facility, but in this case, you will not get it; may be a motorbike, a bicycle which will not be so good for a laboring woman. So if midwives are around, I think we can get most of our pregnant women to come and deliver in the CHPS compound."* **(CHO-Midwife, KNE District)**

Constructing of more CHPS Centers and expanding the existing CHPS compounds to include delivery rooms

According to the midwives and their supervisors, the CHPS compounds were initially built to offer basic services excluding delivery services. Now that the compounds are used for maternity care, CHO-midwives stated lack of delivery and resting rooms as important problems they are confronted with.

….*"The only challenge I have is the delivery room: that small room here is used as consulting room, counseling and everything and also for conducting deliveries is not a convenient place. That is my challenge because I cannot put up my best because of how the room is congested with things. I am always afraid of patient or me contracting infection. I seriously need a delivery room to enable me provide efficient services."*(**CHO-Midwife, KNW District)**

……*"I will say when a woman finishes delivering; we do not have a place to keep this woman. It is a limitation; she should be here for at least twenty-four hours which we cannot do."* **(CHO-Midwife, KNE District)**

….*"Immediately a woman delivers she is asked to go home because there is no space to accommodate her for a long time, but if there was space they could allow such women to stay in the CHPS compound for some time; you know after a woman delivers blood flows and that can worry her. If she gets home and a problem develops, it will be difficult for them to come back."* **(Community Volunteer, KNW District)**

Accommodations for staff

Almost all the CHO-Midwives and their supervisors revealed that the midwives are faced with poor and inadequate staff accommodation, lack of bathrooms, toilets and social amenities in the CHPS compounds. The following quote represents the views of CHO-Midwives regarding infrastructure:

….."*The staff accommodation is poor. We have only one bedroom and a hall and part of it is used as our store. So most of the staff stay in town while coming, one stays just around. We are able to acquire a place for him because he is a male, but the rest sleep in turns. One will come occupy the place for one week and the other one will come because of the inadequate accommodation. They are adults; they are not small children to be packed in one room. That is why they run shift."* **(CHO-Midwife, KNW District)**

Transportation

The midwives, supervisors and health officials of the Bolgatanga Regional Directorate of Health Services said transportation is necessary to facilitate referral of pregnant women and nursing mothers for maternity care in district hospitals or health centers/clinics, but some of the districts are confronted with transportation problems. The health officials reported that most serious is the presence of only one ambulance in each district. The CHOs, midwives and other nurses use pick-up vehicles as ambulances. Health officials described the transportation situation in the region in the following terms:

…"*At times the means of transport to refer the cases is a problem; you know they do not have ambulances in the districts. Few of them have got the ambulances, mostly is the pickups and you know the pickup is not for that purpose alone. They may be calling for a means of transport, but they have sent the pickup to do something else. So they have to call, and call; you will be surprised that some of the midwives have to take the pregnant women to the next level by motorbikes. So these are some of the challenges they are facing.*" **(CHPS Official, Regional Directorate of Ghana Health Service)**

Interactions with Women

Although most community members mentioned that the nurses were friendly, sympathetic, nice, caring and respectful towards their patients/clients, other community stakeholders also complained of the poor attitudes of a few nurses, which can ruin the reputation of all if not addressed:

……"*Some women complain that some nurses shout at them and you know it is not everyone who feels comfortable with that. You may be saying something good to someone but if you say hey!! The person's heart will jump. So whatever you say to the person, you will only be singing. So the nurses should exercise patience. You know, a pregnant woman is like a hungry person; a hungry man is an angry man. So when a woman is pregnant, it makes her angry without any reason. The nurses should exercise patience when they are explaining things to them."* **(Community Volunteer, KNW District)**

The health workers sometimes become angry with their patients/clients, but I will advise that they should always exercise patience when they are handling sick people: already such a person is in pain. I will advise also community members that when they send their relatives to the hospital, they should not force the health workers to do things that

they are not supposed to do, because the nurses are also human beings and can get angry if you put pressure on them." **(Chief, KNE District)**

Despite the variation in the perceived quality of the CHO-Midwives caring, there was widespread consensus among all stakeholders that more are needed, and that the method of recruitment and training must not only ensure that their care is reliable and safe, but that they are kind and dedicated to the communities in which they live and work.

Recommendations for Improvement

In all of our interviews with community members and health professionals, we asked them to offer ideas for the improvement of the CHPS integrated program. Their responses fell into three main categories: 1) increase the number and quality of trained CHO-Midwives, including offering refresher trainings; 2) upgrade their credential from certificate to diploma; and 3) improve space and social amenities available to the CHO-Midwives 'on the job'.

One CHO-midwife said creating friendly environment, interacting with clients, refresher trainings for midwives will help improve the program in rural areas:

…."*CHO-Midwives should always be at post, be friendly with our pregnant women and take good care of them [patients/clients]. If you are friendly with them, they will trust you and will always come to you. A CHO-Midwife should target her pregnant women and visit them once in a while. They should give the CHO-Midwives refresher trainings because there are always new ideas. The CHO-Midwives on their part should learn Information Communication Technology (ICT) and go to the internet for information on their work. They should buy computers for all the facilities. They should give CHO-midwives the opportunity to go for further training."***(CHO-Midwife, KNW District)**

Lessons learned

We asked the CHO-Midwives and other health professionals to summarize the lessons they had learned from the initial roll out of the CHO-Midwives in the CHPS zones. We discovered one overarching theme--the importance of being residents in communities. Residing in communities, CHO-Midwives are able to interact with the people and know their problems, improve their relationship with community members, and thereby offer better health service. Interestingly, the CHO-Midwives reported that these stronger relationships and 'inside knowledge' also sharpened their skills and confidence as health practitioners. The following comments reflect this theme:

….*"It is good, we have experienced a lot. At first you know when you are in the health center, the people come to you; you go to them on rare occasions, but now we are in the community, we do our work, we interact with them, they come to us at any time, we go to them at any time and in fact now the work is so good that I do not even know what to say."* (**CHO-Midwife, Bongo District**)

….*"I have learned a lot because we are always with the women; and if you know your women, you will know their problems and you will help them solve the problems. Instead of coming once a while, doing your antenatal and going away, you are with them in the community and they know you, wherever they meet you they are always happy. So you interact more with your women."* **(CHO-Midwife, KNW District)**

…"*It is actually very interesting to just be with the people, to know them and they also have confidence in you. Actually it has helped to improve the relationship between the community members and the health workers.*" **(Sub-District Supervisor-KNE District)**

Discussion

Integration

The Ghana Health Service has been challenged by a dearth of adequately trained skilled birth attendants. Our results indicated that it is possible to integrate skilled birth attendance into the role and practice of existing CHOs in rural communities in Ghana. The CHO-Midwives had been trained to offer a wide range of maternity care and other health services to women and their families in the CHPS zones. They provided services that included health education, antenatal care, skilled delivery, postnatal care, treatment of minor ailments, and participating in community durbars and other 'outreach' activities. The CHO-midwives often provide the services alone in situations where they are the only providers in the community or with other CHOs if they are in a group. The midwives offering integrated services give them the opportunity to meet a wide range of people and address a wide variety of health problems including skilled delivery.

The Ghana Health Service training of existing community health professionals as midwives represents task delegation, a strategy shown to be promising in other African and Asian countries. In Kenya, for example, retired midwives recruited and trained to provide skilled delivery care to rural women in Kenya, resulting in a significant impact on skilled delivery coverage. [20]In Mozambique medical assistants trained to perform surgical procedures in rural areas since 1984 helped improve surgical procedures in that country. [15]The study by Fenton and colleagues also indicated that the use of 45 anesthetists to conduct cesarean sections in 23 districts and two central hospitals in Malawi produced remarkable outcomes. [16]In India, MBBS doctors were trained in Comprehensive EmOC services to provide the services in rural settings.[21] And in Ghana, TBAs are being trained to provide delivery services in rural communities because of the few numbers of midwives in these settings. [22] We believe the 'integrated service' strategy employed in Ghana is unique among task

delegation initiatives aimed at increasing skilled birth attendance in rural communities in countries with high rates of maternal mortality.

Benefits

In Ghana, the main objective of the skilled delivery program is to reduce maternal mortality and morbidity. [23]Historical evidence and social research have pointed to an association between skilled delivery care and maternal death and disability.[7, 24–26] In our discussions with health professionals and community stakeholders, many reported that CHO-Midwives have helped prevent maternal mortality in their communities by timely intervening in maternal cases that would have resulted in fatalities. The CHO-Midwives are considered crucial because they provide skilled delivery services or promptly refer pregnant women to the next level of care.

The midwives conduct normal deliveries and refer pregnant women with complications such as prolonged labor, underweight and hypertensive women, and women with previous cesarean section or multiple births to the next level for care. Our study found that CHO-Midwives, by and large, refer pregnancy cases that are beyond their expertise to the health centers or district hospitals for prompt care. We found a referral system, where transportation and other logistics are available to facilitate the referral. A strong collaboration between the CHO-midwives and the health providers at the district hospitals and health centres might have contributed to the referral of clients from CHPS zones to the next level. This facilitates easy transfer of pregnant women to the next level for care and boosts the confidence of communities in the health system to continue to send their families for care. Our results contrast with findings from rural Niger that revealed that nurses were reluctant to refer patients to hospitals for fear of loss of power and respect.[27] Our study reinforces the importance of training midwives well, and facilitating a strong collaboration between these midwives and staff of district hospitals/health centers, a strong referral system and a monitoring and

evaluation system, all of which strengthen prompt referral of cases that are beyond the expertise of these midwives.

The CHO-midwives play a pivotal role by ensuring that women and children are safe during delivery. As frontline providers in rural areas, they are sometimes called "doctors" because they are mostly the only or among the few providers of health care in rural communities. Their status as the only or among few providers and their proximity to rural communities offers them the chance to know and understand their clients/patients health problems and address them promptly. The midwives' activities in the communities are perceived as improving skilled delivery coverage in rural areas.

Financial and non-financial incentives are a sure way of improving motivation and performance of health workers.[28] In our study, key informants mentioned that the CHO-Midwives are given 10% of funds generated from every birth to motivate them to continue to provide the services. Our study also revealed that CHO-Midwives received non-financial incentives such as "respect" and "recognition" by community members, paid leave, training, promotion and feedback from supervisors. The Government of Ghana collaborated with other partners to institute a fund for skilled delivery care to enable women access maternity services. Skilled delivery is, therefore, free for pregnant women; but the government pays the health sector for every delivery conducted. The arrangements give the CHO-Midwives some financial incentive but may not be sustainable if government support ends or is reduced. Women in rural areas might not be able to afford the delivery fee and CHO-Midwives may no longer have financial incentives to enhance their service delivery.

In Kenya and other East and Southern African countries, health facilities used financial incentives to motivate their staff to continue to stay and work in the public sector. [29]Kenya health authorities also provided non-financial incentives such as paid leave and overtime pay, access to house or car loan facilities, transport, entertainment, hardship, responsibility, special duty and uniform allowances to their highly skilled sector workers for high performance at work.[29]

It is important that CHO-Midwives are motivated, as they encounter hazards in the communities and must make the sacrifice of leaving their families to work in rural settings. However, it is necessary for health officials and community stakeholders to inquire about how the Ghana Health Service implemented and evaluated the incentives to midwives and to ensure that such schemes are conducted in a way to benefit the midwives for optimal work performance.

The aim of the skilled delivery care in rural areas is to ensure that every woman has access to the services during birth. It is also to make sure that, women and their infants are safe during and after delivery. We found that CHO-Midwives activities in the communities have improved the number of skilled deliveries, health education, antenatal attendance, postnatal care and reduce maternal deaths in rural communities.

Challenges

Health professionals and community stakeholders mentioned a number of challenges facing the program. Above all, there are many aging midwives in the system, who will be going on retirement soon. In addition, there are inadequate numbers of midwives in the health care system. The midwives have experienced challenges that include heavy workload due to personnel shortages: The training of midwives for the program is slow coupled with attrition of some of the already trained midwives to other countries in search for jobs with better salary conditions.[11] Consequently, this

phenomenon has created a wide gap between the demand for midwives in rural communities and the supply of trained midwives in the country.

Poor accommodation for midwives and other staff in the CHPS centers, lack of delivery and resting rooms for pregnant women and nursing mothers, lack of toilet facilities, bathrooms, electricity and water in some CHPS centers are hindering the provision of skilled delivery services in rural communities. The Ghana Health Service started the CHPS program with the aim of offering basic healthcare to rural families, but if the midwifery program is added to CHPS, that will involve expanding the infrastructure to cater for these services. A study on infrastructural capacity in Yemen revealed that many health facilities had no labor room. [30]In this paper, we found that there are few, if any, ambulances to convey pregnant women from remote villages to the health centres or district hospitals. The health officials, CHO-Midwives and community members stated that the insufficiency of transport is a major barrier to skilled birth attendance in these villages: This weakens the referral system and puts pregnant women and nursing mothers at risk of death or disability and that might reduce the confidence communities have on the health system. A study in Ethiopia also found that many women die while waiting for transportation or in the process of being transported to first referral level facilities because of the inadequacy of emergency transportation.[31]

The CHO-Midwives are in CHPS compounds providing integrated health services including midwifery in rural areas. They have successfully collaborated with community members, District Assemblies and NGOs to bring health services to the doorsteps of the people and the program has achieved remarkable results in skilled care at birth. However, the Government of Ghana and the Ghana Health Service could address the challenges above for better service delivery.

Study limitations

The research include limited number of respondents, some selected based on the virtue of their role in the CHPS program and community. The small numbers and the uniqueness of the setting might not make the findings generalizable to other settings. On the other hand, the open-ended interview techniques allowed us to capture the views of the respondents in their own words. This study is focused on skilled delivery program within the context of the CHPS and might not be generalizable to other contexts because of the uniqueness of the design and implementation of the CHPS program in the UER. However, our findings can still be adapted by other developing countries for community-based programs.

Conclusions

Our study demonstrates that CHOs can be successfully trained as midwives and deployed to rural areas to provide skilled delivery services at the doorsteps of rural households. The integration of the skilled delivery program with the CHPS program appears to be an effective model for improving access to skilled birth attendance in rural communities of the UER, Ghana.

The primary challenges that remain include inadequate numbers of CHO-Midwives; insufficient transportation; and infrastructure weaknesses. Each of these challenges requires government attention and resources. Once these barriers are addressed, deploying CHO-Midwives as part of the CHPS program can be scaled up throughout all rural areas in Ghana as a key strategy to improve access to skilled attendance at birth and reduce maternal deaths throughout the nation.

Competing Interest

The author(s) declare that they have no competing interests.

Authors Contribution

ESS and LM designed the study. ESS performed the data analysis, interpreted the results and wrote the manuscript. LM helped in planning and supervised all parts of the study and contributed to the methodology and writing of the manuscript. JB, KYA, SM and HVD contributed to the planning of the study and revision of the manuscript. All authors read and approved the final version of the manuscript.

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