



## The introduction of a midwife-led obstetric triage system into a regional referral hospital in Ghana



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### ABSTRACT

**Objective:** to introduce and embed a midwife-led obstetric triage system in a busy labour ward in Accra, Ghana to improve the quality of care and to reduce delay.

**Design:** the study utilized a participatory action research design. Local staff participated in baseline data collection, the triage training course design and delivery, and post-training monitoring and evaluation.

**Setting:** a regional referral hospital in Accra, Ghana undertaking 11,032 deliveries in 2012.

**Participants:** all midwives and medical staff.

**Measurements:** measurements included maternal health outcomes, observations of labour ward activity, structured assessments of midwife actions during admission, waiting times, focus group discussions, and learning needs assessments which informed the course content. During training, two quality improvement tools were developed; coloured risk acuity wristbands and a one page triage assessment form. Participants measured compliance and accuracy in the use of these tools following course completion.

**Findings:** initially, no formal triage system was in place. The environment was chaotic with poor compliance to existing protocols. Sixty-two midwives received triage training between 2013 and 2014. Two Triage Champions became responsible for triage implementation, monitoring and further training. Following training, the 'in-charge' midwives recorded a cumulative average of 83.4% of women wearing coloured wristbands. A separate audit by the Triage Champions found that 495/535 (93%) of the wristbands were correctly applied based on the diagnosis. Quarterly monitoring of the triage assessment forms by Kybele trainers, showed that 92% recorded the risk acuity colour, 85% a 'working diagnosis' and 82% a 'plan.' Median (interquartile range) waiting times were reduced from 40 (15–100) to 29 (11–60) minutes ( $p = 007$ ). Twenty of 25 of the staff reported that the wristbands were helpful.

**Conclusions:** an interactive triage training course led to the development of a triage assessment form and the use of coloured patient wristbands which resulted in delay reduction and improved quality of maternity care.

### Introduction

This paper describes the introduction of obstetric triage to a busy labour ward at a major referral hospital in Accra, Ghana between 2012 and 2014, in order to improve the assessment, problem identification and first line management of women when they arrive. In 2012, the maternal mortality ratio for this hospital was 499/100,000 live births

compared to the Ghana national average of 380 and the Millennium Development Goal of 185 (United Nations Development Programme, 2015). The subsequent Sustainable Development Goal (SDG) 3.1 seeks to reduce global maternal mortality to < 70 per 100,000 live births by 2030 (United Nations, 2014). Many maternal deaths are avoidable with prompt recognition of complications and timely intervention, therefore delivery in health facilities by skilled birth attendants has been

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promoted for all women (Campbell and Graham, 2006; World Health Organisation, 2014). Improvements in the recognition of pregnancy related complications as well as improved transport procedures have resulted in a higher number of women with complicated pregnancies being referred to referral centres. Most referral hospitals have been unprepared for the additional influx of patients this has created.

Attendance at a health facility does not guarantee high quality maternity care. A recent systematic review defined quality maternity care as the provision of preventive and supportive care with effective treatments for problems when they arise and optimisation of biological, physiological and sociocultural processes (Renfrew et al., 2014). This review describes a framework and essential components for quality maternal and newborn care, including the need for the effective and timely first line management of complications. To deliver high quality maternity care it is necessary to create an environment where these effective midwifery interventions are consistently implemented. However health care facilities in low-income countries (LIC) are frequently characterised by overcrowding, delays, insufficient drugs, equipment and staff, as well as inadequate knowledge and skills. A systematic review of the ‘third delay,’ i.e. delays that occur within the hospital system, cited human resource weakness as a major cause of hospital-based delay, specifically overcrowding, inadequate staff numbers with insufficient training and poor motivation (Knight et al., 2013).

In LIC pregnant women may wait for hours, even days, for evaluation and treatment when they arrive at the hospital. This delay can be deadly for conditions such as haemorrhage, eclampsia, obstructed labour, and fetal distress. Problems are compounded by lack of drugs, equipment, and resources such as water and electricity. The concept of ‘triage’ is uncommon and many hospitals in LIC operate on a ‘first come, first served’ basis (Rosedale et al., 2011). In high resource settings, triage has been used in emergency medicine, paediatrics and more recently in obstetrics, to ensure timely and high quality care (Molyneux et al., 2006; Iserson and Moskop, 2007; Angelini and Howard, 2014). In obstetrics, triage is frequently performed by midwives or obstetric nurses and is defined as ‘the brief, thorough and systematic maternal and fetal assessment performed when a woman presents for care’ (Ruhl, 2014).

Obstetric triage includes labour assessment, monitoring of fetal well-being and laboratory assessment of complications. International guidelines recommend that the initial assessment should begin within 10 minutes of arrival (Paisley, 2011). Results of a recent systematic review found that obstetric triage enabled more rapid response to emergencies, improved maternal and fetal surveillance, prevented unnecessary admissions, improved utilization of beds and reduced waiting times (Angelini and Howard, 2014). Obstetric triage has also been shown to ensure that labour onset is correctly diagnosed so that unnecessary interventions including syntocinon augmentation and caesarean section are prevented (Lauzon and Hodnett, 2001). Misdiagnosis of labour contributes to congestion and increases workload on the labour ward (Cheyne et al., 2006).

Most of the literature describes triage in sophisticated health settings and suggests that its effectiveness is strongly dependent on the provider’s ability to assess, triage, treat, and discharge patients effectively (Zocco et al., 2007). Several studies describe emergency triage, assessment, and treatment (ETAT) in LIC with the development of guidelines for appropriate paediatric triage (Gove et al., 1999; Molyneux et al., 2006). A systematic review of critical care in LIC revealed that emergency care and triage are often the weakest parts of the health system but if these are well organized they can be life-saving and cost effective (Baker, 2009). However, in general, there is a paucity of literature describing methods and outcomes regarding obstetric triage in low-resource settings.

Women are referred to Ridge Regional Hospital (RRH) from nearly 100 maternity polyclinics across Greater Accra. Although new building is in progress, the maternity unit currently operates in the original part

of the hospital built in the 1920s. The labour ward is situated on the first floor and consists of a corridor with a bench and examination room, eight delivery beds plus two beds in the corridor, and a small room for newly delivered mothers. The recently refurbished maternity theatre is a 10 minute walk away. In 2007, Kybele (a non-governmental organisation dedicated to improving childbirth) partnered with the Ghana Health Service (GHS) to conduct a five year quality improvement project to improve processes and practices to reduce maternal and neonatal mortality at RRH (Engmann et al. 2010; Srofenyoh et al. 2012). Part of the initial project involved improving patient and delivery data collection including mortality figures. This phase of the project also identified significant delays that were occurring following the arrival of patients to the labour ward. Seventy per cent of patient admissions were referrals from other facilities with complications, and many of these women were transferred intra partum.

Congestion became more severe, due to an increase in the number of women admitted, all with worsening complications and conditions. Obstetric admissions increased from 4793 in 2006 to 11,032 in 2012. During this period of time there was no increase in space or in staff numbers and the department was close to the breaking point (Srofenyoh et al. 2016). Data on waiting times were collected between September and November 2012 as part of a separate study (Goodman et al., 2017). This showed a median (IQR) waiting time from arrival to assessment of 40 (15–100) minutes with a maximum wait time of 1 day 2.5 hours. Approximately 35% of deliveries were by caesarean section and by 2012, an average of 11 were performed each day. In Ghana, individual institutions collect mortality statistics, and than the national average (Lee et al., 2012). In 2012 there were 55 maternal deaths at RRH, equivalent to a maternal mortality ratio of 499/100,000 live births.

The objective of this study was to establish whether it was possible to introduce and embed a midwife-led obstetric triage system to a busy labour ward in a LIC to improve the quality of care and to reduce delay.

## Methods

### Stage 1- Study setting and design

This project utilized a participatory action research approach to establish whether it was possible to introduce triage principles to improve the identification, assessment and first-line management of women arriving on the labour ward and reduce congestion and delay in the admission process at RRH, Accra. Action research is an interactive enquiry process that consists of a spiral of steps, each of which is composed of planning, action and fact-finding (Loewenson et al., 2014). It has been used in developing countries to improve health programmes and to address health inequalities (Baum et al., 2006; Rhodes et al., 2007). The approach aims to solve problems within an environment by actively participating in the situation while simultaneously conducting research. It consists of a process of organising and validating experience, analysing and reflecting on patterns and collecting data, before agreeing on a course of action, and requires those being researched to be actively involved in the process (Baum et al., 2006). The collaborative nature of the relationship that already existed between RRH and Kybele, as well as trust in the partnership, provided the structure for this process. The overall structure for the project is outlined in Fig. 1.

In 2012, baseline data was collected to describe and understand the operational processes and to identify system weaknesses. Several Kybele team members (experienced midwives and obstetricians) spent several weeks on the labour ward observing the care of mothers and babies. This observation consisted of familiarisation with written policies and records, as well as talking to staff and patients. Meetings and focus groups were held with midwives, nurses, orderlies, managers, medical officers, and senior obstetricians to identify their views about the reasons for delays. Fifty three individual observations were

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