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CLINICAL ARTICLE

Healthcare providers' knowledge and practices associated with postpartum hemorrhage during facility delivery in Dar es Salaam, Tanzania

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ABSTRACT

Objective: To investigate healthcare providers' knowledge and practices associated with prevention and management of postpartum hemorrhage (PPH) to improve care in urban settings and reduce maternal morbidity and mortality. **Methods:** As part of a cross-sectional, survey-based study, providers from 14 government health facilities providing maternal delivery services in the Ilala Municipality, Dar es Salaam, Tanzania, were surveyed about PPH-related practices and knowledge in April 2015. The data were analyzed descriptively, and χ^2 tests of independence were used to examine relationships between experience, facility type, and knowledge. **Results:** Among 115 respondents, 7 (6.1%) answered all PPH knowledge questions correctly. The mean knowledge score was $63.9\% \pm 21.1\%$. Non-calibrated methods for estimating postpartum blood loss were common; only 62 (53.9%) respondents reported direct collection. Referral of patients for PPH-related transfer was reported by 49 (42.6%) respondents; transportation and finances were barriers to transfer. Respondents requested continued training and additional supplies to address emergencies. **Conclusion:** Healthcare providers had suboptimal knowledge of PPH risk factors, diagnosis, and causes. Strategies that provide ongoing education and equip lower-level facilities with adequate supplies might minimize PPH-related transfers. Providing prenatal women with basic delivery items (e.g. a blood collection device) and misoprostol is a viable option to ensure that essential PPH-prevention tools are available at delivery.

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1. Introduction

Significant reductions in maternal mortality have been attributed to global initiatives associated with Millennium Development Goal 5 (MDG 5), which called for a 75% reduction in the global maternal mortality ratio (MMR) between 1990 and 2015. MDG 5 encouraged a focus on both preventable causes of death—e.g. hemorrhage and pre-eclampsia—and improved access to quality care [1]. Although global MMRs have improved, much of Sub-Saharan Africa has failed to meet the benchmarks [2]. Tanzania is a microcosm of this trend: although substantial advances have been made, the 2015 national MMR was still high (432 maternal deaths per 100 000 live births vs 910 per 100 000 live births in 1990) [3,4]. Thus, access to quality care remains a health priority both globally and in Tanzania.

A key strategy for MDG 5 was to increase the number of births attended by skilled health personnel, which is more or less equivalent to increasing facility deliveries and is based on the assumption that women who deliver in facilities will receive access to life-saving, quality care [5]. Although promoting health facility deliveries in urban areas has been largely successful in Tanzania and many other low-resource settings, it is not sufficient to reduce mortality if there is poor quality of care or if facilities are not adequately prepared for this increased volume [6–9]. In Dar es Salaam, Tanzania, more than 90% of deliveries occur in healthcare facilities [10]. Nevertheless, the estimated regional MMR in Dar es Salaam was 499 per 100 000 live births in 2012 [3], which suggests that there is an urgent need to improve quality of care through an enhanced medical infrastructure including space, personnel, medical supplies, and referral systems [5,11]. In an urban context, dysfunctional referral systems and substandard treatment in the health facility setting are notable contributors to maternal death [12]. At the national tertiary care center in Dar es Salaam, substandard care—including limited or no access to blood transfusions, delayed treatment, and overall mismanagement—contributed to 82.3% of maternal deaths in 2011 [13].

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Despite increases in health facility deliveries, postpartum hemorrhage (PPH) remains the leading direct cause of preventable maternal mortality in Tanzania, accounting for nearly 30% of all cases [14]. Given the continued high MMRs and the documented inadequate infrastructure and quality of care to address PPH-related cases in urban facilities [13], the aim of the present study was to investigate the current practices and knowledge of healthcare providers in relation to PPH prevention, management, and referral in Dar es Salaam, Tanzania. The long-term goal is to reduce maternal morbidity and mortality by identifying intervention points to increase optimal care in urban settings with high rates of health facility delivery.

2. Materials and methods

The present descriptive, cross-sectional, survey-based study was conducted among healthcare providers in maternal delivery services at various facilities between April 10 and April 17, 2015, as part of a larger needs assessment to understand urban maternal health in the Ilala Municipality of Dar es Salaam, Tanzania. The research was approved by the National Institute for Medical Research, Dar es Salaam, Tanzania (#2015-1907), and the Institutional Review Board at the University of Illinois at Chicago, IL, USA (#2015-0109). Informed consent was waived for the study so that participant anonymity could be maintained.

There are 38 government health facilities in the Ilala Municipality, consisting of dispensaries, health centers, and hospitals. Of those, 24 provide prenatal care and labor and delivery services. Generally, dispensaries provide basic obstetric care and delivery services, and have minimal medications and supplies, but usually do not have blood supplies or oxygen. Health centers are first-level referral facilities for dispensaries, but also have limited blood supplies and emergency referral services available. Hospitals are second-level referral facilities and have the capacity to perform surgical procedures. In April 2015, midwives from all 24 government facilities providing maternal health services were invited to a municipality health meeting, and staff from 14 of the 24 sites attended. All 14 sites agreed to participate in the research study and were representative of the municipality's government health facilities in terms of size and type, services provided, and distance from the city center. The national referral hospital, which is in the Ilala Municipality, was not included in the study sample.

After the municipality health meeting, participating midwives distributed a paper-based, self-administered questionnaire to eligible healthcare providers at their respective facilities. The inclusion criteria were employment at a government facility and provision of maternal delivery services. The survey questionnaire contained 20 questions about demographics, experiences, and practices, as well as one open-ended question about PPH experiences and seven questions about current PPH prevention and management knowledge (Supplementary Table S1), emphasizing blood loss assessment and use of prophylactic uterotonic drugs.

An informational cover sheet described the purpose of the survey, instructions for completion and return, and contact information for the researchers. Completed surveys were returned to an envelope in a secure location at the facility. To encourage unbiased responses, no identifying information was collected from the participants. All survey data were entered into an electronic database by the research team.

The data were analyzed descriptively with a focus on safe motherhood knowledge, attitudes, and practices, using SPSS version 23 (IBM, Armonk, NY, USA). Each question was analyzed separately. A knowledge index was created that included all seven questions about causes, diagnosis, and risk factors, and the use of uterotonic drugs for PPH to assess overall knowledge. χ^2 tests of independence were performed to examine relationships between providers' years of experience, their facility type, and all the PPH-related knowledge and practice items. Significance was set at a *P* value of less than 0.05.

3. Results

In total, 124 surveys were distributed to healthcare providers offering reproductive health services at 14 government facilities. Of these, 115 respondents representing 13 facilities returned surveys, giving an overall response rate of 92.7%. Of the 13 facilities, 10 were dispensaries, two were hospitals, and one was a health center. Most respondents were nurse-midwives, and more than three-fifths had at least 6 years of experience (Table 1). More than half the respondents worked in a dispensary (Table 1).

The data on PPH-related knowledge and practices are summarized in Table 2. Seven (6.1%) of the 115 respondents answered all questions correctly. Nineteen (16.5%) identified the correct diagnosis for PPH (blood loss ≥ 500 mL, or blood loss < 500 mL with shock symptoms). All PPH-related risk factors were identified by 52 (45.2%) respondents, and uterine atony was recognized as the main cause of PPH by 47 (40.9%). Nearly all providers reported using oxytocin after delivery of the newborn (Table 2). Although 113 (98.3%) respondents knew that misoprostol could be used to control bleeding from PPH, only 42 (36.5%) reported using it, mostly as a result of its unavailability. The recommended prevention dose of misoprostol (600 μg) was known by 72 (62.6%) participants. Using some form of blood loss estimation during delivery was reported by 109 (94.8%) respondents; however, estimation methods varied (Table 2).

There were no significant differences in mean scores of the PPH-related knowledge index between respondents with more than and those with fewer than 6 years of provider experience (data not shown). When individual items were evaluated, respondents with more experience were more likely to correctly identify PPH risk factors ($n=115$, $\chi^2=4.55$, $P=0.037$) and the correct PPH prevention dose of misoprostol ($n=115$, $\chi^2=6.06$, $P<0.001$) than were those with less experience. Providers at dispensaries and the health center were less likely to use a blood collection drape to estimate postpartum blood loss as compared with hospital-based providers ($n=115$, $\chi^2=13.44$, $P<0.001$). No other characteristics of the provider or healthcare setting were significantly associated with PPH-related knowledge, practices, or transfers (data not shown).

Forty-nine (42.6%) providers had referred a woman for a PPH-related transfer in the previous 3 months. When examining these findings by facility type, the highest frequency of referrals occurred at dispensaries (Table 3). Approximately two-thirds of providers reported that their facility had consultation/communication and transport systems (Table 3). When stratified by facility, consultation and referral communication systems were reported by a higher proportion of hospital providers than dispensary and health center providers (Table 3). A transport system for referrals was reported by approximately three-quarters of dispensary providers, and more than half of providers at the health center and hospitals (Table 3).

Table 1
Demographic characteristics of the respondents ($n=115$).

Characteristic	No. (%)
Type of healthcare provider	
Nurse with midwifery training ^a	102 (88.7)
Nurse, no midwifery training	9 (7.8)
Doctor, medical or clinical officer	4 (3.5)
Clinical setting ^b	
Dispensary	70 (60.9)
Health center	24 (20.9)
Hospital	21 (18.3)
Provider experience, y ^c	
≥ 6	71 (62.8)
≤ 5	42 (37.2)
Women	104 (90.4)

^a Includes registered and auxiliary enrolled nurses.

^b Dispensaries and health centers provide basic obstetric care and delivery; health centers serve as a first-level referral facility.

^c Missing data for 2 respondents.

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