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THE EMERGENCY OBSTETRIC AND NEONATAL CARE TRAINING; TRENDS OF MATERNAL OUTCOMES BEFORE AND AFTER TRAININGIN THE HOSPITALS IN SIAYA COUNTY, WESTERN KENYA

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ABSTRACT

The WHO developed and hasrecommended EmONC training to address the concern with the life-threatening complications during pregnancy, delivery, or postpartum period. Indeed, several countries have implemented the training in sub-Saharan Africa but with unique challenges and barriers. However, very limited evaluations have been carried out to inform improvements or implementation strategies. We therefore conducted retrospective study design to assess the trend of maternal outcomes such as caesarian sections and post-partum hemorrhage before (2 years) and after (2 years) implementation of EmONC training at county referral hospital and 5 sub-county hospitals in Siaya County, Western Kenya. The data on maternal outcomes were extracted from DHIS (District Health Information System) and analyzed with SPSS IBM Version 20 software. The findings showsthat there were 4779 maternal outcomes with 3771 (76.63%) caesarian sections (CSs) and 1028 (23.37%) post-partum hemorrhage (PPH) cases. The PPH cases were 645 (62.74%) and 383(37.26%) after and before the training respectively. Also, the CSs cases were 2177 (35.73%) and 1594 (42.27%) after and before the training respectively. The differences of PPH and CSs cases after and before the training were statistically significant with the P values of 0.0003 and 0.029 respectively. Similar trends of increasing maternal outcomes were observed in six hospitals. The findings suggest that EmONC training has no effect on the selected maternal outcomes possibly because of poor implementation strategy. However, we have a caveat on the interpretation of the findings because the increased outcome could be due to more deliveries as a result of free maternity services. We therefore recommend a similar study in other settings controlling for the effect of free maternity services and also including more maternal and neonatal outcomes as findings are critical improvements of the strategy.

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INTRODUCTION

Emergency obstetric and neonatal care (EmONC) remains one of the most challenging services in the practice of medicine, as timely access to emergency obstetric care is necessary to save the lives of women experiencing complications at delivery, and for newborn babies (Dubey, 2005). It is estimated that approximately 15% of expected births worldwide result in life-threatening complications during pregnancy, delivery, or the postpartum period. In India, it has been shown that about 90% of maternal deaths are due to emergency admissions with complications requiring ICU care (Dasari, 2015). In light of these concerns, The WHO has developed and recommended EmONC training services to improve the maternal outcomes (Ali *et al.*, 2005) and there is an effort to scale it up in a potentially broader geographical poor resource settings.The training adopts multiple strategies with important concepts cutting across all components such as equity, quality and leadership as the pillars of success (Fortney, 2005). However, other interventions andunique challenges or barriers in different countries in sub-Saharan Africa are setbacks to the desired outcomes. The notable challenges and barriers are limited commitment of the stakeholders, weak health systems,

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limited allocation of resources (human, financial and capital/material), limited monitoring and evaluation of the implementation of the program etc (Bergh *et al*., 2015). Consequently, with some of these challenges and barriers unique to countries in sub-Saharan Africa, there is a need to evaluate them to inform improvements or a cost-effective implementation strategy.

MATERIALS AND METHODS

Study site

The study sites were Siaya County Referral Hospital (Level 5) and 5 sub-county hospitals (Level 4) namely Bondo, Madiany, Ukwala, Ambira and Yala. Of the six hospitals, all offer services for PPH and only three: Bondo SCH, SCRH and YSCHoffer emergency caesarian section services.

Study design

This was a retrospective design that involved retrieval and review of past hospital/county health records on two maternal outcomes. The data were collected between June 2012 and June 2016 (4 years) from the DHIS database. The implementation of EmONC training was from June 2014 and is still in progress. In addition, five key personnel in charge of 5 sub-county referral hospitals were interviewed to provide their opinion on the progress of the EmONC training. Each personnel had to consent before participating in the study. The study was approved by the Ethical Review Committee of Jaramogi Oginga Odinga Teaching and referral Hospital, Kenya.

Data analysis

The data was managed and analyzed in SPSS IBM Version 20 software. Using the descriptive statistics maternal outcomes were aggregated annually from July 2012 to June 2016 and presented as percentages and frequency distributions. The change of cases were determined by comparing the pre and post training change of cases using t- test. The 95% confidence intervals (CI) around effect estimates were computed and pvalue less than 0.05 was considered statistically significant.

RESULTS

Our study shows that there were 4779 maternal outcomes within the 4 years of the study. Of the total, 3771 (76.63%) and 1028 (23.37%) of the outcomes were of caesarian sections and Post-Partum Haemorrhage respectively (Table 1). We further looked at the effect EmONC training as an intervention aimed at decreasing the trend of the maternal outcomes, against the expected decrease, there was an increase of post-partum hemorrhage from 37.26% to 62.74% (*P value* = 0.0003) after an intervention (Table 2). There was similar observation for Caesarian sections that increased from 42.27% to 57.73% at *P value= 0.0292* (Table 2). Since the training targeted the whole county, we assessed the trend of decrease and increase in the sub-county hospitals as shown in Figure 1, there was an increase of the post-partum hemorrhage cases in all the six health facilities. A similar trend was also observed on the caesarian sections. The findings as reported on both Table 2 and figure 1, is supported by the information provided by those who were in charge of the 6 health facilities, who were involved in the key informant interview. Majority pointed out that the intervention was implemented with very limited resources such as equipment, skilled staff, non-pharmaceutical supplies, and lack of reliable electricity supply etc. In particular, KII2, pointed out under staffing with frequent reshuffling or transfer to other health facilities. However, KII3, pointed out lack of motivation of health care workers as possible reason for increasing cases of maternal outcomes. In addition, the majority had concern with the selection of staff for the training, in particular, KII1 pointed out the inter-cadre conflicts and lack of follow up of post EmONC training by ensuring propersupervision and mid-term reviews.

Table 1. Maternal outcomes within 4 years

Maternal outcome	Year 1	Year 2	Year 3	Year 4	Total
Postpartum Haemorrhage	167	216	284	361	1028 (23.37)
Caesarian section	709	885	1124	1053	3371(76.63)

Table 2. Maternal outcomes before and after EmONC training

Maternal outcome	Intervention (EmONC training)		
	Before training n (%)	After training n (%)	P value
Post-partum hemorrhage	383 (37.26)	645 (62.74)	0.0003
Caesarian section	1594 (42.27)	2177 (57.73)	0.0292

DISCUSSIONS

We report that there was an overall increase of maternal outcomes PPH and CSs in the health facilities and the same increasing trend was observed in each of the six health facilities. The increasing trend of CSs is of a concern and there should be an effort to sensitize the general public as well as health care providers on the observation (Fortney, 2005) and create awareness among the regulatory authorities (Dasari, 2015). Of the maternal outcomes, post-patum hemorrhage was the most prominent, and increased over the study duration, and the finding is consistent with other studies (Otolorin *et al.*, 2015; (Dasari, 2015). Since EmONC training has been focused on the hospital based personnel, there is a need to include non-physician clinicians/associate clinicians in the trainings, in particular, the community health volunteers can play a critical since the complications of PPH can start at the households or home. A study was conducted in rural Tanzania, whose main aim was to explore the impact of such training on health outcomes including maternal and neonatal morbidity and mortality in health facilities, maternal deaths showed a non-significant downward trend over 2 years (Ellard *et al*., 2016a; Fortney, 2005). The findings in this study is consistent with our findings and supports the needs for evaluation of the training in the context of enhancing knowledge, practical skills, clinical leadership of clinicians and appropriate infrastructure.

Other studies have suggested community mobilization directed to understanding the danger signs and enhanced utilization of services at functional facilities when necessary (Kayongo, Rubardt, *et al*., 2006). In addition, there is a need to identify factors influencing utilization of EmONC services and continuous monitoring and periodical assessment of the process indicators (Islam *et al*., 2005). The common barriers to delivery of EmONC services include shortage of qualified

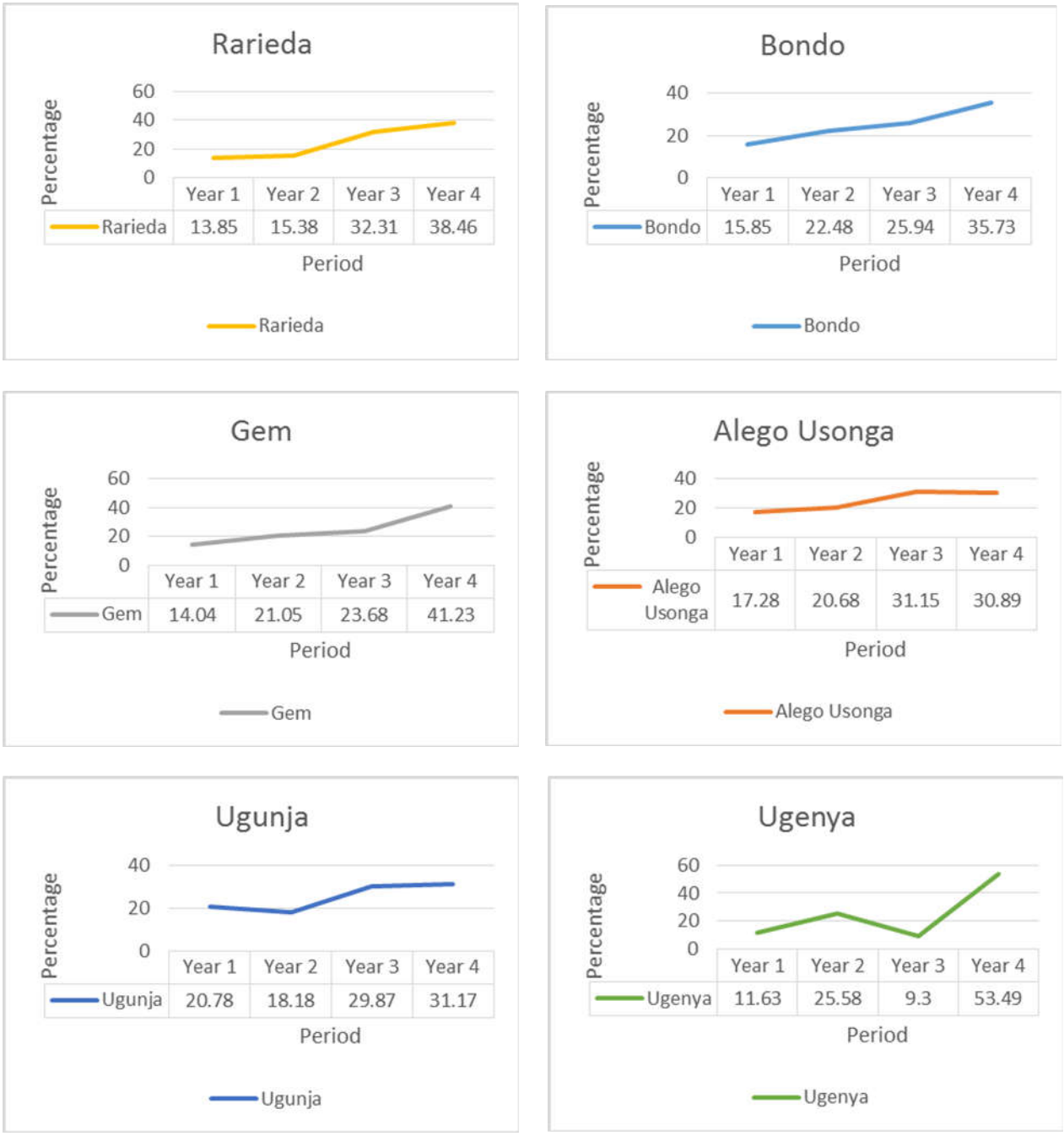

Figure 1. Trends of PPH per sub-county hospitals

staff, lack of essential installations, supplies and medications, increasing workload, burn-out and turnover; and poor data collection and monitoring systems (Cooke *et al*., 2010). In a study to compare barriers in Northern Uganda and Burundi, barriers unique to Northern Uganda included demoralized personnel and lack of recognition; poor referral system; inefficient drug supply system; staff absenteeism in rural areas; and poor coordination among key personnel. In Burundi, weak curriculum; poor harmonization and coordination of training; and inefficient allocation of resources were the unique challenges (Chi *et al*., 2015).Logistics play a critical role in determining the successful delivery of healthcare services anda study designed to assess the effect of distance to EmONC services on early neonatal mortality in rural Ethiopia showed that a closer proximity to EmONC services and higher level of care were associated with lower early neonatal mortality. Nonetheless, it does not make a significant contribution to explaining socio-economic inequality (McKinnon *et al*., 2014).

In brief, this study suggests that Em ONC training has no effect on the selected maternal outcomes and this could be due to poor implementation strategy. However, we have a caveat on the interpretation of the findings because the increased outcome could be due to more deliveries as a result of free maternity services. We thereforere commend a similar study in other settings controlling for the effect of free maternity services and also including more maternal and neonatal outcomes.

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