Respectful Maternity Care

Optimizing the quality of care
for women with hypertensive disorders
of pregnancy in Ghana

Kwame Adu-Bonsaffoh

Respectful Maternity Care: optimizing the quality of care for women with hypertensive disorders of pregnancy in Ghana

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Author: Kwame Adu-Bonsaffoh
Printed by Ipskamp Printing | proefschriften.net
Layout and design: Jildou Hengst, persoonlijkproefschrift.nl
ISBN: 978-94-6473-262-7

The author wishes to express his heartfelt appreciation for financial support received from the Julius Global Health Support program, University Medical Center Utrecht for funding this thesis.

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Respectvolle verloskundige zorg: het optimaliseren van de kwaliteit van zorg voor vrouwen met hypertensieve zwangerschapsaandoeningen in Ghana

(met een samenvatting in het Nederlands)

Proefschrift

ter verkrijging van de graad van doctor aan de
Universiteit Utrecht
op gezag van de
rector magnificus, prof.dr. H.R.B.M. Kummeling,
ingevolge het besluit van het college voor promoties
in het openbaar te verdedigen op

maandag 23 oktober 2023 des ochtends te 10.15 uur

door

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geboren op 1 januari 1977
te ASUAFU-NSUTA, Ghana

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Chapter 1

General introduction

Global burden of hypertensive disorders of pregnancy

Globally, hypertensive disorders of pregnancy (HDPs) remain a major challenge to all the disciplines directly or indirectly involved in maternal care: public health practitioners, physicians, midwives, scientists, policymakers and governments [1,2]. The primary challenge relates to the lack of complete understanding of the etiology and pathophysiology of HDPs despite extensive biomedical and clinical research [3,4]. This has resulted in persistent lack of clinical consensus on the definitions, diagnostic approaches and treatment protocols [5,6]. Consequently, HDPs are associated with significant maternal/perinatal mortality and morbidity which are partly due to their progressive nature and unpredictability of their outcomes [5–7]. In addition, health system challenges especially in low- and-middle income countries (LMICs) result in substandard care and avoidable maternal deaths [8]. Therefore, interventions to improve access to equitable maternal health are needed to adequately prevent, minimize and treat complications of HDP especially in LMICs where the burden is highly prevalent.

Hypertensive disorders of pregnancy comprise a broad spectrum of blood pressure associated conditions with varying complexities and potential risks to the mother and the fetus. Hypertension in pregnancy is defined as systolic blood pressure (BP) ≥140 and/or diastolic BP ≥90 mmHg, measured on two consecutive occasions between 4 to 6 hours interval [5]. Currently, the International Society for the Study of Hypertension in Pregnancy (ISSHP) recognizes the following entities of HDPs: *gestational hypertension* (no proteinuria or other end-organ damage), *chronic hypertension* (pre-existing or predating the pregnancy), *preeclampsia* (de novo or superimposed on chronic hypertension), *white coat hypertension* (elevated clinic blood pressure, but normal when measured at home or work) and *masked hypertension* (elevated blood pressure at home but normal when measured at the clinic) [5].

Preeclampsia (PE) remains the prototype of HDP because it is associated with the most severe adverse outcomes including perinatal morbidity and mortality [7,9,10]. The global incidence of preeclampsia is about 3-8% with more burden in LMICs [11]. PE can present during the antenatal, intrapartum or early postnatal period and is defined as "*de novo* hypertension after 20 weeks' gestation accompanied by proteinuria and/or evidence of maternal acute kidney injury, liver dysfunction, neurological features, hemolysis or thrombocytopenia, and/or fetal growth restriction" [5]. The cause of preeclampsia remains unclear, resulting in lack of consensus on the optimal treatment and timing of delivery. In LMICs, preeclampsia accounts for about 15% of maternal deaths and constitutes a major cause of severe maternal and perinatal morbidities [9]. Maternal mortality and severe morbidity associated with preeclampsia are primarily due to severe complications involving

multiple organs in the body such as the central nervous, respiratory, renal and hematologic systems [9,12].

Hypertensive disorders are amongst the most common complications of pregnancy. Current evidence indicates a progressive increase in the burden of HDP globally. More recently, Wang et al reported a rise in the global incidence of HDPs from about 16 million to 18 million representing over 10% increase from 1990 to 2019 with nearly 28,000 maternal deaths annually [13]. Not surprisingly, the burden of HDP is disproportionately higher in low- and middle-income countries (LMICs) especially in sub-Saharan Africa (SSA). The exceptionally high maternal death rates reflect the effect of inequities in access to maternal healthcare in LMICs compared to high-income countries (HICs). For instance, the maternal mortality ratio (MMR) in Sub-Saharan Africa is 533 per 100,000 live births compared to 5 per 100,000 live births in Western Europe [14]. Relatedly, the life-time risk of maternal death in SSA is 1 in 38 compared to 1 in 11700 in Western Europe [14]. Similar findings of increasing burden of HDP have been reported in the West African subregion [15,16]. In a recent systematic review, Noubiap et al determined the prevalence of HPDs in Africa as approximately 10% (between 8.1 to 12.1%) [17]. The systematic review included studies reporting wide variations in the prevalence of HDP (between 2.5 to 25%) in different settings in Africa [17].

Burden of hypertensive disorders of pregnancy and quality of care in Ghana

In Ghana, HDP constitutes the leading cause of maternal mortality in tertiary health facilities and accounts for 26-37% of maternal deaths [18–21]. Findings from the 2017 Ghana Maternal Health survey indicate that the proportional contribution of HDP to maternal death has doubled over the past decade (9% in 2007 to 18% in 2017) [22,23]. In addition, previous research indicates that HDP occurs in about 1 in 5 women presenting for maternity care at a tertiary hospital in the country and most are due to gestational hypertension and preeclampsia [21]. HDPs usually result in severe multi-organ complications such as renal failure, pulmonary edema and stroke. In addition, HDPs including severe preeclampsia can potentially increase the risk of major long-term complications such as cardiovascular disease (CVD) [2,6,24,25]. Although the clinical management of HDP complications is challenging, they are potentially preventable especially if context-related health system barriers are optimally addressed. Health system challenges including sub-optimal health financing frequently lead to substandard treatment, a significant contribution to maternal death attributed to HDP in both HICs and LMICs although the impact is worse in the latter [26,27].

Similar to other LMICs, Ghanaian women experience real-time barriers to seeking and receiving maternal care at health facilities including accessibility of effective treatment, financial or health care financing challenges, socio-cultural barriers and lack of adequate

number of health professionals [28]. Despite the availability of international guidelines such as the WHO and ISSHP recommendations for managing HDPs the associated maternal death and morbidity rates remain unacceptably high, although significant achievement has been reported. There is adequate evidence of substandard care in the clinical management of HDP including non-compliance with clinical guidelines and this is not limited to LMICs [26,29]. For instance, Browne et al determined a wide variation in health workers' adherence to clinical protocols in Ghana, ranging from 10 to 85% [29]. In addition, there is evidence that structural and organizational restrictions influence the clinical decisions of health providers who carefully navigate through different logics of care during treatment of HDPs [30].

Given the real-life clinical challenges associated with the care for HDPs, there is an urgent need for a paradigm shift in maternity care with particular focus on evidence-based measures to improve women's experiences of care. Such interventions including health system re-structuring will improve the quality and experience of care and minimize complications of HDP.

Respectful maternity care and mistreatment of women

Respectful maternity care (RMC) is a vital evidence-based strategy to improve pregnancy outcomes, satisfaction with care and future utilization of maternal health services globally. [31–33] The World Health Organization (WHO) defines RMC as "organized care provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment and enables informed choice and continuous support during labour and childbirth" [34]. Effective communication between health workers and women using simple and culturally acceptable processes remains central to providing RMC for improving the quality of maternal care. To facilitate RMC, interventions to improve communication strategies are needed with a special focus on information provision, relationship building and shared decision-making with women and their families [35].

Disrespectful maternity care and mistreatment of women during maternity care constitute a global public health phenomenon that is associated with significant maternal adverse outcomes [31,32]. There is evidence that women experience various forms of mistreatments and disrespectful care in health facilities and can potentially disincentivize mothers from seeking care at health institutions in the future [36,37]. The spectrum of mistreatment experienced by women includes physical (pinching, slapping, kicking and gagging) and verbal abuse (use of harsh or rude language, threats, judgmental or accusatory comments and blaming for poor outcomes), ineffective communication, stigma and discrimination, non-consented care, neglect, lack of privacy and confidentiality and lack of professional standards [38,39]. Generally, women who experience mistreatment are reluctant to access care at health facilities unless complications arise in which case, they have no alternatives.

Positive experiences with maternity care providers including respectful care can empower and comfort women whilst negative experiences can potentially inflict lasting psychological and emotional trauma resulting in reduced confidence and self-esteem [31,32].

In the global effort to improve maternal healthcare delivery and achieve the Sustainable Development Goal (SDG) target 3.1, there is evidence that optimizing respectful maternity care values in health facilities can potentially avert preventable maternal deaths and severe morbidities [31]. The SDG's maternal health target (3.1) aims to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030 [40] and RMC remains a critical facility-level intervention to achieving high quality of care and health for all [31,32]. The overall goal of SDG 3 is to ensure healthy lives and promote well-being for all ages and this requires the collaborative effort of all stakeholders including the mothers and their relatives, health workers and policymakers. In addition, health system challenges in LMICs including avoidable delays, frequent shortage of resources and lack of sustainable health financing require urgent interventions to promote the provision of high-quality maternal care. To optimize positive experience of care for pregnant women and incentivize them to access care, appropriate integration of respectful maternity care guidelines into routine maternal care is strongly recommended [34,41].

Respectful maternity care: Ghana context

In Ghana, mistreatment of women during childbirth in health facilities is pervasive and contributes majorly to substandard care and women's reluctance to access facility-based care [42–46]. Previous research indicates most women experience verbal abuse (e.g., shouting, yelling, insults and derogatory remarks) and physical abuse such as pinching and slapping during childbirth at health facilities in the country[43,46,47]. Similarly, other forms of mistreatment such as abandonment, lack of support, neglect and unresponsiveness to women's needs, stigma and discrimination have been reported [44]. Factors associated with mistreatment in the country include young age and women's failure to push during birth, inadequate human resources (health workers), lack of logistics and health system challenges [44,48]. Surprisingly, there are mixed feelings concerning its acceptability and rationalizations for its persistence from the perspectives of affected women and health workers [44,48]. Some have the opinion that such treatment can be useful in preventing adverse birth outcomes and therefore justified in some special circumstances. On the other hand, others believe that mistreatment of women of any form is not acceptable notwithstanding the circumstances of birth [44,48].

Although maternal health coverage has improved significantly over the past decade (health institutional deliveries improved from 54% in 2007 to 79% in 2017), a significant proportion of pregnant women still do not receive supervised deliveries at health facilities in Ghana

[22,23]. In addition, the national maternal mortality ratio remains excessively high (308 per 100,00 live births) with HDPs and obstetric hemorrhage constituting the main contributors [14,22]. Although context-specific health system challenges have been implicated in the sub-optimal quality of maternal care and unimpressive healthcare indicators, the permissive contribution of chronic disrespectful care cannot be ruled out. This is because mistreatment can potentially disincentivize facility-based childbirth and result in persistence of home delivery supervised by traditional birth attendants in the country. Mistreatment of women during childbirth is increasingly recognized as a widespread phenomenon in the country requiring urgent attention to optimize maternal health [43,44,48,49].

Current evidence indicates that RMC results in positive pregnancy, childbirth and postnatal experiences for women and serves as an incentive for accessing health facilities for maternity care services [34,36,37,50–51]. Given the progressive burden of HDPs (high mortality and morbidity), unresolved pathophysiological mechanism and lack of consensus in diagnostic and clinical management guidelines, optimizing respectful maternity care in different contexts seems promising in early diagnosis, treatment and reduce preventable complications of HDP. Successful development and integration of RMC guidelines into routine maternal care and strengthening of women's empowerment will facilitate improved health-seeking behaviour, early diagnosis and treatment, health outcomes and women's satisfaction with care.

Thesis objectives

This thesis aims to assess the quality of care for women with hypertensive disorders of pregnancy and explore how appropriate integration of respectful maternity care can optimize the provision and experience of care and reduce maternal morbidity and mortality. This thesis will specifically assess 1) the burden of hypertensive disorders in pregnancy, 2) the quality of care for hypertensive mothers and 3) respectful maternity care in Ghana.

Thesis outline

Chapter 1 is an introduction to the thesis. Part I describes the burden of hypertensive disorders of pregnancy including adverse maternal and perinatal outcomes in Ghana (Chapters 2 and 3). Part II discusses the quality of care for women with HDP with focus on the clinical challenges based on the perspectives of relevant stakeholders: hypertensive mothers and health professionals (Chapters 4 and 5). Part III discusses mistreatment of women during childbirth including disrespectful care and provides context-related recommendations for improving care (Chapters 6 to 8). Chapter 9 provides a general discussion on the burden and challenges associated with clinical care for HDP and how respectful maternity care could be optimized to reduce maternal mortality and morbidity.

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Part 1

Burden of Hypertensive disorders of pregnancy in Ghana

Chapter 2

Perinatal outcomes of hypertensive disorders in pregnancy at a tertiary hospital in Ghana

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Michael Yao Ntumy
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Joseph Darkwah Seffah

BMC Pregnancy and Childbirth. 2017;17:388

Abstract

Background

Hypertensive disorders in pregnancy remain a major global health issue not only because of the associated high adverse maternal outcomes but there is a close accompaniment of significant perinatal morbidity and mortality especially in Sub-Saharan Africa (SSA). However, the perinatal burden of HDP in Ghana has not been explored. We conducted this study to determine the perinatal outcomes of HDP at a tertiary hospital in Ghana.

Methods

A cross-sectional study conducted between January to February 2013 at Korle Bu Teaching Hospital (KBTH) in Accra, Ghana. Data collection involved baseline review of all the obstetric population who had just delivered to identify those with HDP. An informed consent was obtained after which a structured questionnaire was administered to the hypertensive mothers. The medical records of the mothers and their babies were also reviewed to determine the perinatal outcome indicators of relevance to the study. Data obtained were analyzed using SPSS version 20.

Results

We included 368 women with HDP and singleton births with a mean gestational age at delivery of 37.4 ±3.3 weeks. Adverse perinatal outcomes determined include the following: 91 (24.7%) neonates were admitted to the Neonatal Intensive Care Unit, 56 (15.2%) had neonatal respiratory distress/asphyxia with 14 (3.8%) requiring ventilatory support and 80 (21.7%) were delivered preterm. Also, stillbirth, early neonatal death, intrauterine growth restriction and low birth weight occurred in 25 (6.8%), 14 (3.8%), 23 (6.1%) and 91 (24.7%) respectively with a perinatal mortality rate of 106 per 1000 births. One- and 5-minute APGAR scores <7 occurred in 125 (34.0%) and 55 (14.7%) neonates respectively. Most of the adverse perinatal outcomes were significantly more common in those with preeclampsia compared to the other hypertensive disorders.

Conclusion

There is a significant burden of perinatal morbidity and mortality associated with HDP in the Ghanaian obstetric population and these adverse outcomes were more prevalent in preeclampsia compared to the other hypertensive disorders. Regular goal-oriented clinical audit into perinatal morbidity and mortality associated with HDP and an active multidisciplinary approach to the management of these disorders in the hospital might improve the clinical outcomes of women with maternal hypertension.

Background

Hypertensive disorders in pregnancy (HDP) remain a major global health issue not only because of the associated high adverse maternal outcomes but there is a close accompaniment of significant perinatal morbidity and mortality[1-3]. Although most obstetricians worry more about the risk of maternal death in women whose pregnancies are complicated by hypertensive disorders the risk of perinatal death is more daunting. For instance, the risk of maternal death is less than 1% in severe preeclampsia and whereas that of perinatal death is about 13%. The situation is even worse in eclampsia where the risks of maternal and perinatal deaths occur in about 5% and 28% respectively[4]. The other side of the coin is the occurrence of serious short and long term complications in the surviving newborns such as the risk of neuro-developmental deficits especially in poorly resourced countries[1].

Generally, there is disproportionately high neonatal mortality in SSA and most of these occur during the first 4 weeks of life although being a newborn is not, in itself, a disease. It is estimated that for every early neonatal death there is another baby that is born dead (stillbirth) and HDP account for most of these perinatal losses especially in low resource settings[5]. The adverse perinatal outcomes associated with hypertensive disorders are generally referable to placental insufficiency, placental abruption and prematurity-related complications[2,3]. Adverse perinatal outcomes due to HDP or maternal hypertension are generally most severe in severe preeclampsia/eclampsia and are usually dependent on the gestational age at delivery as well as the severity of the disease process.

Perinatal mortality is a key indicator of maternal care and a reflection of the quality of obstetric and pediatric care available[5]. Global perinatal mortality rate is estimated as 47 per total births with excessively wide disparity between the developed (10 per births) and less developed regions such as West Africa (76 per births). In Ghana, the perinatal mortality is estimated as 45 per 1000 deliveries[5].

More recently, the maternal outcomes associated with HDP at KBTH were determined and a high burden of maternal morbidity and mortality were reported[6]. However, the data regarding perinatal outcomes of these heavily prevalent disorders are lacking in our indigenous setting. In KBTH, where the current study was undertaken, there is a general knowledge (based on clinical practice and expert opinion) among the obstetric and pediatric healthcare providers that HDP accounts significantly for a high proportion of perinatal adverse events although scientific documentation of this clinical impression is limited. The objective of the study was to determine the perinatal outcomes of hypertensive disorders in pregnancy among pregnant women obtaining maternity and childbirth services

at Korle Bu Teaching Hospital in Accra, Ghana. The findings of this study represent evidence for healthcare providers and policy makers in devising more appropriate interventions to improving maternal and perinatal health among pregnant women with hypertensive disorders especially in low resource settings.

Methods

This cross-sectional study was conducted at the Maternity unit of KBTH in Accra between 1st January and 28th February 2013. Korle Bu Teaching Hospital is the largest teaching hospital in Ghana with over 10,000 deliveries annually, and it serves as a tertiary referral centre within a catchment area of about 50 km radius and a population of over 3 million. In this study, we included all women with hypertensive disorders in pregnancy delivering at KBTH who consented to participate in the study. Excluded from the study were women with HDP who declined to participate in the study and those with hypertension who delivered in other health facilities before referral to KBTH. Women with twin gestations were also excluded from the study to avoid their potential confounding effect on the adverse perinatal outcomes associated with HDP.

The data collection involved daily identification of all the women who had delivered during the previous 24 h in the hospital. Baseline data were extracted from patients' folders, admission and discharge registers at the labour wards. After the initial daily baseline data extraction on all the parturient, women with hypertensive disorders were identified and their folder numbers recorded. These women were then assigned study identification numbers after which they were then traced to their respective maternity wards where they had been admitted following delivery. This selected group of women were approached and informed to be included in the study and those who gave written informed consent were included. The purpose of the study was explained to the mothers independently prior to data collection and they were informed that their participation was purely voluntary. The mothers were also informed that failure to participate in or withdraw from the study would not upset the quality of care they would receive for their respective medical conditions.

Their basic socio-demographic characteristics were obtained using a structured questionnaire and their medical records were also reviewed to determine the perinatal outcomes of their pregnancies. The babies of these women (including those admitted to the neonatal intensive care unit-NICU) were followed up on daily basis to find out if they had developed any complication till they were discharged from the hospital. The data obtained from the interviews and the medical records included socio-demographic information (such as age, educational status, marital status) and obstetric data (such as gravidity, parity,

gestational age at booking and delivery). The maternal outcomes associated with HDP have recently been published elsewhere[6]. Perinatal outcomes indicators determined included birth weight, neonatal respiratory distress, the need for NICU admission, APGAR scores, stillbirths and neonatal deaths.

In this study, hypertensive disorders in pregnancy were classified as preeclampsia, gestational hypertension, chronic hypertension and preeclampsia superimposed on chronic hypertension[2,7]. Hypertension in pregnancy was defined as systolic blood pressure (BP) ≥140 mmHg and/or a diastolic BP ≥90 mmHg respectively[2,3]. Proteinuria was determined using a semiquantitative dipstick testing. Dipstick proteinuria of ≥1+, in a random urine, was considered significant in the presence of hypertension without evidence of urinary tract infection[3,7].

We obtained approval for the study protocol from the Ethical and Protocol Review Committee of the School Medicine and Dentistry of the College of Health Sciences, University of Ghana, prior to data collection (Protocol Identification Number: MS-Et/M.11-P.4.9/2011–2012). All the study participants gave a written informed consent prior to the commencement of the study.

The analysis of the data was performed using SPSS version 20.0. Descriptive statistics were performed. The results were presented in percentages where necessary and appropriate measures of centrality (mean) and dispersion (standard deviation) were also calculated. The mean gestational age, systolic and diastolic BP at diagnosis of preeclampsia and gestational hypertension were determined using independent student t-test. Univariate and multivariate analyses were also performed with respect to the occurrence of adverse perinatal outcomes in preeclampsia and the other hypertensive disorders. P-values less than 0.05 were considered significant for the differences obtained.

Results

During the study period, 1856 deliveries were undertaken at KBTH resulting in 1924 total births with 1848 live births. There were 398 women with HDP who delivered over the same period out of which 30 were excluded because 2 declined to give informed consent, 12 had multiple gestations and 16 had incomplete data resulting in a total of 368 cases of HDP which were included in the analysis. Regarding the gestational age at delivery, 288 (78.3%) delivered at ≥37 weeks, 35 (9.5%) between 34 to 36 weeks with 45 (12.2%) of the deliveries occurring below 34 weeks. The mean gestational age at delivery was 37.4 ± 3.3

weeks. Most of the hypertensive mothers [276 (69.9%)] were between 20 to 34 years of age. The maternal socio-demographic and obstetric characteristics are shown in Table 1.

Meconium staining of the liquor occurred in 64 women (17.4%) with the highest (27 women, 19.3%) and lowest (3 women, 13.0%) frequencies occurring in the preeclamptic and uncomplicated chronic hypertensive groups respectively. Cesarean birth occurred in 168 (45.7%) hypertensive mothers. The frequencies of the various perinatal outcome indicators among the different categories of hypertensive disorders are presented in Table 2. Fifty-six neonates (15.2%) had respiratory distress or asphyxia which was significantly highest (21.4%) and lowest (4.3%) in preeclamptic and chronic hypertensive groups respectively. The need for ventilatory support occurred in 14 (3.8%) neonates with the highest requirement occurring in the babies of preeclamptic mothers (Table 2).

There were clinically significant findings among the types of hypertensive disorders with respect to frequency of NICU admission, neonatal respiratory distress, low birth weight, macrosomia and APGAR score at 1 min. The frequency of low birth weight (LBW) was 24.7% which was highest in the preeclamptic group. On the other hand, macrosomia occurred in 7.9% of the babies which was most frequent in chronic hypertension.

Table 1. Socio-demographic and obstetric characteristics of women with hypertensive disorders in pregnancy at KBTH

Variable	Preeclampsia n=140	Gestational Hypertension n=184	Chronic hypertension n=23	Preeclampsia superimposed on chronic hypertension n=21	Total (N=368)
AGE GROUP					
< 20 years	9 (6.4)	11 (6.0)	0	0	20 (5.4)
20-34 years	110 (78.6)	122 (66.3)	15 (65.2)	9 (42.9)	276 (69.9)
=>35 years	21 (15.0)	51 (27.7)	8 (34.8)	12 (57.1)	92 (25.0)
GRAVIDITY					
1	57 (40.7)	63 (34.2)	4 (17.4)	6 (28.6)	130 (35.3)
2-4	73 (52.1)	98 (53.3)	17 (73.9)	10 (47.6)	198 (53.8)
=>5	10 (7.7)	23 (12.5)	2 (8.7)	5 (23.8)	40 (10.9)
PARITY					
0	57 (40.7)	63 (34.2)	4 (17.4)	6 (28.6)	130 (35.3)
1-3	73 (52.1)	98 (53.3)	17 (73.9)	10 (47.6)	198 (53.8)
=>4	10 (7.1)	23 (12.5)	2 (8.7)	5 (23.8)	40 (10.9)
MARITAL STATUS					
Married/ cohabitation	112 (80.0)	145 (78.8)	20 (87.0)	18 (85.7)	295 (80.2)
Single	28 (20.0)	39 (21.2)	3 (13.0)	3 (13.0)	73 (19.8)
EDUCATION					
None	17 (12.1)	16 (8.7)	3 (13.0)	1 (4.3)	37 (10.1)
Primary school	16 (11.4)	23 (12.5)	5 (21.7)	3 (14.3)	47 (12.8)
Secondary school	91 (65.0)	124 (67.4)	13 (56.5)	14 (66.7)	242 (65.8)
Tertiary	16 (11.4)	21 (11.4)	2 (8.7)	3 (14.3)	42 (11.4)
ANTENATAL VISITS					
Less than 4	27 (19.3)	22 (12.0)	0	3 (14.3%)	52 (14.1)
4 or more	113 (80.7)	162 (88.0)	23 (100.0)	18 (85.3)	316 (85.9)

Values in the Table are given as number (percentage)

Table 2. Perinatal outcomes among women with hypertensive disorders in pregnancy at KBTH

Perinatal outcome indicators	Preeclampsia n=140	Gestational Hypertension n=184	Chronic hypertension n=23	Preeclampsia superimposed on chronic hypertension n=21	Total (N=368)
Admission to NICU	51 (36.4)	34 (18.5)	2 (8.7)	4 (19.0)	91 (24.7)
Respiratory distress/ asphyxia	30 (21.4)	21 (11.4)	1 (4.3)	4 (19.0)	56 (15.2)
Need for ventilatory support	10 (7.1)	3 (1.6)	0	1 (4.8)	14 (3.8)
Stillbirth	13 (9.3)	10 (5.4)	1 (4.3)	1 (4.8)	25 (6.8)
Early neonatal death	8 (5.7)	5 (2.7)	0	1 (4.8)	14 (3.8)
Perinatal death	21 (15.0)	15 (8.2)	1 (4.3)	1 (4.8)	39 (10.6)
Intrauterine growth restriction	15 (10.4)	7 (3.7)	0	1 (4.8)	23 (6.3)
Low birth weight	57 (40.7)	27 (14.7)	0	7 (33.3)	91 (24.7)
Normal birth weight	79 (56.4)	139 (75.5)	18 (78.3)	12 (57.1)	248 (67.4)
Macrosomia	4 (2.9)	18 (9.8)	5 (21.7)	2 (9.5)	29 (7.9)
Preterm delivery	49 (35.0)	25 (13.6)	1 (4.3)	5 (23.)	80 (21.7)
APGAR score <7 at 1 minute	64 (45.7)	51 (27.7)	4(17.4)	6 (28.6)	125 (34.0)
APGAR score <7 at 5 minute	29 (20.7)	22 (12.0)	2 (8.7)	2 (9.5)	55 (14.9)

IUGR= Intrauterine growth restriction, LBW= low birth weight, NICU= Neonatal intensive care unit. The results in the table are presented as the number of occurrence of event and the percentage of in parenthesis. Values in the Table are given as number (percentage)

Preterm delivery also occurred in 21.7% of the babies with its occurrence being highest (35.0%) and lowest (4.3%) in preeclampsia and chronic hypertension respectively. Regarding APGAR scores, 34.0% and 14.9% of babies had scores of less than 7 at 1 minute and 5 minutes respectively (Table 2). The occurrence of low birth weight, admission to NICU and low APGAR score after 1 minute of delivery remained significantly higher in preeclampsia compared the other HDP after adjusting for maternal age, parity, number of antenatal visits, gestational age at delivery and the mode of delivery. There was statistically significant difference between preeclampsia and the other HDP regarding birth asphyxia, perinatal deaths and low APGAR after 5 min of delivery in the univariate analysis but the statistical significance disappeared after adjusting for the confounding factors (Table 3). There was a perinatal mortality rate of 106 per 1000 births among women with HDP during the study period.

Table 3. Univariate and multivariate analyses of adverse perinatal outcomes in hypertensive disorders in pregnancy at KBTH

Maternal outcome indicators	Preeclampsia n=140	Other Hypertensive disorders n=228	Unadjusted Odds ratio* (95%CI)	p value*	Adjusted Odds ratio** (95%CI)	P value**
NICU	51 (36.4%)	40 (17.5%)	2.693 (1.659-4.373)	<0.001	1.745 (1.007-3.024)	0.047
Low birth weight	57 (40.7%)	34 (14.9%)	3.918 (2.385-6.438)	<0.001	2.496 (1.272-4.897)	0.008
Stillbirths	13 (9.3%)	12 (5.3%)	1.843 (0.816-4.161)	0.142	1.396 (0.569-3.426)	0.467
Early neonatal deaths	8 (5.7%)	6 (2.6%)	2.242 (0.761-6.605)	0.163	0.807(0.227-2.862)	0.739
Perinatal deaths	21 (15.0%)	18 (7.9%)	2.059(0.435-2.739)	0.037	1.188 (0.542-2.602)	0.667
Birth asphyxia	31 (22.1%)	26 (11.4%)	2.210 (1.248-3.911)	0.006	1.445 (0.760-2.750)	0.262
Low APGAR (1 min)	64 (45.7%)	61 (26.8%)	2.305 (1.480-3.592)	0.001	1.868 (1.118-3.121)	0.017
Low APGAR (5 min)	29 (20.7%)	26 (11.4%)	2.030 (1.139-3.617)	0.023	1.204 (0.603-2.407)	0.599

*Non adjusted p-value or Odds ratio, **Adjusted p-value or Odds ratio, The perinatal outcome indicators were adjusted for maternal age, parity, number of antenatal visits, gestational age at delivery and mode of delivery. CI=confidence interval, NICU= Neonatal intensive care unit

Discussion

Hypertensive disorders in pregnancy are associated with significant perinatal morbidity and mortality especially in the developing world. In this study, the major adverse perinatal outcomes determined among women with HDP include intrauterine growth restriction (6.3%), intrauterine fetal death (6.8%), preterm delivery (21.7%), low birth weight (24.7%) and birth asphyxia or neonatal respiratory distress (15.2%) among other complications. We found a perinatal mortality rate of 106 per 1000 births among women with HDP in KBTH. The proportion of perinatal deaths was highest in preeclampsia compared to the other categories with the lowest rate occurring in the chronic hypertensive group. This might be partly attributed to issues related to the quality of care offered to women with HDP as well as complications of prematurity characteristic of these disorders and their management. The high perinatal mortality rate might also be attributed to the tertiary status of KBTH which serves as the referral centre for the primary and secondary health facilities in the southern part of the country. However, this finding agrees with a recent study from a teaching hospital in Nigeria that reported a perinatal mortality rate of 110.3

per 1000 deliveries in hypertensive mothers[8] but lower than the 144 and 317 per 1000-births reported in Turkey and Ethiopia respectively[9,10].

Similarly, the frequencies of stillbirths (6.8%) and early neonatal deaths (3.8%) were generally high in women having HDP with the highest frequency occurring in the preeclamptic group. It is, however, important to emphasize that there was no early neonatal death and stillbirth in the women with chronic hypertension and superimposed preeclampsia respectively. The finding of significant adverse perinatal outcomes in HDP indicates the importance of optimal antenatal, careful intrapartum and adequate newborn care. This is important because adverse perinatal outcome is a key indicator of maternal health and a reflection of the quality of obstetric and pediatric care[5].

Also, the occurrence of unacceptably high perinatal deaths in HDP indicates the need to revamp the multidisciplinary approach to the management of women with these disorders and their babies in the hospital. A dedicated multidisciplinary team should include active involvement of neonatologist, laboratory staff, midwives, nurses with rich experiences in neonatal care, obstetric physician and obstetricians in the decision making process to ensure effective and comprehensive care for these conditions. This multi-departmental collaboration is indispensable in the provision of evidence-based care for women with these conditions especially in SSA where HDP are the leading cause of institutional maternal deaths[11-14]. In KBTH where this study was conducted, HDP are the leading cause of maternal demise responsible for over 30% of such losses and most of these losses are attributable to suboptimal care[11]. The issue of maternal mortality due to HDP should be addressed comprehensively in conjunction with perinatal deaths as the former might predispose to the latter. Recently, Endeshaw and Berhan determined that maternal mortality is an independent risk factor for perinatal death [15] and this suggests that comprehensive approach should be the ultimate in addressing the high maternal and perinatal adverse outcomes characteristic of HDP. Thus, poor perinatal outcomes of HDP may be largely related to suboptimal management of the maternal condition as well as lack of modern neonatal intensive care support for these babies who require specialized clinical care especially in the low resource settings.

The current study showed that the frequency of neonatal respiratory distress (15.2%) and the need for ventilatory support (3.8%) were generally high among the neonates of hypertensive mothers with the highest and lowest rates recorded in the preeclamptic and chronic hypertensive groups respectively. Hauth et al. also reported a similar finding of increased neonatal respiratory distress requiring resuscitation and ventilatory support in babies of hypertensive mothers and these were significantly severe in the preeclampsia[16]. Their study was limited to mild and severe preeclampsia and did not include chronic

hypertension and superimposed preeclampsia. However, the current study compared the perinatal outcomes among the various categories of HDP to better understand the relativity of these untoward outcomes.

Other studies have also described similar findings of increased adverse perinatal outcomes in women with hypertensive disorders[17,18]. Yadav et al.[17] showed that 40% of babies of hypertensive mothers required admission to the NICU and HDP contributed to an estimated 22% of all perinatal deaths. In the current study, NICU admission rate for babies of hypertensive mothers was 24.7% and this was highest and lowest in the women with preeclampsia and chronic hypertension respectively. These adverse perinatal outcomes may be attributed to placental insufficiency, placental abruption and complications of prematurity. The issue of prematurity in relation to HDP is a real disturbing obstacle to improving perinatal survival resulting in major difficulty in deciding the optimal gestational age to deliver these babies. Generally, but not surprisingly, the equation is tilted to favour the obstetrician than the neonatologist by resorting to preterm delivery to salvage maternal survival in preference to the fetus with the resultant delivery of babies with varying degrees of intrauterine maturity. Perinatal morbidity and mortality may also result from intrauterine growth restriction which occurred in 6.1% in the current study with the highest rate occurring in women with preeclampsia. This finding is consistent with the incidence of 6.1% and 6.6% reported in Iran and South Africa respectively among pregnant women with hypertensive disorders[18,19].

There is evidence that most of the maternal deaths associated with HDP are due to substandard care[20]. Similarly, the high prevalence of adverse perinatal outcomes in women with HDP determined in this study might have substandard care as the underlying cause in majority of cases due to clinical management-related challenges in the hospital. We recommend regular and well focused perinatal morbidity and mortality audits in cases of HDP with adverse perinatal outcomes to identify specific areas where significant substandard care contributed to the recorded adversity. Although the optimal management of women with HDP is crippled with myriads of systemic and clinical management-related problems such as lack of up-to-date laboratory support and parenteral antihypertensives in low resource settings, maternal-fetal health may be improved following careful and continuous clinical assessment and timely delivery of the fetus.

Also, the APGAR score of less than 7 at one and 5 minutes occurred in 34.0% and 14.7% respectively in neonates of hypertensive mothers with significantly high proportion of low scores in the preeclamptic group. However, there was substantial improvement in the APGAR scores at 5 min among the various types of hypertensive disorders and this might be partly attributed to a more effective neonatal resuscitation from adequate preparation

during the transition to extrauterine life. The finding of significantly low 1 minute APGAR score in babies of hypertensive mothers is consistent with the study by Fatemeh et al. although their study did not include all the women with hypertensive disorders but was limited to primigravidas[18]. Similarly, a recent study in Ethiopia by Wolde et al. also reported low 1 minute APGAR scores in hypertensive disorders with significantly increased frequency in preeclampsia compared to the other categories[10]. These findings suggest the need for adequate preparation for neonatal resuscitation at the time of childbirth in pregnancies complicated by hypertensive disorders.

Regarding birth weight, there were significant differential end points in this study in terms of low birth weight (LBW), normal birth weight and macrosomia occurring in 24.7%, 66.0% and 7.9% respectively. The occurrence of low birth weight was highest in the preeclamptic women and none of the neonates from mothers with uncomplicated chronic hypertension had LBW. Also, the occurrence of macrosomia was significantly highest and lowest in the chronic hypertensives and preeclamptics respectively. The above findings seem to suggest that uncomplicated chronic hypertension in pregnancy is associated with normal birth weight which might be comparable to that of normal uncomplicated pregnancy. However, a recent study has demonstrated that chronic hypertension is associated with increased risk of preterm delivery, LBW and SGA infants and these adverse outcomes were more common in those managed on antihypertensives[21].

Moving forward, there is an urgent need to improve the quality of care provided to women with HDP in the country to optimize both maternal and perinatal outcomes associated these conditions. Frequent shortages of essential parenteral antihypertensive drugs such as hydralazine and labetalol as well as magnesium sulphate should be purposefully addressed. In Ghana, magnesium sulphate is first line drug for managing women with eclampsia and severe preeclampsia alongside antihypertensives. However, a recent nationwide survey indicated this essential drug was available in only 55% of health facilities providing maternity services at the time of data collection[22]. Other major challenges in the management of HDP in the country include poor laboratory support, delay in receiving care in health facilities, lack of adequately resourced neonatal intensive care unit (NICU) and poor referral system including transportation related issues. The biggest indisputable underlying factor associated with the above management related issues is extreme poverty characteristic of most developing countries like Ghana. We assert that the major perinatal adverse outcomes linked to HDP could be significantly improved if the above treatment related challenges are minimized.

The strength of this study resides in the fact that we included women with singleton pregnancies complicated by all the various types of HDP displaying the relativity of the

perinatal outcomes among the groups. This study serves as the baseline data on perinatal outcomes associated with HDP in the country upon which further studies could be referenced. The short duration of the study as well as the relatively small numbers involved are considered as limitations of the study. However, the findings from this study provides a broad idea about the perinatal health issues related to the management of HDP in Ghana and other West African countries with similar settings. Large longitudinal studies with high methodological quality and longer duration of data collection are recommended to better understand the dynamics of the perinatal outcomes associated with HDP and management strategies in Sub-Saharan Africa.

Conclusion

Our study determined a significant burden of perinatal morbidity and mortality associated with HDP in the Ghanaian obstetric population and these adverse perinatal outcomes were more prevalent in preeclampsia compared to the other hypertensive disorders. We recommend a regular goal-oriented clinical audit into perinatal morbidity and mortality associated with HDP and a facelift of the defunct multidisciplinary approach to the management of these disorders in the hospital to improve the clinical outcomes of women with maternal hypertension.

Abbreviations

APGAR: Appearance, Pulse, Grimace, Activity, and Respiration.; CI: Confidence Interval; HDP: Hypertensive Disorders in Pregnancy; IUGR: Intrauterine Growth Restriction; KBTH: Korle Bu Teaching Hospital; LBW: Low Birth Weight; NICU: Neonatal Intensive Care Unit; SGA: Small for Gestational Age; SSA: Sub-Saharan Africa

Acknowledgements

We are grateful to Mr. Abdul-Wahab Tommie and Mr. Godwin Binlinla for their input in the data collection. We are also grateful to all the staff at the Maternity unit of Korle Bu Teaching Hospital who contributed to the clinical management of the mothers whose medical information were used in this study.

Funding

The study was self-funded by the authors.

Availability of data and materials

The dataset for this study is available from the corresponding author upon reasonable request.

Author contributions

KAB, JDS and SAO conceived and designed the study with contribution from MYN. KAB, MYN, JDS and SAO conducted the study. KAB analyzed the data and wrote the manuscript. MYN, JDS and SAO provided input to the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate

Approval for the study was obtained from the Ethical and Protocol Review Committee of the School Medicine and Dentistry of the College of Health Sciences, University of Ghana. All the study participants gave a written informed consent prior to data collection. Confidentiality was ensured during the course of the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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Chapter 3

Maternal near-miss and maternal mortality associated with hypertensive disorders of pregnancy remote from term: A multicenter observational study in Ghana

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AJOG Global Reports. 2022; 2(2):100045

Abstract

Background

Maternal death rates remain high in many low- and middle-income countries. Hypertensive disorders of pregnancy account for 18% of maternal mortality in Ghana. The maternal near-miss approach was designed to evaluate severe (acute) complications in pregnancy, which is useful to detect potential areas for clinical care improvement.

Objective

This study aimed (1) to determine the incidence of severe maternal complications, maternal near-miss cases, and mortality cases associated with hypertensive disorders of pregnancy remote from term and (2) to assess the health system's performance indicators for the management of hypertensive disorders of pregnancy remote from term in middle-income country referral hospitals.

Study design

This study was nested in the ongoing Severe Preeclampsia adverse Outcome Triage study, a multicenter observational cohort study, and included women recruited from December 1, 2017, to May 31, 2020, from 5 referral hospitals in Ghana. Women aged >16 years, admitted to the hospital with hypertensive disorders of pregnancy, with gestational age between 26 and 34 weeks were eligible. Near miss was defined according to the World Health Organization and sub-Saharan African near-miss criteria. Descriptive statistics of pregnancy and maternal and perinatal outcomes up to 6 weeks after delivery of women with severe maternal outcomes were presented for maternal deaths and maternal near-miss case and compared with that of women without severe maternal outcomes. The health system's maternal and perinatal performance indicators were calculated.

Results

Overall, 447 women with hypertensive disorders of pregnancy were included in the analyses with a mean maternal age of 32 (±5.8) years and mean gestational age at recruitment of 30.5 (±2.4) weeks. Of these patients, 46 (10%) had gestational hypertension, 338 (76%) had preeclampsia, and 63 (14%) had eclampsia. There were 148 near-miss cases (33.1%) and 12 maternal deaths (2.7%). Severe maternal outcomes constituted complications from severe preeclampsia (80/160 [50%]) and eclampsia (63/160 [39.4%]). Concerning organ dysfunction, hematologic and respiratory dysfunctions constituted 59/160 [38.6%] and 23/160 [14.8%] respectively. Nearly all women had a cesarean delivery (347/447 [84%] and 140/160 [93%] in the severe maternal outcome group) and delivered prematurely (83%, with 178/379 [93%] at <32 weeks of gestation). Stillbirth and neonatal deaths occurred in 63 of 455 women (14%) and 81 of 392 women (19%), respectively, constituting a stillbirth

ratio of 161 per 1000 live births and neonatal mortality rate of 207 per 1000 live births as there were 392 live births in this cohort. Overall, the intensive care unit admission rate was 12.7% (n=52/409); moreover, 45 of 52 women (86.5%) admitted to the intensive care unit had severe maternal outcomes. The maternal death ratio was 3100 per 100,000 live births, the maternal near-miss–to–mortality ratio was 12.3, and the mortality index was 8%.

Conclusion

Maternal near miss and maternal and perinatal mortalities were common in women with hypertensive disorders of pregnancy remote from term in referral hospitals in Ghana. Providing appropriate patient-centered and multidisciplinary quality care for these women is crucial in improving pregnancy outcomes. Context-tailored interventions should be considered in the clinical management of complications associated with hypertensive disorders of pregnancy in resource-limited settings. Further research on interventions to improve timely referral and reduce in-hospital delays in care provision is recommended to facilitate emergency care services for women with hypertensive emergencies.

AJOG Global Reports at a Glance

Why was this study conducted?

Hypertensive disorders of pregnancy (HDP) are highly prevalent and an important cause of severe morbidity, long-term health impact, and maternal and perinatal deaths. Near-miss studies are clinically useful in assessing potential areas for improvement of maternal healthcare.

Key findings

Maternal near-miss (MNM) and mortality cases associated with HDP at <34 weeks of gestation were high in referral hospitals in Ghana. The ratio of MNM events to maternal deaths (MDs) was 12.3 to 1.0, with a mortality index of 8%. This indicated substantial substandard care for women with HDP.

What does this add to what is known?

This study has presented data on a large prospective cohort of women with HDP remote from term in a low-resource setting and has shown the importance of improving healthcare quality for these women with a higher risk of severe complications in resource-limited settings to reducing MD rates.

Introduction

Hypertensive disorders of pregnancy (HDP), such as gestational hypertension, preeclampsia, and eclampsia, are the most common medical complication encountered during pregnancy, affecting approximately 10% of pregnancies.[1,2] Worldwide, HDP are an important cause of death, severe morbidity, and long-term adverse health outcomes among mothers and their neonates.[3,4] Low- and middle-income countries are disproportionately affected.[5] In Ghana, where the maternal mortality ratio (MMR) was estimated to be 308 deaths per 100,000 live births in 2017,[6] approximately 18% of maternal mortality cases were caused by eclampsia and preeclampsia.[7]

Improving maternal health and reducing death rates have been on the global agenda for decades, including the Sustainable Development Goals. Evaluation of maternal near miss (MNM) is a recommended strategy to identify and analyze factors leading to adverse maternal outcomes.[8] MNM is defined as a woman who nearly died but survived a complication that occurred during pregnancy, childbirth, or within 42 days of termination of pregnancy.[9] There is evidence that women who experience severe acute complications in pregnancy share many pathologic and circumstantial factors with women who experience mortality. Thus, the evaluation of MNM allows for cross case comparisons to identify care and contextual factors with reduced sentiments of blame, within maternal care improvement cycles.[10]

To improve uniformity in MNM studies, standardized methods for study setup and classification of the criteria were provided in 2011 by the World Health Organization (WHO).[9] However, several studies have locally adapted or proposed new criteria because of the unavailability of some of the recommended clinical parameters in low-resource settings (eg, the arterial oxygen partial pressure to fractional inspired oxygen [PaO2/FiO2] or arterial blood gas analyses [pH and lactate]).[11-17] Although this adaptation might improve the identification of MNM cases locally, the cross-setting comparison is reduced.[10]

Analyzing high-risk pregnancies with high mortality and near-miss rates, such as HDP in early pregnancy (<34 weeks of gestation), is clinically useful to create awareness about quality-of care issues and detect potential areas for improving maternal healthcare. Therefore, this study aimed to assess pregnancy outcomes in near-miss cases associated with HDP and evaluate the maternal and perinatal health system's performance indicators of quality of care.

Materials and Methods

Study setting and design

This analysis was nested within the ongoing Severe Preeclampsia adverse Outcome Triage (SPOT) study, a multicenter observational prospective cohort study in Ghana, which aims to validate previously developed risk prediction models for the management of women with preeclampsia and other HDP.[18,19] Of note, 4 major referral hospitals in the Greater Accra Region (Greater Accra Regional Hospital [Ridge Hospital], Korle-Bu Teaching Hospital, La General Hospital, and Tema General Hospital) and 1 hospital in the Eastern Region of Ghana (Koforidua Regional Hospital) were selected on the basis of their large patient volume and infrastructure to conduct this study. The total number of deliveries in these facilities exceeds 30,000 annually, and all hospitals have neonatal intensive care units (NICUs). Moreover, HDP are a leading cause of maternal morbidities in these facilities and account for 18% of all maternal mortalities in the country.[7]

Women aged ≥16 years with a diagnosis of preeclampsia or another HDP (definitions are provided in Supplementary A) at a gestational age between 26 and 34 weeks admitted to any 1 of the participating facilities were eligible for participation in the SPOT study. The exclusion criteria were spontaneous active labor at admission and occurrence of any of the adverse maternal outcomes before meeting the inclusion criteria or collecting the independent variables. In this analysis, all women who were recruited between December 1, 2017, and May 31, 2020, were included.

Maternal death and maternal near-miss classification

Women who died during admission or within the follow-up period of 6 weeks because of pregnancy-related complications were classified as maternal deaths (MDs). In all surviving women, those who met the WHO or sub-Saharan African (SSA) MNM criteria were considered MNM. Supplementary B provides an overview of the criteria. This approach was chosen because of the appropriateness of SSA in this context.[20] The fulfillment of at least 1 criterion was enough to consider a woman as MNM.[9,17] The SSA criterion on severe complications of abortion was not applicable as only pregnant women with a gestational age >26 weeks were considered eligible. Several other criteria were not included because of (1) limited access to laboratory tests (ie, pH or lactate), (2) nonrecording of observations that were not commonly documented in medical files (ie, acute cyanosis, gasping, or jaundice), and (3) other data that were not included in the case report forms of the SPOT study (ie, respiratory rates, urine production, loss of consciousness, cardiopulmonary resuscitation, or severe malaria).

Definitions of clinical conditions and diseases that were included as maternal outcomes (eg, severe postpartum hemorrhage and severe preeclampsia) followed WHO MNM guideline definitions (Supplementary A).[9] Intensive care unit (ICU) was defined as a ward where mechanical ventilation and administration of continuous vasoactive drugs were possible. This included an extended stay at the postoperative recovery room >6 hours, considering the limited availability of actual ICU departments.[21] Body mass index was calculated on the basis of height in meters and weight in kilogram at first booking in antenatal care (ANC).

All MNM cases and MDs conjointly were categorized as "severe maternal outcomes" (SMOs). Women who did not experience MD or near miss were considered as the comparison group. Data on near-miss cases, MDs, SMO cases, stillbirths, and neonatal mortality cases were presented as ratio per 1000 live births. The MNM mortality ratio (=MNM cases/MDs), mortality index (=MDs/SMO cases £ 100%), and ICU admission rate (which is equal to the number of women admitted to the ICU/all included women) in total and among SMO cases were calculated to assess complexity and performance of care. All ratios are listed in Supplementary A.[9]

Data sources and measurement

Trained research assistants prospectively collected data from medical records supplemented by face-to-face interview of the women to complete the information that were not initially obtained from the medical records, using standardized data collection forms designed for the SPOT study. Information regarding sociodemographic characteristics (eg, ethnicity, religion, marital status, and the highest level of education), medical history, obstetrical history (especially previous pregnancy complications), and information regarding current pregnancy and ANC services provided were recorded within 24 hours after admission. Symptoms and clinical signs of organ dysfunction were documented at the time of admission and daily during hospitalization. When delivery occurred during admission, circumstances of delivery, required interventions and maternal and neonatal outcomes were recorded. In case of discharge before delivery or data collection completion, information regarding pregnancy outcomes was collected at follow-up. Data of any readmissions before the end of pregnancy were added to the study file. Late maternal complications and neonatal outcomes were obtained at follow up, during a routine visit, 6 weeks after delivery. All available data at the time of analysis were considered for this study.

Statistical analysis

Baseline characteristics and maternal and pregnancy outcomes for all women with HDP were presented using descriptive statistics for women without SMOs, women with SMOs, near-miss cases, and MDs. Categorical variables were presented as frequency (percentage), whereas continuous variables were presented as mean (standard deviation)

and transformed into categorical groups when necessary. P values were calculated using the chi-square, Fisher exact, or unpaired 2-samples Wilcoxon test. Outcomes among the 5 study sites were compared using stratified analyses. Missing values and inconsistent data were cross-checked, source documents consulted, and missing data were excluded in the analyses. All analyses were executed using R statistics (version 4.0.2; R Foundation for Statistical Computing, Vienna, Austria).

Ethical approval

The SPOT study protocol was approved by the Ghana Health Service Ethical Review Committee (protocol ID GHSERC-GHSERC015/09/17) and the Ethical and Protocol Review Committee of the College of Health Sciences, University of Ghana (protocol ID GHSERCCHS- EtM.4-P1.2/2017-2018). All participants gave their written informed consent.

Results

Maternal near miss and maternal deaths

A total of 543 women were included in the SPOT study at the start of this analysis. However, 49 patients did not meet the inclusion criterion regarding gestational age at admission (ie, 48 with gestational age >34 weeks and 1 with gestational age <26 weeks) and were subsequently excluded from the initial study population. An additional group of 47 patients was excluded because of missing values (gestational age [n=9] and maternal mortality outcome [n=38]), resulting in a total of 447 women with HDP included (82%) in the final analysis (Figure).

In addition, 12 women died during pregnancy or within 6 weeks after delivery, resulting in a maternal mortality incidence of 2.7% (12/447). Moreover, 148 cases were classified as MNM (33.1%) (69 fulfilled both SSA and WHO criteria and 79 fulfilled only SSA criteria). Of the MNM cases, 138 (93%) met the clinical criteria, 41 (28%) met the laboratory criteria, and 14 (9%) met the management-based criteria (Table 1). The most common fulfilled MNM criteria were failure to form clots (ie, bedside clotting time of >7 minutes; 35/148 [45.5%]), eclampsia (60/148 [40.5%]), and/or severe preeclampsia with ICU admission (39/148 [26.4%]).

Sociodemographic and obstetrical characteristics

Baseline characteristics are summarized in Table 2. The mean age was 32 (±5.8) years among women with HDP, and 256 of 447 women (70%) were between 30 and 40 years old. Of the 447 women, 226 (51.8%) belonged to the Akan ethnic group, 401 (89.6%) were

Christians, 347 were married (79.4%), and 278 (63.8%) completed secondary education and 100 (22.9%) completed tertiary education; moreover, 404 of 447 women were employed.

Women were on average 30.5 (±2.4) weeks pregnant when admitted with hypertension (46/447 [10.3%]), preeclampsia (338/447 [75.6%]), or eclampsia (63/447 [14.1%]). Nearly all pregnancies (391/447 [94.7%]) were singleton pregnancies. Compared with women without SMOs, women with SMOs were often younger (<20 years; 5.1% vs 1.8%) or older (>40 years; 10.1% vs 9.7%), had a higher unemployment rate (8.3% vs 5.7%), had slightly higher frequencies of grand multiparity (13.3% vs 8.1%), and had <4 ANC visits (39.7% vs 31.7%), all not statistically significant. All women with eclampsia and 28.4% of all women with preeclampsia were included in the SMO group.

Educational levels were relatively lower in MD cases than in MNM cases (16.7% with no education and 16.7% with primary education in MD cases vs 2.7% with no education and 3.4% with primary education in MNM cases). In addition, blood pressure (BP) on admission was higher in MD cases than in MNM cases (mean systolic BP 174 [±23] vs 153 [±29] mm Hg and mean diastolic BP 109 [±39] vs 96 [±21] mmHg). Finally, the percentage of women with pre-existing hypertension was higher in MD cases than in MNM cases (41% vs 19%). All cases of MD had a singleton pregnancy.

Table 1. Type of criteria (clinical, laboratory, management criteria) in maternal near miss cases.

Maternal near miss criteria	Maternal near miss (SSA) n(%)	Maternal near miss (WHO) n(%)	Maternal near miss (combined) n(%)	Maternal death n(%)
	n=148	n=69	n=148	n=12
Clinical criteria	138 (93)	35 (51)	138 (93)	7 (58)
Failure to form clots	35 (24)	35 (51)	35 (24)	2 (17)
Stroke	-	-	-	-
Eclampsia	60 (41)	NA	60 (41)	3 (25)
Ruptured uterus	1 (1)	NA	1 (1)	-
Sepsis or severe systemic infection	-	NA	-	1 (8)
Pulmonary edema	3 (2)	NA	3 (2)	1 (8)
Severe pre-eclampsia with ICU admission	39 (26)	NA	39 (26)	-
Laboratory criteria	36 (24)	41 (59)	41 (28)	4 (33)

Table 1. Type of criteria (clinical, laboratory, management criteria) in maternal near miss cases. (continued)

Maternal near miss criteria	Maternal near miss (SSA) n(%)	Maternal near miss (WHO) n(%)	Maternal near miss (combined) n(%)	Maternal death n(%)
	n=148	n=69	n=148	n=12
Oxygen saturation <90 for >60 minutes	17 (11)	17 (25)	17 (11)	2 (16)
PaO2/FiO2 <200 mmHg	NA	5 (7)	5 (3)	-
Creatinine ≥300µmol/l or ≥3.5 mg/dl	6 (4)	6 (9)	6 (4)	1 (8)
Bilirubin >100 µmol/l or > 6.0 mg/dl	NA	-	-	1 (8)
Acute thrombocytopenia (<50.000 platelets/ml)	13 (9)	13 (19)	13 (9)	-
Management-based criteria	14 (9)	3 (4)	14 (9)	4 (33)
Use of continuous vasoactive drugs	NA	-	-	1 (8)
Hysterectomy following infection or hemorrhage	-	-	-	-
Transfusion of ≥2 (SSA) or ≥5 (WHO) units of blood or red cells	11 (7)	-	11 (7)	2 (17)
Intubation and ventilation not related to anesthesia	3 (2)	3 (4)	3 (2)	-
Dialysis for acute renal failure	NA	-	-	1 (8)
Laparotomy other than CS	-	NA	-	-

ICU=intensive care unit; CS=caesarean section; n=number; NA=not applicable; SSA=Sub-Saharan African; WHO=World Health Organisation; - indicates zero

Table 2. Maternal socio-demographic and obstetric characteristics of women with hypertensive pregnancy disorders

Maternal variable	Total HDP n(%)	Missing n (%)	Non-severe maternal outcomes n(%)	Severe maternal outcomes (SMO) n(%)	p-value	Maternal deaths n(%)	Maternal near-miss n(%)	p-value
	n= 447		n= 287	n= 160		n= 12	n= 148	
Socio-demographic factors								
Maternal age (years)								
Mean age (±SD)	32,0±5,8	12 (2,7)	32,2±5,5	31,7±6,2	0.52	31,3±6,1	31,7±6,2	0.86
<20 years	13 (3,0)		5 (1,8)	8 (5,1)	0.21	1 (8,3)	7 (4,8)	0.86
20-30 years	126 (29,0)		82 (29,6)	44 (27,8)		2 (16,7)	42 (28,8)	
30-40 years	256 (58,9)		166 (59,9)	90 (57,0)		8 (66,7)	82 (56,2)	
>40 years	40 (9,2)		24 (8,7)	16 (10,1)		1 (8,3)	15 (10,3)	
Marital status		10 (2,2)			0.99			0.80
Single	84 (19,2)		53 (18,9)	31 (19,7)		3 (25,0)	28 (19,3)	
In a relationship	6 (1,4)		4 (1,4)	2 (1,3)		-	2 (1,4)	
Married	347 (79,4)		223 (79,6)	124 (79,0)		9 (75,0)	115 (79,3)	
Education		11 (2,5)			0.06			<0.05
No education	19 (4,4)		13 (4,7)	6 (3,8)		2 (16,7)	4 (2,7)	
Primary	39 (8,9)		32 (11,5)	7 (4,4)		2 (16,7)	5 (3,4)	
Secondary	278 (63,8)		166 (59,7)	112 (70,9)		8 (66,7)	104 (71,2)	
Tertiary	100 (22,9)		67 (24,1)	33 (20,9)		-	33 (22,6)	
Religion		4 (0,9)			0.41			1.000
Christianity	397 (89,6)		253 (89,4)	144 (90,0)		11 (91,7)	133 (89,9)	
Islam	46 (10,4)		30 (10,6)	16 (10,0)		1 (8,3)	15 (10,1)	
Employment		9 (2,0)			0.43			1.000
Yes	404 (92,2)		263 (93,3)	141 (90,4)		11 (91,7)	130 (90,3)	
Student	5 (1,1)		3 (1,1)	2 (1,3)		-	2 (1,4)	
No	29 (6,6)		16 (5,7)	13 (8,3)		1 (8,3)	12 (8,3)	
Ethnicity		11 (2,5)			0.22			0.70
Akan	226 (51,8)		134 (47,9)	92 (59,0)		7 (63,6)	85 (58,6)	

Table 2. Maternal socio-demographic and obstetric characteristics of women with hypertensive pregnancy disorders (continued)

Maternal variable	Total HDP n(%)	Missing n (%)	Non-severe maternal outcomes n(%)	Severe maternal outcomes (SMO) n(%)	p-value	Maternal deaths n(%)	Maternal near-miss n(%)	p-value
Ewe	66 (15,1)		47 (16,8)	19 (12,2)		1 (9,1)	18 (12,4)	
Ga	80 (18,3)		57 (20,4)	23 (14,7)		2 (18,2)	21 (14,5)	
Northern	59 (13,5)		40 (14,3)	19 (12,2)		1 (9,1)	18 (12,4)	
Other	5 (1,1)		2 (0,7)	3 (1,9)		-	3 (2,1)	
Body-mass index* (kg/m^2)								
Mean BMI (±SD)	30,3±7,5	157 (35,1)	30,8±7,8	29,4±6,9	0.12	28,8±4,1	29,4±7,1	0.97
Underweight (<18,5)	4 (1,4)		1 (0,5)	3 (3,1)	0.18	-	3 (3,3)	0.47
Normal (18,5-25)	53 (18,3)		36 (18,6)	17 (17,7)		-	17 (18,9)	
Overweight (25-30)	94 (32,4)		61 (31,4)	33 (34,4)		4 (66,7)	29 (32,2)	
Obese (>30)	139 (47,9)		96 (49,5)	43 (44,8)		2 (33,3)	41 (45,6)	
Blood pressure on admission (mmHg)								
Mean Systolic BP (±SD)	156±26,9	9 (2,0)	157±25,8	155±29,0	0.32	174±23,2	153±28,9	0.01
Mean Diastolic BP (±SD)	98±19,6	12 (2,7)	99±18,3	97±21,9	0.41	109±39,4	96±21,0	0.27
Medical history								
Pre-existing Hypertension	96 (27,1)	93 (20,8)	70 (29,9)	26 (21,7)	<0.05	5 (41,7)	21 (19,4)	0.01
Sickle cell disease	7 (1,6)	8 (1,8)	5 (1,8)	2 (1,3)	0.84	-	2 (1,4)	1.000
Malaria	69 (15,7)	9 (2,0)	42 (14,9)	27 (17,0)	0.53	3 (25,0)	24 (16,3)	0.09
Urinary tract infections	36 (8,2)	10 (2,2)	25 (8,9)	11 (6,9)	0.64	-	11 (7,5)	0.36
Diabetes	14 (3,2)	7 (1,6)	11 (3,9)	3 (1,9)	0.30	-	3 (2,0)	1.000
Obstetric history								
Parity		16 (3,6)			0.06			0.07
Nulliparous	124 (28,8)		77 (28,2)	47 (29,7)		4 (36,4)	43 (29,3)	
Multiparous, 1-3	264 (61,3)		174 (63,7)	90 (57,0)		7 (63,6)	83 (56,5)	
Multiparous >4	43 (10,0)		22 (8,1)	21 (13,3)		-	21 (14,3)	

Table 2. Maternal socio-demographic and obstetric characteristics of women with hypertensive pregnancy disorders (continued)

Maternal variable	Total HDP n(%)	Missing n (%)	Non-severe maternal outcomes n(%)	Severe maternal outcomes (SMO) n(%)	p-value	Maternal deaths n(%)	Maternal near-miss n(%)	p-value
HDP (in multiparous women)					0.69			1.000
Gestational Hypertension	60 (19,5)	-	37 (18,9)	23 (20,7)		1 (14,3)	22 (21,2)	
Pre-eclampsia	14 (4,6)	-	9 (4,6)	5 (4,5)		-	5 (4,8)	
Eclampsia	1 (0,3)	-	-	1 (0,9)		-	1 (1,0)	
Current pregnancy								
Number of fetuses		33 (7,4)			<0.05			1.000
Singleton	391 (94,4)		258 (93,5)	133 (96,4)		10 (100,0)	123 (96,1)	
Multiple	23 (5,5)		18 (6,5)	5 (3,6)		-	5 (3,9)	
Smoking in current pregnancy	3 (0,7)	3 (0,7)	2 (0,7)	1 (0,6)	0.57	-	1 (0,7)	1.000
Number of antenatal visits		36 (8,1)			0.22			0.48
<4	142 (34,5)		84 (31,7)	58 (39,7)		3 (30,0)	55 (40,4)	
≥4	269 (65,5)		181 (68,3)	88 (60,3)		7 (70,0)	81 (59,6)	
Mean GA at admission (weeks) (±SD)	30,5±2,4	-	30,6±2,5	30,4±2,3	0.82	30,2±2,1	30,5±2,4	0.50
HDP		-			<0.05			0.55
Gestational Hypertension	46 (10,3)		45 (15,7)	1 (0,6)		-	1 (0,7)	
Pre-eclampsia	338 (75,6)		242 (84,3)	96 (60,0)		9 (75,0)	87 (58,8)	
Eclampsia	63 (14,1)		-	63 (39,4)		3 (25,0)	60 (40,5)	

HDP=Hypertensive pregnancy disorder; SD=standard deviation; BMI=body-mass index; BP=blood pressure; GA=gestational age; n=number; * based on calculation of weight in kg during first booking in antenatal care, divided by squared body length in meters. - indicates zero

P-values were calculated using Chi-square-, Fisher's exact- or unpaired two-samples Wilcoxon test

Maternal and pregnancy outcomes

Results regarding maternal outcomes are presented in Table 3. The most prevalent severe complications were preeclampsia with severe features (249/447 [55.7%]) and eclampsia (63/447 [14.1%]). All cases of MD had either 1 of 2 diagnoses (preeclampsia [9/12 (75%)] or eclampsia [3/12 (25%)]). All women presenting with organ dysfunction were included in the SMO group; the most prevalent outcomes were respiratory and hematologic dysfunctions. Compared with women without SMOs, women with SMOs seemed to require blood products more frequently (22/160 [15.0%] in the SMO group vs 3/287 [1.2%] in the non-SMO group) and were more frequently admitted to the ICU (31% in the SMO group vs 2.7% in the non-SMO group). Complications, such as sepsis, cardiovascular dysfunction, and hepatic dysfunction, occurred once, and all these complications resulted in maternal mortality (mortality index was 100% for each complication).

The mean gestational age at delivery was 32.6 (±3.3) weeks, and 379 of 455 neonates (83%) were premature. The cesarean delivery rate was 84% among study participants (375/447). Neonatal outcomes were known for 455 infants (96%). There were 63 stillbirths (14%). The percentage rates of neonates with an Apgar score below 7 after 1 and 5 minutes were 51.6% and 29.3%, respectively. A total of 81 live births (18.7%) resulted in the death of the neonate within 6 weeks after delivery. Compared with non-SMO cases, SMO cases (especially MDs) seemed to have shorter admission-delivery intervals (8.9±15.6 vs 18.5±22.8 days) and higher (emergency) cesarean delivery rates (93% vs 80%). Neonates among this group were born with a lower gestational age (31.7±2.8 vs 33.1±3.4 weeks), and the prematurity rate was higher (93% vs 78%). The mean birthweight was 1547 (±690) g in the SMO group and 1936 (±857) g in the non- SMO group. The NICU admission rate was high (129/139 [81%]), and eventually, 40 of 139 neonates (25%) born in the SMO group died after delivery.

Maternal and perinatal healthcare indicators

Table 4 presents maternal and perinatal healthcare indicators. The incidence of SMOs was 408 cases per 1000 live births, the MNM ratio was 378 per 1000 live births, and the MD ratio was 3100 per 100,000 live births. The ratio of MNM events to MDs was 12.3 to 1.0 with a mortality index of 8%. Overall, the ICU admission rate was 13%, and 87% of women admitted to ICU had SMOs. Only 1 MD case was admitted to the ICU, which makes the proportion of MDs assisted without ICU 92% (11/12). The stillbirth ratio was 161 per 1000 live births (63/392), and the neonatal mortality rate was 207 per 1000 live births (81/392).

Differences among included hospitals

Near-miss indicators and maternal outcomes (ie, severe complications, critical interventions, and organ dysfunction) for each (anonymized) center can be found in Supplementary C. The incidence of MNM, SMO, mortality index, MD ratio, and perinatal mortality differed across hospitals.

Table 3. Maternal and pregnancy outcomes

	Total HDP n (%)	Missing n (%)	Non-severe maternal outcomes n (%)	Severe maternal outcomes (SMO) n (%)	Maternal deaths n (%)	Maternal near-miss, n (%)	Mortality index
	n= 447		*n= 287*	*n= 160*	*n= 12*	*n= 148*	
Maternal outcome							
Severe complications							
Severe postpartum haemorrhage	13 (3,4)	66 (14,8)	7 (2,8)	6 (4,5)	-	6 (4,9)	0,0
Severe pre-eclampsia	249 (55,7)	-	169 (58,9)	80 (50,0)	9 (75,0)	71 (48,0)	11,3
Eclampsia	63 (14,1)	-	-	63 (39,4)	3 (25,0)	60 (40,5)	4,8
Sepsis or severe systemic infection	1 (0,3)	50 (11,2)	-	1 (0,7)	1 (9,1)	-	100,0
Uterine rupture	1 (0,2)	-	-	1 (0,6)	-	1 (0,7)	0,0
Critical Interventions							
Use of blood products	25 (6,3)	48 (10,7)	3 (1,2)	22 (15,0)	3 (30,0)	19 (13,9)	13,6
Laparotomy	-	-	-	-	-	-	NA
Admission to intensive care unit	52 (12,7)	38 (8,5)	7 (2,7)	45 (31,0)	1 (9,1)	44 (32,8)	2,2
Organ dysfunction							
Cardiovascular dysfunction	1 (0,2)	24 (5,4)	-	1 (0,6)	1 (9,1)	-	100,0
Respiratory dysfunction	23 (5,4)	24 (5,4)	-	23 (14,8)	2 (18,2)	21 (14,6)	8,7
Renal dysfunction	7 (1,6)	9 (2,0)	-	7 (4,4)	1 (9,1)	6 (4,1)	14,3
Coagulation/haematologic dysfunction	59 (14,0)	26 (5,8)	-	59 (38,6)	3 (27,3)	56 (39,4)	5,1
Hepatic dysfunction	1 (0,3)	102 (22,8)	-	1 (0,8)	1 (9,1)	-	100,0
Neurologic dysfunction	-	23 (5,1)	-	-	-	-	NA
Uterine dysfunction/ hysterectomy	-	-	-	-	-	-	NA

Table 3. Maternal and pregnancy outcomes (continued)

	Total HDP n (%)	Missing n (%)	Non-severe maternal outcomes n (%)	Severe maternal outcomes (SMO) n (%)	Maternal deaths n (%)	Maternal near-miss, n (%)	Mortality index
	n= 447		*n= 287*	*n= 160*	*n= 12*	*n= 148*	
Other maternal outcomes							
Pulmonary edema	4 (1,0)	31 (6,9)	-	4 (2,6)	1 (9,1)	3 (2,1)	25,0
Pregnancy outcome							
Delivery							
First admission-delivery interval (days), mean (±SD)	15,0±20,9	19 (4,3)	19±22,8	8,9±15,6	5,3±7,8	9,2±15,9	NA
Mode of delivery		36 (8,1)					NA
Spontaneous vaginal delivery	9 (2,2)		7 (2,7)	2 (1,3)	-	2 (1,4)	
Induced vaginal delivery	55 (13,4)		46 (17,7)	9 (6,0)	2 (22,2)	7 (4,9)	
Elective caesarean section	30 (7,3)		24 (9,2)	6 (4,0)	-	6 (4,2)	
Emergency caesarean section	317 (77,1)		183 (70,4)	134 (88,7)	7 (77,8)	127 (89,4)	
Caesarean section rate*	(84)	36 (8,1)	(80)	(93)	(78)	(94)	
Obstetric outcome (in all neonates)	*n= 455*		*n= 294*	*n= 161*	*n= 12*	*n= 149*	
Mean GA (weeks) (±SD)	33±3,3	14 (3,1)	33±3,4	32±2,84	30±1,67	32±2,87	NA
Prematurity	379 (83,3)	14 (3,1)	230 (78,2)	149 (92,5)	9 (75,0)	140 (94,0)	NA
<28 weeks	34 (9,0)		22 (9,6)	12 (8,1)	-	12 (8,6)	
28-32 weeks	144 (38,0)		76 (33,0)	68 (45,6)	2 (22,2)	61 (43,6)	
32-37 weeks	201 (53,0)		132 (57,4)	69 (46,3)	7 (77,8)	67 (47,9)	
Still births	63 (13,8)	-	41 (13,9)	22 (13,7)	5 (41,7)	17 (11,4)	NA

Table 3. Maternal and pregnancy outcomes (continued)

	Total HDP n (%)	Missing n (%)	Non-severe maternal outcomes n (%)	Severe maternal outcomes (SMO) n (%)	Maternal deaths n (%)	Maternal near-miss, n (%)	Mortality index
	n= 447		*n= 287*	*n= 160*	*n= 12*	*n= 148*	
Neonatal outcome (in live births)	*n*= 392		*n*= 253	*n*= 139	*n*= 7	*n*= 132	
Mean Birthweight (grams) (±SD)	1795±821,4	34 (8,7)	1936±857,4	1547±690	1743±1556	1539±645	NA
NICU admission	308 (70,2)	8 (2,0)	179 (64,2)	129 (80,6)	6 (50,0)	123 (83,1)	NA
Low Apgar score (<7)							NA
1 minute	215 (51,6)	30 (7,7)	121 (42,2)	94 (58,8)	3 (25,0)	91 (61,5)	
5 minutes	122 (29,3)	31 (7,9)	68 (23,7)	54 (33,8)	1 (8,3)	53 (35,8)	
Newborn deaths**	81 (18,7)	14 (3,6)	41 (14,9)	40 (25,3)	6 (50,0)	34 (23,3)	NA

HDP, Hypertensive disorder of pregnancy; SD, standard deviation; GA, gestational age; NICU, neonatal intensive care unit; NA, not applicable; n, number

** Caesarean deliveries divided by all deliveries*

** Neonatal mortality up to 6 weeks postpartum, - *indicates zero*

Table 4. Maternal and perinatal health care indicators

Maternal health care indicators **In the source population**	**n**
Live births	392
Severe maternal outcomes (SMO) cases	160
Maternal deaths	12
Maternal near-miss cases	148
Near-miss indicators: complexity of care	
Severe maternal outcome ratio (per 1000 live births)	408
Maternal near-miss ratio (per 1000 live births)	378
Maternal death ratio (per 100.000 live births)	3100
Near-miss indicators: performance	
Maternal near-miss mortality ratio	12,3
Mortality index	8%
Intensive care use	
Total number of women giving birth	447
ICU admission rate	13%
ICU admission rate among women with SMO	31%
SMO rate among women admitted to ICU	87%
Proportion of maternal deaths assisted without ICU admission	92%
Perinatal health care indicators **In the source population, n(%)**	
Live births	392
Stillbirths	63
Neonatal deaths	81
Perinatal health indicators	
Stillbirth ratio (per 1000 live births)	161
Neonatal mortality ratio (per 1000 live births)	207

Supplementary A provides the definitions of the included ratios and indicators.
SMO, severe maternal outcome; ICU, intensive care unit; n, number
See supplementary A for the definitions of the included ratios and indicators

Discussion

This multicenter study assessed the SMOs in a large cohort of women with HDP remote from term in Ghana. We observed a high MNM ratio of 408 per 1000 live births with a prevalence of 33%, mortality index of 8%, and nearmiss-to-mortality ratio of 12.3:1.0. In addition, high rates of stillbirth and neonatal mortality were observed, and the health system's indicators varied across participating hospitals.

Compared with other near-miss reviews in low-resource settings,[11-13,21-32] the reported near-miss ratios were high, and this can be attributed partly to the case mix in this cohort consisting of women with severe HDP remote from term admitted to referral hospitals. A systematic review that included 14 MNM reviews in Africa reported MNM prevalence ranging between 0.05% and 15.00%[20] and reflecting the influence of participant selection (eg, only women with HDP vs unselected populations), facilities (eg, only referral hospitals vs smaller facilities), or criteria and definitions used.[33] Importantly, considering that severe and early-onset hypertension in pregnancy is generally associated with high MD rates,[3,4] the mortality index (8%) and MNMMR (1.0:12.3) that we reported were relatively low but significant and required appropriate interventions for improving care for women with HDP. The mortality index of 8% could suggest that the included healthcare facilities were performing quite well in the management of HDP and the role of the health facility's performance on outcomes is reflected by the substantial differences among the facilities. To optimize pregnancy outcomes, there is a need to improve these indicators of quality of care for women with HDP in the country.

Clinical characteristics were the most frequently fulfilled near-miss criteria. Similar to the observations in previous studies,[10,17,20] a large proportion of women with MNM would not have been identified without the expanded SSA near-miss criteria. Although there is a risk of overclassification of MNM with the adapted SSA criteria used compared with the WHO criteria, underclassification (eg, because of context irrelevant criteria or underregistration) is equally problematic, reflected in the fact that 7 of 12 MDs did not fulfill any criteria.

Severe preeclampsia and eclampsia were the leading conditions associated with SMOs. Affected organ systems were mainly hematologic and respiratory systems. Although in other MNM reviews in low-resource settings, severe hemorrhage and sepsis were often highly prevalent[11-13,23-26,28,29,32]; however, incidences in our cohort were relatively low. These findings could be partly explained by the restrictive inclusion criteria (limited to HDP) and possibly reflective of the referral setting with adequate access to medications and interventions, including timely delivery and active management of the third stage of labor.[23] Moreover, this may explain the low sepsis rate (1/447 [0.7%] in women with SMO), despite

the very high cesarean delivery rate (88% vs often ±30% in other MNM reviews [11,12,16] and associated risk of postpartum maternal infection.[34,35]

The ICU admission rate among women with SMO in this cohort (31%) was comparable with the rates in other MNM reviews of comparable facilities in Iraq and Rwanda (between 28% and 37%).[12,25] The proportion of MDs that was not admitted to the ICU was even higher in this study (92%) than in available literature (46%–50%).[12,25] Low ICU admission rates among these women with severe illness could indicate a shortage of ICU beds or difficulty in recognizing deteriorating patients in the absence of sophisticated diagnostics. In a previous MNM study in the largest tertiary hospital in Ghana, the ICU admission rate of 19% was reported among women with SMOs.[21] In that study, the definition of admission to the ICU was broadened to include admission to the recovery ward for more than 6 hours because of the frequent unavailability of the ICU for SMO cases. The current study used this extended criterion for similar reasons.

Clinical and research implications

The high occurrence of SMOs and adverse perinatal complications associated with HDP has been determined in our study. Most of these were because of substandard care, evidenced by the mortality index of 8%. The near-miss rates and indicators varied among participating centers, and interfacility variation has been observed in other MNM reviews that included multiple facilities.[16,36] These interfacility comparisons allow for further understanding of health facility and system related factors that contribute to poor or good outcomes, including availability and content of local protocols, availability and use of critical interventions or laboratory diagnostics, demographic accessibility or availability of resources, and training and skills of personnel.[17] Future studies should consider strategies to optimize the care for women with HDP, including timely referral, regular availability of medications, and laboratory support, and minimize in-hospital delays to facilitate optimal quality of care for women with HDP.

In addition, further research should include the identification, development, and evaluation of context-specific interventions to aid the clinical management of HDP to prevent severe complications, including MNM cases and mortalities. This could include refresher courses for healthcare professionals; these are useful adjuncts in improving the clinical management of HDP. Integrating this within a multidisciplinary clinical audit cycle for all MNM cases to identify treatment gaps or substandard treatment should be the cornerstone for quality-of-care improvement strategies to improve pregnancy outcomes.[37,38]

Strengths and limitations

The strengths of this study included the large number of women included in this prospective cohort, as most other MNM studies were (retrospective) case-control studies. This resulted in a lower risk of selection bias, the availability of a control group without SMO, and high-quality data for risk factors and adverse outcome incidence. At the same time, as these analyses were nested in and therefore were confined to the eligibility criteria of the SPOT study, we did not include women who presented with near-miss on arrival—a substantial group in sub-Saharan Africa as shown by others.[36] The cohort was not purposefully set up for an MNM review, which led to limitations in data availability (eg, unavailability of some near-miss criteria) and generalizability (eg, women with HDP remote from term in nonreferral hospital settings and women with HDP at >34 weeks of gestation).

Conclusions

Women who experienced a hypertensive disorder in their pregnancy remote from term had high levels of SMOs in referral hospitals in Ghana. Our study echoed the applicability concerns of the WHO MNM criteria in low-income settings. Regular review of MNM and maternal mortality cases, as part of a clinical audit for quality improvement system, can advance the quality of healthcare provision, reduce substandard care, and result in better maternal and perinatal outcomes.

Patient and public involvement

The SPOT study consortium includes Action on Preeclampsia Ghana (APECGH), an advocacy organization of survivors of hypertensive disorders in pregnancy. As consortium members, they are involved in meetings and conferences in which research progress is discussed. Research questions and outcomes are informed by their priorities, experience, and preferences, identified either during consortium meetings or through joint public engagement events. This cohort was established before the first contact between SPOT study members and APECGH, and as such, they were not involved in the early design stages of this study and cohort; however, they were involved in subsequent expansions.

This specific study arose from a shared interest to understand the incidence of severe maternal and perinatal outcomes associated with HDP in our study population. APECGH was not involved in the design of this substudy, recruitment of participants, or conduct of the study. They will be involved in the dissemination of the study results to participants and the wider public through their newsletter (layman summary and abstract with link to full article) and public engagement activities (webinars and social media postings).

ACKNOWLEDGMENTS

The authors gratefully thank all participating women and involved research assistants. Furthermore, we would like to acknowledge the feedback of the Severe Preeclampsia adverse Outcome Triage studies consortium members on drafts of the manuscript: Prof Robert Davis (PhD), Dr Linda Ahenkorah Fondjo (PhD), Dr Marcus Rijken (MD, PhD), Dr Vincent Boima, Dr Brege de Kok (PhD), Dr George Downward (MD, PhD), and Dr Beth Payne (PhD). In addition, we are grateful to the Bill & Melinda Gates Foundation (grant number OPP1197342), the Dutch Research Council (grant number NWA.1160.18.159), and the University Medical Center Utrecht Global Health Fellowship for funding this project.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.xagr.2021. 100045.

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Supplementary A. Relevant definitions

Hypertensive disorders of pregnancy (HDP)	
Gestational hypertension	Blood pressure≥140/90 mmHg (at least one component, twice, ≥4 hours apart,≥20+0weeks) without significant proteinuria
Chronic hypertension	Blood pressure≥140/90 mmHg before 20+0weeks of gestation
Pre-eclampsia	1) Bloodpressure≥140/90 mm Hg (at least one component, twice, ≥4 h apart, ≥20+0weeks) and either: - Proteinuria (of≥2+by dipstick, ≥0.3 g per day by 24-h collection, or≥30 g/mol by urinary protein:creatinine ratio), or - Hyperuricemia (greater than local upper limit of local non-pregnancy normal range) 2) Hemolysis, elevated liver enzymes and low platelets (HELLP) syndrome
Eclampsia	Generalized fits in a pregnant patient without previous history of epilepsy. Includes coma in pre-eclampsia
Partial HELLP	Hemolysis and low platelets, or low platelets and elevated liver enzymes
Maternal death, maternal near miss, severe maternal outcomes (WHO, 2011)	
Maternal death (MD)	Maternal death occurring during pregnancy or within six weeks after end of pregnancy, attributable to pregnancy complications
Maternal near miss (MNM)	A woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy
Severe maternal outcomes (SMO)	Refers to all women who either qualified as maternal near-miss cases or those who died
Maternal outcomes	
Severe postpartum hemorrhage,	Genital bleeding after delivery, perceived abnormal bleeding (≥500ml in vaginal birth, ≥1000ml in caesarean section))
Severe pre-eclampsia	1) Elevated blood pressure, systolic ≥160mmHg or diastolic ≥110mmHh, at least one component, twice, ≥4 h apart, ≥20+0 weeks; and proteinuria (of≥2+ by dipstick, ≥0.3 g per day by 24-h collection, or≥30g/mol by urinary protein: creatinine ratio) or hyperuricemia 2) HELLP syndrome: hemolysis, elevated liver enzymes, and low platelets; even in the absence of hypertension or proteinuria. 3) Pre-eclampsia with severe symptoms (headache, blurred vision, right upper quadrant pain)
Eclampsia	The presence of pre-eclampsia and convulsions
Sepsis or severe systemic infection	The presence of fever (>38 degrees Celsius), a confirmed or suspected infection (e.g. chorioamnionitis, septic abortion, endometritis, pneumonia), and at least one of the following; heart rate >90, respiratory rate >20, leukopenia (white blood cells <4000), leukocytosis (white blood cells >12000)
Pulmonary edema	Clinical diagnosis with X-ray confirmation or requirement of diuretic treatment and SpO2<95%
Failure to form clots	Bedside clotting test ≥7 minutes, failure of a clot to form after 7 minutes or a soft clot that breaks down easily

Supplementary Table (continued)

Organ dysfunction	
Cardiovascular dysfunction	Use of continuous vasoactive drugs
Respiratory dysfunction	Intubation/ventilation not related to anaesthesia and/or oxygen saturation <90% for >60 minutes and/or PaO2/FiO2 <200mmHg
Renal dysfunction	Dialysis for acute renal failure and/or creatinine ≥300umol/l or ≥3.5 mg/dl
Coagulation/hematologic dysfunction;	Failure to form clots and/or transfusion of ≥2 blood units
Hepatic dysfunction	Bilirubin ≥100umol/l or ≥6.0mg/dl
Neurologic dysfunction;	Stroke
Uterine dysfunction	Hysterectomy following infection or hemorrhage
Maternal and perinatal health care indicators (WHO, 2011)	
Severe maternal outcome ratio (SMOR)	Refers to the number of women with life-threatening conditions (MNM + MD) per 1000 live births (LB). This gives an estimate of the amount of care and resources that would be needed in an area or facility. Higher ratios indicate that a substantial proportion of cases will require more complex interventions.
Maternal near miss ratio (MNMR)	Refers to the number of maternal near-miss (MNM) cases per 1000 live births (LB). This gives an estimate of the amount of care and resources that would be needed in an area or facility. Higher ratios indicate that a substantial proportion of cases will require more complex interventions.
Maternal mortality ratio (MMR) / Maternal death ratio	Refers to the number of maternal deaths (MD) per 100.000 live births. This gives an estimate of the amount of care and resources that would be needed in an area or facility. Higher ratios indicate that a substantial proportion of cases will require more complex interventions.
Maternal near miss mortality ratio (MNMMR)	Refers to the ratio between maternal near miss cases and maternal deaths. Provides an estimate of performance. Higher ratios indicate better care.
Mortality index (MI)	Refers to the number of maternal deaths divided by the number of women with life-threatening conditions expressed as a percentage. Provides an estimate of performance. The higher the index the more women with life-threatening conditions die (low quality of care), whereas the lower the index the fewer women with life-threatening conditions die (better quality of care). With a low mortality rate, the health-care facilities are performing well in dealing with complex and severe cases.
Stillbirth ratio	Refers to the number of stillbirths (i.e. a baby who dies after 28 weeks of pregnancy, but before or during delivery) per 1000 live births.
Neonatal mortality ratio	Refers to the number of neonatal deaths (i.e. neonatal mortality up to 6 weeks postpartum) per 1000 live births.

Supplementary B. Maternal near miss criteria

Clinical criteria	WHO	SSA	SPOT
Acute cyanosis	+	+	-
Gasping	+	+	-
Respiratory rate >40 or <6/min	+	+	-
Shock	+	+	-
Oliguria non responsive to fluids or diuretics	+	+	-
Failure to form clots	+	+	+
Loss of consciousness lasting more than 12 hours	+	+	-
Cardiac Arrest	+	+	-
Stroke	+	+	+
Uncontrollable fits / total paralysis	+	+	-
Jaundice in the presence of pre-eclampsia	+	+	-
Eclampsia	-	+	+
Ruptured uterus	-	+	+
Sepsis or severe systemic infection	-	+	+
Pulmonary edema	-	+	+
Severe complications of abortion	-	+	-
Severe malaria	-	+	-
Severe pre-eclampsia with ICU admission	-	+	+
Laboratory criteria	WHO	SSA	SPOT
Oxygen saturation <90%	+	+	+
PaO2/FiO2 <200 mmHg for >60 minutes	+	-	+
Creatinine ≥300µmol/l or ≥3.5 mg/dl	+	+	+
Bilirubin >100 µmol/l or > 6.0 mg/dl	+	-	+
pH <7.1	+	-	-
Lactate >5 mEq/mL	+	-	-
Acute thrombocytopenia (<50.000 platelets/ml)	+	+	+
Loss of consciousness, glucose/ketoacids in urine	+	+	-
Management-based criteria	WHO	SSA	SPOT
Use of continuous vasoactive drugs	+	-	+
Hysterectomy following infection or hemorrhage	+	+	+
Transfusion of … units of blood or red cells	5	2	2
Intubation and ventilation not related to anesthesia	+	+	+
Dialysis for acute renal failure	+	-	+
Cardiopulmonary resuscitation	+	+	-
Laparotomy other than cesarean section	-	+	+

WHO, World Health Organization; SSA, Sub Saharan African

Supplementary C. Summary for each hospital

	Hospital 1 *n*(%) *n= 237*	Hospital 2 *n*(%) *n= 129*	Hospital 3 *n*(%) *n= 50*	Hospital 4 *n*(%) *n= 3*	Hospital 5 *n*(%) *n= 27*
Maternal health care indicators					
In the source population, (n)					
live births	211	111	47	2	21
Severe maternal outcomes (SMO) cases	96	52	3	1	8
Maternal near miss	92	47	1	1	7
Maternal death	4	5	2	-	1
Near-miss indicators: complexity of care					
Severe maternal outcome ratio (per 1000 live births)	455	468	64	500	381
Maternal near-miss ratio (per 1000 live births)	436	423	21	500	333
Maternal death ratio (per 1000 live births)	19	45	43	-	48
Near-miss indicators: performance					
Maternal near-miss mortality ratio	23	9	1	-	7
Mortality index	4%	10%	67%	-	13%
Perinatal health care indicators					
In the source population, (n)					
Live births	211	111	47	2	21
Stillbirths	32	20	3	1	7
Neonatal deaths	51	18	8	-	4
Perinatal health indicators					
Stillbirth ratio (per 1000 live births)	152	180	64	500	333
Neonatal mortality ratio (per 1000 live births)	242	162	170	0	190
Maternal outcomes	*n= 237*	*n= 129*	*n= 50*	*n= 3*	*n= 27*
Severe complications					
Severe postpartum haemorrhage	8 (4,2)	4 (3,2)	1 (14,3)	-	-
Severe pre-eclampsia	146 (61,6)	67 (51,9)	11 (22,0)	3 (100,0)	22 (81,5)
Eclampsia	29 (12,2)	28 (21,7)	2 (4,0)	-	4 (14,8)
Sepsis or severe systemic infection	-	-	-	-	1 (5,3)
Uterine rupture	-	1 (0,8)	-	-	-
Critical Interventions					
Use of blood products	13 (6,5)	10 (8,1)	-	-	2 (7,4)
Laparotomy	-	-	-	-	-
Admission to intensive care unit	46 (22,4)	4 (3,2)	-	1 (33,3)	1 (3,7)
Organ dysfunction					
Cardiovascular dysfunction	-	-	-	-	1 (3,7)
Respiratory dysfunction	20 (9,2)	2 (1,6)	-	-	1 (4,0)
Renal dysfunction	2 (0,9)	4 (3,1)	1 (2,0)	-	-
Coagulation/haematologic dysfunction	31 (14,0)	19 (15,4)	1 (2,2)	-	8 (29,6)
Hepatic dysfunction	-	-	-	-	1 (3,8)
Neurologic dysfunction	-	-	-	-	-
Uterine dysfunction/hysterectomy	-	-	-	-	-
Other maternal outcomes					
Pulmonary edema	2 (0,9)	1 (0,8)	-	-	1 (4,0)

Part 2

Quality of care for hypertensive disorders of pregnancy

Chapter 4

Provision and experience of care among women with hypertension in pregnancy: a multi-center qualitative study in Ghana

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Reproductive Health. 2023;20(1):49

Abstract

Background

Hypertensive disorders of pregnancy (HDP) remain a leading global health problem with complex clinical presentations and potentially grim birth outcomes for both mother and fetus. Improvement in the quality of maternal care provision and positive women's experiences are indispensable measures to reduce maternal and perinatal adverse outcomes.

Objective

To explore the perspectives and lived experiences of healthcare provision among women with HDP and the associated challenges.

Methods

A multi-center qualitative study using in-depth interviews (IDIs) and focus group discussions (FGDs) was conducted in five major referral hospitals in the Greater Accra Region of Ghana between June 2018 and March 2019. Women between 26-34 weeks' gestation with confirmed HDP who received maternity care services were eligible to participate. Thematic content analysis was performed using the inductive analytic framework approach.

Results

Fifty IDIs and three FGDs (with 22 participants) were conducted. Most women were between 20 to 30 years, Akans (ethnicity), married/cohabiting, self-employed and secondary school graduates. Women reported mixed (positive and negative) experiences of maternal care. Positive experiences reported include receiving optimal quality of care, satisfaction with care and good counselling and reassurance from the health professionals. Negative experiences of care comprised ineffective provider-client communication, inappropriate attitudes by the health professionals and disrespectful treatment including verbal and physical abuse. Major health system factors influencing women's experiences of care included lack of logistics, substandard professionalism, inefficient national health insurance system and unexplained delays at health facilities. Patient-related factors that influenced provision of care enumerated were financial limitations, chronic psychosocial stress and inadequate awareness about HDP.

Conclusion

Women with HDP reported both positive and negative experiences of care stemming from the healthcare system, health providers and individual factors. Given the importance of positive women's experiences and respectful maternal care, dedicated multidisciplinary women-centered care is recommended to optimize the care for pregnant women with HDP.

Plain language

High blood pressure (hypertension) in pregnancy can have severe complications for both mother and fetus including loss of life. The outcome of pregnancy for women who develop hypertension during pregnancy can be improved by ensuring optimal quality of care. In this study, we explored the opinions and experiences of women whose pregnancies were affected by hypertension concerning the care they received during their recent admission at different hospitals in Ghana and the challenges they faced. In four major referral hospitals in the Greater Accra Region of Ghana, we interviewed the women and had focus group discussions. Women who were pregnant for 26 weeks up to 34 weeks and had hypertension in pregnancy were invited for inclusion in the study.

We conducted in-depth interviews with fifty women and three focus group discussions with 22 women. Most women who participated in the study were between 20 to 30 years old, Akans (ethnicity), married/cohabiting, self-employed and secondary school graduates. The women reported both positive and negative experiences of care during their admission at the hospitals. Examples of positive experiences were receiving good quality of care, satisfaction with care, and adequate counselling from the health workers. Examples of negative experiences were poor communication between the providers and affected women, inappropriate attitudes by the healthcare providers, and disrespectful treatment such as verbal and physical abuse. The major factors in the health system that influenced women's experiences of care were lack of logistics, substandard professionalism, inefficient national health insurance system and long delays at health facilities prior to receiving treatment. The individual women's factors that affected the quality of care included financial constraints, psychosocial stress and inadequate knowledge about hypertension during pregnancy.

In conclusion, we determined that women with hypertension in pregnancy experience both positive and negative aspects of care and these may be due to challenges associated with the healthcare system, health providers and women themselves. There is the need to ensure optimal quality and respectful maternity care considering the nature of hypertension in pregnancy. These women require dedicated hospital staff with significant experience to improve the quality of care provided to women with hypertension in pregnancy.

Introduction

The global maternal mortality ratio is estimated at 199 per 100,000 live births, with a lifetime risk of maternal death of 1 in 190. The lifetime risk is substantially higher in sub-Sahara Africa (1 in 38) compared to high-income countries (1 in 5,400) indicating significant healthcare inequities [1]. Hypertensive disorders of pregnancy (HDP) or maternal hypertension is among the major causes of maternal mortality, with complex clinical presentations and potentially devastating birth outcomes for both the woman and fetus [2]. HDP-related maternal morbidity and mortality disproportionately affect low- and middle-income countries (LMICs) [3,4] with approximately 1,900 maternal deaths in high-income countries, compared to 20,900 maternal deaths in Sub-Saharan Africa [3].

Prevention of avoidable maternal deaths through improvement in obstetric and newborn care has been a long-standing priority for the World Health Organization (WHO) and the global agenda of the Millennium Development Goals (2001-2015) and Sustainable Development Goals (SDGs, 2015-2030). Overall, provision of care (coverage) has improved during antenatal, intrapartum and postpartum periods, globally. However, lagging improvements to optimize the quality of maternal care resulted in reductions in maternal mortality that fall short of the global ambitions [5]. For instance, the maternal mortality ratio in Ghana remains high at 308 per 100,000 live births despite demonstrable improvements (740 in 1990) [1]. About 98% of pregnant women in Ghana receive antenatal care from skilled birth attendants and the institutional deliveries rate has increased from 54% in 2007 to 79% in 2017 [6,7]. The proportion of maternal deaths attributed to hypertension in pregnancy has doubled over the past decade in the country and it is the second largest cause after hemorrhage [6].

The WHO defines quality of care as the extent to which healthcare services provided to individuals and patient populations improve desired health outcomes [5]. High quality of care is multidimensional and incorporates safety, effectiveness, timeliness, efficiency, equitability and usefulness to people [5,8]. Thus, improvement in the quality of care is critical in achieving the SDG 3's target of reducing the global maternal mortality to less than 70 per 100,000 live births [9]. Importantly, during provision of care, the rights and dignity of the women should be respected to promote positive pregnancy and childbirth experience [10,11]. Disrespectful care is increasingly being identified as endemic in most maternity care settings with a direct negative impact on the quality of care and can constitute a significant disincentive to future health-seeking behavior of women [11,12].

Recently, a WHO multi-country study with Ghana inclusive reported that over 40% of women experienced significant mistreatment including physical, verbal, stigmatization or

discrimination [13]. A key recommendation from this study hinges on further research into a comprehensive understanding of the drivers and structural dimensions of disrespectful maternity care including socio-economic inequalities. As such, women's perspectives and their actual experiences of care at health facilities are vital to improving the existing healthcare system and the quality care for HDPs in the country. Therefore, the main objective of this study was to explore women's perspectives on provision and lived experiences of care and identify specific challenges among women treated for hypertension during pregnancy in five health facilities in Ghana.

Methods

Study design and setting

This multi-center qualitative study using both in-depth interviews (IDIs) and focus group discussions (FGDs) was conducted in five major health facilities in the Greater Accra Region (GAR) of Ghana. The study sites were Kore-Bu Teaching Hospital (KBTH), Greater Accra Regional Hospital, La General Hospital, Lekma Hospital and Tema General Hospital. The Greater Accra Metropolitan Area of Ghana has a population of about 4 million inhabitants with different ethnic backgrounds. The antenatal care coverage by skilled health provider is about 97.5% comprising mainly midwives and doctors. The region records the highest facility-based childbirth (91.9%) in the country with the majority (71.4%) from public institutions and about 20.5% from private health facilities [6].

This qualitative synthesis was part of a large study titled "Severe Preeclampsia adverse Outcome Triage study (SPOT study)". The overarching aim of the SPOT study was to validate the fullPIERS (Pre-eclampsia Integrated Estimate of RiSk) and miniPIERS risk prediction Models for adverse pregnancy outcomes in women with severe preeclampsia in Ghana [14,15]. The detailed methodology of the SPOT study including the maternal outcomes has been published recently [16]. The main objective of the qualitative analyses was to comprehensively explore the quality of care for women with maternal hypertension in the clinical setting based on the lived experiences of pregnant women and perspectives of health workers. The health professionals' perspectives on clinical challenges associated with managing maternal hypertension and context-specific recommendations have been published recently [17]. In addition, hypertensive mother's knowledge, attitudes and misconceptions on HDP have been reported [18]. In this paper, we report hypertensive mothers' perspectives and their lived experiences of care at health facilities in Ghana.

Participants

Eligibility criteria were women with HDP diagnosed at gestational ages between 26 to 34 weeks, who received maternity services in any of the study centers and provided written informed consent. HDPs diagnosed before 34 weeks (early onset type) are considered severe disease with increased risk for poor outcomes and hospitalization for an extended period. We excluded women with hypertensive disorders diagnosed after gestational ages more than 34 weeks. There is evidence that planned early delivery for women with HDP after 34 weeks' gestation is associated with less composite maternal morbidity and mortality compared with prolongation of the pregnancy[19]. Hypertensive pregnancies that occurred prior to 26 weeks were also excluded as conservative clinical management (i.e. prolongation of pregnancy) is generally not recommended due to the high risk of poor pregnancy outcomes [20].

Participant recruitment and interviews

Data collection commenced on 1st June 2018 and was completed on 31st March 2019. Study participants were recruited via purposive sampling based on the specified inclusion criteria. Initially, a potential participants' list was compiled comprising women with hypertension in pregnancy. Patients that met the inclusion criteria were then identified by one of the authors (ET) with the help of the medical doctor in the study team. The selected potential participants were approached by ET who explained the study protocol to them individually. Women who agreed to participate in the study and provided informed consent were then assigned study identification numbers. The in-depth interviews (IDIs) were carried out immediately after discharge from the hospital. However, if IDI was missed after discharge from the hospital, the interview was re-scheduled within the postnatal period (six weeks postpartum). The IDIs were started first and continued until the point of saturation where no new information emerged from subsequent interviews. All the in-depth interviews (IDIs) were conducted by ET with regular supervision and support from KAB. The FGDs were also conducted and moderated by ET and notes were taken by another trained research assistant. We used interview guides for the IDIs and FGDs to gain a comprehensive understanding of the challenges during provision of care and experiences of hypertensive mothers. Both the IDIs and the FGDs were either conducted in Ga or Twi (local Ghanaian languages) and all were audio-recorded. The notes taken during the interviews were kept in a diary and provided additional clarification and greater transparency during the data analysis.

The IDIs and the FGDs were conducted in designated quiet rooms specifically allocated for the qualitative interviews in each facility to avoid frequent interruptions. There were no other people present in the interview rooms at the time of data collection apart from ET and the research assistant (note taker). The IDIs and FGDs usually lasted for between

30 to 60 minutes and 60 to 120 minutes respectively. The FGDs were conducted after the women had been discharged from the health facilities and within six weeks of childbirth so as to reduce recall bias and provide a clear picture of the overall quality of care they received during their admission at the health facilities.

Ethical consideration

The study protocol was reviewed and approved by the Ghana Health Service Ethics Review Committee (Protocol ID GHSERC- GHSERC015 /09/17) and Ethical and Protocol Review Committee (EPRC) of the College of Health Sciences, University of Ghana (Protocol ID GHSERC- CHS-EtM.4-P1.2/2017-2018). We obtained written informed consent from all the study participants prior to the interviews and they were assured of strict confidentiality of the information provided. Anonymity was ensured by the non-inclusion of any identifiable information about the respondents.

Data management and analysis

In this study, mixed methodological orientations of phenomenology and grounded theory were employed via systematic data collection and careful thematic content analysis [21]. We used an inductive analytic framework approach in the data analysis. In the inductive thematic analysis, the themes were derived mainly via coding of the data (data-driven) without being influenced by our theoretical interest in the topic. Deductive analytic approach complemented the analysis as data coding was not performed without any prior theoretical and epistemological background [21].

Transcription of the interviews and translation from Twi or Ga into English started soon after the commencement of the data collection and continued alongside the interviews. Prior to the data analysis, a two-day qualitative data analysis training session was organized for ET and KAB at the School of Public Health, University of Ghana, by the Social Scientists in the team headed by (PG and NA). After the training, the codebook was developed by ET with input from KAB based on the semi-structured interview guides. The transcripts were read multiple times by two authors (KAB and ET) in a more recursive manner to familiarize themselves with the data and to understand the train of thoughts of the respondents. During the recursive process of reading the transcripts, important notes were taken to indicate potential thematic areas and this resulted in the generation of the initial codes which were critical for the final coding of the transcripts. Coding was done by ET and KAB using NVivo software (version 12) based on the thematic content. During the data analysis, the notes that were scribed during the interviews provided clearly objective contribution and understanding via comparison with the transcripts. The study team discussed the codes and the emerging thematic areas until a consensus was reached.

In this study, triangulation of the results was ensured via the inclusion of hypertensive mothers of different backgrounds, from different health facilities (data source triangulation) and with the use of both IDIs and FGDs (method triangulation) [22]. Coding was undertaken by two authors (ET and KAB) and disagreements regarding coding were resolved via discussions by the team. The interviews were undertaken with a clear understanding of the principle of reflexibility and active note-taking during the IDI and FGDS. Reflexivity was ensured via comparison of the interview transcripts with the notes taken during the data collection to provide objective representation and greater transparency of the findings. The consolidated criteria for reporting qualitative research (COREQ) were used as a guide in reporting this paper [23].

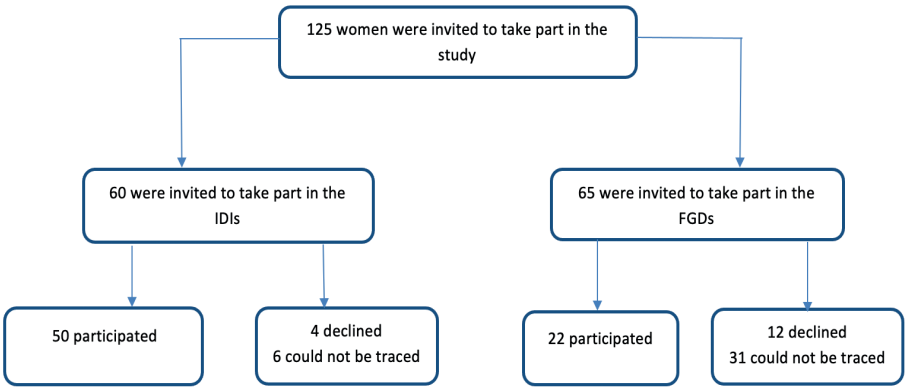

Figure 1. Flow chart for inclusion of women with hypertension in pregnancy

Results

Characteristics of the study participants

In this multicenter study comprising five hospitals in Ghana, a total of 125 women were invited to take part out of which 72 women finally participated comprising 50 and 22 for the IDIs and FGDs respectively. For the FGDs, most of the women could not be traced following discharge from the hospital (Figure 1). The FGDs were conducted in three out of the five hospitals: Korle-Bu Teaching Hospital (n=4 participants, 19 could not be traced out of 23 women invited), Greater Accra Regional Hospital (n=10 participants, 5 could not be traced out of 15 women invited) and Tema General Hospital (n=8 participants, 7 could not be traced out of 15 women invited). Overall, 12 women (18.5%) declined to participate in the FGDs. A total of 31 (47.7%) women (out of 65) could not be traced during the postpartum period following invitation to participate in the FGDs. There was some challenges in recruiting participants from the two smaller hospitals (La General hospital and Lekma hospital) for the FGD as we could not assemble the minimum number for the FGD on different occasions. The socio-demographic characteristics of the participants and the facility distributions are presented in Table 1.

Most of the women included in this study had Akan ethnicity (48.6%, n=35), and were married/co-habiting (69.4%, n=50), self-employed (62.5%, n=45) and between the age group of 20 to 30 years (51.4%, n=37). Majority had attained secondary education (58.3%, n=42) and experienced between 1 to 4 previous childbirths (86.1%, n=62) and lived in urban areas in the Accra Metropolis (97.2%, n=70). Majority of the IDIs were contributed by the Korle-Bu Teaching Hospital (40.0%, n=20) and Greater Accra Regional Hospital (32.0%, n=16). Of the 60 potential participants for the IDIs, ten (16.7%) were excluded (4 declined and 6 could not be traced).

Table 1. Socio-demographic characteristics of the study participants

variable	IDIs n (%)	FGDs n (%)	Total n (%)
Age			
<20	3 (6.0)	0	3 (4.2)
20-30	29 (58.0)	8 (36.4)	37 (51.4)
30-39	14 (28.0)	10 (45.5)	24 (33.3)
40+	4 (8.0)	4 (18.2)	8 (11.1)
Marital status			
Single	17 (34.0)	5 (22.7)	22 (30.6)
Married/cohabiting	33 (66.0)	17 (77.3)	50 (69.4)
Educational status			
None/primary	14 (28.0)	3 (13.6)	17 (23.6)
Secondary	27 (54.0)	15 (68.2)	42 (58.3)
Tertiary	9 (18.0)	4 ((18.2)	13 (4.2)
Number of previous births			
0	6 (12.0)	0 (0)	6 (8.3)
1-4	41 (82.0)	21 (95.5)	62 (86.1)
5+	3 (6.0)	1 (4.5)	4 (5.6)
Residence			
Urban	48 (96.0)	22 (100.0)	70 (97.2)
peri-urban	2 (4.0)	0 (0)	2 (2.8)
Ethnicity			
Akan	28 (56.0)	7 (31.8)	35 (48.6)
Ewe	10 (20.0)	6 (27.3)	16 (22.2)
Ga	6 (12.0)	4 (18.2)	10 (13.9)
Other	6 (12.0)	5 (22.7)	11 (15.3)
Occupation			
Unemployed	15 (30.0)	2 (9.1)	17 (23.6)
Formally employed	6 (12.0)	0 (0)	6 (8.3)
Self-employed	26 (52.0)	19 (86.4)	45 (62.5)
Casual worker	1 (2.0)	0 (0)	1 (1.4)
Others	2 (4.0)	1 (4.5)	3 (4.2)
Health facilities (study sites)			
Korle-Bu Teaching Hospital	20 (40.0)	4 (18.2)	24 (33.3)
La-General Hospital	4 (8.0)	-	4 (5.6)
Lekma Hospital	5 (10.0)	-	5 (6.9)
Greater Accra Regional Hospital	16 (32.0)	10 (45.5)	36 (50.0)
Tema General Hospital	5 (10.0)	8 (36.4)	13 (18.1)

IDIs: In-Depth Interviews; FGDs: Focus Group Discussions

In this study, we explored the women's perspective on provision and experiences of care, and specific challenges faced by women treated for maternal hypertension. The major themes that emerged included (1) women's knowledge on hypertension in pregnancy, (2) women's experiences of care and (3) challenges experienced by women while receiving care.

1. Women's Knowledge on hypertension in pregnancy

Most of the study participants had limited knowledge about HDP including the danger symptoms of severe hypertension, especially those with limited educational level. Most women indicated that they were ignorant about preeclampsia and other HDPs and wondered why health workers do not routinely educate them on the subject.

"Please, I will like to ask that the name that they are mentioning [pre-eclampsia], is it an illness? (Laughter by the women) Because that is what the doctors always write. Because we are illiterates we don't understand. I don't know what it is" (FGD, 40 years, married)

"Truth be told, I had never heard about it before. And I still really don't even know what it is in detail. I quite remember I even use to point to the wrong place when I was asked to point to my heart. In my first pregnancy, nothing about hypertension was mentioned to me (IDI, 29 years, single)

However, few mothers had adequate knowledge of hypertension and its major complications including stroke. Adequate knowledge was commonly demonstrated among women who had experienced preeclampsia or other types of maternal hypertension in their previous pregnancies. Most women diagnosed with hypertension in pregnancy had limited knowledge about the condition before their diagnoses were made. Other women did not know that hypertension can affect pregnant women although they had heard about hypertension in the general population.

"Your health is the most important because your BP [blood pressure], when it goes up very high it can kill you or leave you with a stroke" (IDI, 29 years, married)

"I've heard it because I experienced it in my previous pregnancy and I know what it can bring about. So when even someone says [s]he has headache I tell the person to go and check, it might be hypertension because it can kill you easily" (IDI, 39 years, single)

"I have heard about BP before but I didn't know that you could have BP when pregnant" (IDI, 31 years, married)

Majority of the respondents attributed their hypertension to stressful situations they experienced during pregnancy. Other women related the occurrence of the hypertension to grudges at workplaces and the home environment. Some participants hinted that in some situations, disturbances in the home environment by family members resulting in 'excessive thinking' in pregnancy were associated with hypertension in pregnancy. Most women frequently attributed hypertension in pregnancy to stressful situations which lead to heightened psychological stress and excessive thinking by the women.

"Where I was staying, there were other tenants living there who always want to argue with me. Anytime they see me they start to insult and mock at me. So because of that I decided to leave that house because I was very angry so I don't know if that is what triggered the BP" (IDI, 28 years, single)

"What I can say about it is that when we think too much that is what causes it so if you are thinking reduce it and give everything to God. He does all things but when you think too much it will not be able to solve that problem, and then also you should find time to rest. You shouldn't do too much work" (IDI, 39 years, married)

2. Women's experiences of care

Experience of care was a key recurring theme reported by majority of the women with maternal hypertension. The respondents had different interpretations of what was considered "good quality of care" based on their lived experiences of care at their respective health facilities and the outcomes of their pregnancies. The reported experiences by the women relating to their care at the respective health facilities were mixed. Few women reported positive experiences and perceptions of good quality of care. The hypertensive mothers narrated mixed feelings regarding their care experiences, indicating significant dissatisfaction among participants. However, some hypertensive mothers had positive experiences and described the quality of care they received as optimal. The high quality of care experienced by some of the women commenced with excellent reception at the health facilities followed by provision of appropriate treatment (standards of professionalism) and reassurance by the health workers.

"As for me I was well cared for. They've really cared for me. The way the thing [hypertension] happened to me and the way they were able to take care of me. They gave me injections when they had to. They really took very good care of me and I'm very happy" (FGD, 28 years, married)

"On the day that I came, honestly, they gave me a good reception because my baby's heartbeat was up and my Bp was also up so they calmed me down so that my Bp will come down. So they gave me excellent care and I was very happy" (FGD, 42 years, married)

However, it was apparent that some women were extremely unhappy with the care they received while they were on admission. They enumerated the negative experiences they encountered and recommended measures to mitigate against such inappropriate treatment by health workers.

"Getting up from the bed was very difficult for me. I could not raise my leg. A nurse will ask you to come to her for her to check your temperature and something else while she is seated at the other end. I couldn't walk and almost fell so I had to hold unto the beds of others when I walked a little bit. On the other hand, there are those (nurses) who will come over to help you when you tell them you can't get up" (FGD, 41 years, married)

"When labour started, at the initial stages when I called any nurse who was passing by, they ignored me instead of them may be encouraging me to bear the pain. When it happens like that you think that maybe you are going to die not knowing anybody there because the person who you know as a nurse who is supposed to help you isn't. When the baby's head was coming out she then asked me to get up. It's fine if you don't know the condition in which a woman has to go through when in labour. When I had squatted when the baby's head was coming, she was looking on but she kept urging me to get up and I told her that I couldn't get up in that condition. There was a container under my bed, and it was in this container that I delivered into (Respondents: ooh!). I was very hurt and told my husband. I was very hurt because I'm sure she was one of the student nurses. If she had drawn closer and helped me with the delivery maybe I wouldn't have lost so much blood. I bled a lot and suffered a lot before the baby came out" (FGD, 26 years Married)

There were mixed findings regarding provision of relevant information and counselling with respect to procedures undertaken by health professionals. Some women were given comprehensive counselling prior to the procedures they went through; they were satisfied with the care received and they commended the health professionals.

"Yes, they will tell you this is going to be painful. They tell you before they inject you. When I came back from the theatre, I told the doctor that my buttocks really hurt. He told me that he will mix the drug with another drug to make it less painful. So he mixed it with another drug before injecting me and the pain was less" (IDI, 31 years, married)

a. Experience of complications of maternal hypertension

Although the pregnancy outcomes were generally good for most of the women, some experienced adverse outcomes of maternal hypertension, such as the demise of their babies. The narratives provided by some mothers who experienced adverse outcomes

clearly indicated that they had some form of postpartum psychological strain and depression.

"For me, since they took the child out I didn't want anyone to come to me because in my room when the babies around me cry, I panic, so I told them to let me go home" (IDI, 29 years, single)

"They did a scan and realized that the baby had died in my womb. My sister signed as a witness to the death of the baby. After my vitals and blood were checked, everything was alright except my BP" (IDI, 28 years, married)

Some of the patients experienced severe complications of maternal hypertension such as convulsions or loss of consciousness (eclampsia). A typical example was a woman who collapsed (had eclampsia) and was rushed to the hospital in an unconscious state and was referred to the tertiary center for further treatment.

"After collapsing at home, I was sent to a nearby clinic and after regaining consciousness the clinic transferred me here. When I got here, I was given medicine" (FGD, 26 years, married)

A similar occurrence of eclampsia and prolonged loss of consciousness was reported by a young woman who regained her consciousness long after she had been operated upon (cesarean section).

"I remember I started eating kenkey and started vomiting and that was it. I didn't remember anything again…. I saw that there was plaster on my stomach and I was lying down before my mother came and I ask them what I was doing here and they said I had been operated because I was pregnant" (IDI, 18 years, single)

b. Experience of mistreatment and disrespectful care

Some of the participants recounted unpleasant experiences of disrespectful treatment while receiving maternal care services at the health institutions. These abusive treatments were meted by different categories of health professionals (doctors, midwives) and took different forms including verbal, neglect and physical mistreatment. Verbal abuse was rampant, and most women reported their experience of being shouted at, insulted or scolded during the provision of care. In addition, non-verbal abusive attitudes were displayed toward some hypertensive women.

"Some people [health workers] talk to you in a "funny way" so you won't feel it but others too will be shouting at you and you think she is doing her job so you can't say anything about it, but some do it in a very nice way" (IDI, 28 years, single)

"In all the doctors take good care of us, but the nurses who work with the doctors are snobs. So you will say that I don't like this place because when you go there the nurses are snobs. They do this too much" (IDI, 31 years, married)

Various instances of neglect by healthcare providers were mentioned by the respondents. The affected women felt neglected and worried especially during the times when they needed the support of the health professionals most. Incidents of extreme forms of inadequate attention or abandonment by health workers during the critical times of childbirth in the health facilities were recounted with a lot of emotions by some of the women.

"When I was in labour, I had to tell the nurse that she should come and check me so I can go to the labour ward and she only told me that I should allow them to sleep because that time it was around dawn, 2am. She said I should allow them to sleep and that I'm not in any labour. So I had to go and so it was when I started pushing that the people [other patients] on the ward called out to the nurses "she is giving birth ooo" and when they came I had given birth" (IDI, 24 years, married)

In the process of provision of maternal care some women experienced physical abuse which included being hit by health providers. Reasons cited for such mistreatment include patients' refusal to obey instructions and lack of patience on the health workers' part.

"When they [health workers] have to wake you up for you to take your medication, they hit you very hard as if you were their little sister before they will tell you to take your medication instead of tapping you gently. That was my problem" (FGD, 37 years, married)

Sometimes the attitudes of some of the health workers put the patients off and made them wish they had an alternative health facility to seek treatment. Majority of the mothers felt uncomfortable and worried when health professionals who are taking care of them are unfriendly and disinterested in their welfare.

"Some nurses are not all that friendly; if you are talking to them as if they are listening, sometimes the way they talk to you makes you feel uncomfortable, so I think at least they should be a little friendly to us" (IDI, 24 years, married)

Lack of interactive communication between the health professionals and hypertensive women was considered a major shortcoming in the process of providing care. Adequate communication from the doctors and nurses on the status and progress of their medical conditions with heartfelt expression of empathy was a major expectation of the women.

Some women observed that the lack of communication was even worse for women with no or minimal educational attainment.

"Hmmm I have a problem with the doctors and nurses, some don't explain things to the patients. You come and they say everything is okay and fine, unless those who have gone to school a little bit and can read. But I think in everything, they should tell the patients" (IDI, 26 years, married)

3. Challenges experienced while receiving care

Women with hypertension in pregnancy experienced myriads of challenges related to the health system and attitudes of healthcare professionals while receiving care at health facilities. Institutional challenges include inadequate facilities such as beds or space for managing women referred for urgent care due to severe maternal hypertension. Unavailability of hospital beds for admitting mothers with hypertensive emergencies in most health facilities was frequently mentioned. However, urgent institutional arrangements were made in some cases to provide space for admission of the affected mothers following some avoidable institutional delays.

"When we came in the evening, we were told there was no bed. So they came to look for a place to put a bed. So they cleared the place where they had put certain things and then put me there. They said because of my case I had to lie down. I shouldn't be standing so they made a bed for me to lie down and then they checked my BP frequently" (IDI, 28 years, married)

Situations where pregnant women on admission had no beds and slept on the floor were also mentioned. Such situations occurred frequently when the hospitals were overwhelmed with high patient loads. A typical example of these experiences encountered personally by some of the hypertensive mothers is indicated below.

"Please one good experience I encountered when I was transferred after delivery to the ward was that, there were no beds for the first half and I was given a mattress which I laid on till evening. In the evening one midwife came and asked why a BP patient was lying on the floor. There was a bed then, so she carried me unto the bed like a baby. The woman [midwife] did very well. So, this is one good experience which I had" (FGD, 32years, co-habiting)

In some instances of "no bed syndrome", some hypertensive pregnant women are managed in chairs until beds become available. The following quote describes a typical experience by one hypertensive pregnant woman who was nursed in a plastic chair when she presented with severe hypertension and required hospital admission and immediate treatment

"When I arrived here, I was told there was no bed so I should look for a plastic seat and sit on. So I sat in the seat while they took care of me. I was injected and all that sitting in the chair"(FGD, 31 years, married)

a. High cost of laboratory tests and antihypertensive medications

The cost of healthcare was a prominent theme that emerged from almost all the respondents. It became clear that the most important underlying challenge associated with the care for women with maternal hypertension was financial constraint. An important concern mentioned by majority of the women was the high cost of hospital stay. In addition, the costs of medications (antihypertensive drugs) were high for which they implored the government and other organizations to support.

"The drugs are very expensive. There are some drugs which are not covered by health insurance. You will have to buy it yourself. You can buy drugs to the tune of 400, 500, 600 and sometimes 1.2 cedis [with the sum mentioned here ranging from 70 to 125 USD]. Some are even more than that. So you will buy it yourself. Health insurance doesn't cover. It covers very little, the ones that are not expensive like 35 or 5 cedis" (IDI, 33 years, married)

Financial constraint was cited as the single most important challenge encountered by women with hypertension, especially in paying for their laboratory tests and medications. The participants made recommendations to the government to either reduce the cost of the medications or supply the relevant drugs to them at no cost.

"So the government should make sure that the labs [laboratory tests] done for pregnant women with hypertensive disorders of pregnancy should be made free because without the labs the doctors cannot do their work well" (IDI, 33 years, married)

"The government should reduce the cost and help those of us who don't have money so that we can receive the care the doctors are ready to give us. Because if you have high blood pressure and you don't have money, you are still thinking how will the hypertension will go?" (IDI, 43 years, married)

b. Insecurity about the proficiency of the medical team

Some women with maternal hypertension had the impression that some of the medical practitioners were not adequately competent to offer optimal treatment to them on certain occasions. There were instances of arguments among the doctors about the most appropriate clinical decision in the presence of the patients and this created a feeling of insecurity, uncertainty and fear due to perceived impression of inexperienced medical personnel. These feelings of insecurity were compounded by lack of communication

and interaction with the affected patients who only looked up to God for miracle. Some mothers narrated how they were scared by the actions or clinical decision of some doctors.

"My problem over here is that it was like trial and error. When this person comes [referring to the doctor] he will come and write his report, "severe pre-eclampsia". When this person [referring to another doctor] also comes, he writes mild pre-eclampsia and then leaves. What I have being yearning for my whole life [referring to a baby], you have students coming in and out. When this one comes, he comes to write then when the doctors come, they don't read the report. This one comes to write "mild" and then the other one comes to write "severe". So when the time came for me to go to theatre they should have found out whether it [the baby] will come on or not, but they were arguing among themselves that I was para zero or para "o" or something so they had to go and take the baby out for me. So this is the problem I had" (FGD, 42 years, married)

"When I came they [doctors] did not explain things to me and when they checked they asked me to go home and come the following week but if it had not been for the head of the hospital I could have gone home and something could have happened to me" (FGD, 29 years, single)

c. Delays in receiving care at health facilities

Majority of the mothers with maternal hypertension recounted their experiences of significant delays at the health facilities before receiving the needed care. This was reported by participants from all the health facilities included in the study. Further enquiry indicates that the actual provision of care they received at the facilities are commendable despite prior delays in accessing the care.

"I leave home very early because I'm coming from afar. I get here by 6 am and start heading back home at 5 pm. We suffer a lot. We are cared for alright but some people who arrive later go ahead of us because they know someone who works here. We sit in the queue for long because we don't know anyone who works here. So we really suffer a lot" (FGD, 31 years, married)

Some women who were referred on account of severe hypertension had to obtain folders before they were provided the needed care. The challenge of going through the long registration process without the initial triage or treatment results in significant delay in receiving the needed urgent care, especially for emergency cases. Such long processes of acquiring folders (in-hospital registration) could result in increased adverse pregnancy outcomes for undiagnosed hypertensive emergency due to delay in initiating anti-hypertensive treatment on time.

"When I got here, I was asked to go and make a card. After that I was given a nurse who checked my BP so upon checking my BP, they realized it was an emergency so they saw that the BP had gone up so they gave me to a doctor" (IDI, 33 years, married)

"We got here at 3 something and they asked us to go and get a folder. My husband kept long with the getting of the folder. So I was attended to after the folder was brought and they checked my Bp and then they sent me to a room. I was given injections instantly" (FGD, 34 years, Married)

d. Shortage of Health professionals

Majority of the women thought the number of health professionals (nurses and doctors) were inadequate to take care of the high patient load. Most women appreciated implicitly that the actual number of health professionals were not adequate. However, they were mostly supported by students who were learning on the job. Some patients attributed poor professional output by the health professionals to the high patient load and the inadequate numbers to manage the high volumes of obstetric cases.

"I think sometimes there is pressure on them (doctors) and some of the patients they do not abide by the instructions, and they don't take their drugs and come with worse conditions. So, I think a lot of doctors should be employed" (IDI, 26 years, married)

"The midwives are not many so if more of those who have completed school can be added. At the government hospitals the patients are more than the nurses that is why they don't have time for us so the government should see to it for us" (FGD, 41 years, married)

e. National health insurance associated challenges

There was a general perception that the National Health Insurance (NHIS) has major limitations and does not cover the cost of maternal care completely. Most women had extreme difficulty in procuring all the prescribed medications and laboratory tests. These sentiments were expressed by almost all the hypertensive mothers with mixed reports on whether the NHIS covers the drugs and laboratory tests fully or partly.

"The NHIS doesn't cover the BP drugs so they should improve the insurance so that it covers the drugs because not everyone can afford it. When I came, I have spent almost 600 Ghana cedis here and not everyone can afford it" (IDI, 29 years, single)

"With the labs it was not expensive because the health insurance covers some and the rest you will have to pay for it. And the drugs too, the insurance covers some of them so the ones it does not cover you have to buy them either at the hospital when they have some or outside". (IDI, 31 years, single)

Based on the gross limitations associated with the NHIS as enumerated by the women including its inability to pay for the cost of most medications and laboratory tests, several requests were made to the government. These appeals mainly related to increasing the coverage of the NHIS to defray the hospital bill for women with maternal hypertension.

"They should increase the coverage of the insurance. We are told with insurance, delivery is free but this is not so we still pay. Even for the labs and drugs we still pay. So far, I have spent almost 500 cedis" (IDI, 33 years, married)

f. Home care management

Some participants recommended the idea of managing some selected patients at home for less severe conditions as compared to the strict hospital confinement. Inferably, some women felt their condition were not severe enough to require admission to the hospital and that the possibility of home care and monitoring for less severe cases of maternal hypertension should be explored by health professionals. The reasons for advocating home management as compared to hospital care majorly related to reduced healthcare cost and loss of women's productive time.

"I think when someone comes and the condition is not too serious the doctors should prescribe drugs for the person and not necessarily admit the person as it takes some productive hours of work away from the person and being admitted here, the cost of admission too is expensive and not all can pay" (IDI, 29 years, single)

"For me, I was not ok because I told them to allow me to go home so that I can come for review while searching for some money and they refused, and it was because of my siblings I left at home" (IDI, 25 years, single)

Discussion

This multicenter qualitative study provides a unique opportunity to understand the quality of maternal care from the perspectives of women treated for hypertension during pregnancy and their lived experiences of care at health facilities in Ghana. Women with HDP reported mixed (positive and negative) experiences of care. Major bottlenecks in the provision of high-quality care identified relate to health system challenges such as lack of logistics, inefficient national health insurance and unexplained delays at health facilities; health professionals-related factors including ineffective provider-client communication, inappropriate attitude by the health professionals, disrespectful treatment including verbal and physical abuse; and inadequate women's knowledge about hypertension in pregnancy.

The finding of inadequate knowledge on the preeclampsia or maternal hypertension by the hypertensive mothers is consistent with other reports across the globe especially in LMICs [24-28]. In a related study in the United Kingdom, Wotherspoon et al determined limited knowledge of preeclampsia by women most of whom were unaware of the potential risk of developing preeclampsia [29]. In that study, majority of the women were uninformed about the rationale for regular measurement of their blood pressures and urine samples. Relatedly, majority of the mothers attributed the development of hypertension to stressful situations they experience during pregnancy especially from their workplaces and home environment. The notion of 'stress-induced preeclampsia' was of paramount concern to the hypertensive mothers and this emerging discovery requires further research as similar findings have been reported [28]. Although the etiology of maternal hypertensive remains elusive recent studies have demonstrated causal associations with chronic psychosocial stress [30-33].

Majority of the mothers with maternal hypertension recounted their experiences of significant delays at the health facilities before receiving healthcare services as reported by other studies [2,34,35]. These unnecessary and avoidable delays could result in preventable maternal deaths or severe morbidity [35,36]. Also, high costs of laboratory tests and antihypertensive medications were considered a major challenge for women and continuous support from the government was frequently solicited. In this case, all-inclusive and effectively working NHIS is indispensable in improving the quality of care. Majority of the mothers lamented desperately on the limitations of the existing NHIS. Originally, the NHIS in Ghana was deemed to cover 95% of all healthcare cost (including maternal care services) with some specific exceptions [37]. However, the constant public outcry including reports of frustrations experienced by hypertensive mothers in this multicenter study calls for a critical review of patients' benefit and coverage of the NHIS in the country.

Another important health system-related concern was the feeling of insecurity by some women about the proficiency of the medical teams. Some hypertensive mothers had the impression that some of the health workers were not adequately competent. Unavailability of skilled personnel to make correct diagnosis and implement appropriate healthcare plan constitutes substandard care with increased risk of severe maternal near-miss and mortality [38]. The challenge of substandard care for maternal hypertension is not limited to LMICs. For instance, in the Netherlands where maternal mortality ratio is among the lowest worldwide, maternal hypertension is the leading cause of maternal deaths with about 96% associated with substandard care [39]. Similar concerns related to the quality of maternal care have been reported in other high-income countries including the confidential inquiries into maternal deaths in the United Kingdom. The issue of substandard care remains a major clinical challenge that warrants urgent attention globally [27].

In addition, a significant number of mothers reported personal experiences of disrespectful treatments from some health professionals including neglect, verbal and physical abuse. Such mistreatment of women during provision of maternal care remains a global phenomenon with worse implications in the LMICS [11,40]. In Ghana, disrespectful maternity care occurring in various forms has been reported with differing opinions about its rationale or acceptability in contemporary maternal care [12,41-43]. Admittedly, mistreatment of women during provision of maternal care is a complex phenomenon that requires the input of all stakeholders including the government, health institutions, health professionals and society. More recently, a WHO multi-country study on mistreatment of women comprising both labour observation and postpartum community survey reported that over 40 % of women experienced some form of mistreatment [13]. The main public health concern about mistreatment of women with hypertensive disorder relates to its potential to disincentivize prospective mothers and their families in seeking care at health facilities. Evidence-based interventions of locally appropriate dimensions are urgently required to minimize abusive treatment of women and improve respectful maternity care in the country.

Effective communication between health care providers and women is strongly recommended by WHO to enhance positive experience of care and minimize unnecessary anxiety[10]. In our study, inadequate interactive communication was a major theme that emerged from majority the hypertensive mothers, consistent with similar reports from other studies [25,44,45]. In a related study in the United States, various recommendations were provided to improve effective communication between patients and healthcare providers including building trust, rapport and reflective listening [46]. Lack of effective communication negatively impact on satisfaction with care. In a study conducted in Germany, approximately 70% of the hypertensive mothers reported dissatisfaction with the medical information provided by their healthcare providers on maternal hypertension [47]. This quantitative report by Leeners et al [47] complements the qualitative reports demonstrated in our study and calls for a paradigm shift in provider-client communication. Re-training and empowerment of healthcare professionals, including improvement of their salaries, health facilities and personal circumstances are viable measures to improve efficient provision of care and women's experiences.

Intriguingly, the concept of home care management and monitoring for less severe maternal hypertension was raised by some of the hypertensive mothers to reduce the burden on health facilities, health care cost and improve women's productivity. In another study, Barlow et al reported expression of similar recommendation by hypertensive mothers as they preferred to continue their bed rest and medications at home because they thought their condition were not severe [48]. In some high-income countries home management of women with non-severe maternal hypertension is permissible and recommended [49-51]. More

recently, Perry et al reported significant reduction in the number of hospital visits among hypertensive pregnant women when managed on home-based blood pressure monitoring without increasing adverse pregnancy outcomes [52].

Strengths and limitations

The main strengths of this qualitative study include the multicenter nature comprising five major hospitals in Ghana and the rigorous methodology adopted. In this study, women of various age groups were sampled purposively which resulted in a comprehensive assessment of experiences of care and major determinants of quality of care. Another important aspect of this study relates to the timing of the interviews which occurred after hospital discharge which enabled participants to express the opinions freely without any fear of retribution from the healthcare providers. Also, all the IDIs and the FGDs were undertaken by a trained researcher who is non-healthcare professional, and this enhanced the women's willingness to discuss their views freely. Finally, we employed both IDIs and FGDs to ensure comprehensive understanding (method triangulation) [22] of the process involved in the provision of care and lived experiences of hypertensive mothers.

This study has some limitations. Although this was a multicenter study, it was mainly conducted in the southern zone of the country where coverage of maternal healthcare services is highest. Therefore, women's experiences of care including challenges associated with provision of maternal care services reported in our study may be underestimated. Also, data collection for the IDIs was mainly undertaken by only one author and this may have influenced the triangulation of the findings (investigator triangulation) with increased potential for monotony. Investigator triangulation relates to the use of more researchers in data collection or analysis resulting in improved assurance of data variety and confirmation of the findings [22]. However, the findings of this study depict the gross overview of the quality of care associated with maternal hypertension in the country.

Conclusion

This multicenter qualitative study has highlighted hypertensive women's perspectives on the quality of care and their lived experiences with the care for women with hypertensive disorders of pregnancy. A complex array of elements affects the provision and experience of care for women with maternal hypertension. This includes health system related factors such as *lack of logistics*, *substandard professional attitude and unexplained delays at health facilities*. Patient related factors that negatively influence the provision of care comprise inadequate awareness of maternal hypertension and its complications and financial challenges. The quality of care experienced by women with maternal hypertension was

negatively influenced by ineffective provider-client communication, inappropriate attitude by the health professionals, disrespectful treatment.

The quality of provision and experience of care for maternal hypertension in the country could be improved by integration of appropriate evidence-based interventions at different levels such as health system, healthcare cost coverage, regular refresher courses for health workers and patient-centered care interventions. The emphasis should be placed on multidimensional collaboration of all stakeholders in both governmental and non-governmental organizations as well as the entire society. Well-integrated maternal health education promotion should be integrated into the educational programs to create and maintain optimal awareness about the relevance of high-quality maternal health. Further studies of high methodological quality with wider national coverage are recommended to better understand how quality and experience of care can be improved for women with maternal hypertension

Abbreviations

COREQ: Consolidated Criteria for Reporting Qualitative Research
FGD: Focus Group Discussion
GAR: Greater Accra Region
HDP: Hypertensive Disorders in Pregnancy
IDI: In-Depth interview
KBTH: Korle-Bu Teaching Hospital
LMICs: Low- and Middle-Income Countries
NHIS: National Health Insurance Scheme
SDG: Sustainable Development Goals
WHO: World Health Organization

Acknowledgements

We are grateful to staff of the health facilities included in the study and all the women who participated in this study. We thank Ms Mary Boamah for her special role in the in-depth interviews and the focus group discussions.

Authors contributions

KAB and JB conceptualized the research idea with major contribution from DEG, ES, AF and EKA. ET conducted the data collection with supervision from KAB, JB and ES. KAB and ET conducted the data analysis with support from AN and PDG. KAB prepared the first draft of this manuscript. All authors contributed to the data interpretation and reviewed the final manuscript. All authors read and approved the final manuscript

Funding
This research received funding support from the UMC Utrecht Global Health Fellowship for Dr Adu-Bonsaffoh. This paper is the sole responsibility of the authors. The funders had no role in the conceptualization, study design, data collection and analysis, decision to publish and the manuscript preparation.

Availability of data and materials
The full transcripts for this qualitative study are available upon request from the corresponding author.

Declarations

Ethics approval and consent to participate
The study was approved by the Ethical and Protocol Review Committee (EPRC) of the Ghana Health Service (Protocol ID GHSERC- GHSERC015 /09/17) and the College of Health Sciences, University of Ghana (Protocol ID GHSERC- CHS-EtM.4-P1.2/2017-2018). Letters of support were obtained from all the principal investigators for all the study sites during the process of IRB approval. We obtained written informed consent from all the study participants prior to the data collection and they were assured of strict confidentiality of the information provided. Anonymity was ensured by non-inclusion of any identifiable information about the respondents.

Consent for publication
Not applicable

Competing interests
The authors declare no conflicts of interests.

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Received: 6 August 2021 Accepted: 5 March 2023
Published online: 25 March 2023

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Chapter 5

Health professionals' perspectives on clinical challenges in managing hypertensive disorders of pregnancy and recommendations to improving care: A multi-center qualitative study

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Frontiers in Global Women's Health. 2022;3:968914

Abstract

Background

Hypertensive disorders of pregnancy (HDP) are a leading cause of maternal mortality and morbidity globally despite the intensive international effort to improving maternal care. Substandard clinical care has emerged as a major contributing factor to high maternal deaths associated with maternal hypertension globally and the impact is severer in low- and middle-income countries (LMICs). Context specific challenges impact negatively on the quality of maternity care and health providers play a crucial role in achieving positive pregnancy experiences for women. This study explored the perspectives of health professionals on the clinical challenges associated with the management of HDP in Ghana and recommendations to improving care.

Methods

A multi-center qualitative study using in-depth interviews (IDIs) was conducted in five major hospitals in the Greater Accra Region of Ghana between June 2018 and March 2019. Health professionals (midwives/nurses and medical doctors) who have worked in the study sites for at least three months were included. Data were analysed based on thematic content using Nvivo software.

Results

We included 62 health professionals comprising 40 midwives/nurses (64.5%) with a median age of 32.5 years (range 26 to 59) and 22 medical doctors (34.5%) with a median age of 34 years (range 25 to 55). Health providers highlighted major challenges associated with clinical management of hypertension in pregnancy: 1) patient-related factors (inadequate understanding and misconceptions about hypertension in pregnancy, women's non-compliance with clinical advice, financial constraints); 2) health system-related challenges (frequent unavailability of logistics, medications and laboratory support, delays in provision of care and limitations in the health insurance coverage); 3) health provider associated factors (inadequate number of health professionals and poor attitudes). Context-specific recommendations suggested for improving the quality of care in managing maternal hypertension include restructuring of the health system to reduce delays in providing care, improving financial coverage of medical insurance, encouraging social/family support, enhancing education on HDP and strengthening the health workers' numbers and working conditions.

Conclusion

Major challenges in the clinical management of HDP relate to the health system, health professionals and pregnant women themselves. Context-specific interventions are required

to improve the quality of care for hypertensive mothers including regular health education, re-structuring of the health systems, refresher courses for health providers, improvement in health insurance coverage and government subsidy for hypertensive women.

Introduction

Globally, maternal mortality and severe morbidity continue to present a major clinical and public health challenge to efforts aimed at achieving the Sustainable Development Goal (SDG) 3, to ensure healthy lives and promote well-being for all ages[1-3]. The SDG's maternal health target aims to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030[3]. Unfortunately, there remains a wide disparity in the distribution of maternal mortality with unacceptably high rates in low- and middle-income countries (LMICs)[4,5]. For instance, the maternal mortality ratio estimates for Western Europe and Sub-Saharan Africa are 5 and 533 per 100,000 live births respectively indicating unacceptably high inequity[6].

The major causes for maternal deaths have been extensively studied and include obstetric haemorrhage, maternal hypertension or hypertensive disorders in pregnancy (HDP), sepsis and abortion related complications[4]. While many local and international interventions have been instituted and significant progress achieved in terms of coverage of maternal health interventions and services, the progress to eliminate preventable maternal deaths has been slow. Hypertensive disorders including preeclampsia are the most common medical condition in pregnancy and are associated with worse pregnancy outcomes. In LMICs, preeclampsia accounts for about 15% maternal deaths with associated severe maternal and perinatal morbidities[5,7,8].

In Ghana, there is nearly 100% coverage for antenatal care for pregnant women with about 80% facility-based delivery rates[9]. However, the maternal mortality in the country remains disproportionately high with a life-time risk of 1 in 82 compared to 1 in 11,700 in Western Europe[6]. Although haemorrhage and maternal hypertension are the two leading causes of maternal mortality in the country, the relative proportion of the latter has doubled over the past decade with significant reduction in the former[9]. Current evidence indicates that hypertensive disorders in pregnancy are the leading cause of institutional-based maternal deaths in Ghana[10,11] and other countries in SSA have reported similar findings[12,13].

Evidence-based interventions including locally appropriate measures are needed to further improve the quality of care for women with maternal hypertension. More recently, substandard clinical care has emerged as a major contributing factor to high maternal deaths associated with maternal hypertension globally although the impact is more severe in LMICs[14,15]. To optimally reduce the maternal deaths and severe morbidity attributed to hypertension in pregnancy there is the urgent need to actively involve all the relevant stakeholders in the decision including the healthcare providers. The perspectives of the doctors and midwives/nurses on the clinical care for hypertensive mothers are

indispensable in identifying the barriers and facilitators to improving the quality of maternal care in the country. The objective of this multi-center qualitative study was to explore healthcare providers' perspectives on the challenges associated with the provision of maternal care for women with hypertension in pregnancy. The clinical experience of the healthcare providers would generate comprehensive evidence-based measures to improve the quality of care for pregnant women with maternal hypertension.

Methods

This multi-center qualitative study was conducted in five major hospitals in the southern zone of Ghana namely: Greater Accra Regional Hospital, La General Hospital, Kore-Bu Teaching Hospital (KBTH), Tema General Hospital and Lekma Hospital. All the five health facilities are located in the Greater Accra Metropolitan Area (GAMA) with a population of approximately 4 million. In the GAMA, there is about 98% of antenatal care coverage by skilled providers with a facility-based childbirth rate of about 92%, with most deliveries undertaken in public hospitals[9]. The included health facilities conduct between 5000 to 11000 childbirths annually and cesarean section rates are between 30 to 45%.

This qualitative study is part of a larger study (Severe Pre-eclampsia adverse Outcome Triage (SPOT) study). The main aim of the SPOT study was to externally validate risk prediction models for adverse maternal and perinatal outcomes in severe preeclampsia[16,17]. The detailed methodology of the SPOT study has been pulished elsewhere[18]. The qualitative component assessed the quality of care associated with the clinical management of maternal hypertension based on the perspectives of the health providers and affected patients. In this paper, we report the clinical challenges associated with the care for women with HDP based on the perspectives of the health providers. The perspectives and lived experiences of care by the affected hypertensive mothers have been explored in a forthcoming paper[19].

Inclusion criteria comprised maternity health workers (doctors and midwives/nurses) who had worked in their current facility for at least three months, and provided written informed consent. We excluded health professionals who have worked in the health facility for less than three months.

Participant recruitment and interviews

We recruited the study participants via purposive sampling and in-depth interviews (IDI) were conducted. In each study site, potential health professionals were approached individually, and the study protocol explained to them. Study identification number was assigned to those who agreed to participate in the study and a specific date was scheduled

for the interview. All the study participants provided written informed consent prior to the interviews (IDIs) which commenced from 1st June 2018 and ended on 31st March 2019. The IDIs continued till saturation point was reached when subsequent interviews yielded no new themes. Saturation in data collection for qualitative research describes the point where no additional or new information is generated indicating the endline to stop collecting further data[20,21]. At saturation, the researcher obtains similar or same responses over and over again with further interview. In this study, all the in-depth interviews (IDIs) conducted were audio-recorded. A semi-structured interview guide was used for the IDIs which were all conducted in English. A special room was specifically dedicated for the interviews in each health facility to prevent frequent disruptions during the course of conducting the IDIs. The duration of each IDI was between 30 to 45 minutes.

Data management and analysis

Data were analysed based on the thematic content using the inductive analytic framework approach. The derivation of the themes was data-driven with minimal influence from the theoretical background[22]. Transcription of the interviews commenced alongside the data collection and continued till the point of saturation. Initially, a codebook wasdeveloped to facilitate the thematic content analysis. To familiarize ourselves with the data, the transcripts were read severally in a more recursive manner by two members of the research team to identify the commonly occurring themes. This recursive reading of the transcripts was necessary to appreciate and understand the perspectives or the worldview of the study respondents. The notes taken during the interviews contributed significantly towards identifying the thematic areas that emerged from the transcripts. This resulted in the creation of the initial codes from the transcripts which were crucial to the final coding. The coding was undertaken by two members of the research team and inconsistencies were discussed between them. In case of any unresolved disagreement, further discussions were held with the other research members. The codes and the emerged themes were discussed and agreed on among the members of the research team. NVivo software (version 12) was used for the coding and analysis. We ensured adequate triangulation of the results by including healthcare providers of different categories (medical doctors and midwives of different clinical experiences) from different health facilities (data source triangulation)[23].

Results

In this qualitative study, 70 health maternity care professionals were eligible, out of which 62 participated comprising 40 (64.5%) midwives/nurses and 22 (35.5%) medical doctors. The median ages of the midwives/nurses and medical doctors were 32.5 years (range 26 to 59) and 34 years (range 25 to 55) respectively. Table 1 shows the socio-demographic characteristics of the participants. The responses from the participants highlighted the important contemporary issues in the clinical management of hypertension in pregnancy in Ghana. The prominent themes that emerged from the narratives concerning the clinical problems in the management hypertension in pregnancy included patient-related challenges, health system-related challenges and health provider level challenges.

Theme 1: Patient-related challenges

Challenges related to pregnant women themselves may hinder the provision of optimal maternal care. The health providers described client-related factors associated with sub-optimal quality of care for women with hypertension in pregnancy. These include inadequate women's knowledge on hypertension in pregnancy, spiritual beliefs and misconceptions, non-compliance with medical instructions, financial constraints and inadequate family support.

Table 1. Characteristics of study participants

Variable	Total N=62	Percentage (%)
Age categories (years)		
25-30	16	25.8
31-40	32	51.6
41-50	8	12.9
51-60	6	9.7
Position		
Midwives/nurses	40	64.5
Doctors	22	35.5
Gender		
Female	45	72.6
Male	17	27.4
Length of stay with facility		
< 1 year	6	9.7
1-5 years	27	43.6
6-10 years	17	27.4
11-20 years	9	14.5
≥21 years	3	4.8
Hospital		
Korle-Bu Teaching Hospital	16 (6 doctors, 10 midwives/nurses)	25.8
La-General Hospital	14 (4 doctors, 10 midwives/nurses)	22.6
Lekma Hospital	9 (4 doctors, 5 midwives/nurses)	14.5
Greater Accra Regional Hospital	14 (4 doctors, 10 midwives/nurses)	22.6
Tema General Hospital	9 (4 doctors, 5 midwives/nurses)	14.5

Women's inadequate knowledge on hypertension in pregnancy

A very common running theme recounted by the health professionals was inadequate knowledge on hypertension in pregnancy and preeclampsia displayed by the women. Lack of basic understanding about maternal hypertension and its complications presents a major challenge in the clinical management as patients frequently do not understand or appreciate the need for hospital admission especially in severe cases.

"Majority of them [pregnant women] do not understand it because they've never had hypertension before, they've never been told they have hypertension and you [the woman] just come and we tell you, "You have hypertension". Some of them do not understand what it is." (Resident doctor, 31 years)

"*In my opinion, some of the challenges are that most of these women have very low educational background so they might not really understand the severity of their condition."* (Specialist doctor, 32 years)

The health workers emphasized the extent of pregnant women's ignorance and disbelief about HDP and potential for adverse outcomes. One midwife remarked that some of the women do not know the potential dangers associated with hypertension in pregnancy and harbour disbelief about having hypertension.

"Ignorance because she has no idea this [hypertension in pregnancy] is a dangerous disease. Once she comes to the clinic… once she is told she has hypertension, she goes home doesn't come back again or she didn't even believe what you told her so she goes she doesn't come back again." (Midwife 40 years)

Relatedly, almost all the doctors and midwives/nurses overwhelmingly reported that health education promotion on hypertension in pregnancy are either non-existent or extremely minimal. They believed that the low knowledge and awareness levels of preeclampsia exhibited by the pregnant women are mostly due to lack of education on the subject. Some people stated that they hardly hear health promotion programs on hypertension in pregnancy via the media compared to the other medical conditions like malaria.

"*The education is not enough, we need to do more than what we are doing now. I hardly hear someone talk about hypertension in pregnancy on radio. The last time I heard was a lady who had a foundation, and she lost her baby … I had friends who were like "Is there something like that? [hypertension in pregnancy]". But you will hear[about] the others [diseases] like malaria, but you will hardly hear people talk about hypertension in pregnancy."* (Midwife, 40 years)

Spiritual beliefs and misconception

Deep-rooted spiritual beliefs and misconceptions were considered major factors contributing to substandard care. Most of the health providers stated that one major obstacle they encounter frequently is the issue of "dominance and control" of pregnant women by spiritual leaders such as pastors and herbalists. Most women had a lot of misconceptions concerning the causes of hypertension in pregnancy, with significant attribution to spirituality. The health professionals hinted that majority of women usually

seek help from the religious leaders who "keep them" and only make referrals to hospitals when severe complications occur. Such delays in reporting to the medical facilities constitute a major challenge in managing HDP, as early detection and treatment are key.

"You see [in] our part of the world we tend to be more into religion. Sometimes some of these women might have stayed in "prayer camps" and other places for a long time and when things get out of hand then they come to the hospital to seek care which sometimes might be too late for them." (Specialist Obstetrician, 32 years)

However, the health professionals continue to educate the mothers to appreciate that preeclampsia is a medical condition and not spiritually related. In some cases, the hypertensive mothers request for prayers from their spiritual leaders before they consent to medical treatment. Spiritual or religious inclinations and misconceptions contribute significantly to delay in initiation of treatment and may be associated with worse adverse outcomes.

"Even when they come for admission we go ahead to sometimes tell them that once you are here this is the condition [and] it is not spiritual. If you still believe it just add your prayers to the fact that the doctors are also doing their best for you. That is how we go about those things but some of them will still insist (..) their pastor (..) agrees." (Midwife, 30 years)

The need for regular and coordinated client education was mentioned as an important intervention to improving women's understanding of hypertension in pregnancy. The health providers recommended that the health education should not be restricted to the hospital setting but the whole society should be involved by means of social media campaigns.

"*The education should be done very well not in only the hospital; we should go out, the radio, the community; we should go and talk to them about the condition, how serious it is and why they should always see a doctor in case they have any problem like that."* (Medical Officer, 38 years)

The providers believed that optimal knowledge about hypertension in pregnancy and its consequences will have positive impact on preventing major complications and improving clinical management. In some facilities, the introduction of maternal class into antenatal care is an important intervention to improve the health education promotion. However, the maternal classes are not organized frequently and not in all the facilities.

"They have a maternal class that goes on every other week on Saturdays. That's where they address almost all those issues: diabetes in pregnancy, hypertension in pregnancy and all those issues including breast feeding and everything." (Midwife, 30 years)

Non-compliance with medical advice

The doctors and midwives recounted several instances of misunderstanding between the health providers and patients during the course of providing care. Most of these conflicts are associated with patients' noncompliance with the prescribed treatment or refusal of hospital admission recommended by the health workers. In some situations, the patients present with hypertensive emergencies that require urgent initiation of treatment but some of them refuse admission and prefers to seek advice from their spiritual leaders.

"Somebody comes in with imminent eclampsia, you want to admit and they are telling you they want to go and talk to their pastors first before they will agree to any interventions, so occasionally we get such situations or misunderstanding." (Medical Officer, 37 years)

Financial constraints

An important theme that that emerged repeatedly from all the study sites was the chronic financial constraints experienced by the women with hypertension and their families. There were several instances where women could not afford the bill for their prescribed medications. Generally, these women require additional drugs to control the preeclampsia compared to the general normotensive pregnant women populations.

"Most of these patients, their main problem is the money to buy their medications. They always complain of the medications being expensive or they don't have money to buy, to do the lab [tests] because it's too expensive." (Medical doctor, 32 years)

Similarly, women with preeclampsia undertake several laboratory tests to guide the clinical decision by the health professionals. Multiple laboratory tests are required to assess the severity and integrity of the various organs that could be affected by the disease. In instances where the women are unable to pay for laboratory services, the health professionals are left in limbo as the they do not have the laboratory support necessary to guide the clinical management.

Family support system and education

Family support system was a prominent theme that emerged from almost all the categories of health professionals. It became apparent that the clinical management of women with hypertension in pregnancy is multi-dimensional and the role of the family members is indispensable in achieving treatment success and preventing major complications. Adequate health education promotion for the immediate family members will improve their understanding and facilitate co-operation and social support.

"For family members, I think it's more of education. Public Health educating the masses so they know the dangers associated with hypertensive disease and once they have any pregnant woman in their midst they should keep an eye on such women- those who may have hypertension along the line in their pregnancy." (Medical doctor, 37 years)

Another important consideration that emerged repeatedly was the need for the close family members including the partner to accompany the pregnant women to the health facilities for antenatal care services. Active involvement of family members in the antenatal care will provide the opportunity to learn about preeclampsia and other conditions in pregnancy which can improve the quality of care for the women especially at the home settings.

"Family members, especially the partners, they should come with their wives to antenatal. As we explain things to their wives, their husbands pick it up. They will help manage the case at home because it's not all hypertensive disorders in pregnancy that are on admission. Majority of them are also on 'admission' at home and we will need vigilance there too and their partners can help in that." (Medical doctor, 26 years)

Theme 2: Health system-related challenges

Majority of health professionals cited health system challenges as a major issue that hampered the quality of care for women with hypertension in pregnancy. These health system related challenges include irregular supply of medications, logistics and instruments for monitoring patients.

Shortages in medications and monitoring devices

Most of the interviewees reported that medications for treating severe hypertension were frequently unavailable. The health workers remarked that the frequent shortage of essential antihypertensives accounts for significant morbidities associated with maternal hypertension in the country.

"The drugs are not always available. Sometimes, you write it in the folder, it's not there; patient has to buy it." (Midwife, 43 years)

Also, majority of the health professionals were emphatic on the issue of inadequate blood pressure measuring devices in most of the maternity units. Almost everyone cited the problem of frequent breakdown of the instruments due to high patient load. In addition, the challenges with the repair of these non-functioning instruments were frequently mentioned. The frequent shortage of the blood pressure measuring instruments frequently

leads to sub-optimal monitoring of women with severe preeclampsia and this might be associated with poorer pregnancy outcomes. The high patient turn-out with overuse and the limited supply appeared as some of the underlying reasons for the situation:

"*You need a BP apparatus to work with, you go to the stores, there is none. Sometimes two rooms will have to share one.*" (Midwife, 40 years)

"BP apparatuses, because of the rate at which we use them it gets spoilt quickly and we don't have enough, at least we have to get three or four at the ward." (Midwife, 36 years)

"And for the logistics, the instruments and gadgets; the BP machines, some are not in good working conditions... Because of the pressures on the ward... [BP machines] are not durable enough: just one BP machine taking care of 50 patients, so within months it's spoilt and getting one becomes a problem. So sometimes you have to go to another ward to borrow a BP machine ...and use [it] on the ward. All these are creating problems." (Midwife 30 years)

An ultrasound scan for the initial assessment of the pregnancy is problematic in most cases. Some doctors complained about the unavailability of ultrasound scan during the 24-hour duty. Some participants deemed the ultrasound scan very necessary to confirm or monitor the fetal wellbeing especially in emergency situations during the night shift.

"At 2 o'clock [p.m.] the ultrasound people will tell you they have closed, so it becomes difficult if a woman comes and you urgently need an umbilical artery doppler. Such women when they are in labour you need to closely monitor them on CTG, and we don't have CTG papers so we are monitoring on screen we can't print anything and we can't reproduce the result to a specialist or someone." (Medical doctor, 28 years)

Laboratory challenges

Both the doctors and midwives shared their experiences related to the challenges associated with the laboratory tests performed for women with hypertension in pregnancy. The main concern was the delay in obtaining the results of the various tests performed because it usually takes days before the results arrive. The laboratory reports are vital for clinical decisions on a daily basis.

"Laboratory support is another major challenge. They have to be doing all those labs continuously and then they don't have the finances for that." (Senior staff midwife, 30 years)

"Some of the "labs" we request for women with hypertensive diseases, at a point we couldn't get them done here so the samples had to be taken outside and you get them in 2 to 3 days and it makes decision making difficult." (Medical doctor, 28 years)

Some doctors complained about the fact that the laboratory unit does not work at night making their work very difficult. They sometimes get frustrated especially when laboratory support is needed urgently to supplement the treatment or diagnose complications of hypertension in pregnancy.

"*In this hospital, my only challenge with the "lab" will be the nights. They don't come at night so if you have a case at night they will have to go to an outside lab- that's frustrating sometimes."* (Medical doctor, 28 years)

Challenges with blood products

Blood and blood products are important in the clinical management of preeclampsia and other hypertensive disorders in pregnancy. Majority of doctors and nurses recounted their unpleasant experiences with scarcity of blood products for obstetric patients especially in emergency situations. Frequent reports of unavailability of these essential treatment adjuncts hinders the treatment of severe preeclampsia especially when it is complicated with coagulopathy.

"Sometimes you need blood urgently and they tell you there is no blood." (Medical doctor, 32 years)

"It depends on the blood type and its availability at our blood banks. So as long as the blood is available at the bank they will issue it. Unfortunately, sometimes at the blood bank [they can't] …, because it's serving so many patients." (Medical doctor, 42 year)

Sometimes it becomes difficult to secure blood for the women especially in emergency situations due to shortage of the blood products. In some situations in which blood is urgently needed, relatives of patients are sent to search for blood and blood products from other health facilities. Such frequent shortage of blood products especially in emergency cases puts the patients at risk of severe morbidity and might result in maternal death. In most of the health facilities, relatives or partners of pregnant women are requested to donate one or two units of blood to save for emergencies cases. . Most of the relatives or partners are prepared to donate blood when their family member urgently needs it.

"*So what happens is that we have to take samples from the patient's blood, fill the blood bank form and then we give it to the patient's relative to take it to "37" or Korle-Bu to donate and bring the blood back." (Medical doctor, 38 years)*

"The availability of blood and blood products is an issue. There are instances where we have to close the ER [Emergency Room] because of the non-availability of blood and we do case selection in terms of management. We have to liaise with other hospitals for blood and blood products." (Medical doctor, 31 years)

"Usually, they are willing to donate if they have the emergencies and their relatives need it then they can see they need blood. That's when you see them rushing to donate." (Medical doctor, 31 years)

Unavailability of bed space

Another important finding frequently mentioned in all health facilities was recurrent shortages of beds for admitting pregnant women with obstetric emergencies, commonly referred to us as "no bed syndrome". This normally occurs when the patient load is high and all the beds in the health facility are occupied. In most cases, pregnant women are referred to other hospitals if there are no beds at the time of reporting to the emergency room (ER). Some doctors stated that referring such patients to other hospitals is necessary to prevent severe complications which could arise as the patient is waiting to get a bed space. Usually, doctors triage the emergency cases and attend to the more severe ones first when the patient load is high.

"Once there is no bed you don't expect a pregnant woman to come and sit on the floor and deliver; you don't expect one in early labour to wait as she might need caesarean section or else might rupture [uterine rupture]. If the place is choked, we refer to other hospitals." (Medical doctor, 31 years)

"Sometimes when the whole place is full, emergency is full, theatres choked and all that we have lined up are emergencies and we have to choose among the emergencies again. So then when the case comes we triage and say with this one [patient] we can put this intervention in place." (Medical doctor, 31 years)

Severe obstetric cases usually require critical monitoring and treatment at the intensive care unit to optimize the needed care. Most of the health workers frequently described the reality of non-existence of ICU in the health facilities for critically ill obstetric clients. Unavailability of intensive care units (ICU) hamper optimal management of complicated cases of HDP which require strict monitoring and can potentially contribute to maternal

mortality. The ICU is considered instrumental in the management of severe obstetric cases for continuous monitoring and lack of such facilities constitutes a major limitation in maternal care provision.

"We try our best to stabilize the patients, but such people need ICU care and we don't have ICU care here. They need continuous monitoring. Some might need ventilators; some might need dialysis and we don't have such facilities here so we normally refer such cases." (Medical doctor, 31 years)

Challenges with health information management and communication

Inaccessible medical information was a major running domain in the narratives of the health professionals. In most cases, the previous medical records of the women are not obtainable due to poor health information storage in the health facilities and lack of electronic data management systems. Access to previous medical records is key to early diagnosis and initiation and optimization of treatment. However, medical information documentation and storage remains a real-time challenge as pointed out vividly by one of the participants.

"What you will find out is that they will tell you she delivered in this hospital. You go and request for her folder to see what was recorded for past pregnancy and the folder is not there. They will end up giving her a new folder and you will always see her as a new client although she has a history." (Medical doctor, 26 years)

Poor communication between referring and referral facilities was also considered a major challenge. The health professionals in the referral center are not aware of or are not given adequate information about the emergency case being transferred. Lack of prior inter-facility communication about the referred cases and inadequate accompanying medical information might result in suboptimal care at the treatment center. On the other hand, some of the referrals were wrongly referred to the tertiary centers as they could have been managed at the secondary level facilities.

"So you are just here and a referral comes and you are not prepared for the referral. You normally have to move from a health center, you go through a clinic, to a hospital, to the regional hospital before you get to a teaching hospital but a clinic can just refer straight and by pass all of that to a teaching hospital. We get referrals which do not need to come to Korle-Bu." (Medical doctor, 32 years)

Delay at the health facility

Delay in providing care at the health facility is a major factor associated with adverse pregnancy outcomes. Some of the health professionals pointed out that institutional delays

in provision of appropriate treatment could result in complications. Typical examples of facility-based delays include wrong or late diagnosis and failure to initiate appropriate treatment.

"In terms of the causes of the complications, there are certain delays and one of the delays is the delay that happens in the hospital facility be it in the referral centre or the teaching hospital. (Medical doctor, 31 years)

Similarly, some patients are kept in a queue for a long time prior to clinical consultation. It was pointed out that some patients wait for a long time before they are attended to by a doctor. On the other hand, the patients do not usually wait for long periods prior to medical consultations with the midwives.

"At the antenatal clinic there are instances that the patients show up in the morning around 7, 8 and they leave, especially if they have to see a doctor, they may leave around 2, 3 o'clock. It can take hours but if they are not seeing a doctor but only a midwife then just after the consult with the midwife they can leave." (Medical doctor, 37 years)

Challenges with national health insurance scheme

The health professionals frequently mentioned some intrinsic limitations in the existing national health insurance scheme (NHIS) which hinder provision of optimal care for hypertensive mothers. Most of the health professionals indicated that the NHIS does not cover all the hospital bills for the hypertensive mothers. There was a general impression that the NHIS covers only part of the antihypertensive medication and the laboratory tests which are generally costly.

"NHIS covers for hypertensive drugs but then there are certain categories of medication that are beyond the cover of the NHIS and for those ones we write for the patient but generally the normal ones are covered." (Medical doctor, 31 years)

"It is expensive because even though NHIS covers for some of the drugs, the labs, not all are covered; and sometimes these people, even before they deliver, might have been on admission for a long time." (Medical doctor, 32 years)

Another related challenge that emerged from the interviews was that some of the women were not registered under the NHIS and this made their hospital admission extremely costly. These are usually women of low socio-economic class.

"One other issue too is that there are instances where you admit patients, the Bp drugs are available they may not have the insurance and they may not have money to get it. So sometimes it becomes a challenge especially the emergency medications." (Medical doctor, 37 years)

Theme 3: Health professionals-related challenges

Inadequate number of health professionals

Majority of the doctors and nurses complained about the mismatch between the high patient load and the inadequate number of health professional. Sometimes, the high patients load precludes optimal monitoring of the patients and results in substandard care.

"So for the challenges, when we talk about the health workers, our numbers are just small. It doesn't match up with the number of patients that we have on our wards, so sometimes we are not able to monitor them as we are supposed to." (Midwife, 33 years)

"Lots of challenges especially with the staff strength. You see, a ward that has 50 beds and sometimes over because some patients are discharged and are not going home because they have to be on the floor, so we get more than that sometimes. And you have 3 midwives running such a ward, so the ratio you can imagine and then you have these hypertensive disorders in pregnancy, not just one, you have three, four, five." (Midwife, 30 years)

Most of the health professionals openly narrated instances where suboptimal monitoring of pregnant women with severe preeclampsia occurs due to inadequate number of health care staff and high patient load.

"The most difficult aspects has to do with monitoring their BP on time. Yeah it doesn't always happen on time. The drug administration too, the number of people too counts because when you start, by the time you get to the one with the high BP the time is far spent so they don't get their medication too on time." (Midwife, 35 years)

Inappropriate attitudes of health providers

Some health providers indicated situations when delays in providing care for hypertensive mother may be due to the actions of the health providers themselves resulting in severe complications. There are unusual occurrences of misdiagnosis which results in delays in initiating appropriate treatment. In some situations, mistakes or professional errors (by omission or commission) on the part of the health professional result in avoidable complications and adverse outcomes. In the quote below, one medical officer mentions

a practical scenario of misdiagnosis, delay in treatment initiation, and the potential for severe complications.

"So if maybe you fail to diagnose a woman who is having BP on the high side and based on one or two reasons you forget….. On the other hand if you diagnose but fail to institute treatment early or on time complications do set in." (Medical doctor, 31 years)

Some of the respondents described situations where some health workers absent themselves from work when they are expected to be at post. Similarly, issues related to inadequate information flow between the health workers were mentioned especially between the workers and their supervisors (inadequate inter-professional communication). These challenges usually lead to suboptimal provision of care and conflicts among the workers. Other attitudes related to standards of care include delays in timely provision of care due to the inactivity of the health workers as well as inadequate/irregular provision of relevant information to pregnant women.

"We want to get surgeries done and the "orderly" is not around; there are materials that are finished, you want people to call their in-charges to bring in the materials and they are just sitting there so in the end you have some conflicts." (Medical doctor, 40 years)

"We the professionals, I think we should treat the women promptly; education should be constant and ongoing throughout the antenatal period. We don't just say it at one visit and then stop. Every time we come into contact with these women we have to continue." (Medical doctor, 32 years)

Discussion

In this qualitative study, we explored the real-life challenges experienced by health professionals in the clinical management of hypertensive disorders in pregnancy in health facilities in Ghana. The major challenges highlighted mainly relate to patient factors (inadequate understanding and misconceptions, financial burden and noncompliance with medical instructions), health systems factors (facility delays and lack of logistics, medications and laboratory support) and health provider factors including inadequate number of health professionals, inadequate patient education, inappropriate attitudes and professional errors.

Previous studies indicate women's suboptimal knowledge of preeclampsia partly accounts for the high incidence of complications and suboptimal outcomes[24,25]. In a study to assess women's knowledge on preeclampsia, only 43% of the questions were answered correctly by the women and the factors associated with higher awareness included literacy, previous history of preeclampsia, multiparity and prior health education on the condition[25]. In this study, a significant level of suboptimal knowledge on hypertension in pregnancy has been determined and this illustrates the necessity to optimally promote health literacy among pregnant women and their relations. In a recent study involving Moroccan pregnant women, approximately 50% had no knowledge about hypertension in pregnancy and its danger symptoms[24]. Most of the women considered communicating information via movies as the most appropriate way to promote education on HDP[24].

In the typical clinical settings, some hypertensive women are unable to comply with the standard care prescribed by the health providers. Women's non-compliance may be due to the high level of misconception and traditional beliefs which constitute major challenges in providing high quality care and impact negatively on shared decision making. Spiritual inclinations coupled with misconceptions may also contribute significantly to unnecessary delays in treatment initiation for hypertensive mothers and may result in worse adverse outcomes[26]. In this direction, promotion of maternal health literacy is crucial in improving care, creating awareness and optimizing pregnancy outcomes associated with maternal hypertension[24,26]. To achieve this, integration of maternal classes into antenatal care provides an important opportunity for promotion of the health education and this is associated with lowered risk of cesarean section and increased satisfaction with care received[27].

In this study, health system challenges were considered a major hindrance to the provision of quality care for women with hypertension during their pregnancy**.** In low resource settings, health systems do not usually function optimally due to the intrinsic bottlenecks

and inappropriate policies. Compared with the population needs, there is evidence of significant deficiency in the health systems in SSA including health infrastructure, health expenditure and skilled health professionals resulting in substandard care[28]. According to WHO, the health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health. The WHO framework has six building blocks making up the health system comprising of health services, health workforce, health information, medical technologies, health financing and leadership and governance[29]. In this study nearly all the components of the health system's building blocks were mentioned as limitations in providing high quality of care for hypertensive pregnant women.

In contemporary management of hypertension in pregnancy, functional health systems are critical in reducing the associated severe morbidity and mortality. Institutional delays in provision of appropriate treatment accounts for significant complications and adverse pregnancy outcomes. Facility-based delays are partly attributed to staff shortage, lack of motivation, high workload, lack of beds or ward space, and financial limitation[30]. For instance, financial burden on women remains a core obstacle to provision of high quality maternal care. The national health insurance scheme (NHIS) was introduced to eliminate the associated delays and achieve universal coverage. In this study, most of the health professionals indicated that the NHIS does not cover all the hospital bills for the hypertensive mothers. There was a general impression that the NHIS covers only part of the antihypertensive medications and laboratory tests which are generally costly. Most women are unable to afford the cost of treatment (medications and laboratory tests) making clinical decision-taking challenging. In a recent study in Ghana, Vestering et al. describes how health providers innovatively navigate the logic of care for women with hypertension in pregnancy given the prevailing health system and patient related challenges[31]. In this situation, poverty eradication is requisite for sustainable development and remains the greatest global challenge worldwide especially in LMICs[1,32]. There is the need for urgent revamp in the health systems to optimize the available scarce resources to improve the quality of maternal care.

Similarly, logistics related challenges including frequent breakdown or shortage of blood pressure measuring tools are a core contributor to suboptimal care in LMICs[30,33-35]. These limitations are attributed to frequent use and high turnover rate due to large numbers of hypertensive mothers. The frequent shortage of the blood pressure measuring instruments precludes optimal monitoring of women with preeclampsia with a potential for poor pregnancy outcomes. In a recent related survey in South Africa, more than half of the practicing midwives indicated frequent shortage of basic essential equipment such as BP measuring machines[35] similar to the current findings. Similarly, frequent unavailability of essential medications (antihypertensives) and blood products remains a major challenge in

the management of HDP in pregnancy especially in LMICs[34]. Unavailability of safe blood products for transfusion accounts for a significant proportion of maternal deaths especially in low resource settings[30,36]. Furthermore, challenges associated with laboratory tests for hypertensive women is paramount and affect clinical decision especially in emergency cases.

Another important health system challenge was the recurrent shortage of beds for admitting the pregnant women, frequently described as the "no bed syndrome". This normally occurs when the health facility is overwhelmed with cases and all the beds are occupied. In most cases, pregnant women are referred from a lower-level facility to the larger hospitals and major complications might occur in the process. Relatedly, the issue of inadequate number of health professionals and poor professional attitudes negatively impacts the provision of the optimal quality of care for hypertensive mothers. Frequent shortages of health staff is endemic in LMICs and partly accounts for the severe maternal morbidity and mortality[30,35]. In a similar study in Zimbabwe, suboptimal monitoring of hypertensive mother was partly attributed to frequent shortage of human resources[33] as also reported in this study.

In minimizing patient-related challenges, strengthening family support system emerged prominently from almost all the categories of health professionals. Clinical management of women with hypertension in pregnancy is multi-dimensional and the role of the family members is indispensable in achieving success and preventing major complications. Majority of the doctors and midwives recounted that the family members including the husbands/partners have poor knowledge of or are completely unaware about the conditions the women are suffering from. Adequate health education promotion for the immediate family members will improve their understanding and facilitate co-operation and social support. Similarly, regular provision of health education to women during pregnancy and the entire population (via film, social media and demonstrations including role play), addressing shortage of staff and inappropriate professional attitude, promotion of blood donations, and expanding NHIS coverage (admittance, medication) constitute viable entry points in optimizing clinical care for hypertensive pregnant women in the country.

In addition, provision of essential medications, blood pressure apparatuses and other basic logistics, and human resource are considered primary responsibilities of the government to ensure improved quality of maternal care and universal health coverage. In the end, political commitment remains the cornerstone in optimizing the clinical management of HDP especially in LMICs.

Strengths and limitations

The key strengths of the study include the use of in-depth interviews (IDIs) and multicenter design to explore the experiences of health workers concerning the challenges in managing maternal hypertension. IDI is considered one of the most powerful approaches for gaining significant understanding and exploring specific concepts and topics into details because as it allows for spontaneity, flexibility, and responsiveness to the respondents[23].

The main limitation of our study centers on non-inclusion of focused group discussion (FGD) which would have generated a comprehensive discussion of the subject and emergence of relevant key themes. FGD generates a dynamic and interactive discussions among participants resulting in the emergence of multiple stories and display of diverse experiences. Another limitation relates to the use of one interviewer for all the IDIs. While a single interviewer results in more efficiency in the data collection the use of more interviewers (with different reflexivity strengths) provides multiple observations and different perspectives as well as confirmation of the findings from different sources (investigator triangulation)[23]. Despite the enlisted limitations, this study highlights relevant insights into context-specific challenges associated with clinical management of maternal hypertension. The findings of this study may be transported to other LMICs with similar settings.

Conclusion

This study explored major challenges observed by health professionals associated with the clinical management of hypertension in pregnancy. These challenges include patient-related factors (including inadequate awareness, non-compliance with medical instructions, financial limitations and misconceptions), health system-related challenges (including frequent unavailability of logistics and medications) and health provider-associated issues (inadequate number of health staff and poor attitudes). The findings of this study underscore the importance of an integrative approach to tackling health system challenges. Context-specific interventions such as regular health education promotion, re-structuring of the health systems through improvement in health insurance coverage and government subsidy for hypertensive mothers are recommended to inform policy change and improve the quality of clinical care for women with hypertension in pregnancy.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Ghana Health Service Ethics Review Committee the Ethics and Protocol Review Committee of the College of Health Sciences, University of Ghana. The participants provided their written informed consent to participate in this study.

Authors contributions

KAB and JB designed the study. ET and KAB conducted the data collection. KAB and ET conducted the data analysis with support from AN. KAB prepared the first draft of this manuscript. All authors contributed to the data interpretation, and reviewed and approved the final manuscript.

Funding

This research received funding support from the UMC Utrecht Global Health Fellowship for Adu-Bonsaffoh (FM/D- 18-029368). The funders did not have any contribution to the study design, data collection and analysis, manuscript preparation or the decision to publish.

Acknowledgments

The authors are grateful to the healthcare providers who provided informed consent and participated in the from the five participating hospitals in Greater Accra Region, Ghana.

We are very grateful to Mary Boamah for her immense support during the conduct of the in-depth interviews.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Part 3

Respectful maternity care and recommendations for optimizing maternal care

Chapter 6

Women's perspectives of mistreatment during childbirth at health facilities in Ghana: findings from a qualitative study

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Reproductive Health Matters. 2018;26(53):70-87

Abstract

Mistreatment of women during childbirth at health facilities violates their human rights and autonomy and may be associated with preventable maternal and newborn mortality and morbidity. In this paper, we explore women's perspectives on mistreatment during facility-based childbirth as part of a bigger World Health Organization (WHO) multi-country study for developing consensus definitions, and validating indicators and tools for measuring the burden of the phenomenon. Focus group discussions (FGDs) and indepth interviews (IDIs) were used to explore experiences of mistreatment from women who have ever given birth in a health facility in Koforidua and Nsawam, Ghana. Interviews were audio-recorded, transcribed and thematic analysis conducted. A total of 39 IDIs and 10 FGDs involving 110 women in total were conducted. The major types of mistreatment identified were: verbal abuse (shouting, insults, and derogatory remarks), physical abuse (pinching, slapping) and abandonment and lack of support. Mistreatment was commonly experienced during the second stage of labour, especially amongst adolescents. Inability to push well during the second stage, disobedience to instructions from birth attendants, and not bringing prescribed items for childbirth (mama kit) often preceded mistreatment. Most women indicated that slapping and pinching were acceptable means to "correct" disobedient behaviours and encourage pushing. Women may avoid giving birth in health facilities in the future because of their own experiences of mistreatment, or hearing about another woman's experience of mistreatment. Consensus definitions, validated indicators and tools for measuring mistreatment are needed to measure prevalence and identify drivers and potential entry points to minimise the phenomenon and improve respectful care during childbirth.

Introduction

Global efforts to improve maternal health care include strategies to reduce maternal mortality, increase the proportion of births attended by a skilled provider, and ensure access to quality reproductive health services for all women.[1,2]Addressing preventable maternal and newborn mortality and morbidity is a key component of the sustainable development goals.[1] Although there was a substantial reduction (43%) in maternal mortality from 1990 to 2015 globally, still 99% of maternal deaths occur in developing countries.[3] 3 Ghana has recorded improvements in its maternal health indicators, with a decline in the maternal mortality ratio from 634 in 1990 to 319 per 100,000 live births in 2015[3] while the rate of facility-based deliveries increased from about 42% in 1988[4] to approximately 73% in 2014.[5] However, a significant proportion of women still do not access health facilities for childbirth services.

Women's reluctance to give birth in health facilities may be partially attributed to a fear of mistreatment by healthcare providers. [6–9] In 2015, a systematic review by Bohren and colleagues proposed an evidence-based typology of what constitutes mistreatment during childbirth, including: physical abuse (hitting, slapping, pinching), verbal abuse, stigma and discrimination, and systemic issues in health facilities and systems that contribute to poor experiences of care. [7,9] Mistreatment during childbirth violates the human rights and autonomy of women[10] and may constitute a major disincentive for seeking maternity care services at health facilities. A recent WHO statement regarding this public health and human rights issue called for more proactive action, dialogue, research and advocacy to improve maternal health globally.[11]

Mistreatment of women during facility-based childbirth in Ghana has been documented, albeit in few studies.[12–14] D'Ambruoso et al. presented women's accounts of their interaction with birth attendants during facility-based childbirth in semi-urban suburbs of Accra.[12] Their findings showed that women were deeply concerned about health provider attitudes and refused to attend health facilities where they were not treated kindly. A study among student midwives across Ghana also confirmed occurrences of mistreatment during childbirth.[14] Similarly, a study by Moyer et al.[13] in rural northern Ghana noted that mistreatment during facility-based childbirth was pervasive, and could serve as a disincentive for attending health facilities in the future. These studies did not specifically assess views of acceptability of mistreatment during childbirth, or the perceived factors influencing mistreatment. Previous studies relating to disrespectful care during childbirth tackled different aspects of the mistreatment of women in health facilities without recourse to standardised definitions and methodologies. This has resulted in different descriptions

and estimations of the true burden of the problem with diverse propositions for eliminating the mistreatment of women during childbirth, and promoting respectful maternity care.

Although the occurrence of mistreatment of women and disrespectful care during childbirth in health facilities is increasingly well-documented in both resource-rich and resource-poor countries, consensus definitions including standardised categorisations and measurement tools are lacking globally.[9] The lack of consensus on definition, classification and specific indicators for measurement of disrespectful care during the birthing process impede accurate prevalence estimation and development of effective interventions.[7,9,15]

WHO is coordinating a two-phased, multicountry, mixed-methods study on measuring the mistreatment of women during facility-based childbirth in four countries: Ghana, Guinea, Myanmar and Nigeria.[16] The overall objective of this study is to develop an evidence-based definition, identification criteria and two measurement tools to better understand and measure mistreatment, based on the experiences and perceptions of women, healthcare providers and administrators in maternity care settings.

The first phase of this study is a formative phase, including a multi-country qualitative study to inform the development and components of the two measurement tools (direct observations of labour and a community survey with women). These measurement tools will then be used to measure the burden of mistreatment in different settings, and permit standardised comparisons across settings and over time. The qualitative evidence from the first phase will also improve understanding of the context in which mistreatment during childbirth occurs, the contributing factors, and also identify potential entry points to reduce mistreatment and promote respectful care. This paper explores women's perspectives of mistreatment during facility-based childbirth in the Ghanaian context specifically.

Methods

The study was carried out in two different towns in Ghana, a country with a population of about 25 million in 2010 and a population growth rate of about 2.5% per annum.[17] Most women in Ghana give birth in government institutions where maternity care is free due to complete coverage by national health insurance. The health system in Ghana comprises primary, secondary and tertiary levels of care. Women with pregnancy-related complications

are referred to a higher level of care based on clinical urgency and expertise. The study was conducted from May to July 2015 in the towns of Koforidua and Nsawam in the Eastern

region of Ghana which has a population of about 2.6 million.[18] Approximately 97% of pregnant women in the region attend antenatal care, and 68% of births take place in health facilities.[5] We employed an exploratory qualitative design using in-depth interviews (IDIs) and focus group discussions (FGDs) to gain comprehensive knowledge on how women are treated during facility based childbirth.

The study involved women of reproductive age (15–49 years) in Koforidua and Nsawam who had recently given birth in any health facility, as well as health care providers and health service administrators working in two public health facilities. The focus of this paper is to share findings of qualitative research on women of reproductive age only. The perspectives of healthcare providers and administrators will be published separately. To explore individual experiences and perceptions regarding mistreatment during childbirth, IDIs were conducted with women who had given birth in any health facility within 12 months prior to the study. Secondly, to explore community norms regarding mistreatment during facility based childbirth, FGDs were held with women who had given birth in any health facility within the previous two to five years.

Recruitment, sampling and data collection procedures

Participants for the study were purposively selected by the community health nurses and midwives who live in the communities and therefore had knowledge about the locations of the potential study participants. Women for the FGDs were contacted through face-to-face interaction with a community health nurse within their respective communities. Those for the IDIs were approached by midwives from child welfare clinics at their respective facilities. Following recruitment by the community health nurses and the midwives, research assistants then approached and informed them about the study. All the women who were approached agreed to participate in the study. They were given a date, time and location for the interviews. Participants were stratified according to age (**Table 1**).

Before each IDI or FGD, participants provided written informed consent and had their demographic information taken. Each IDI and FGD was conducted by two experienced research assistants; a moderator and a note taker. Field workers (research assistants) adept in qualitative interviews were recruited and trained for the purpose of the study. The social scientist in the team communicated constantly with the interviewers in the field and responded to any issues that arose during data collection. There were six research assistants per site; 12 in all. The research assistants were non-healthcare providers who worked mainly as research assistants and had social science backgrounds with at least a first degree from a recognised university. Non-healthcare providers were used to avoid response or social desirability bias in the data collection, as the research team hypothesised that people with clinical training may interact with the research participants in a different

way, or that research participants may share their experiences with healthcare providers differently from with non-healthcare providers. None of the research assistants originated from the study areas, or had relatives or friends in communities or health facilities in the study area. Due to the sensitive nature of childbirth issues, all the research assistants were females. A training session was organised for the research assistants during which a mock interviewing exercise was conducted by each participant in English and the local language (Twi).

Semi-structured IDI (**Appendix 1**) and FGD (**Appendix 2**) guides were used to guide data collection. The primary domains of interest were: (1) expectations of care during childbirth at health facilities (2) experiences and perceptions of mistreatment during childbirth (3) perceived factors influencing mistreatment (4) decision-making processes to give birth at a facility (5) views of acceptability of different scenarios of mistreatment during childbirth. The IDIs and FGDs were conducted either in English or Twi and audio recorded. The moderator and assistant debriefed immediately after each interview and recorded the debriefing so as to capture their observations and comments on the discussion. The field notes were also incorporated into the debriefing. Each IDI and FGD lasted between 45 and 60 minutes and 60 and 90 minutes, respectively. All the interviews and discussions were conducted in a quiet community centre in the study sites, outside participants' homes and health facilities with only the study participant(s) and interviewers involved. Each interview was conducted only once.

Data management and analysis

The audio recordings were transcribed in English by the interviewers soon after each interview. The transcripts were checked for completeness and accuracy by the field supervisor and the social scientist in the research team. In preparation for the data analysis, the researchers (a social scientist, public health specialists and obstetricians) and research assistants participated in a three-day workshop on qualitative data analysis facilitated by researchers from WHO. A codebook was developed based on the interview guides, findings from a systematic review[9] and themes emerging from the data. During the coding process, each member read each transcript several times to ensure in-depth familiarity. Three of the research assistants who completed the qualitative training workshop independently coded different transcripts manually based on the thematic content. Thereafter, the codes and emerging findings were discussed as a group until consensus was reached.

After coding and categorising the codes, a working analytic framework was developed based on consensus from all the researchers and this was applied to all the transcripts to obtain the final output. Thus, the framework method of qualitative research, with inductive and deductive analytic approaches, was systematically employed during the analysis of this

study. In the inductive analytic approach themes were allowed to emerge from the data, whilst the systematic review and interview guides were used in the deductive approach. The final analysis and presentation of the results were performed by the social scientist in the team with contribution from all other authors. The data was enriched by triangulation of IDIs and FGDs. Differences among team members regarding interpretations of the findings were discussed until consensus was reached.

Technical and ethical considerations

Scientific and technical approval for the study was obtained from the World Health Organization Human Reproduction Programme (HRP) Review Panel on Research Projects (RP2). Ethical approval was obtained from the WHO Ethical Review Committee (Protocol ID, A65880) and the Ethical Review Committee of the GHS (Protocol ID GHSERC 13/01/15). Written informed consent was obtained from the respondents just before the interviews. They were assured of confidentiality of any information provided. To ensure anonymity, no identifiable participant information was taken. The participants were not compensated for taking part in the study but were given a token of GHC 30.00 (USD 8.00) to cater for their time and transportation.

Findings

Overview

Forty-one IDIs and 10 FGDs were conducted with a total of 110 women (**Table 1**). None of the women approached declined participation in the study. Most women were 30–34 years (33) or 15–19 years old (29), married (75), and residing in urban communities (82). Almost all the participants were Christian (109) and most were of Akan ethnicity (71) (**Table 2**). Prominent themes which emerged on the subject of mistreatment included (1) experiences and perceptions of mistreatment during childbirth (2) perceived factors influencing mistreatment, (3) views of acceptability of different kinds of mistreatment during childbirth and (4) influence of mistreatment on preferences for choice of facility- based childbirth. Although not all women recounted personal experiences of mistreatment, it was a phenomenon that participants commonly associated with facility-based childbirth, and they shared stories that they had heard from friends or family members.

Table 1. Age distribution of women in In-depth interviews and Focus group discussions

	IDIs (n=39)		FGDs (n=10)	
Age groups	**Koforidua**	**Nsawam**	**Koforidua**	**Nsawam**
Women aged 15-19 years	6	6	1	1
Women aged 20-34 years	7	8	2	2
Women aged 35-49 years	5	7	2	2
Total	18	21	5	5

Table 2. Socio-demographic characteristics of participants: women of reproductive age

	FGDs *n* = 69	IDIs *n* = 41	Total *n* = 110		FGDs *n* = 69	IDIs *n* = 41	Total *n* = 110
Age (years)				**Highest level of education attained**			
20-24	4	1	5	Primary	3	7	10
25-29	8	9	17	JHS/MSLC	42	17	59
30-34	27	6	33	SHS/SSS	15	10	25
35-39	13	8	21	Tertiary	6	4	10
40+	3	2	5	Vocational	0	2	2
Marital Status				None	3	1	4
Married	55	20	75	**Employment**			
Single	12	8	20	Trader	27	21	48
Cohabiting	2	12	14	Hairdresser	8	4	12
Widowed	0	1	1	Teacher	8	0	8
Location				Caterer	2	4	6
Urban	54	28	82	Dressmaker	5	1	6
Peri-Urban	15	13	28	Other	6	3	9
Religion				Unemployed/None	13	8	21
Christian	68	41	109	**Total number of children living**			
Muslim	1	0	1	1	20	17	37
Ethnicity				2 to 3	37	17	54
Akan	48	23	71	4 to 5	9	5	14
Ewe	14	13	27	6+	3	2	5
Ga/Ga-Adangbe	2	2	4	**Total number of deliveries**			
Gruisi/Fafra/Dagomba	5	3	8	1	23	18	41
				2 to 3	37	16	53
				4 to 5	8	5	13
				6+	1	2	3
				Total	69	41	110

**MSLC (Middle School Leaving Certificate) **JHS (Junior High School) **SHS (Senior High School).

Mistreatment during childbirth described by women

With regards to forms of mistreatment experienced, there were themes on verbal and physical abuse, as well as psychological stress resulting from neglect and lack of supportive care, along with the critical influence of mistreatment on preferences for choice of facility-based childbirth.

Verbal abuse

Women detailed experiences of verbal abuse, including shouting, yelling, insults and derogatory remarks from healthcare providers. They identified these experiences as demeaning, and explained that verbal abuse happened across the duration of their stay in the health facility, from the initial contact with the healthcare providers, through labour and childbirth, as well as during discharge.

I: *How were you received by the health workers when you got to the hospital?*

R: *When I got there, I went there with a sister and I was asked what I am coming to do and I told them I am in labour. I was actually in pains so I couldn't even talk hard and they were shouting at me that I should talk for them to hear. Why? Am I a baby? How they received me I even felt sorry for myself for going there. It made me feel so bad. (IDI, Married woman, 32 years, Nsawam)*

I = Interviewer R = Respondent

Those who experienced shouting and yelling in the early stages of labour described it as scary and intimidating. Women acknowledged that health care providers often yelled at them because they did not arrive at the health facility with the required items for childbirth (e.g. sanitary pads, mackintosh, soap and baby dresses) or they did not assume the "required" position for childbirth (to lie on their back with legs apart).

When we were going to the hospital, I knew my pregnancy was eight months so I told my sister not to take my things for delivery. When we got to the hospital, the nurse we met said "villager, hmmmm …foolish girl…" I didn't talk because I was in pain. Then the nurse asked me to go and sit on a chair there, then the other nurse said she has to go and lie down. The other nurse said this villager sitting there which bed is she going to lie on, so the second nurse took a cloth and spread it on the bed for me to lie on. I didn't know when you lie down you have to lie on your right side, one nurse saw me turning myself and she said I'm stubborn. (IDI, Married woman, 30 years, Koforidua)

Some women recounted experiences of midwives shouting at them when they were ready to bear down during the second stage of labour. These derogatory remarks usually targeted the woman's inability to push as expected.

I: *How was the shouting like?*

R: *Hey Ewura (lady), you are not the only one to give birth here. You have given birth before. Are you coming to show your arrogance to me, the nurse?*

I: *…at what time of the delivery process did this happen?*

R: *During the pushing period before the delivery. When the baby was about to come I shouted "auntie nurse please it is coming oooh". But because she was angry, she shouted at me. (IDI, Widowed, 40 years, Koforidua)*

Although, verbal abuse was experienced by women across all age groups, abusive remarks directed at younger women (15–19 years) often touched on the issue of teenage pregnancy.

When you get pregnant and you go to the hospital they would insult you because you are a teenager, so when you are fifteen or fourteen and you go there you will never be happy until you deliver your child. They [healthcare providers] have an age when you can get pregnant, that is from 20-30. (FGD, Married woman, 19 years, Koforidua)

Physical abuse

Participants also recounted physical abuse they endured during childbirth at health facilities. Physical abuse included pinching and slapping of their thighs and sometimes their backs. In some instances, such acts were accompanied by derogatory remarks about their progress through labour or ability to push.

I: *Did you like how you were treated in the facility?*

R: *Please no…When I was pushing there were three nurses around me, when I couldn't push one nurse pinched me and said I should force and push, the other also slapped my thighs and also said I should push but I didn't push, because of that I will not go there again. I wasn't happy; it made another madam insult me and even said that they are not here to help people like me. She even went further to use the word "nasty person". (IDI, Single, 19 years, Koforidua)*

These experiences were evident among women of all ages, and often occurred during the pushing stage of the childbirth process. Women sometimes described these gestures

positively, viewing them as corrective measures taken by the healthcare providers to ensure safe childbirth. Although women were displeased with being hit, they believed that such gestures were necessary due to their inability to effectively push:

R: *When I was due for labour and was asked to push, I couldn't push and the nurse beat me very well. She used a cane to whip me so I could push, but I told her I was tired but she insisted I should push. So she really whipped me with the cane and later used her hand to hit my thigh. There I became conscious and was able to push. (FGD, Married woman, 35 years, Koforidua)*

Failure to meet professional standards of care (neglect and lack of supportive care)

Women's experiences suggested psychological stress during labour and childbirth resulting from instances of neglect, lack of support, and health workers' unresponsiveness to their needs. Although women acknowledged that the number of skilled attendants was inadequate to meet the demands of women, they felt that attendants focused on other activities rather than showing interest in the women. In extreme cases women gave birth in the facility without the presence of a healthcare provider, and believed that this was due to poor monitoring and assessment of women during the labour process:

I: *Why did you think you did not get the kind of support you anticipated?*

R: *The nurses were not enough…Also even though the nurses were not enough they sat by their table too much. If they could move around the labour ward, they will know who needs help. One woman delivered on the bed alone in the labour room because we are not well monitored. (IDI, Married woman, 30 years, Koforidua)*

Some women recounted their personal experiences of typical displays of disrespectful care and lack of clinical support during critical moments of maternity care. They described mistreatment by healthcare providers as psychologically disturbing and making them feel helpless and powerless, as enumerated below by a respondent in a FGD:

R: *When the nurse came to look at me, just seconds after she left, then I saw that the thing was coming, and I couldn't do anything about it. And I called the nurse to come. At that time she had already reached her table and was conversing. One said, "did you not just leave that place? and what?, are you the only one coming to deliver here"? So the security personnel who was passing saw my state and called out to the nurses that my baby's head was showing so they should hurry up. But the nurse angrily came and wheeled me away. Truly speaking I was disturbed, but my hand was in her mouth so I kept quiet. (FGD, Married woman, 35 years, Koforidua)*

Acceptability or non-acceptability of types of mistreatment

Women were also asked about their views on the acceptability or non-acceptability of specific acts by healthcare providers that could be considered mistreatment. Their responses were nuanced, showing variations in perceptions and norms among different age groups, reactions to different forms of mistreatment, as well as conditions and timing within which such acts occur. In general, several women expressed strong beliefs, with some indicating that all acts of mistreatment, irrespective of the type or time committed, were unacceptable.

The conversations below indicate strong convictions among women against any form of mistreatment

I: *If a woman is shouted at by the midwife during labour when do you think [it] is acceptable?*

R: *For that one it is not acceptable. Slapping her, pinching her, shouting at her all is not acceptable. If you will shout at her, it should be after delivery, even that, excuse me, she is somebody's wife, uh huh and you have also delivered before and you know how it is and people behave differently during labour so it not acceptable for you to shout on the person. (IDI, Married Woman, 39 years, Nsawam)*

In contrast, a few women believed that mistreatment during childbirth was acceptable under certain situations. For example, some women believed it was appropriate for clients who do not follow instructions given by health workers. For a few women "pinching" and "beating" are corrective measures to alert mothers to assume the right position during birth or to enable them to push":

I: *So when they (health workers) pinch a pregnant woman to open the legs for the baby to come, is it acceptable?*

R: *When they pinch them it means they don't obey the instructions of the nurses. Maybe the baby is coming and you are closing your legs so the nurse must pinch you to open them up. Yes it is acceptable. (IDI, Single, 18 years, Nsawam)*

Most women did not hold strong opinions about mistreatment during childbirth. Their responses suggest dilemmas regarding the usefulness of specific acts of mistreatment and their contextual interpretations, compared to the harms it could cause.

I: *Will pinching ever be justified in some cases?*

R: *Come to think of it, yes, because some of us women have difficulty in understanding*

things, and some because they behave outside just like they do at home sometime their behaviour calls for that. Sometimes when they are told to push, they don't push, they will be lying there doing nothing. So to avoid being tagged that those on duty caused the death of so and so number of children they will do whatever it takes…

I: *How would you feel if it happens to you?*

R: *If it's for a reason to save my baby I will accept it, but if for no reason, I will take the matter up (IDI, Married woman, 26 years, Koforidua)*

Women implied that some acts of mistreatment were useful for addressing a woman's misbehaviours, misunderstandings, and miscommunications with health providers during the birthing process. In these instances, acts of mistreatment are not expected to be the "first line" of action used by the health provider, but could be applied as "supportive" practices to help mothers through the birthing process.

R: *Sometimes is not the fault of the health worker. When it is time for you to push the baby out and you don't push, that one it is not the fault of the health worker. If she doesn't slap you to push the baby out you will not [push]. Sometimes it is our fault.*

I: *Would this be acceptable?*

R: *It is not right. You don't need to slap too much because some people do not want to push when they are asked to push. When you slap a bit, she will push, so it is right.*

I: *So it is acceptable to pinch and slap?*

R: *Yes, it will force us to push the baby out.*

I: *How would you feel if this happens to you?*

R: *It will encourage me to push for the baby to come out. (IDI, Cohabiting woman, 28 years, Nsawam)*

In some cases, women felt that when the provider yelled or slapped a woman during labour, it would help to communicate the gravity of the situation and as a way of "guiding you as to when you should push and when you should breathe in between" (IDI, Married

woman, 32 years, Koforidua). These inconsistencies, dilemmas and differences in opinions regarding acceptability were particularly evident during FGDs among women across all ages. Women's views on acceptability or non-acceptability placed the various forms of mistreatment on a spectrum and depicted some as more acceptable and less harmful than others. Most women believed it was unacceptable for a healthcare provider to refuse to help women during labour and childbirth, and some women even noted that such an act should be reported.

I: *Is it acceptable for a health care provider to refuse to help a woman in labour?*

R: *It cannot be acceptable because it is their job and so even if I call you and it is not yet time for me to deliver I would want you to come and examine me and tell me that my sister endure the pain because it is not yet time for you to deliver. But if you refuse coming, then it is intentional. And so if you even come and say something I will feel that when the time is up the baby would come out. (FGD, Married woman, 30 years Nsawam)*

Influence of mistreatment on preferences for choice of facility-based childbirth

Some women stated that health workers' attitudes, including mistreatment, are major reasons for non-utilisation of skilled birth attendance. Some women identified previous experiences of mistreatment from healthcare providers as influencing future decisions regarding the use of the facility for childbirth, in which case they prefer to give birth at home:

I: *Why do some also give birth in the house?*

R 1: *Please sometimes it's because of the behaviour of some of the nurses that is why they give birth in the house… Shouting and the intimidation, they are not patient with them.*

R 2: *They insult us very well so when you are pregnant and you give birth in the house*

you are treated well, [better] than the hospital.

R 3: *The nurses are not patient with us they will be insulting us especially when you are not married you are treated badly. (FGD, Women 15-19 years, Koforidua).*

R 4: *No, I did not, I had wanted to deliver at home because someone told me that if you go and deliver in the hospital, they mistreat you, they don't have patience for you; so that was the reason why I wanted to deliver at home but the nurses managed to convince me to come and deliver at the hospital. (IDI, Married woman, 30 years, Koforidua)*

Discussion

This qualitative study has demonstrated that multiple forms of mistreatment are experienced by women during facility-based childbirth in Ghana. In this study, most women reported experiencing verbal abuse in the form of shouting, yelling, insults and derogatory remarks, which had a negative impact on their self-confidence. Physical abuse in the form of pinching and slapping was also reported. Other forms of mistreatment included abandonment, lack of support, neglect and unresponsiveness to women's needs. Although mistreatment occurred throughout the birthing process in the health facilities, women reported that it was most common during the second ("pushing") stage.

This study has also shown that mistreatment can disincentivise facility-based childbirth in the future. Our findings are similar to the few previous studies in Ghana, which reported women experiencing physical abuse, scolding, shouting and abandonment during childbirth, as well as health facilities that are unresponsive to their needs, or unable to provide the necessary emotional and physical support during childbirth.[12–14,19,20] Failure to push, young age and inability to bring all items required for the birthing process were reported in our study as potential triggers for mistreatment, also echoing previous studies in Ghana.[13,14,20]

Mistreatment during facility-based childbirth is increasingly recognised as a widespread problem. Comparable findings of mistreatment of women, in varied forms, during childbirth in health facilities have been reported in Tanzania, Kenya and Nigeria.[6,8,21] Other study sites in this WHO-led multi-country study (Nigeria and Guinea) have revealed similar experiences of mistreatment in health facilities.[22,23]

Such mistreatment may have negative effects on future maternal health-seeking behaviour and choices regarding facility-based childbirth. A recent systematic review determined the existence of a wide range of disrespectful and abusive treatment of women during childbirth in Nigeria.[24] The authors suggested that female education and empowerment, strengthening of the health systems and refresher training of healthcare providers represent viable solutions to reducing disrespectful treatment of women during childbirth.[24] Disrespectful and undignified care during facility based childbirth also occurs in higher-income countries[25,26] but forms and patterns of mistreatment may differ.

These findings buttress the need for concerted efforts (both locally and internationally) to objectively measure and determine the prevalence of mistreatment and abuse during childbirth. This will serve as the necessary contextual information on which any evidence-based measures to eliminate mistreatment and promote respectful maternity care could be based. Elimination of such forms of mistreatment could improve facility-based childbirth

rates and ultimately maternal and perinatal health outcomes. Previous studies in Africa have demonstrated clearly the relationship between mistreatment and future childbirth in health facilities.[13,27,28]

Eliminating all forms of mistreatment and ensuring that women's rights are respected hinges on extensive education, especially in low resource settings, on whether such acts are appropriate or useful. In this study, some women believed that in some contexts, some forms of physical and verbal abuse are needed to ensure the safety of the mother and baby during childbirth. Trainee midwives in Ghana14 and healthcare providers and women in Nigeria[29] and Guinea[23] have also rationalised some mistreatment as ensuring good pregnancy outcomes. This may explain why mistreatment was reported to be more prevalent during the second stage of labour, the terminal and critical phase of the birthing process. Using mistreatment as a means to achieve better outcomes during childbirth may have dire consequences, given that mistreated women may opt for home births in the future, as attested to by this study and others.[13,30–32] This could in turn derail gains made in reducing maternal mortality and improving quality of care. The cultural normalisation of some forms of mistreatment needs to be considered and addressed when developing interventions.There is also a need to address systemic failures within health facilities and health systems that contributes towards mistreatment and abuse of women. Although low staff numbers (as indicated by women in our study) can affect the quality of care, women raised concerns regarding staff idleness. This made women feel powerless, and led to negative labour and childbirth experiences. Similar sentiments have been expressed by women in South Africa and Tanzania[32,33] and can erode the importance of attending health facilities for childbirth.

In Ghana, there are specific health system challenges which influence the optimal provision of maternal health care including delays in providing care, shortage of healthcare providers, logistics, laboratory supports and effective drugs. Some of these specific issues came up in the health workers' interviews which are not incorporated in this paper as its focus is on women's perspectives on mistreatment during facility-based childbirth. Health system-related issues are described in a forthcoming paper on health worker perspectives. A recent systematic review has highlighted persistent lack of adequate resources, among other factors contributing to the delay in providing emergency obstetric care in developing countries.[34] Despite these challenges, significant, although slow, progress has been achieved in key maternal health indicators in Ghana. A recent country-wide survey in 2015 indicated that 97% of pregnant women obtained antenatal care from a skilled provider compared to 82% in 1988. Health facility-based childbirth and supervised skilled-birth provision have increased from 42% and 40%, respectively, in 1988 to 73% and 74% in 2014.[35] However, a wide disparity in maternal morbidity and mortality persists compared with

resource rich countries. This variation in clinical outcome indicators could be attributed to differences in the quality of maternity care services where a significant proportion of women in the developing world do not have access to supervised facility-based childbirth, despite remarkable improvements in antenatal care coverage.

The structure of the health system in Ghana is such that most uncomplicated maternal-related cases are managed at primary and secondary health facilities whilst complicated and severe cases are managed at tertiary or teaching hospitals. In cases of obstetric emergencies, patients are usually transferred to tertiary hospitals to access a more complete multi-disciplinary specialist level of care. Obstetric emergencies which present at lower-level facilities are transferred to a higher institution based on the preparedness of the facility for such complications. On the other hand, some clients obtain maternity services from traditional births attendants (TBAs) who have not had formal training in the provision of maternal health care. In Ghana, TBAs still conduct a significant proportion of deliveries, despite several attempts to channel all births to health facilities. The recent Ghana Demographic Health Survey indicated that 16% of births are delivered by traditional birth attendants.[5] The occurrence of a significant proportion of births unsupervised by trained providers in health facilities in the country might be related partly to the persistence of mistreatment of women during facility-based provision of maternity care services as recounted by respondents in the current study. The findings of this study are instrumental in the attempt by WHO to globally estimate the true burden of the phenomenon of mistreatment and its underlying factors using internationally validated measurement tools with subsequent identification of potential entry points to minimise mistreatment and improve respectful care.

Strengths and weaknesses

One of the strengths of this study is being part of a larger WHO multi-country study, which aims to define mistreatment during childbirth, and develop and validate two tools for measuring its occurrence (a labour observation tool and a community-based survey tool). The lived experiences and perceptions of Ghanaian women described in this paper have been synthesised with findings from other participating countries (Guinea, Myanmar and Nigeria), and stakeholder groups (healthcare providers and administrators) and integrated into the design and components of the two measurement tools. This will ensure that the tools address what is actually experienced by women giving birth in health facilities in different settings. For example, while the forms of mistreatment identified in our study have been documented in other settings, the timing, specific actions and terms used by Ghanaian women to describe mistreatment informed how corresponding measurement questions are framed and timed. Quantitative findings on the application of these tools in maternity care facilities in Ghana will be explored in a forthcoming paper.

An additional strength of this study is the inclusion of the views of women purposively sought from all age groups (adolescents as well as adults) in both urban and suburban settings. Grouping women into similar age groups for the FGD allowed the adolescents to express themselves without fear of reprisal from older women, which culturally is the norm. Also, we employed non-clinical research assistants to reduce the risk of social desirability/response bias and there were regular ongoing discussions with multi-country research teams about emerging findings. This was buttressed with regular monitoring by the social scientist in the team to respond to issues related to the data collection.

This study also has some weaknesses. It is possible that the nurses who recruited the study participants may have influenced their responses to favour providers. Different socio-economic factors, including educational level and women's marital status, that could affect their childbirth experiences, were not stratified. Despite this potential limitation, women in this study reported negative personal experiences or experiences of others within their social network. Given the qualitative methods used in this study, the findings may not be transferable to populations outside of the study settings. We did not compare the occurrence of mistreatment of women during childbirth at the facility to home deliveries by TBAs. However, our findings, indicating a significant burden of mistreatment of women during facility-based childbirth in various typological forms, are aligned with other studies conducted in sub-Saharan Africa.[23,29,35]

These findings, and forthcoming findings from our research group on healthcare providers' and administrators' views on mistreatment, can help to identify and implement strategies to address the problem of disrespectful facility-based maternity care. Our findings provide the evidence to encourage the Ministry of Health to engage stakeholders and formulate appropriate policies to improve respectful care of women during childbirth in health facilities. Strategies need also to engage pre-service training institutions, to address cultural norms around mistreatment at health facilities during childbirth and to sensitise staff on the occurrence and consequences of mistreatment of women during childbirth. Furthermore, collaborating with women's and community groups to raise their expectations and demands for high quality care will be critical to design and adapt health services to be more woman centred. Provision of high quality of care by eliminating disrespectful treatment of women at the time of childbirth will improve maternal health in Ghana and ensure that all women have the right to access high quality maternal healthcare.

Conclusion

Mistreatment of women occurs during facility-based childbirth in our study sites in Ghana, with negative impacts on women's care experiences. Conflicting opinions exist amongst women regarding its appropriateness and usefulness. Evidence-based consensus definitions, as well as validated indicators and tools for measuring mistreatment, are needed to help identify the underlying factors and potential entry points to minimise the phenomenon and improve respectful care during childbirth.

The authors declare no conflict of interest in this study. This study represents the views of the named authors only, and not the views of the World Health Organization.

Acknowledgements

The authors would like to express their appreciation to Drs Kwame Anim-Boamah and Kofi Ablorh for their assistance during the data collection. We are also grateful to Mr Philip Tabong for his immense contribution to the final preparation of the manuscript. Finally, we thank the women who took part in this study.

Funding

This study was financially supported by the World Health Organization (WHO) and the United States Agency for International Development (USAID).

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Résumé

La maltraitance pendant l'accouchement dans les centres de santé viole les droits fondamentaux des femmes ainsi que leur autonomie et elle est peut-être associée à la mortalité et la morbidité maternelles et néonatales évitables. Dans cet article, nous explorons les perspectives des femmes sur la maltraitance pendant des accouchements en institution, dans le cadre d'une étude multinationale plus large de l'OMS pour élaborer des définitions consensuelles, des indicateurs validés et des outils pour mesurer la charge de ce phénomène. Des discussions de groupes d'intérêt et des entretiens approfondis ont permis d'analyser les expériences de maltraitance des femmes ayant déjà accouché dans un centre de santé à Koforidua et Nsawam, Ghana. Les entretiens ont été enregistrés sur bande sonore et transcrits, puis une analyse thématique a été menée. Dans l'ensemble, 39 entretiens approfondis et 10 discussions de groupes d'intérêt avec 110 femmes au total ont été réalisés. Les principaux types de mauvais traitements identifiés étaient : les violences verbales (cris, insultes et commentaires désobligeants), la maltraitance physique (pincements, tapes) et le manque d'attention ou de soutien. La maltraitance était fréquente pendant le deuxième stade du travail, particulièrement chez les adolescentes. L'incapacité à bien pousser pendant ce deuxième stade, le non-respect des instructions données par le personnel supervisant l'accouchement et l'absence des articles demandés pour la naissance (trousseau de la maman) précédaient souvent la maltraitance. La plupart des femmes ont indiqué que les tapes et les pincements étaient des moyens acceptables de « corriger » des comportements désobéissants et d'encourager à pousser. À l'avenir, les femmes risquent d'éviter de donner naissance dans des centres de santé en raison de leurs propres expériences de maltraitance, ou de celles d'autres femmes dont elles ont entendu parler. Des définitions consensuelles, des indicateurs validés et des outils pour mesurer la maltraitance sont nécessaires pour estimer la prévalence et identifier les facteurs et les points d'entrée potentiels de façon à minimiser ce phénomène et améliorer des soins respectueux pendant l'accouchement.

Resumen

El maltrato de las mujeres durante el parto institucional viola sus derechos humanos y su autonomía, y podría estar asociado con morbimortalidad materna y neonatal evitables. En este artículo, exploramos las perspectivas de las mujeres sobre el maltrato durante el parto institucional como parte de un estudio más extenso multinacional realizado por la OMS para crear definiciones de consenso, indicadores validados y herramientas para medir la carga del fenómeno. Se utilizaron discusiones en grupos focales (DGF) y entrevistas a profundidad (EAP) para examinar las experiencias de maltrato sufrido por mujeres que habían dado a luz en una unidad de salud, en Koforidua y Nsawam, en Ghana. Las entrevistas fueron grabadas y transcritas, y se realizó un análisis temático. Se realizaron 39 EAP y 10 DGF con 110 mujeres en total. Los principales tipos de maltrato identificados fueron: maltrato verbal

(gritos, insultos y comentarios despectivos), maltrato físico (pellizcos, bofetadas), abandono y falta de apoyo. El maltrato fue frecuente durante la segunda etapa del parto, especialmente entre adolescentes. La incapacidad para empujar bien durante la segunda etapa, la desobediencia de las instrucciones de asistentes del parto, y no traer los objetos indicados para el parto (kit de mamá) a menudo precedían el maltrato. La mayoría de las mujeres indicaron que las bofetadas y pellizcos eran medios aceptables de "corregir" comportamientos desobedientes y motivar a las mujeres a empujar. Es posible que las mujeres eviten tener un parto institucional en el future debido a sus experiencias de maltrato, o por haber oído hablar de las experiencias de maltrato de otras mujeres. Las definiciones de consenso, indicadores validados y herramientas para medir el maltrato se necesitan para poder medir la prevalencia e identificar los impulsores y posibles puntos de entrada para minimizar el fenómeno y mejorar la atención respetuosa durante el parto.

Appendix 1: In-depth interview guide for women of reproductive age who delivered at a facility in the past 12 months (phase 1)

In-depth interview guide

Women of reproductive age who delivered at a facility in the past 12 months

Step 1: Introduce yourself to the participant. Describe the purpose of the interview and how information will be used. Obtain oral/written consent.

Step 2: Ask the participant to identify herself and fill out the table below on sociodemographic information prior to beginning the interview.

Step 3: Conduct the interview. Please remember to audio record the interview.

Step 4: Complete the form at the end of the interview guide.

Participant #	**Age group** (circle)	**Number of deliveries in a facility** (write in)	**Number of deliveries at home** (write in)	**Education** (circle)	**Marital status** (circle)
Participant	<30 30-45 >45			< Primary Primary Secondary > Secondary	Single Married/ cohabitating Divorced Widowed

Start time: : **Interviewer ID __ __ __ __**

Interview date: __ __/__ __/____

DD / MM / YY

Interview discussion guide

A. Decision-making process to deliver at a facility during the most recent birth

Please take a moment to think about your most recent delivery.

1. Why did you decide to give birth in a health facility?
2. Who was involved in making this decision about where to give birth?
3. Were you planning to deliver in that health facility? [Probe: were you referred to/from another health facility?]

B. Experiences and perceptions of care provided at the most recent facility-based delivery, focusing on treatment by providers and the facility environment.

4. What were your expectations when you delivered at the health facility?
5. In your opinion, what do you need from your NURSE OR DOCTOR in a health facility in order to receive respectful care during childbirth?
6. In your opinion, how are women treated by staff [administrators, nurses/midwives, physicians] in the facility when they come to deliver [from admission to discharge]?
7. In your opinion, how were you treated by the health workers during your most recent labor and delivery? Please explain.
    a. Probe: If the participant says that she was treated well, ask her if her family and friends had a similar experience as she did. Please explain.

C. Elements of disrespect and abuse to inform the development of the identification criteria, including involved parties, timing and frequency of disrespectful or abusive care

Sometimes women are mistreated or poorly treated during childbirth by health workers and health staff at health facilities. This mistreatment may take several different forms. Now, I would like to discuss some of these forms of mistreatment with you.

8. In your opinion, did you experience mistreatment or poor treatment during your most recent childbirth? [Probe: if the participant says no, ask if she has ever experience mistreatment during any of her deliveries. If the participant says no, ask if any of her family or friends have ever experienced mistreatment during their delivery.]
    a. Could you explain the situation?
    b. Who was involved in the situation?
    c. How were you [friend/family] mistreated?
    d. When did it happen? [Probe: time of day, during labor, during delivery or postpartum].
    e. How often did it happen? [Probe: just once or more often].

*** If the participant describes a situation related to verbal mistreatment, physical mistreatment, or poor communication between the patient and provider, then probe the following accordingly:

Verbal mistreatment:	Physical mistreatment:	Poor communication between the patient and provider:
Did the provider raise his/her voice?	Did that include pinching?	Were there any problems with the language of communication?
What types of comments were made?	Did that include slapping?	If so, was a translator available?
Were these comments made to threaten with poor outcomes?	Did that include beating?	Was the poor communication related to lack of consent for a test or procedure?
Were these comments judgmental/derogatory in nature?	Did that include kicking?	
Were these comments based on her age or her number of children?	Did that include hitting?	
Did the provider blame her for getting pregnant?		

9. In your opinion, how common is the situation that you described? [Probe: do situations like this happen often?]

Now I would like to ask your opinion on the treatment of women during labor and delivery.

10. Are there any situations where it would be acceptable for a health worker to pinch or slap a woman during delivery? Please explain. [Probe: how would you feel if this happened to you? Explain.]
11. Are there any situations where it would be acceptable for a health worker to not ask for the patient's consent before a test or procedure when the patient is conscious? Please explain. [Probe: how would you feel if this happened to you? Explain.]
12. Are there any situations where it would be acceptable for a health worker to tell the woman she will have a poor outcome if she does not cooperate? Please explain. [Probe: how would you feel if this happened to you? Explain.]
13. Are there any situations where it would be acceptable for a health worker to physically restrain a woman during labor or delivery? [Probe: how would you feel if this happened to you? Explain.]
14. In your opinion, what could be done to improve the treatment of women during labor and delivery?

D. Perceived factors that influence disrespect and abuse in the facilities

15. In your opinion, what are the factors that influence the mistreatment of women during labor and delivery? Please explain. Probe:
    a. Related to supplies (availability of medication, equipment)
    b. Related to health provider staffing (number of staff, attitude towards patients)
    c. Related to patient load (number of patients, overcrowding)
16. In your opinion, what could be done to address these factors so that women are treated better during labor and delivery?

When the interview appears to have finished, ask participant if there is anything that you have misunderstood or that they would like to add.

Thank the participant for his/her time. Remind them that the information will be kept confidential.

End time ☐☐ : ☐☐

Appendix 2: Focus group discussion guide for women of reproductive age who have delivered in a facility in the past 5 years (phase 1)

FGD guide

Women of reproductive age who have delivered in a facility in the past 5 years

Step 1: Introduce yourself to the group. Describe the purpose of the FGD and how information will be used. Obtain verbal/written consent.

Step 2: Ask each participant to identify herself and fill out the table below on sociodemographic information prior to beginning the discussion.

Step 3: Conduct the FGD. Please remember to audio record the discussion.

Step 4: Complete the FGD form at the end of the discussion guide.

Participant #	**Age group** (circle)	**Number of deliveries in a facility** (write in)	**Number of deliveries at home** (write in)	**Education** (circle)	**Marital status** (circle)
Participant 1	<30 30-45 >45			< Primary Primary Secondary > Secondary	Single Married/ cohabitating Divorced Widowed
Participant 2	<30 30-45 >45			< Primary Primary Secondary > Secondary	Single Married/ cohabitating Divorced Widowed
Participant 3	<30 30-45 >45			< Primary Primary Secondary > Secondary	Single Married/ cohabitating Divorced Widowed
Participant 4	<30 30-45 >45			< Primary Primary Secondary > Secondary	Single Married/ cohabitating Divorced Widowed
Participant 5	<30 30-45 >45			< Primary Primary Secondary > Secondary	Single Married/ cohabitating Divorced Widowed
Participant 6	<30 30-45 >45			< Primary Primary Secondary > Secondary	Single Married/ cohabitating Divorced Widowed

Start time: : **Interviewer ID __ __ __ __**

Interview date: __ __/__ __/__ __
DD / MM / YY

FGD discussion guide

A. Decision-making process to deliver at a facility and perceptions of delivering at a facility

Please take a moment to think about places where women deliver in your community.

1. Where do women prefer to give birth in your community? (probe: at a health facility or home)
2. Who is involved in making the decision about where to give birth?
3. Why do you think women go to health facilities to give birth?

B. Perceptions of care provided at the facility, focusing on treatment by health workers and the facility environment

4. What do you think of the care that women receive at these health facilities during childbirth? Why do you think this way? Please explain.
5. In your opinion, how are women treated by staff [administrators, nurses/midwives, physicians] in the facility when they come to deliver [from admission to discharge]?

C. Elements of disrespect and abuse to inform the development of the identification criteria, including involved parties, timing and frequency of disrespectful or abusive care

Sometimes women are mistreated or poorly treated during childbirth by health workers and health staff at health facilities. This mistreatment may take several different forms.

6. In your opinion, in what ways could women be mistreated or poorly treated during labor and delivery at health facilities?
    f. Who is usually involved in these situations [nurses/midwives/doctors]?
    g. When does it usually happen? [Probe: time of day, during labor, during delivery or postpartum].
    h. In your opinion, how common is/are the situation(s) that you described? [Probe: do situations like this happen often?]

Now I would like to ask your opinion on the treatment of women during labor and delivery.

7. Are there any situations where it would be acceptable for a health worker to pinch or slap a woman during delivery? Please explain.
8. Are there any situations where it would be acceptable for a health worker to not ask for the patient's consent before a test or procedure when the patient is conscious? Please explain.
9. Are there any situations where it would be acceptable for a health worker to tell the woman she will have a poor outcome if she does not cooperate? Please explain.
10. Are there any situations where it would be acceptable for a health worker to physically restrain a woman during labor or delivery? Please explain.

11. In your opinion, what could be done to improve the treatment of women during labor and delivery?

D. Perceived factors that influence disrespect and abuse in the facilities

12. In your opinion, what are the factors that influence the mistreatment of women during labor and delivery? Please explain. Probe:
    a. Related to supplies (availability of medication, equipment)
    b. Related to health provider staffing (number of staff, attitude towards patients)
    c. Related to patient load (number of patients, overcrowding)
13. In your opinion, what could be done to address these factors so that women are treated better during labor and delivery?

When the interview appears to have finished, ask participant if there is anything that you have misunderstood or that they would like to add.

Thank the participant for his/her time. Remind them that the information will be kept confidential.

End time ☐☐ : ☐☐

Chapter 7

Health professionals' and hospital administrators' perspectives on mistreatment of women during facility-based childbirth: A multicenter qualitative study in Ghana

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Reproductive Health. 2022;3:968914

Abstract

Background

Globally, mistreatment of women during facility-based childbirth continues to impact negatively on the quality of maternal healthcare provision and utilization. The views of health workers are vital in achieving comprehensive understanding of mistreatment of women, and to design evidence-based interventions to prevent it. We explored the perspectives of health workers and hospital administrators on mistreatment of women during childbirth to identify opportunity for improvement in the quality of maternal care in health facilities.

Methods

A qualitative study comprising in-depth interviews (IDIs) with 24 health workers and hospital administrators was conducted in two major towns (Koforidua and Nsawam) in the Eastern region of Ghana. The study was part of a formative mixed-methods project to develop an evidence-based definition, identification criteria and two tools for measuring mistreatment of women in facilities during childbirth. Data analysis was undertaken based on thematic content via the inductive analytic framework approach, using Nvivo version 12.6.0.

Results

Health workers and hospital administrators reported mixed feelings regarding the quality of care women receive. Almost all respondents were aware of mistreatment occurring during childbirth, describing physical and verbal abuse and denial of preferred birthing positions and companionship. Rationalizations for mistreatment included limited staff capacity, high workload, perceptions of women's non-compliance and their attitudes towards staff. Health workers had mixed responses regarding the acceptability of mistreatment of women, although most argued against it. Increasing staff strength, number of health facilities, refresher training for health workers and adequate education of women about pregnancy and childbirth were suggestions to minimize such mistreatment.

Conclusion

Health workers indicated that some women are mistreated during birth in the study sites and provided various rationalizations for why this occurred. There is urgent need to motivate, retrain or otherwise encourage health workers to prevent mistreatment of women and promote respectful maternity care. Further research on implementation of evidence-based interventions could help mitigate mistreatment of women in health facilities.

Plain language summary

Respectful maternity care is vital to achieving positive pregnancy and childbirth experiences for women and their families. Mistreatment of women during childbirth at facilities can negatively impact women's future health seeking behaviors and utilization of maternal care services. The experiences and perspectives of doctors, midwives and nurses working in labour wards are vital in understanding how women are treated during childbirth, and what measures can be taken to prevent it. In this study, we explored the opinions of health workers and hospital administrators on how women are treated during childbirth to determine the gaps in the quality of maternal care in health facilities in Ghana. Participants expressed mixed feelings concerning mistreatment of women during childbirth. Most were aware of the occurrence of mistreatment in health facilities including physical and verbal abuse, and denial of preferred position for childbirth and companionship. The reasons provided for mistreatment included low staff capacity, high workload, non-compliance by women and poor attitudes towards health workers. Most health workers were against mistreatment during childbirth. Participants thought mistreatment could be minimized by improving staff skills, refresher training, and childbirth preparation education for women. Our study indicates the need to motivate, retrain or encourage health professionals to provide respectful care to women during childbirth to improve their experience of care. Further research to help implement better maternity care devoid of mistreatment in health facilities in Ghana is needed.

Introduction

Globally, mistreatment of women during facility-based childbirth continues to impact negatively on the quality of maternal healthcare provision and utilization. Mistreatment remains a global public health challenge, considering its prevalence, associated infringements on women's rights, and adverse impacts on health and well-being of the affected women and families[1-3]. In a recent World Health Organization (WHO) multi-country study comprising both labor observation and community survey, about 4 in 10 women experienced some form of mistreatment including physical, verbal, discrimination and neglect during facility-based childbirth[4]. Women who experience mistreatment in healthcare facilities, particularly in limited-resource settings, may resort to alternative services for childbirth such as traditional health attendants, where they feel better treated and respected[5,6].

In Ghana, approximately 90% of pregnant women receive four or more antenatal visits; the rate of facility births is about 80%, increasing from 54% over the past decade[7]. Although this increase in maternal healthcare service utilization is positive, maternal mortality ratio has improved only marginally, from 371 in 2005 to 308 maternal deaths per 100,00 livebirths in 2017[8]. This disconnect between improved healthcare access and persistent high levels of maternal mortality suggests the quality of maternity care services is suboptimal[9]. Promisingly, recent evidence indicates that promoting respectful maternity care (RMC) can improve maternal health care utilization[2,10].

The negative impact of mistreatment of women in health facilities has been recognized by the global community and active efforts have been implemented to minimize its occurrence. WHO defines respectful maternity care as the care organized for and provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labor and childbirth[11]. The types of mistreatments during childbirth that have been identified include physical, verbal, and sexual abuse, stigma and discrimination, neglect, substandard care, poor communication and lack of privacy and confidentiality[3,12]. WHO's 2018 intrapartum care recommendations for a positive childbirth experience emphasize the importance of respectful, supportive care interventions for women giving birth, as well as the need for effective, culturally sensitive communication with women and their families[11].

In a previous qualitative paper, we reported the occurrence of major types of mistreatments experienced by women in Ghana including verbal abuse (shouting, insults), physical abuse (pinching, slapping) and neglect[6]. Similar reports indicate that, mistreatment and disrespectful care are pervasive in the country[5,13,14]. These events were more prevalent

during the second stage of labor, and amongst adolescent mothers[4,6]. The views of health workers are vital to achieving a comprehensive understanding of the phenomenon, especially as health workers' behaviors and health system failures have been implicated in some forms of mistreatment[3,5,15-17]. However, there is insufficient evidence on the perspectives of maternity care providers and administrators in Ghana on this issue. The objective of this article was to explore the perspectives of health workers and hospital administrators on mistreatment of women during childbirth in Ghana, to identify opportunities for improving the quality of maternal care. This qualitative study provided evidence for the development and validation of two tools for measuring mistreatment of women during childbirth at health facilities.

Methods

Study design and sites

This was a qualitative phenomenological study conducted between May to July 2015 in two major towns (Koforidua and Nsawam) in the Eastern region of Ghana. The study was part of formative research to develop an evidence based definition, identification criteria and two tools for measuring mistreatment of women during childbirth in health facilities. The study protocol has been published previously[18]. We have also published our findings on women's perspectives on mistreatment during childbirth in Ghana[6]. In this article, we present the perspectives of health workers (including nurses, midwives and doctors) and hospital administrators, to complement the analysis of women's perspectives and inform development of quality improvement strategies to enhance respectful maternity care in the country.

The two study sites comprised secondary level facility or higher, one facility located in a rural or peri-urban area and the other urban with well-defined catchment area. To be eligible, the included health facility required a minimum of 3 doctors/specialists, 3 nurses/midwives working in the maternity unit of the hospital and at least 2 administrative personnel in the facility. The two study sites (Koforidua and Nsawam) are located in the same administrative region in Ghana with a population of approximately 2.6 million[19]. Koforidua, the capital of the Eastern region of Ghana, is an urban location with a large regional hospital including a specialist maternity care unit. Comparatively, Nsawam is a peri-urban city with a district hospital which also provides maternity care services. In the Eastern region, about 97% of pregnant women receive antenatal care services from skilled providers and about 77% give birth at health facilities with nearly 80% supervision from skilled birth attendants[7].

Study participants and sampling

We used in-depth interviews (IDIs) to obtain comprehensive knowledge on how women are treated during facility-based childbirth from health workers (Additional file 1: Appendix 1) and hospital administrators (Additional file 2: Appendix 2). The use of IDIs is considered one of the most powerful methods in gaining comprehensive understanding of people including personal experiences and perspectives and exploring relevant topics in depth[20]. Purposive sampling was employed to recruit the participants from their places of employment. The types of study participants included nurses/midwives, medical officers (doctors), and health administrators with different levels of experiences (e.g. both junior and senior staff).

Data collection

A total of twelve research assistants were trained to conduct the interviews, with six per study site. All research assistants were non-clinical health researchers, and had at least a bachelor's degree education, with experience in conducting qualitative interviews for research. Prior to the data collection, a training workshop was organized for all the research assistants, field supervisor and all the members of the research team and including training on study procedures to ensure consistency. During the training workshop, a mock interviewing exercise was organized for the research assistants to ensure consistency in the procedures for the data collection in both English and Twi (a local language). The interview guide was developed based on a systematic review of mistreatment of women during childbirth[3] and adapted after the pilot interviews.

Each interview was facilitated by two experienced research assistants, one who acted as a moderator and one as a note-taker. There was no prior relationship between the participants and interviewers, and no contact with the participants after the interviews were completed.

We conducted all interviews in either English or Twi and audio recorded. After each interview, immediate debriefing was carried out by the research assistants to document the comments and observation that emerged during the interview with incorporation of the field notes. On the average, each interview lasted between 45 to 60 min and all the interviews were undertaken in a private room at the participating hospitals. Recruitment of participants continued until no new themes emerged from the data (data saturation reached).

Data management and analysis

The interviewers transcribed all the audio recordings in English immediately after the interviews. The interviews conducted in Twi (a local language) were directly transcribed into English by the interviewers, shortly following the interviews. The completeness and

accuracy of the transcripts were cross-checked and confirmed by the social scientist and field supervisor in the research team. Prior to the data analysis, three-day workshop on qualitative data synthesis and analysis was organized and facilitated by our collaborating research team from WHO. The participants of the workshop included the research assistants and investigators comprising social scientists, public health physicians, obstetricians and the field supervisor as well the WHO research team. The inclusion of different investigators with relevant specialties provided appropriate reflexivity and improved the interpretation of the study findings. Reflexivity describes the researchers background (preconceptions) and positions which can influence the research in terms of the research question, data collection method, analysis, interpretation and communication of the findings[21].

In this study, the codebook for the analysis was developed by KAB and ET following identification of the major themes that emerged from iteratively reading the transcripts. This was necessary to ensure comprehensive familiarization with the transcripts and to appreciate the worldview of the respondents in terms of their individual perceptions of mistreatment of women during childbirth. Discrepancies in the coding process were discussed between KAB and ET until consensus was reached. The generated codes based on the major themes identified in the transcripts were then transferred into NVivo (QSR International (1999) NVivo Qualitative Data Analysis Software, Version 12.6.0 [Software]) which was used for the thematic analysis. The main qualitative analytic framework used in this study was the inductive approach which involves repeated reading of the transcripts resulting in the identification of the common themes discussed by the respondents[22]. Triangulation of the results was achieved by the case-mix involving the different health workers (nurses, midwives and doctors of varied experiences) and the hospital administrators from two study sites of different catchment areas (data source triangulation)[20]. Also, multiple research assistants and note takers (investigator triangulation) conducted the interviews and coding of the transcripts was undertaken by two different researchers. We validated the themes and results of the study with the research assistants and the note takers during the analysis workshop but not the study participants. This paper was reported according to the Consolidated criteria for reporting qualitative research (COREQ)[23].

Results

Thirty participants were invited to participate in the in-depth interviews, of which six declined due to their unavailability resulting in a total of 24 participants. Table 1 describes the sociodemographic characteristics of participants. In total, 9 midwives/nurses, 11 doctors and 4 administrators were interviewed. Majority of the respondents (18) were between the ages of 25–39 years, single (12) and female (14). Most respondents had been working in their respective health facilities for a period of 1–4 years.

The major themes on mistreatment during childbirth that emerged from the IDIs include the following:

1. General perception of women's satisfaction during childbirth
2. Support systems for women during childbirth
3. Occurrence of mistreatment of women during childbirth
4. Perceived factors that influence mistreatment during childbirth
5. Acceptability or rationalization of mistreatment during childbirth
6. Major challenges faced by health workers

Table 1. Sociodemographic characteristics of participants: healthcare providers

Variable	Nurse/midwives n=9	Doctors n=11	Administrators n=4
Age (years)			
30-39	6	11	1
40+	3	-	3
Marital status			
Single	3	5	4
Married	4	6	-
Widowed	2	-	-
Gender			
Female	9	3	2
Male	-	8	2
Years of practice at facility			
1-4	6	9	3
5-9	1	1	1
10+	2	1	-
Hospital			
Tertiary facility	5	7	1
Secondary facility 4		4	3

General perception of women's satisfaction during childbirth

Health workers had diverse responses regarding women's satisfaction with the childbirth services provided at their facilities. Some believed that women were satisfied with their care during birth, while others considered women's satisfaction as variable, depending on their experiences. Some respondents indicated that women who experienced standard quality of care were usually satisfied.

"I think that it's a two-way thing. Some of them think that …[they were] shouted at…that we actually don't give off our best. But there are some of them who also know what was going on. Some of them think that we are doing very well" (27 years, Medical officer).

"In general, I think they are treated well…. Childbirth is not easy, the pain alone can make someone forget that they are in labour or something and they use harsh words, so if you are not calm you may also use the same harsh words on them" (26 years, Midwife).

Health workers described their labour wards as busy environments. Some women travel longer distances to utilize their maternity services. The providers believed that women's willingness to travel long distances to access care was due to the high quality of care they provided compared to other facilities at lower levels of care.

"In our health facility I must confess that they are treated very well, but I wouldn't say that our midwives or staffs are angels. They are not, but with continuous quality assurance training, they do their best to make the women feel comfortable and that is why we get a lot of cases here. We get a lot of cases coming in from even Accra which is not our catchment area" (34 years, Medical officer).

Support systems for women during childbirth

Health workers described support to women during labour including physical, emotional and psychological elements. It included words of encouragement and gentle massage from providers, family or friends. The presence of a birth companion was identified as a way to relieve women's stress. Some respondents considered anxiety to be more common amongst women who had not given birth before, and that these women, in particular, need supportive care during childbirth.

"Support comes in a number of ways, we have the physical, we have the emotional and we have the psychological. For the patients who haven't delivered before, they don't even know how it is like to be in labour and go through the pain and deliver. They are also anxious. They will need a lot of support and that is how we come in to support them so with encouragement, trying to reduce their pain and then making them as comfortable as they can" (34 years, Medical officer).

"I think for labour support, one, for the woman having her relatives around either the husband, mother or sister, whoever she wants to be around is the number one way the woman feels supported because she feels she is not alone, she has somebody to lean on. Many women want to be pampered, want to be caressed, so at that time that she is in distress and there is somebody there who she thinks best understands her, I think it's best for her.". (32 years, Medical officer).

Occurrence of mistreatment of women during childbirth

Almost all participants had heard of women being mistreated during childbirth. They described instances of physical, verbal and emotional abuse by clinical staff towards women, as well as instances of denying women birth companions or preferred birthing position.

Physical abuse

Some respondents described situations where women were physically hit when they were unable to push during birth. Some health workers described instances where women were physically held down strongly with their legs apart, to prevent them from closing their legs when the baby was crowning, ostensibly to prevent birth asphyxia.

"Mostly, it's during the pushing time that those things happen because everyone is like very aggressive to just get the baby out. So sometimes it may happen that someone lashed her" (27 years, Medical officer).

Verbal abuse

The use of abusive words or shouting at women was described as a common occurrence, especially when women were in the second stage of labour. Health workers described instances where women are screamed at to facilitate birth of the baby, and instances where women were shouting at for not following instructions from clinical staff.

"The midwife was shouting at her. They ask her to lie down and she says she won't and she (the midwife) was shouting. As I said, formally a relative will tell you that I went to this particular midwife and she gave me some slaps, but nowadays we have stopped all these things" (59 years, Nurse).

Birthing positions

Most health workers stated that women usually give birth in the lithotomy position (lying on the back with legs flexed), which was the preferred position of providers. Some of the health workers indicated that women's birth positions are dependent on the discretion of the midwife who assists with the birth.

"Here we have only the lying, the lithotomy position, they lie down at the back and raise their legs" (36 years, Midwife)

"That one will go to the discretion of the midwife who is going to do the delivery if the position the woman prefers is not feasible in our setting or the midwife can't get access to guide you to deliver, then the midwife will definitely not allow you but if it is feasible then the midwife can allow you" (27 years, Medical officer).

Birth companions

Most women were not allowed to have a birth companion, because health workers considered that labor ward environments were already over-crowded and unable to accommodate them. In such environments, providers described limited privacy for individual women—for example, multiple women laboring in the same room. Majority of the health workers indicated that women might be permitted a birth companion if she is the only patient in the labor ward, but this hardly ever occurs due to over-crowding.

"In our facility, how our first stage room is, there are so many patients so we cannot allow other people to come and see other people' relatives, so we don't allow any relative inside, unless you are alone in that room, if there are no patients around and you are alone, we can allow your relative to come and see you" (36 years, Midwife).

Some health workers indicated that some women prefer to have birth companions including their husbands. However, the labour rooms in most health facilities are not designed to accommodate the presence of birth companions due to multiple women in labor occupying the same and limited space.

"Yes, they would have wished, especially if their husband were around but you realize that this place is not like abroad" (57 years, Health Administrator)

Lack privacy for women during childbirth

Inadequate privacy for women during labour in health facilities was a major recurring theme that emerged from the health workers' narratives. Lack of privacy was a major form of mistreatment and nearly all the health workers were emphatic about this deficiency or limitation in the health care delivery.

"Talking about privacy, it is not adequate for the women who comes to the hospital to deliver at the labor ward. For instance, in our first stage room we have six beds and they are all lined up so when there is the need to do something for the women, sometimes if you don't have enough screens. There is no privacy that the woman would have" (51 years, Health Administrator).

Perceived factors that influence mistreatment during childbirth

Health workers identified some factors contributing to mistreatment in their health facilities. These include lack of supplies, limited staff capacity, health facility policies and infrastructure and the women's attitude.

Limited staff capacity

Participants generally agreed that there were inadequate numbers of staff on their wards resulting in overwhelming clinical workload. This led to additional stress on providers, affecting how they treated women. Staff become exhausted, irritable or frustrated, and consequently shout at women or ignore them if they are perceived as e uncooperative. This situation may be worsened when multiple women present at different stages of labor, or when only one or two midwives are on duty.

"Well, I think principally, I will say it is because of the workload. The number of midwives in this hospital basically is about 25 and you deliver…about 3,000 women in 6 months. So, the pressure of work is there. And at times you will come in the night and there is only one midwife on duty" (39 years, Hospital administrator).

Health facility policies and infrastructure

On the whole, health workers did not feel that the infrastructure influenced the occurrence of mistreatment. However, some doctors felt overworked by 24-h shifts, which negatively affected the quality of care they provided to the birthing women. The lack of a 24-h on-site pharmacy was also noted as a major challenge, as it required midwives to travel to obtain medications.

Perception of women's non-compliance with instructions

According to the health workers, another major factor that influenced mistreatment was the behavior of the women. They believed that women were not compliant with instructions, inability to push during the second stage of labor and lack of co-operation sometimes provoke some of the health workers resulting in some forms of mistreatment.

"There are some patients who are called bad patients or difficult patients when you tell them do this, it's always the opposite irrespective of how you communicated well to them or how well you are treating them, there are always bad nuts who will come and cause problems" (27 years, Medical officer).

"Basically, as a health worker you should tolerate all the attitudes that are thrown at you. But every human being will break at a point especially if you don't get the cooperation of others" (31 years, Medical officer).

When women were viewed as non-compliant, then health workers justified the use of force as appropriate, rather than communication and encouragement. However, the preferences, needs and concerns of the women need to be incorporated or considered in this complex phenomenon of non-compliance to clinical instructions.

"She just wasn't cooperative. I mean if you have a woman who wouldn't let you listen to the fetal heart, you can imagine how frustrating it will be for you as a clinician because you are yearning to have a live baby and a well mother and you can't monitor the fetal heart then you become a bit frustrated" (33 years, Medical officer).

Acceptability or non-acceptability of different types of mistreatment

Most health workers stated that the acts of mistreatment are unacceptable and should not be practiced except when the act like shouting and beatings are used to prevent childbirth complications. Most participants strongly disagreed that pinching or slapping women was appropriate, although a few health workers together believed these acts were acceptable, if used to encourage women to cooperate.

"I don't think under any normal circumstances should you slap or pinch someone during delivery. Because, we all know that labor is associated with pain and once someone is in pain she can say or do anything so you shouldn't be provoked by the words she says or whatever she does. Yours is to encourage her to do whatever you need her to do" (26 years, Midwife).

"For pinching, I think it is okay because at times when you call their relatives, they will tell you that madam 'wo nbo no nma me' [madam won't you beat her for me], the mother will come and be beating them" (37 years, Midwife).

Physically restraining the woman, holding her down, and shouting or yelling at the woman were also considered unacceptable by most health workers. They emphasized the need for health workers to speak calmly with the women since their seemingly unacceptable behaviors are expected because of the pain they might be going through. On the other hand, the minority argued that it could be acceptable to prevent adverse neonatal outcomes.

"In my opinion, I will say yes it can be acceptable—though it is not right—but it can be acceptable in order to prevent the mother from losing the baby. Because sometimes they might not know the seriousness in what they are doing or how far their actions may affect the results of the baby" (28 years, Midwife).

"At times the head will be stuck in the vagina; we asked them to push and they refuse by telling you they can't push, meanwhile, we can't do anything for you at that point. She will go blaming it on the midwife, saying the midwife killed her baby instead of blaming herself for not pushing, so you pinch her, with that pain she will push, so at times it's acceptable (36 years, Midwife).

Major challenges faced by health workers

Inadequate staffing, lack of equipment and logistics were identified by the health workers as the most challenging aspects of their work. Some indicated that excessive workload results in stressful situations and some experience severe headaches. Some respondents described situations when they become extremely frustrated and vulnerable because of unavailability of the needed equipment and logistics, and inadequate staff.

"Most challenging is when you come to work and you feel there are inadequate staff…like two staff against forty-five patients and you have emergency coming in, you feel stressed out, you get this headache, you feel very bad" (26 years, Midwife).

The study participants suggested that increasing the number of staff and health facilities, retraining of health workers and educating the women about labor and their what to expect could improve the quality of care. Regular short duration courses or workshops for the health workers was considered as an important step in minimizing the occurrence of mistreatment of women at health facilities.

"In my opinion, I think this place is already a friendly place for them, so what we can do to help is that we increase the number of staff working so that everybody can work happily without getting over worked and displacing their anger on any patient. Also, the patient should know what to expect before they even come to the hospital" (27 years, Medical officer).

"I will say in-service training is another important tool in the management of all sector health workers. So, in-service training first and then a sort of motivation for hard work…. you will reward hard work. Citations for the wards in general and then individuals who excel" (51 years, Health Administrator).

Also, motivation of the health workers for hard work was considered as a means on improving the work output in addition to provision of adequate logistics. Staff motivation may encourage the health workers to put up their best performance which may result in respectful maternity care.

"I think the basic thing that the health workers need from the hospital is availability of logistics and motivation. When I say motivation, it comes in various forms. Even getting up and going to

the ward and just greeting them and encouraging them is enough motivation" (39 years, Health Administrator).

Discussion

This paper gives important insights into health workers' and hospital administrators' perspectives about mistreatment of women during childbirth in health facilities in Ghana. The health workers reported mixed feelings regarding the quality of care experienced by women during childbirth. Generally, the participants were aware of the occurrence of mistreatment during childbirth, with specific mentions of physical abuse and verbal abuse. Common presentations of mistreatment reported by participants include slapping, forceful physical restraint, verbal abuse, denial of preferred birthing position and denial of birth companion. The major factors participants associated with mistreatment were limited staff capacity, high workloads and seeming perceptions of women not complying with clinical requests. There were mixed responses regarding the acceptability of mistreatment during childbirth although majority were against it. Increasing staff strength, number of health facilities, refresher training for health workers and adequate education of the women on what to expect in labour were proposed as measures to minimize mistreatment of women.

Previous literature showed that, women will consciously change their health facility and will not recommend it to others if they experience humiliating and intolerable behavior during childbirth[24]. Also, some women prefer to give birth at home because of the harsh treatment they receive from midwives at health facilities[6,13,25]. Generally, women are more likely to return for medical care in health facilities where health workers treat them well including respectful care[26]. On the other hand, some women might still access facilities they are not satisfied with simply because they have no alternatives. The perspectives of health workers in our study are consistent with the experiences of mistreatment described by women in Ghana in our previous research[6]. Surprisingly, some health workers do not consider these acts as mistreatment. They argue that, such actions serve to encourage cooperation and compliance from the women to enable favorable birth outcomes. This language around "women's compliance" with clinical requests seems to place responsibility for poor treatment as the woman's fault and aligns with other research on mistreatment against women. It also represents an important entry point for training providers on how to cope with stressful work environments and high workloads, while still providing woman-centered care.

Similarly, most of the women are usually denied their preferred birthing position[26-30] and compelled to deliver in the birth positions preferred by the midwives. Anecdotal information

indicates that, the denial of women's preferred birth positions, stems from the fact that the health workers lack expertise in conducting deliveries in other birthing positions apart from the supine or lithotomy position. More research is needed to explore how health workers in low resource settings can be trained to support women to give birth in more empowering positions of their choice.

In addition, birth companions can lead to better health and birth outcomes for women, including reduced rates of caesarean section, and better birth experiences[26,28-32]. However, most women in Ghana do not have access to birth companionship. In this study, lack of privacy and birth companions during childbirth were attributed to the restrictive nature of the labour wards and high caseloads. In most instances, there are several labouring women in one labour room which precludes the needed privacy or birth companions. Thus, the labour wards may need redesigning or the use of curtains to provide privacy which may also allow for the presence of birth companions.

The challenge of mistreatment of women remains pervasive in the subregion and various manifestations of disrespectful care have been described such as verbal abuse, physical abuse, ineffective communication, discrimination and neglect[3,33]. In South Africa, neglect is considered the most prevalent type of mistreatment and has been associated with inequality in healthcare access and utilization[34]. Persistence of this public health issue requires concerted regional and local interventions at multiple levels to address the menace including political will and appropriate institutional policies[35]. For instance, health workers in Kenya described the drivers of mistreatment of women including suboptimal supervision, demotivation and unavailability of relevant medical equipment and supplies[33]. Mistreatment of women during childbirth is considered a subset of violence against women which usually originates from structural gender inequality[35]. It is important to emphasize that mistreatment of women during childbirth is a longstanding obstetric phenomenon[36] and remains detrimental to achieving respectful maternity care[11]. Our study findings highlight the perpetuation of this obstetric violence in the subregion with a potential of disincentivizing women in seeking care at health facilities in their future maternities.

The persistence of mistreatment in health facilities and health system-related challenges, calls for improvement in the existing healthcare policies. Unsupportive working environment needs retooling to minimize intrinsic challenges such as inadequate staff number, high workload, unavailability of equipment/tools and long working hours. Training of staff and educating the women about labor and the expected outcomes are suggested recommendations to improve maternal care[37,38]. Health facilities require re-designing to allow for birth companionship since their presence provide adequate psychological support to the laboring women.

Strengths and limitations

The main strength of this study relates to it being part of a larger WHO multi-country research to develop consensus definition of mistreatment during childbirth and develop and validate tools for measuring disrespectful maternity care. Although the women's perspectives on the subject have been published earlier, the corresponding views from the health workers are critical in preventing mistreatment and promoting respective maternity care. This study adequately utilized appropriate triangulation in the data collection (data source triangulation), transcription and analysis of the data. The use of research assistants experienced in qualitative interviews reduced the level of bias. To improve the validity of the findings, the issue of reflexivity was considered at various stages of the study including framing of the research question, data collection, analysis and interpretation via the inclusion multiple researchers of different but related medical fields[21].

The main limitation is that the study was conducted in only one geographical region of Ghana, and results may not be transferable to other settings. Also, the responses presented in this study do not include the actual experiences of mistreatment by the women themselves, which have been presented in a separate analysis[6]. Although this study has some recognizable limitations, the findings are significant collectively as evidence-base support in devising appropriate consensus-based criteria in measuring mistreatment of women during childbirth. Our research team included people with different training, expertise, and experiences, and these complementary backgrounds helped us to refine the research questions, design the methodology, and conduct thorough analysis. The convergence of multiple researchers with different reflexivity potentials strengthens the research, as we were able to both supplement and contest each other's opinion.

Conclusion

Women experience different forms of mistreatment during childbirth at health facilities with the common ones being physical and verbal abuse. The main rationale for mistreatment of women during childbirth, as perceived by the health workers, includes inadequate number of health professionals, unavailability of logistics, high patient load and non-compliance on the part of the women. Mistreatment of women was considered important in some clinical situation to prevent adverse birth outcomes and this indicates inadequate understanding of the clinical impact of mistreatment of women during childbirth. We recommend appropriate locally acceptable steps for integration and implementation of evidence based measures to mitigate the burden of mistreatment in the country. Further research on implementation of evidence-based interventions to minimize mistreatment of women during childbirth

is globally recommended to enhance positive intrapartum experience and respectful maternity care.

Abbreviations

COREQ: Consolidated Criteria for Reporting Qualitative Research; ERC: Ethical Review Committee; GHS: Ghana Health Service; HRP: Human Reproduction Programme; RMC: Respectful Maternity Care; WHO: World Health Organization.

Supplementary Information

The online version contains supplementary material available at https:// doi.org/10.1186/s12978-022-01372-3.

Additional file 1: Appendix 1. In-depth interview guide for healthcare providers.

Additional file 2: Appendix 2. In-depth interview guide for hospital administrators.

Acknowledgements

The authors grateful to Drs. Kofi Ablorh and Kwame Anim-Boamah as well as all the research assistants for their immense assistance in the data collection. We also, thank Dr. Phyllis Dako-Gyeke (Social scientist) for her active supervision in the data collection. Finally, we express our appreciation to the healthcare professional and the hospital administrators who consented and took part in this study.

Authors' contributions

KAB, MAB and OT designed the study with input from EM and JV. KAB, EM, JV, OT and MAB conducted data collection and management. KAB and ET led the analysis with input from all authors. All authors read and approved the final manuscript.

Funding

This project received funding support from the United States Agency for International Development (USAID) and the UNDP/UNFPA/UNICEF/WHO/ World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP), Department of Reproductive Health and Research, World Health Organization. This article is the sole responsibility of the authors. The funders had no contribution into the study design, data collection, analysis, decision to publish and preparation of the manuscript.

Availability of data and materials

The full transcripts for this qualitative study are available upon request from the corresponding author.

Declarations

Ethics approval and consent to participate

This study was approved by the World Health Organization Ethical Review Committee (protocol ID: A65880) and the World Health Organization Human Reproduction Programme (HRP) Review Panel on Research Projects (RP2). This study protocol was also approved by the Ghana Health Service Ethical Review Committee (protocol ID: GHS-ERC:1301/15). All the study participants provided written informed consent prior to data collection and strict confidentiality of information provided was assured. In the process of the IDIs, no identifiable participant information was collected to ensure complete anonymity.

Consent for publication

Not applicable

Competing interests

The authors declare no competing interests

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Received: 16 April 2021 Accepted: 23 February 2022
Published online:29 March 2022

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Supplementary Material

Appendix 1

In-depth interview guide for healthcare providers

Step 1: Introduce yourself to the participant. Describe the purpose of the interview and how information will be used. Obtain written consent.

Step 2: Ask the participant to identify her/himself and fill out the table below on sociodemographic information prior to beginning the interview.

Step 3: Conduct the interview. Please remember to audio record the interview.

Step 4: Complete the form at the end of the interview guide.

Participant #	**Age group** (circle)	**Sex** (circle)	**Cadre and position** (write in)	**Total years of service** (circle)	**Years of service in current facility** (circle)
Participant	<30 30-45 >45	Female Male		< 1 year 1 – 5 years > 5 years	< 1 year 1 – 5 years > 5 years

Start time: : **Interviewer ID __ __ __ __**

Interview date: __ __/__ __/_

DD / MM / YY

Interview discussion guide

A. Perceived decision-making process and expectations for women to deliver at a facility

Please take a moment to think about your work on the labor and delivery ward and your patients.

1. In your opinion, why do women seek care at facilities during delivery?
2. In your opinion, how is the decision made for women to seek care at facilities during delivery?
3. In your opinion, what do patients EXPECT when they seek care at the facility for childbirth? Please explain.
4. What do you think patients NEED when they seek care at the facility for childbirth? Please explain.

B. Elements of respectful care during childbirth

5. In your opinion, how are women treated by staff [administrators, nurses/midwives, physicians] in the facility when they come to deliver [from admission to discharge]?

a. In your opinion, how should they be treated, if different than what you described?

C. Elements of disrespect and abuse to inform the development of the identification criteria, including involved parties, timing and frequency of disrespectful or abusive care

Please take a moment to think about a time when a woman was mistreated or poorly treated by a coworker during labor and delivery.

6. Could you tell me about this situation when a woman was mistreated by a coworker during labor and delivery.
   a. Explain the situation.
   b. Who was involved in the situation?
   c. How was the woman mistreated?
   d. When did it happen? [Probe: time of day, during labor, during delivery or postpartum].
   e. How often did it happen? [Probe: just once or more than often].

*** If the participant describes a situation related to either verbal mistreatment, physical mistreatment, or poor communication between the patient and provider, then probe the following accordingly:

Verbal mistreatment:	**Physical mistreatment:**	**Poor communication between the patient and provider:**
Did the provider raise his/her voice to the woman?	Did that include pinching?	Were there any problems with the language of communication?
What types of comments were made?	Did that include slapping?	If so, was a translator available?
Were these comments made to threaten the woman with poor outcomes?	Did that include beating?	Was the poor communication related to lack of consent for a test or procedure?
Were these comments judgmental/ derogatory in nature?	Did that include kicking?	
Were these comments based on the woman's age or her number of children?	Did that include hitting?	
Did the provider place blame on the woman for getting pregnant?		

7. In your opinion, how common is the situation that you described? [Probe: do situations like this happen often?]

Now I would like to ask your opinion on the treatment of women during labor and delivery.

8. Are there any situations where it would be acceptable for a provider to pinch or slap a woman during delivery? Please explain.

9. Are there any situations where it would be acceptable for a provider to not ask for the patient's consent before a test or procedure when the patient is conscious? Please explain.
10. Are there any situations where it would be acceptable for a provider to tell the woman she will have a poor outcome if she does not cooperate? Please explain.
11. In your opinion, what could be done to improve the treatment of women during labor and delivery?

D. Perceived factors that influence disrespect and abuse in the facilities

12. In your opinion, what are the factors that influence the mistreatment of women during labor and delivery? Please explain. Probe:
    a. Related to supplies (availability of medication, equipment)
    b. Related to health provider staffing (number of staff, attitude towards patients)
    c. Related to patient load (number of patients, overcrowding)
    d. Related to your health facility (policies, infrastructure, services)
13. In your opinion, what could be done to address these factors so that women are treated better during labor and delivery?

E. How staff are treated (*remind participant that all responses will be confidential and their responses will not impact their job in any way).*

14. Do you have a mentor at work? (Probe: if yes, ask participant to elaborate on the relationship with the mentor. If no, ask if there is anyone at work who they go to for work-related advice?).
15. Could you please describe for me what the relationship that you have with your supervisor is like? (Probe: what is the job title of your supervisor?)
16. Do you feel that your supervisor supports you in your work responsibilities? Please explain (probe: could you tell me about a time when your supervisor supported you? Could you tell me about a time when your supervisor did not support you?
17. Could you please describe for me what the relationship that you have with your peers is like? (Probe: do you feel supported by your peers? If you are struggling to meet the demands of your work, can you look to your peers for help?).
18. Overall, do you feel that your work environment is supportive? Please explain.
19. How do you feel your training prepared you for your current position?

When the interview appears to have finished, ask participant if there is anything that you have misunderstood or that they would like to add.

Thank the participant for his/her time. Remind them that the information will be kept confidential.

End time ☐☐ : ☐☐

Appendix 2

In-depth interview guide for hospital administrators

Step 1: Introduce yourself to the participant. Describe the purpose of the interview and how information will be used. Obtain written consent.

Step 2: Ask the participant to identify her/himself and fill out the table below on sociodemographic information prior to beginning the interview.

Step 3: Conduct the interview. Please remember to audio record the interview.

Step 4: Complete the form at the end of the interview guide.

Participant #	**Age group** (circle)	**Sex** (circle)	**Position** (write in)	**Total years of service** (circle)	**Years of service in current facility** (circle)
Participant	<30 30-45 >45	Female Male		< 1 year 1 – 5 years > 5 years	< 1 year 1 – 5 years > 5 years

Start time: :

Interviewer ID __ __ __ __

Interview date: __ __/__ __/__ _

DD / MM / YY

Key informant interview guide

A. Perceived factors that influence disrespect and abuse in the facilities

Sometimes women are mistreated during childbirth by providers and staff at health facilities. This mistreatment may take several different forms. I would like to discuss the factors that influence this type of mistreatment with you.

20. In your opinion, what are the factors that influence the mistreatment of women during labor and delivery? Please explain. Probe:
    a. Related to supplies (availability of medication, equipment)
    b. Related to health provider staffing (number of staff, attitude towards patients)
    c. Related to patient load (number of patients, overcrowding)
    d. Related to policies in your facility
    e. Other factors at a health facility level
    f. Other factors at a health system level
21. What could be done to address these factors so that women are treated better during labor and delivery?
    a. From a facility administration perspective?
    b. From a larger health system perspective?

B. How staff are treated (*remind participant that all responses will be confidential and their responses will not impact their job in any way).*

1. Do you have a mentor at work? (Probe: if yes, ask participant to elaborate on the relationship with the mentor. If no, ask if there is anyone at work who they go to for work-related advice?).
2. Could you please describe for me what the relationship that you have with your supervisor is like? (Probe: what is the job title of your supervisor?)
3. Do you feel that your supervisor supports you in your work responsibilities? Please explain (probe: could you tell me about a time when your supervisor supported you? Could you tell me about a time when your supervisor did not support you?
4. Could you please describe for me what the relationship that you have with the doctors, nurses and midwives in your facility is like?
5. Overall, do you feel that your work environment is supportive? Please explain.
6. How do you feel your training prepared you for your current position?

When the interview appears to have finished, ask participant if there is anything that you have misunderstood or that they would like to add.

Thank the participant for his/her time. Remind them that the information will be kept confidential.

End time ☐☐ : ☐☐

Chapter 8

Vaginal examinations and mistreatment of women during facility-based childbirth in health facilities: secondary analysis of labour observations in Ghana, Guinea and Nigeria

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BMJ Global Health. 2022; 5(Suppl 2):e006640

Abstract

Background

Previous research on mistreatment of women during childbirth has focused on physical and verbal abuse, neglect and stigmatisation. However, other manifestations of mistreatment, such as during vaginal examinations, are relatively underexplored. This study explores four types of mistreatment of women during vaginal examinations: (1) non-consented care, (2) sharing of private information, (3) exposure of genitalia and (4) exposure of breasts.

Methods

A secondary analysis of data from the WHO multicountry study 'How Women Are Treated During Childbirth' was conducted. The study used direct, continuous labour observations of women giving birth in facilities in Ghana, Guinea and Nigeria. Descriptive and multivariable logistic regression analyses were used to describe the different types of mistreatment of women during vaginal examinations and associated privacy measures (ie, availability of curtains).

Results

Of the 2016 women observed, 1430 (70.9%) underwent any vaginal examination. Across all vaginal examinations, 842/1430 (58.9%) women were observed to receive non-consented care; 233/1430 (16.4%) women had their private information shared; 397/1430 (27.8%) women had their genitalia exposed; and 356/1430 (24.9%) had their breasts exposed. The observed prevalence of mistreatment during vaginal examinations varied across countries. There were country-level differences in the association between absence of privacy measures and mistreatment. Absence of privacy measures was associated with sharing of private information (Ghana: adjusted OR (AOR) 3.8, 95% CI 1.6 to 8.9; Nigeria: AOR 4.9, 95% CI 1.9 to 12.7), genitalia exposure (Ghana: AOR 6.7, 95% CI 2.9 to 14.9; Nigeria: AOR 6.5, 95% CI 2.9 to 14.5), breast exposure (Ghana: AOR 5.9, 95% CI 2.8 to 12.9; Nigeria: AOR 2.7, 95% CI 1.3 to 5.9) and non-consented vaginal examination (Ghana: AOR 2.5, 95% CI 1.4 to 4.7; Guinea: AOR 0.21, 95% CI 0.12 to 0.38).

Conclusion

Our results highlight the need to ensure better communication and consent processes for vaginal examination during childbirth. In some settings, measures such as availability of curtains were helpful to reduce women's exposure and sharing of private information, but context-specific interventions will be required to achieve respectful maternity care globally.

KEY QUESTIONS

What is already known?

- Most studies on mistreatment of women during childbirth have reported measures related to physical abuse, verbal abuse, neglect, and stigma and discrimination.
- There is limited and varied evidence using empirical data to explore manifestations of different types of mistreatment during the vaginal examinations, which are a particularly sensitive time for women giving birth.

What are the new findings?

- Using a standardised labour observation tool across three countries, we provide evidence that women are experiencing different forms of mistreatment across any vaginal examinations including 1) non-consented care, 2) sharing of private information, 3) exposure of genitalia and 4) exposure of breasts.
- Non-consented care was common across all countries during vaginal examinations. We also found that the other forms of mistreatment (sharing of private information, exposure of genitalia breasts) were associated with an absence of privacy measures such as availability of curtains and, it varied depending on the country.

What do the new findings imply?

- Across all vaginal examinations and countries, three out of five women were observed to receive non-consented care.
- Our study shows the importance of how privacy measures can be important in promoting respectful maternity care, particularly women's rights to privacy and confidentiality.
- At the interpersonal level, education and counselling on vaginal examinations as part of routine antenatal care may help women prepare for what to expect during childbirth.
- At the health system level, enabling environments to support health care workers, including appropriate continuing education/training, supervision, and supportive policies are needed to promote respectful care.

Background

Women's experiences of mistreatment during childbirth in health facilities is a major public health issue globally.[1-3] The WHO declared that 'every woman has the right to the highest attainable standard of health, which includes the right to dignified, respectful healthcare'.[4] This statement emerged following growing evidence that mistreatment of women during childbirth is associated with unacceptable short-term and long-term adverse effects on maternal health, including future reluctance to seek facility-based care and violations of women's rights to care.[5-7] Moreover, the 2018 WHO intrapartum care guideline recommends respectful maternity care for all women, including effective communication, companionship during labour and birth, maintenance of privacy and confidentiality, freedom from harm and mistreatment, and informed choice.[3]

Most studies on mistreatment of women have reported measures related to verbal abuse, physical abuse, neglect, stigma and discrimination.[8-10] However, other manifestations of mistreatment, such as during vaginal examinations, are relatively underexplored. Previous studies have reported that women experience psychologically traumatic vaginal examinations, although the extent of its occurrence and effect on childbirth has not been extensively studied.[11,12] In a recent WHO study, more than half of women reported an uncomfortable experience of vaginal examination while being admitted for childbirth, with about 60% not being informed or consenting to being examined.[13] Negative experiences during vaginal examinations have likewise been reported in South Africa and Tanzania.[14,15] Mistreatment during vaginal examination is not limited to low-income and middle-income countries.[1] For instance, de Klerk et al reported women's experiences of painful, insensitive and disrespectful vaginal examinations by healthcare professionals in the Netherlands.[16]

Vaginal examination during labour is an important clinical assessment used to determine the progress of labour by assessing cervical dilation and relevant fetal parameters. WHO recommends that in healthy low-risk women, vaginal examination should be performed at intervals of every 4 hours for routine assessment of active first stage of labour, with the recommendation remarks specifying that priority should be given to restricting the frequency and total number of examinations, as well as limiting the number of caregivers conducting the examinations.[17] Given the inherently sensitive and invasive nature of vaginal examinations, it is critical to obtain informed consent and permission from the woman prior to conducting the examination and to communicate clearly the findings of the examination to her using a language that she understands.

Despite their usefulness in assessing progression of labour, vaginal examinations can be viewed or experienced negatively by women.[11,17,18] This may be particularly true for

women giving birth for the first time or women who may not have benefited from clear communication about when and why vaginal examinations are needed. This can result in women feeling powerless or experiencing severe pain and discomfort.[11] For instance, a study in Palestine reported that women undergoing vaginal examinations felt they were treated insensitively by health professionals and that the process lacked privacy, respect and dignity.[19] Similarly, a recent study in Kenya found that inappropriate professional standards of care were characterised by lack of informed consent prior to vaginal examinations, frequent examinations and lack of privacy during examinations.[20] These negative experiences of vaginal examinations can result in women feeling embarrassed, physically traumatised, without communication, and lacking trust, dignity and respect.[21] More recently, similar sentiments and experiences have been reported in other countries including the Netherlands,[16] Iran[22] and Turkey.[23]

The objective of this study was to assess the determinants of mistreatment of women during vaginal examination in Ghana, Guinea and Nigeria using data collected through direct continuous observation of women during facility-based childbirth.

Methods

Study design and participation

This study is a secondary analysis of data that were collected for a larger cross-sectional study designed to develop and validate two tools (community survey and labour observation tools) to measure the mistreatment of women during childbirth in health facilities. The protocols for the formative phase and methodological development of these tools are available,[24,25] and the methods and results of the primary analysis have been published.[13] Briefly, in each country, three facilities were purposively selected based on the following inclusion criteria[15]: (1) facilities not included in the formative phase of developing these tools; (2) secondary-level facility or higher; (3) ≥200 births per month; and (4) well-defined community catchment area. This analysis used data collected from the labour observations, which were conducted in Ghana, Guinea and Nigeria.

Data collection and management

Participants

Women were eligible for labour observations if they were admitted to the participating health facilities for childbirth in early established or active labour (<6 cm cervical dilation), were ≥15 years, willing and able to participate, and provided written informed consent.[13] All

labour observations were continuous, one-to-one observations of women by independent data collectors from admission, throughout labour and childbirth, until 2 hours postpartum. Data collection took place 24 hours/day, 7 days/week. Data were collected using digital, tablet-based tools with built-in quality checks and validation rules (BLU Studio XL2, Android; BLU Products, Miami, Florida, USA). Data were submitted securely to a central database (WHO, Geneva) using a 3G cellular connection or wireless Internet.

Measurement tool

The labour observation tool was developed using an iterative mixed-methods approach which is described in detail elsewhere.[24,25] In short, the tool consisted of (1) an admission form; (2) an incident report form; and (3) a childbirth, interventions and discharge form. The admission form was completed once (immediately after enrolment) for all women and included screening questions and sociodemographic information. The incident report form was completed if, and only if, one of the following events occurred: physical abuse, verbal abuse, stigma and discrimination, or a vaginal examination, and could be completed and submitted multiple times (ie, repeating data collection for multiple events). For instances of vaginal examination, the form captured information about whether the sharing of private information, consent, privacy and confidentiality were observed or not, and were reported as 'incidents' because multiple vaginal examinations can occur throughout a woman's labour.[24] The childbirth, interventions and discharge forms were completed once at the end of the observation for all women and included pain relief, mobilisation, fluids, companionship, fees, neglect, privacy, health outcomes and interventions.

Outcome and predictor variables

In this analysis, the outcome of interest was mistreatment of women during vaginal examination and consisted of four key variables: (1) non-consented vaginal examination (the staff did not provide prior information or obtain permission or both); (2) breast exposure during vaginal examination (vaginal examination was conducted in a way that other patients, visitors or non-medical staff could see the woman's breasts); (3) genitalia exposure during vaginal examination (vaginal examination was conducted in a way that other patients, visitors, non-medical staff could see the woman's genitalia); and (4) private information shared during vaginal examination (defined as 'a woman's private health information was shared in a way that other non-medical staff, visitors, patients or non-consented family members could hear'). The independent variables of interest were women's characteristics (sociodemographic and obstetric) and availability of curtains during labour (eg, to maintain privacy, as it was standard practice in the study settings for two or more women to be managed in the same room during labour and birth).

Data analysis

Descriptive analyses and χ2 tests of associations were conducted to assess sociodemographic characteristics, obstetric characteristics and whether women experienced a vaginal examination. We examined the differences between mistreatment of women during vaginal examination across all examinations (n=1430). Additionally, we explored multiple examinations to investigate how mistreatment might differ for subsequent vaginal examinations, by considering women at their first vaginal exam (n=1430), at their second vaginal examination (among women who received at least two examinations (n=839) and at their third vaginal examination (among women who received at least three examinations (n=419) by country (online supplemental annex 1).

In the primary analysis of these data, we found that women who reported no use of privacy measures (eg, curtains) during labour and childbirth were more likely to report lack of privacy during vaginal examination compared to women with privacy measures.[13] We therefore hypothesised for this analysis that the absence of privacy measures may be associated with different types of mistreatment during vaginal examinations specifically. As such, multivariable logistic regression models were fitted to evaluate the association between women's characteristics, availability of curtains during labour and the mistreatment of women during vaginal examination using four variables of interest: non-consented care, genitalia exposure, breast exposure and private information shared. Due to the presence of effect modification by country, models were stratified by country. All models were adjusted for maternal age, education and marital status. Data were analysed using SAS V.9.4.

Patient and public involvement

A technical consultation with representatives from advocacy groups, non-governmental organisations, research organisations, universities, professional associations, and United Nations agencies was held at the WHO in November 2013, which informed the design of the multicountry study. Women who recently gave birth were involved in content validity testing and providing feedback on the validity testing of the community survey tool, which was harmonised with the labour observation tool for comparability.

Results

Figure 1 describes the number of vaginal examinations experienced by women. There were 2016 women across the three countries in the study (Ghana: n=926, Guinea: n=682 and Nigeria: n=408). Among the 2016 women, 586 (29.1%) women did not experience any vaginal examination during the observation period. Of the 2016 women, 1430 (70.9%) experienced at least one vaginal examination; 839 (41.6%) experienced at least two

examinations; 419 (20.8%) experienced at least three examinations; 201 (9.9%) experienced at least four examinations; and 80 (3.9%) experienced five examinations.

Table 1 shows the sociodemographic and obstetric characteristics of women, stratified by experience of vaginal examination. Overall, women who did not experience vaginal examinations during the labour observation were younger, had no education and had a lower number of previous births. Among women who experienced a vaginal examination, 785/1430 (55.2%) were observed to have an absence of curtains during labour, whereas among women who did not experience a vaginal examination, this was 240/586 (40.9%). The median duration of observation was similar for women who experienced a vaginal examination (5.5 (range 3.9–8.5) hours), and who did not (4.8 (range 3.6–6.8) hours).

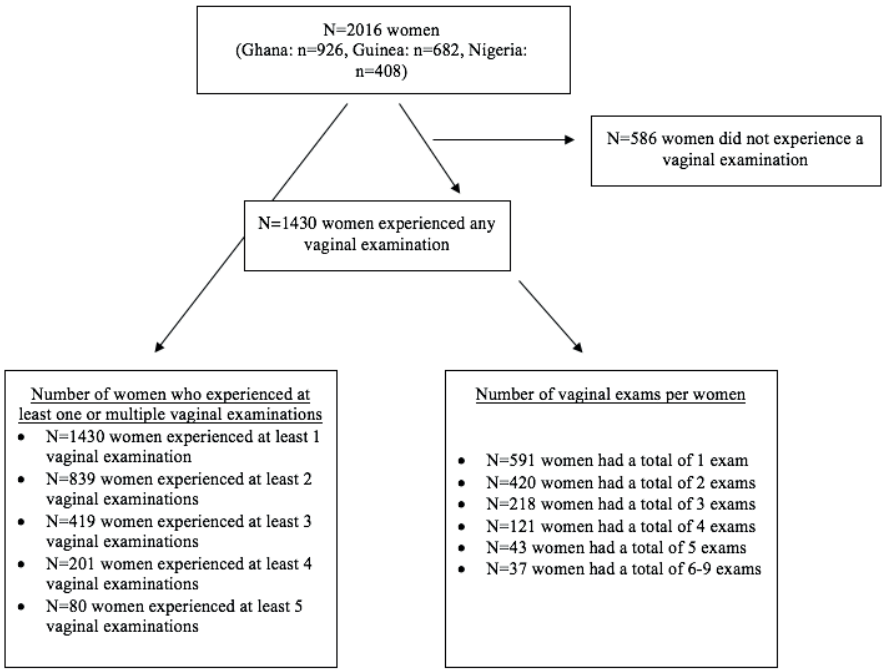

Figure 1. Flow diagram of vaginal examinations across study sample

Table 1. Sociodemographic and obstetric characteristics of women by experience of vaginal examination

	Experience one or more vaginal examinations (n=1430)	Did not experience a vaginal examination (n=586)	Total (n=2016)
	n (%)	n (%)	n (%)
Maternal age*			
15-19	159 (11.1)	115 (19.6)	274 (13.6)
20-29	705 (49.3)	304 (51.9)	1009 (50.1)
≥30	566 (39.6)	167 (28.5)	733 (36.4)
Marital status			
Single	136 (9.5)	69 (11.8)	205 (10.2)
Currently married/Co-habitating	1251 (87.5)	505 (86.2)	1756 (87.1)
Other	43 (3.0)	12 (2.0)	55 (2.7)
Education*			
No education	199 (13.9)	172 (29.4)	371 (18.4)
Some primary	134 (9.4)	80 (13.7)	214 (10.6)
Some secondary	389 (27.2)	128 (21.8)	517 (25.6)
Complete Secondary	396 (27.7)	130 (22.2)	526 (26.1)
Complete Tertiary	273 (19.1)	57 (9.7)	330 (16.4)
Vocational/Other/ Unknown	39 (2.7)	19 (3.2)	58 (2.9)
Number of previous births (index included)			
1	525 (36.7)	220 (37.5)	745 (36.9)
2	378 (26.4)	138 (23.6)	516 (25.6)
3	244 (17.1)	84 (14.3)	328 (16.3)
4	275 (19.2)	143 (24.4)	418 (20.7)
Unknown	8 (0.6)	1 (0.2)	9 (0.5)
Curtains during labour			
Yes	789 (55.2)	325 (55.5)	1114 (53.3)
No	593 (41.5)	240 (41.0)	833 (41.3)
Unknown	48 (3.4)	21 (3.6)	69 (3.4)
Duration of observation			
Mean (SD) in hours	6.7 (6.1)	5.2 (5.8)	6.3 (6.0)
Median (IQR) in hours	5.5 (3.9, 8.5)	4.8 (3.6, 6.8)	5.2 (3.8, 8.0)
Mode of birth			
Vaginal birth	1189 (83.1)	491 (83.8)	1680 (83.3)
Caesarean birth	190 (13.3)	71 (12.1)	261 (12.9)
Other/unknown	51 (3.6)	24 (4.1)	75 (3.7)
Birth companion*			
Yes	112 (7.8)	14 (2.4)	126 (6.2)
No	1318 (92.2)	572 (97.6)	1890 (93.8)

*p-value <0.005 IQR,
Interquartile range; SD, Standard Deviation.

Figure 2 shows the different types of mistreatment across any vaginal examinations. Women's experience of non-consented care was consistently high across any vaginal

examinations. Women's private information shared during vaginal examinations was highest in Nigeria across any vaginal examinations, compared with similar lower trends in Ghana and Guinea. Similarly, women's breasts exposed during vaginal examinations was highest in Nigeria across any vaginal examinations, followed by Guinea and Guinea. Women's genitalia exposed during vaginal examinations was highest in Nigeria across any vaginal examinations, followed by Guinea and Ghana. Online supplemental annex 1 shows that the trends in different types of mistreatment across are similar across multiple vaginal examinations.

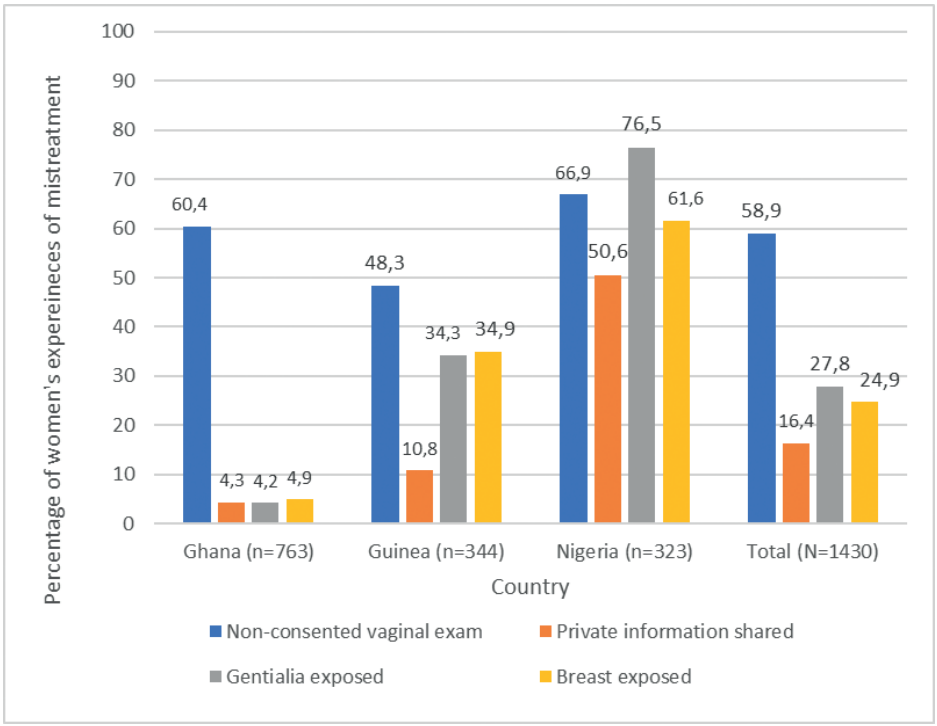

Figure 2. Different types of mistreatment during any vaginal examination by country

Association between curtains during labour and vaginal examination

Table 2 shows the results of the adjusted multivariable logistic regression model examining whether the absence of curtains is associated with a woman's experience of mistreatment during any vaginal examination, adjusting for maternal age, education and marital status. Overall, the association between availability of curtains and types of mistreatment during vaginal examination varied by country. The odds of a woman's genitalia exposure during vaginal examination was six times higher among women without curtains during labour in Ghana and Nigeria (Ghana: AOR 6.7, 95% CI 2.9 to 14.9; Nigeria: AOR 6.5, 95% CI 2.9 to 14.5) in contrast to Guinea (AOR: 0.04, 95% CI 0.02 to 0.08). In Ghana and Nigeria, the absence of curtains during labour was also statistically significantly associated with higher odds of a woman's breast exposure during vaginal examination (Ghana: AOR 5.9, 95% CI 2.8 to 12.9; Nigeria: AOR 2.7, 96% CI 1.3 to 5.9), whereas in Guinea, it was associated with a lower likelihood (AOR 0.04, 95% CI 0.02 to 0.07). In Ghana and Nigeria, there was also a significant association between the absence of curtains during labour and a woman's private information shared during vaginal examination (Ghana: AOR 3.8, 95% CI 1.6 to 8.9; Guinea: AOR 1.7, 95% CI 0.7 to 4.2); Nigeria: AOR 4.9, 95% CI 1.9 to 12.7). Also, absence of curtains during labour was associated with increased and reduced odds of non-consented vaginal examination in Ghana (AOR 2.5, 95% CI 1.4 to 4.7) and Guinea (AOR 0.2, 95% CI 0.1 to 0.4), respectively.

Table 2. Association between women's characteristics and mistreatment during any vaginal examination, by country (N=1430)

		Any non-consented vaginal examination			**Any genitalia exposed**			**Any breast exposed**			**Any private information shared**		
		aOR* (95% CI)			aOR* (95% CI)			aOR* (95% CI)			aOR* (95% CI)		
		Ghana	Guinea	Nigeria	Ghana	Guinea	Nigeria	Ghana	Guinea	Nigeria	Ghana	Guinea	Nigeria
Curtains during labour	No	2.5 (1.4, 4.7)	0.2 (0.1, 0.4)	1.9 (0.9, 3.9)	6.7 (2.9, 14.9)	0.04 (0.02, 0.08)	6.5 (2.9, 14.5)	5.9 (2.8, 12.9)	0.04 (0.02, 0.07)	2.7 (1.3, 5.9)	3.8 (1.6, 8.9)	1.7 (0.7, 4.2)	4.9 (1.9, 12.7)
	Yes	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref

*Adjusted for women's age, education, marital status

Discussion

This WHO multicountry study provides significant insight into the occurrence and determinants of different types of mistreatment of women during vaginal examination during childbirth across Ghana, Nigeria and Guinea using direct labour observations. Using a standardised labour observation tool, we ascertained how different types of mistreatment varied across countries. Across the three countries, women were consistently observed to experience non-consented care across any or multiple vaginal examinations, whereas for other types of mistreatment, it varied (private information shared, breast and genitalia exposure) across vaginal examinations. In particular, women in Nigeria experienced more accounts of each type of mistreatment during vaginal examinations, which may be due to the lack of curtains to ensure privacy of the woman's body and some protection from disclosing personal information to others.

While there is a paucity of evidence on mistreatment during vaginal examinations, various studies have reported the prevalence of this phenomenon. A study in Pakistan used direct observations of labour and found that among women who received vaginal examination, 54% of examinations were performed without informed consent,[26] similar to the 59% observed in our study. In terms of other types of mistreatment, studies have shown that women's private information is shared during examinations (referred to as non-confidential care in other studies); however, it varies across studies that have used different methodologies: 54% in a study in Tanzania using community follow-up,[15] 5.6% in a community-based study in India[27] and 11.5% among postnatal women in Saudi Arabia.[28] In our study, we also found substantial variation in women who had private information shared across the countries, ranging from <5% in Ghana to approximately 50% in Nigeria.

The association between experiences of different types of mistreatment across any vaginal examinations and absence of curtains during labour varied significantly by country. Overall, after adjusting for women's sociodemographic characteristics, the absence of curtains during labour was associated with an increased risk of vaginal examination-related mistreatment during childbirth in Nigeria (more than fivefold increased risk of genital and breast exposure) and Ghana (more than twofold increased risk of private information shared), but a decreased risk of all vaginal examination-related mistreatment in Guinea. Our findings from the labour observations are consistent with the community survey data within the same WHO multicountry study, which showed that the association between some types of mistreatment (ie, physical abuse, verbal abuse, poor communication and the absence of a labour companion) also varied by country.[29] Absence of a labour companion was associated with non-consented vaginal examination in Ghana and Guinea but not Nigeria, which only showed a significant association with decreased waiting time.[29] In this

study, non-consented vaginal examination was generally high across all the three countries, ranging from approximately 50% in Guinea to nearly 70% in Nigeria. The burden of non-consented vaginal examination seems widespread and under-reported. In a study among maternity care providers in Czech Republic, over 50% did not obtain women's consent for vaginal examination at the facility level, while permission was always sought during home birth.[30] Differences in the types of mistreatment during vaginal examination across countries highlight the importance of the role of context implications in the interpretation of our findings. While there is limited evidence on interventions for addressing mistreatment, health systems need context-specific adaptations to interventions, which may include improved privacy measures and training of health workers on improved communication, to improve women's experiences of care.

Across the three countries, the different types of mistreatment women experience during vaginal examinations have implications for women's general experience of care. First, evidence shows women are generally uncomfortable during a vaginal examination; in the community survey component of this study, approximately 30% of women reported feeling very uncomfortable during vaginal examinations (19.5% in Guinea, 37.4% in Nigeria and 45.9% in Ghana). While this may be due to the inherently invasive nature of vaginal examinations, more can be done to improve communication and consent before the exam and to improve the manner in which examinations are conducted. Simulated healthcare professional trainings to improve provider–women communication, informed consent care and ensuring adherence to women's privacy measures should be emphasised such that women can be comfortable and experience better care during vaginal examinations.[31] For instance, a recent pilot (baseline and endline) study in Ghana evaluated the impact of an integrated simulation-based training on provision of respective maternity care and reported significant improvement in the quality of care: about 15% in dignity and respect, 55% in supportive care and 87% in communication and autonomy.[32] Relaxation methods may also minimise the discomfort and pain experienced by birthing women during vaginal examinations.[23]

The different types of mistreatment occurring during vaginal examinations are not aligned with quality of care standards and may in some cases violate women's rights. The WHO Standards for Quality of Maternal and Newborn Care in Health Facilities states that all women should have informed choices in the care they receive, and the need for interventions should be clearly explained.[33] The quality of care experienced by women remains an important driver to improve maternal and newborn health as increasing the coverage of essential interventions alone is not adequate to reduce maternal mortality and severe morbidity.[7,34]

Strengths and limitations

The strengths of the study include use of large WHO multicountry data and standardised tool. In this study, we determined country-specific differences in the occurrence of mistreatment during vaginal examination. The use of direct observation of the labour events is considered a strength of the study as this allowed direct visualisation of the occurrence of mistreatment during vaginal examinations. Also, using non-health workers as direct observers of the labour events resulted in objective documentation of the events that occurred during the course of labour. This approach is considered superior to reports by the women themselves due to the potential risk of recall bias. While direct observations of care may positively influence health worker behaviour (Hawthorne effect), we explored this and found no evidence of its presence (by facility, country or month of recruitment).[13]

The limitations of our analysis include the fact that the timing of vaginal examination and the results of the assessment (eg, cervical dilation) were not explored in women who received multiple examinations. This could provide insight into the how a woman's labour progressed in cases of mistreatment. In addition, other relevant information such as volume of deliveries (including episiotomy) and other types of mistreatment was reported in the main paper and not included in the analysis. Furthermore, we have limited data on other contextual facility-level (eg, supplies) and provider-level (eg, type of provider) factors as determinants of mistreatment during vaginal examination. We would also like to note that estimates of cervical dilation are often imprecise and can vary significantly both between examinations and across health workers. Also, non-communication of the vaginal examination findings with the women may constitute a significant component of mistreatment. However, this was beyond the scope of our study and was not reported. Despite these limitations, the findings of this study remain relevant in improving respective maternity care during childbirth in health facilities.

Implications for research and practice

Our study showed that different types of mistreatment occur frequently during vaginal examinations across multiple countries. Regular training of maternal healthcare providers (eg, refresher courses, preservices and in-service) on the proper etiquette of conducting a woman-centred vaginal examination including optimal informed consent may help to enhance and promote positive childbirth experience.[3] Given the sensitive nature of vaginal examination, the standard guidelines should be well integrated in the teaching curriculum and well taught in training institutions (eg, midwifery and medical schools). Furthermore, as part of routine antenatal care, education and counselling of pregnant women about experiencing vaginal examinations during labour, including why they are conducted, what they feel like, how often they might happen and what the risks are, may help women to feel more prepared for what to expect during childbirth. Further research is needed into the

training standards to improve clinical skills in conducting respectful vaginal examinations (eg, consent, health literacy, communication and privacy) while reducing discomfort for women as much as possible.

Health systems must ensure enabling environments to support healthcare workers, including appropriate continuing education, supervision and supportive policies to promote respectful care.[7] By adopting and implementing the WHO recommendations on intrapartum care and WHO standards for improving quality of maternal and newborn care in health facilities, health systems can achieve respectful maternity care for their users.[3,33]

Conclusion

Our findings indicate different types of mistreatment of women (including non-consented care, lack of privacy and exposure of genitalia and breasts) are observed across any vaginal examinations and differently across the countries included in the study (Ghana, Nigeria and Guinea). The study strongly suggests the need to ensure better communication and consent processes prior to undertaking vaginal examination, in addition to the core principles of respective maternity care. Refresher courses for health providers and appropriate integration and teaching of the standard guidelines for performing vaginal examinations in training institutions are strongly recommended to ensure positive intrapartum care experience for birthing women. Furthermore, across different settings, health system interventions including availability of curtains can help increase women's privacy during vaginal examinations. Different forms of mistreatment during vaginal examination have implications for women's general experiences of care, quality of care standards and may even violate women's rights. The country-level differences of mistreatment during vaginal examinations indicate context-specific interventions are necessary to scale up respectful maternity care globally.

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Acknowledgements

We thank the data collection team for their excellent work and the women who participated in this study. We appreciate the thoughtful contributions of participants in the end-of-study investigator meeting.

Contributors
KA-B, HM, MAB and OT conceptualised the analysis. MAB, JPV, KA-B, EM, RA, AKA, CG, AKA, OT, MDB and TAI conducted training, data collection and management. KA-B, HM, MAB and OT conducted the data analysis. KA-B and HM prepared the first draft of this article. All authors were involved in data interpretation and review of the final manuscript. KA-B is the guarantor.

Funding
This research was made possible by the support of the American People through the United States Agency for International Development and the United Nations Development Programme (UNDP)/United Nations Population Fund (UNFPA)/UNICEF/WHO/World Bank Special Programme of Research, Development and Research Training

Disclaimer

The funders had no role in the study design, data collection and analysis, decision to publish or preparation of the manuscript.

Competing interests

None declared.

Patient consent for publication

Not applicable.

Ethics approval

All women provided written consent. Institutional permission for recruitment and observation was obtained from each site; consent was not sought from providers. This study was approved by the WHO Ethical Review Committee (A65880), WHO Review Panel on Research Projects, and in-country ethics committees: Guinea [le comité national d'éthique pour la recherche en santé]; Nigeria [Federal Capital Territory Health Research Ethics Committee; Research Ethical Review Committee, Oyo State; and State Health Research Ethics Committee of Ondo State]; and Ghana [Ethical Review Committee of the Ghana Health Service; Ethical and Protocol Review Committee of the College of Health Sciences, University of Ghana], and Myanmar [Ethics Review Committee, Department of Medical Research].

Provenance and peer review

Not commissioned; externally peer reviewed.

Data availability statement

Data are available upon reasonable request.

Supplemental material

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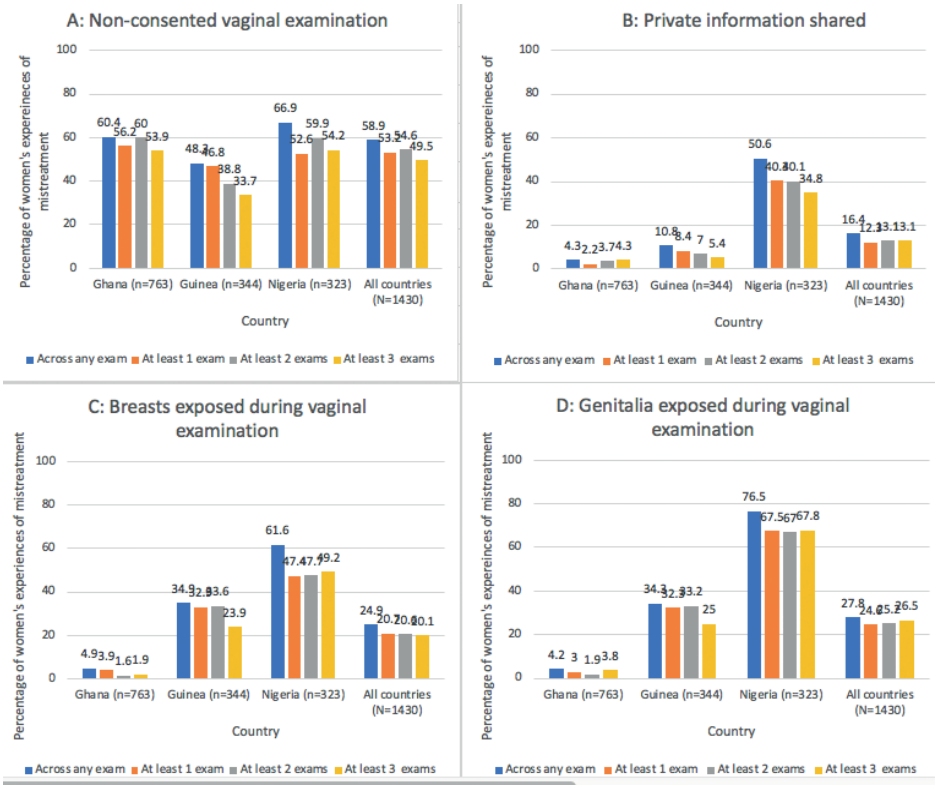
Supplementary File

Annex 1. Different types of mistreatment across multiple vaginal examinations by country



Chapter 9

General discussion

Respectful Maternity care for improving clinical outcomes of hypertensive disorders of pregnancy

Respectful maternity care (RMC) is a vital evidence-based approach to achieve positive pregnancy, childbirth and postnatal experiences for women and optimal pregnancy outcomes [1–3]. The main components of RMC include maintenance of women's dignity, privacy and confidentiality, freedom from harm and mistreatment, and opportunity for informed choice and continuous support during childbirth [4]. Effective provider-client communication remains central to RMC and improves, women's satisfaction with care and future utilization of health institutions. Emerging evidence indicates women experience wide range of disrespectful care and mistreatment in health facilities which can potentially disincentivize them from seeking facility-based maternity care [5–7]. Globally, evidence-based strategies to reduce maternal mortality traditionally include measures to increase the proportion of births attended by skilled providers. However, the global effort to optimize maternal health is hampered by frequent report of women's reluctance to give birth in health facilities which is partly attributed to fear of mistreatment by health workers [5,7]. Therefore, significant number of women do not utilize health facilities for maternity care services. For instance, about 16% of women in Ghana still give birth at home and do not receive supervised skilled birth care [8].

Until recently, the issue of mistreatment and its impact on the quality of maternal health had not been optimally explored and given the needed global attention. To adequately characterize the phenomenon, Bowser and Hill performed a landscape analysis of disrespectful care and abuse in childbirth in 2010 and outlined seven integral components [5]. These include physical abuse, non-dignified care, non-consented care, non-confidential care, discrimination based on specific patient attributes, abandonment of care, and detention in health facilities [5]. Subsequently, the White Ribbon Alliance in 2011 published the Respectful Maternity Care Charter reinforcing Universal Rights of childbearing women [9]. Then, the WHO statement on prevention and elimination of disrespect and abuse was published in 2014 and highlighted RMC as an important intervention to achieving the targets of Sustainable Development Goals (SDGs) [10]. Following the expiration of the Millennium Development Goals (MDGs) in 2015 with most nations not achieving their targets, a more comprehensive evidence-based interventions including RMC are recommended to optimize maternal health.

Although childbirth is an important historic life event in women's lives with high expectation of happiness and empowerment in the society, it remains an extremely vulnerable journey because the outcome is not always predictable – especially in low resource settings [9]. Intrapartum events may result in severe complications such as maternal near-miss events

and maternal death. Similarly, the antenatal and postnatal events are equally important and require the commensurate medical attention to achieve universal health coverage for all women. For instance, Say et al reported in a WHO systematic review that global maternal mortalities attributed to hemorrhage occurred during the antenatal (6.5%), intrapartum (0.9%) and postpartum (19.7%) periods with overall prevalence of 27% [11]. In the same report, HPDs accounted for 14% of all maternal deaths and was second to obstetric hemorrhage. In addition, a recent study in Nigeria among women with HDP indicated that eclampsia, a major complication of HDP, occurred in the antepartum (16%), intrapartum (46%) and postpartum (39%) periods [12].

Findings from this thesis indicate the burden of preventable maternal and newborn death remain high with significant proportion attributed to HPD [8,13,14]. Generally, the risk perinatal death associated with HDPs is higher compared to maternal deaths. For example, maternal death risk is approximately 1% in severe preeclampsia while perinatal death risk is about 13%. In eclampsia, the disparity in the risks of maternal and perinatal deaths is disproportionately wider (about 5% versus 28%) [15]. Similarly, we determined that severe maternal outcomes including maternal deaths were associated mainly with severe preeclampsia (50%) and eclampsia (39.4%) whiles organ dysfunction was primarily related to hematologic and respiratory complications. Also, stillbirth and neonatal deaths occurred in 14% and 19%, respectively [13]. These adverse outcomes of HDPs are alarming and require effective evidence-based interventions to minimize these complications and optimize HDP outcomes.

In addition, the clinical prognoses of HDP are not easily predictable because they are progressive in nature and their etiology and pathophysiology are not fully understood [16]. Considering the high global burden of HDP compounded with unresolved pathophysiology, controversies in definitions and treatment guidelines [16,17], and context specific socio-cultural implications [18], optimal implementation RMC can potentially be the game changer in reducing severe complications from HDP. This approach is particularly applicable to LMICs where the disease impact is unacceptably high and individual, provider and health system related barriers lead to significant substandard care. However, there are context related bottlenecks that influence effective provision of respectful maternity care including health system challenges [19]. In addition, findings from this thesis indicates that patient- and health worker-related barriers might contribute to substandard care for hypertensive mothers and mistreatment of women [20]. It must be emphasized that RMC majorly relates to the interpersonal relationships in the health provider-woman–dyad with key influence from the health system challenges at different levels.

In the context of LMICs where over 90% of maternal deaths occur [21], mistreatment of women during provision of maternal care may be considered an additional delay (4th delay) to the well-known three delay model described by Thaddeus and Maine in 1994 [22]. The Three Delays Model comprises 1) delay in decision making to seek care, 2) delay in accessing the health facility and 3) delay in receiving care the health facility. Undue delay which occurs at the facility level prior to initiation of care is a recognized source of mistreatment that can potentially lead to severe maternal complications [7,23].

Interventions to address avoidable delays in providing care can be considered at different levels of the health system. In our multi-center qualitative study, health workers outlined the major challenges associated with clinical care for women with maternal hypertension and these include issues related women themselves, health workers and the health systems [20]. These challenges constitute a significant barrier to achieving RMC and result in substandard care and severe maternal morbidities. For instance, we determined a high incidence of severe maternal outcomes (severe maternal morbidity and deaths) among women with HPD remote from term. Our research showed a high maternal mortality ratio (MMR) of 3100 per 100,000 live births, maternal near miss-to-mortality ratio of 12.3, and the mortality index was 8% [13]. These findings are archetypical of severe HDPs especially if interventions such as antihypertensive and delivery are not instituted timely. In conditions with high case fatality rates such as HDPs, preventive medicine including RMC remains the most favorable initial intervention as further research on curative treatment ensues. Therefore, the combined burden of HDPs and mistreatment of women constitute a potential hindrance to achieving the SDG target 3.1 (reduce the global MMR to less than 70 per 100,000 live births) [24], especially in low resource settings.

Our research indicates that the clinical challenges associated with HDP treatment are compounded by mistreatment of women in health facilities with varying severities of women's experiences [20,23]. Women with HDP experience longer duration of hospital admission, utilize health services more and have longer contact duration with care providers and therefore likely to experience mistreatment. Findings from this thesis reveal that RMC is not optimally practiced resulting in decreased women's interest in patronizing care from health facilities [23,25,26]. Mistreatment of all kinds (verbal, physical, neglect, stigmatization, etc) occur and constitute a major disincentive to health seeking behavior among pregnant women leading to late presentation at health facilities with severe complications [25,27]. The thesis highlights the main underlying reasons for mistreatment of women: inadequate number of health professionals, health system challenges, unavailability of logistics, high patient load and women's attitudes such as non-compliance with medical instructions [20,25,28].

Moreover, the main barriers to accessing facility-based care are not generalizable to all contexts and include socio-cultural and familial influences, long distance to the facility (physical accessibility), financial constraints (economic accessibility), perceived low quality of care and fear of discrimination by health workers [18]. In addition to the already high burden of HDP in Ghana, there is ample evidence that birthing mothers experience varied spectrum of mistreatment and disrespectful care at health facilities [25,28–30]. The combined burden of HDP and mistreatment of women during provision of maternity care services constitute the main fulcrum of this thesis. Mistreatment of women constitutes a social barrier to positive pregnancy, intrapartum and postnatal experience and violates fundamental human rights of women [18]. For instance, women may feel reluctant to express their concerns to health professionals, even in the hospital setting, due to perceived fear of mistreatment by health workers. Secondly, women who experience abusive care will most likely resort to alternative care from traditional or spiritual experts and would not recommend the health facilities to other women [18,25].

Relatedly, an important psychologically traumatic finding from this thesis relates to high prevalence of mistreatment of women associated with vaginal examination during childbirth. For instance, non-consented care occurred in nearly 60% of women during vaginal examination whiles genital and breast exposures were reported in approximately 30% and 25% respectively [26]. We determined that absence of privacy measures including lack of curtains was associated with the different types of mistreatment during vaginal examination in different contexts. These have major clinical implications on the importance of privacy measures in promoting RMC, especially when it comes to women's rights to privacy and confidentiality. Surprisingly, the issue of psychologically traumatic women's experiences during vaginal examination is a global phenomenon and not limited to LMICs. In a typical example, Klerk et al. highlighted women's reports of painful, disrespectful and insensitive experiences during vaginal examinations by health providers in the Netherlands [31]. These negative experiences of disrespectful care can result in women feeling embarrassed and psychologically traumatized. Also, mothers who experience severe forms of mistreatment during childbirth may be prone to debilitating postpartum psychological events such as depression and psychosis [32]. Such psychologically traumatic childbirth experiences can potentially disincentivize women from seeking facility-based care in their subsequent pregnancy adventures.

Generally, maternal health indicators have traditionally focused mainly on life-saving interventions (process indicators) and health outcomes (outcome indicators), but these indicators do not adequately incorporate women's experiences of care including preservation of their dignity, respect, communication, and emotional support [4]. Integration of context-specific interventions including RMC guidelines is line with the maternal health

target of the SDGs and Global Strategy for Women's, Children's and Adolescents' Health [24,33–35]. Therefore, women and their families should be involved in the clinical decision making from the outset and their opinions and preferences should be factored into the care they receive. This should involve making a conscious effort to understand the worldview of hypertensive mothers who have experienced mistreatment in the clinical settings. In settings where the burden mistreatment is high, we recommend further research into context-specific facilitators and barriers to facility-based care to better understand and appreciate the various dimensions implicated in the perpetuation of mistreatment of women.

In our attempt to understand hypertensive mothers' lived experiences, we determined both positive and negative experiences of care which were influenced by factors related the healthcare system, health providers and the women themselves [23]. These personalized experiences can be synthesized and translated into tailored interventions (eg clinical care guidelines) for improving maternal care. In addition, the perspectives of health providers and their recommendations to improve care for hypertensive and mistreated mothers are critical to the implementation of context-specific measures [20]. Therefore, there is the need to understand the complexities of socio-cultural and gender-based influences in clinical care settings and health system factors in managing the concomitant burden of HPD and mistreatment of women.

Moving forward, context-specific and evidence-based interventions are needed to ending preventable deaths (SURVIVE), ensuring health and well-being (THRIVE) and expanding enabling environments (TRANSFORM) to facilitate continuum of high quality of maternal care [33]. The double burden of HDP and mistreatment of women during maternal care can be significantly improved by appropriate integration of RMC guidelines in relation to the evidence-based roadmap on global strategy for women's health described by Kuruvilla et al[34]. Context-related adaptation (Figure 1) of this roadmap for HDP and mistreatment of women can improve maternal care and ensure preservation of women's rights to health care, dignity, confidentiality and satisfaction in Ghana and other LMICs with similar settings. The scope of this roadmap strategy is universal and has a multisectoral functionality that can result in transformative change across various challenging clinical areas of maternal health and sustainable development[33]. To achieve the global SDG 3.1 target, RMC remains vital because of the complexities and multi-dimensional nature of mistreatment of women and its potential for causing preventable maternal morbidities. There is the need to ensure optimal continuum of maternal and newborn care including antenatal [1], intrapartum [2] and postnatal care [3] to achieve the maternal health target of the SDGs [24].

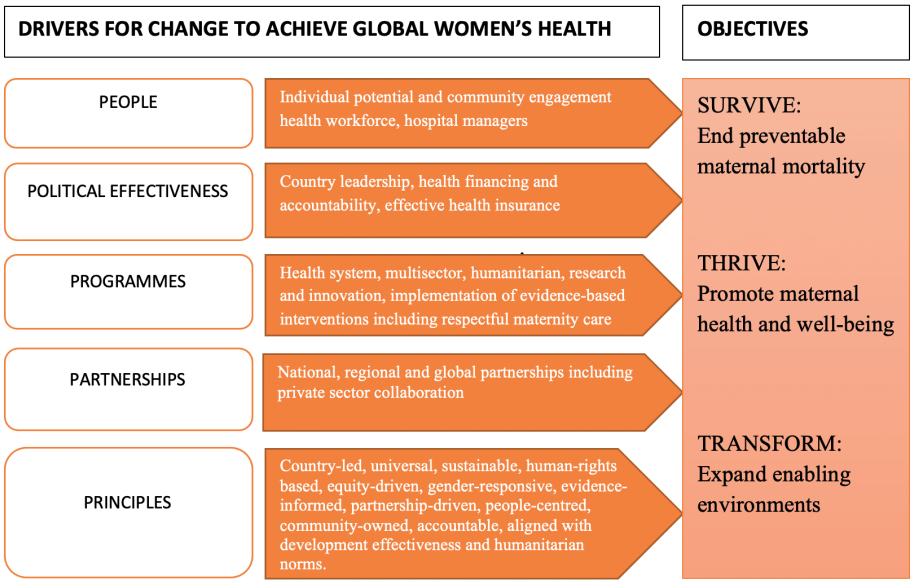


Figure 1. Global strategy to improve maternal health (adapted from Kuruvilla et al 2016)

Key recommendations to improve maternal care for HDP

1. The quality and experience of care for women with HDP in low resource settings can be markedly improved via conscientious attention to fundamental health system needs. The core needs such as perennial shortages of essential medications and human resource (health workers) should be purposefully addressed by governments and health institutions. Other health system challenges such as delay in receiving care in health facilities, lack of adequately resourced neonatal intensive care unit (NICU) and poor referral system including transportation related issues require urgent attention.
2. Regular clinical audit into perinatal morbidity and mortality associated with HDP in health facilities is strongly recommended to provide clinical guidance. Development of evidence-based, locally practicable treatment guidelines for HDPs is urgently required to facilitate provision and experience of care and reduce severe complications of HDP.
3. There is substantial evidence that pregnant women frequently experience mistreatment during childbirth at health facilities and can potentially constitute a major disincentive to seeking care in future. Therefore, development and integration of national respectful maternity care (RMC) guidelines into routine maternal care services, supervision, evaluation and monitoring with regular feedback from women and maternal health professionals are strongly recommended. In addition, RMC guidelines should encompass assessment and treatment of psychological and socio-cultural issues that negatively influence women's experiences of care. The tenets of RMC should highlight the main

domains that facilitate positive women's experience: respect and dignity, effective communication, and optimal emotional support.

4. Women and their families should be actively involved in the decision making relating to their individualized treatment to facilitate active participation and ownership of the care they receive. To this end, women need adequate education and orientation concerning their legitimate rights to maternal care to facilitate the needed empowerment, person-centered care and shared-decision making. In this manner, women will feel respected, accepted and actively involved to freely discuss their concerns, expectations and (dis) satisfaction to facilitate efficient clinical decision making and improved quality of care.

Future research needs

1. Further research is recommended to explore context-relevant strategies to optimize the care for women with HDP, with specific focus on timely referral, regular availability of medications, and laboratory support, and minimize in-hospital delays to facilitate quality of care. Subsequent research should consider the development and evaluation of evidence-based interventions to aid clinical management of HDP and prevent severe complications and mortalities.
2. Regular refresher courses for health professionals and inclusion of RMC guidelines in training institutions' curricula for health workers constitute medium-to-longterm interventions to achieving universal practice of RMC, and this can be further explored. For the Ghanaian context, further studies with wider national coverage are recommended to better understand how the quality and experience of care can be improved for women with maternal hypertension.
3. We recommend implementation research on how to effectively integrate and implement locally acceptable and evidence-based interventions to mitigate the burden of mistreatment in the country, with special focus on different dimensions of RMC.
4. Further research is recommended to develop nationally applicable clinical guidelines for RMC and HDP with the involvement of all the relevant stakeholders: women and their families, traditional leaders/spiritual leaders, health workers including midwives, health administrators, government officials.

Conclusion

Hypertensive disorders of pregnancy remain a major clinical and public health challenge in Ghana due to the associated high maternal-perinatal morbidity and mortality. In addition, there is a more complex multidimensional national issue: mistreatment of women during maternal care in health facilities. The main cause of this global socio-clinical phenomenon is still not fully understood and constitute a major additional barrier to equitable access to maternal care services. The major concerns of mistreatment of women relate to its potential for constituting a major barrier to universal health coverage via disincentivizing women from seeking care at health facilities. Consequently, there is an urgent need to integrate RMC guidelines in a continuum manner during antenatal, childbirth and postnatal care to improve maternal and newborn health outcomes, especially in LMICs. Given the pervasiveness of HDP, lack of consensus on optimal treatment and the high perinatal morbidity/mortality, appropriate implementation, monitoring and evaluation of RMC guidelines in routine maternal care can optimize women's experiences, satisfaction and clinical outcomes in the country.

Implementation of RMC should be considered at the different hierarchical levels involving the women and their families, socio-cultural dimensions, health professionals and health systems. The clinical environment and policies of health institutions should facilitate improved provider-client communication and consent processes for women receiving care in languages they can understand best. In addition, health institutions should organize regular refresher courses on RMC and treatment of HDP for health providers as an initial step in the transformation process. Similarly, the core concepts of RMC should be appropriately integrated into the teaching curriculum of training institutions for health professionals such as medical, nursing and midwifery schools in the country. Finally, there is an urgent need to develop national guidelines on RMC and treatment of HDP based on the context-specific considerations such as variable socio-cultural and health systems challenges. Further research is recommended to better understand how best to integrate, monitor and evaluate the impact on RMC on maternal health.

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Chapter 10

Summary of thesis

Hypertensive disorders of pregnancy (HDPs) constitute a global health challenge, especially in low- middle-income countries where they account for a significant proportion of maternal and perinatal severe morbidities and mortalities. In Ghana, HDPs are overly pervasive affecting about one in five women reporting for maternity services at tertiary health facilities. The proportion of maternal deaths attributed to HDs has doubled over the past decade (from 9% in 2007 to 18% in 2017). Given the high HDP prevalence and perinatal morbidities, evidence-based interventions are urgently needed to improve health outcomes for women with HDP. Although there has been a significant global and national effort to reduce the incidence of HDPs and the associated adverse outcomes, the overall effects of these interventions seem marginal and unimpressive. Despite extensive research, the pathophysiology of HDPs remains unclear and this has partly resulted in a lack of consensus on treatment guidelines.

This thesis assessed the quality of care for women with HDP and explored how appropriate integration of respectful maternity care can optimize the provision and experience of care and reduce maternal morbidity and mortality. The thesis specifically assessed the burden of hypertensive disorders of pregnancy in Ghana including the associated severe maternal morbidity and mortality. In addition, the clinical challenges associated with the care of pregnant women with HDP were assessed to better understand the local context in relation to the overall quality of care. Finally, the thesis explored the burden of disrespectful maternity care and mistreatment of women during childbirth to provide insight into how appropriate integration of respectful care could optimize the provision and experience of care for hypertensive mothers in Ghana.

Part I of the thesis described the burden of hypertensive disorders in Ghana including adverse perinatal outcomes (maternal and neonatal morbidities and mortalities).

Chapter 2 determined the perinatal morbidity and mortality associated with HDP in a Ghanaian obstetric population. Adverse perinatal outcomes determined include admission to Neonatal Intensive Care Unit (24.7%), neonatal respiratory distress/asphyxia (15.2%), preterm birth (21.7%) and low birth weight (24.7%). The perinatal mortality rate was 106 per 1000 births comprising stillbirth (6.8%) and early neonatal deaths (3.8%). Most of the adverse perinatal outcomes were significantly more common in preeclampsia compared to the other HDPs.

In **Chapter 3,** we assessed 1) the incidence of severe maternal complications, maternal near-miss cases, and mortality cases associated with hypertensive disorders of pregnancy remote from term (between 26 to 34 weeks gestation) and (2) the health system's performance indicators for the management of hypertensive disorders. HDP comprised 10% gestational

hypertension, 76% preeclampsia, and 14% eclampsia. Maternal near-miss cases occurred in 33.1% with 2.7% maternal deaths. Severe maternal outcomes occurred among 50.0% and 39.4% of women with severe preeclampsia and eclampsia respectively. The most common organ system involvement was hematologic dysfunction (38.6%), followed by respiratory (14.8%) dysfunction. Nearly all women (84%) had cesarean delivery with 93% in the women with severe maternal outcome. Stillbirth and neonatal deaths occurred in 14% and 19% of births respectively whiles intensive care unit admission rate was 12.7%. The main indicators of quality of care included maternal mortality ratio of 3100 per 100,000 live births, maternal near-miss-to-mortality ratio of 12.3, and mortality index of 8%.

In **Part II,** the thesis focuses on the quality of care for women with HDP in relation to clinical challenges based on the perspectives of relevant stakeholders.

Chapter 4 explored the perspectives and lived experiences of healthcare provision among pregnant women with HDP and the associated challenges. Women reported mixed (positive and negative) experiences of maternal care. Positive experiences reported include receiving optimal quality of care, satisfaction with care and good counselling and reassurance from the health professionals. Negative experiences of care comprised ineffective provider-client communication, inappropriate attitudes of health professionals, disrespectful treatment including verbal and physical abuse. Major health system factors influencing the women's experiences of care included lack of logistics, substandard professionalism, inefficient national health insurance system and unexplained delays at health facilities. Patient-related factors that influenced provision of care enumerated were financial limitations, chronic psychosocial stress and inadequate awareness about HDP.

In **chapter 5**, we explored the perspectives of healthcare professionals on the clinical challenges associated with the management of HDP in Ghana and recommendations for improving care. In this study**,** health providers highlighted major challenges in the clinical management of hypertension of pregnancy as follows: 1) patient-related factors (inadequate understanding and misconceptions about hypertension in pregnancy, women's non-compliance with clinical advice, financial constraints); 2) health system-related challenges (frequent unavailability of logistics, medications and laboratory support, delays in provision of care and limitations in the health insurance coverage); 3) health provider associated factors (inadequate number of health professionals and poor attitudes). Context-specific recommendations suggested for improving the quality of care in managing maternal hypertension include restructuring the health system to reduce delays in providing care, improving financial coverage of medical insurance, encouraging social/family support, enhancing education on hypertension in pregnancy and strengthening the health workers' numbers and working conditions.

Part III of the thesis evaluated the evidence for disrespectful care and mistreatment of women during childbirth and recommendations for improving respectful maternity care (RMC). Therefore, **Chapter 6** explored women's perspectives on mistreatment during facility-based childbirth using Focus group discussions (FGDs) and in-depth interviews (IDIs) in Ghana. The major types of mistreatment identified were: verbal abuse (shouting, insults, and derogatory remarks), physical abuse (pinching, slapping) and abandonment and lack of support. Mistreatment was commonly experienced during the second stage of labour, especially among adolescents. Inability to push well during the second stage of labour, disobedience to instructions from birth attendants, and not bringing prescribed items for childbirth (mama kit) often preceded mistreatment. Most women indicated that slapping and pinching were acceptable means to "correct" disobedient behaviours and encourage pushing the baby out. The research indicates that women may avoid giving birth in health facilities in the future because of their own experiences of mistreatment or hearing about another woman's experience of mistreatment.

In **Chapter 7,** the perspectives of healthcare professionals and hospital administrators on mistreatment of women during childbirth were explored to identify opportunity for improvement in the quality of maternal care in health facilities. In this study, healthcare providers and hospital administrators reported mixed feelings regarding the quality of care women receive. Almost all respondents were aware of the occurrence of mistreatment and described physical and verbal abuse and denial of preferred birthing positions and birth companionship as typical examples. Rationalizations for mistreatment provided by the health workers included limited staff capacity, high workload, perceptions of women's non-compliance and women's attitudes towards maternity staff. Health workers had mixed responses regarding the acceptability of mistreatment of women during childbirth, although most argued against it. Increasing staff strength, the number of health facilities, refresher training for health staff and adequate education of women about pregnancy and childbirth were relevant suggestions to improve respectful care.

Chapter 8 explored four types of mistreatment of women during vaginal examinations in Ghana, Guinea and Nigeria: (1) non-consented care, (2) sharing of private information, (3) exposure of genitalia and (4) exposure of breasts. Across all vaginal examinations, 842 women (58.9%) received non-consented care; 233 women (16.4%) had their private information shared; 397 women (27.8%) had their genitalia exposed, while 24.9% (n=356) had their breasts exposed. The observed prevalence of mistreatment during vaginal examinations varied across countries. There were country-level differences in the association between the absence of privacy measures and mistreatment. Lack of privacy measures was associated with sharing of private information (Ghana: adjusted OR (AOR) 3.8, 95% CI 1.6 to 8.9; Nigeria: AOR 4.9, 95% CI 1.9 to 12.7), genitalia exposure (Ghana:

AOR 6.7, 95% CI 2.9 to 14.9; Nigeria: AOR 6.5, 95% CI 2.9 to 14.5), breast exposure (Ghana: AOR 5.9, 95% CI 2.8 to 12.9; Nigeria: AOR 2.7, 95% CI 1.3 to 5.9) and non-consented vaginal examination (Ghana: AOR 2.5, 95% CI 1.4 to 4.7; Guinea: AOR 0.21, 95% CI 0.12 to 0.38). Our results highlight the need to ensure better communication and consent processes for vaginal examination during childbirth. In some settings, measures such as the availability of curtains were helpful in reducing women's exposure and sharing of private information, but context-specific interventions will be required to achieve respectful maternity care globally.

Chapter 9 provides a general discussion of how appropriate implementation of respectful maternity care can potentially improve the quality of care for women with HDP and minimize pregnancy outcomes.

In conclusion, the thesis has evaluated the burden, clinical challenges and quality of care associated with HDPs in a low resource setting, Ghana. Although the clinical management of these complications is challenging, they are potentially preventable especially if the context-related health system barriers are optimally addressed. Appropriate integration of evidence-based respectful maternity care (RMC) into routine maternal care at the different hierarchical levels and addressing challenges related to women's socio-cultural dimensions, health professionals and health systems can potentially be the game changer in maternal health. This recommendation is particularly important in LMICs where there are real-time clinical challenges and considering the potential health implications of disrespectful care and mistreatment of women.

Hoofdstuk 10

Nederlandse samenvatting

Hoge bloeddruk (hypertensieve)-gerelateerde aandoeningen in de zwangerschap zijn een uitdaging voor de wereldgezondheid, vooral in lage- en midden-inkomenslanden waar ze een aanzienlijk deel van de maternale en perinatale morbiditeit en mortaliteit veroorzaken. In Ghana komt zwangerschapshypertensie veel voor: tussen de 10-12% van de vrouwen krijgt het gedurende hun zwangerschap, en 1 op de 5 vrouwen die opgenomen worden in derdelijnszorg ziekenhuizen heeft deze diagnose. Het aandeel van de moedersterfte dat toegeschreven wordt aan hypertensieve aandoeningen in de zwangerschap is in het laatste decennia verdubbeld van 9% in 2007 naar 18% in 2017. Gezien de hoge prevalentie en de gestaag toenemende maternale en perinatale morbiditeit zijn er dringend wetenschappelijk onderbouwde maatregelen nodig om de gezondheidsuitkomsten voor deze vrouwen en hun baby's te verbeteren. Dit is des te urgenter omdat er ondanks de lokale, nationale en internationale inspanningen om de incidentie van zwangerschapshypertensie en de daarmee samenhangende negatieve uitkomsten te reduceren, de effecten van deze maatregelen marginaal en weinig indrukwekkend. Een voorbeeld hiervan is het uitblijven van een goed begrip over de pathofysiologie van hypertensieve aandoeningen in de zwangerschap en dit leidt tot een gebrek aan consensus over behandelrichtlijnen.

In dit proefschrift werd de kwaliteit van de zorg voor vrouwen met zwangerschapshypertensie onderzocht en gekeken hoe respectvolle geboortezorg de zorgverlening en -beleving kan optimaliseren en maternale morbiditeit en sterfte kan verminderen. Het proefschrift richtte zich op de ziektelast van zwangerschapshypertensie in Ghana. Daarnaast werden de klinische uitdagingen van de zorg voor zwangere vrouwen onderzocht, om de algemene kwaliteit van de zorg binnen de lokale context beter te begrijpen. Tot slot onderzocht het proefschrift de gevolgen van respectloze zorg en mishandeling van vrouwen tijdens de bevalling, om inzicht te geven in hoe een passende integratie van respectvolle zorg de zorgverlening en -beleving voor hypertensieve moeders in Ghana zou kunnen optimaliseren.

Deel I van het proefschrift beschreef de ziektelast van hypertensieve aandoeningen in Ghana, waaronder nadelige perinatale uitkomsten (maternale en neonatale morbiditeit en mortaliteit).

Hoofdstuk 2 stelde de perinatale morbiditeit en mortaliteit door zwangerschapshypertensie in een Ghanese populatie. Onder meer de volgende perinatale uitkomsten werden vastgesteld: opname op de *Neonatal Intensive Care Unit* (NICU, 24,7%), neonatale zuurstoftekort (asfyxie, 15,2%), vroeggeboorte (21,7%) en laag geboortegewicht (24,7%). Het perinatale sterftecijfer bedroeg 106 per 1000 geboorten, waaronder doodgeboorte (6,8%) en vroegtijdige neonatale sterfte (3,8%). De meeste ongunstige perinatale uitkomsten kwamen significant vaker voor bij pre-eclampsie in vergelijking met andere hypertensieve aandoeningen tijdens de zwangerschap.

In **Hoofdstuk 3** evalueerden wij 1) de incidentie van ernstige maternale complicaties, *'near-miss'* gevallen bij moeders en sterfgevallen in verband met hypertensieve aandoeningen in de zwangerschap in de premature periode (tussen 26 en 34 weken zwangerschap) en 2) de prestatie-indicatoren van het zorgstelsel voor de behandeling van hypertensieve aandoeningen in de zwangerschap. Hypertensieve aandoeningen in de zwangerschap omvatte 10% zwangerschapshypertensie, 76% pre-eclampsie en 14% eclampsie. Maternale 'near-miss' gevallen kwamen voor in 33,1% met 2,7% maternale sterfgevallen. Ernstige maternale uitkomsten traden op bij respectievelijk 50,0% en 39,4% van de vrouwen met ernstige pre-eclampsie en eclampsie. Het meest voorkomende betrokken orgaansysteem was hematologische disfunctie (38,6%), gevolgd door respiratoire disfunctie (14,8%). Bijna alle vrouwen (84%) kregen een keizersnede. Dit was 93% onder vrouwen met ernstige maternale uitkomsten. Doodgeboorte en neonatale sterfte kwamen voor bij respectievelijk 14% en 19% van de bevallingen, terwijl het opnamepercentage op de intensive care 12,7% bedroeg. De belangrijkste indicatoren voor de kwaliteit van de zorg waren de moedersterfte van 3100 per 100.000 levendgeborenen, de ratio tussen maternale 'near-miss' gevallen en maternale sterfte van 12,3 en de sterfte-index van 8%.

In Deel II richt het proefschrift zich op de kwaliteit van zorg voor vrouwen met hypertensieve aandoeningen in de zwangerschap in relatie tot klinische uitdagingen, op basis van de perspectieven van relevante betrokkenen.

Hoofdstuk 4 onderzocht de perspectieven en ervaringen van zwangere vrouwen met hypertensieve aandoeningen in de zwangerschap met betrekking tot de zorgverlening en de daarmee samenhangende uitdagingen. Vrouwen rapporteerden gemengde (positieve en negatieve) ervaringen met de kraamzorg. Tot de positieve ervaringen behoorden het ontvangen van optimale kwaliteit van zorg, tevredenheid met de zorg en goede begeleiding en geruststelling door de zorgverleners. Negatieve ervaringen met de zorg omvatte ineffectieve communicatie tussen zorgverlener en cliënt, ongepaste houdingen van zorgverleners, respectloze behandeling, waaronder verbale en fysieke mishandeling. Belangrijke factoren in de gezondheidszorg die van invloed waren op de ervaringen van de vrouwen waren onder andere een gebrek aan logistiek, ondermaats professionalisme, een inefficiënt nationaal zorgverzekeringssysteem en onverklaarbare vertragingen bij gezondheidsinstellingen. Patiënt gerelateerde factoren die de zorgverlening beïnvloedden waren financiële beperkingen, chronische psychosociale stress en onvoldoende bekendheid met hypertensieve aandoeningen in de zwangerschap.

In **Hoofdstuk 5** onderzochten we de perspectieven van zorgmedewerkers op de klinische uitdagingen die samenhangen met de behandeling van hypertensieve aandoeningen in de zwangerschap in Ghana en adviezen over verbetering van de zorg. In dit onderzoek

wezen zorgverleners op de volgende belangrijke uitdagingen bij de klinische behandeling van hypertensie tijdens de zwangerschap: 1) patiënt gerelateerde factoren (onvoldoende begrip en misvattingen over hypertensieve aandoeningen in de zwangerschap, het niet opvolgen van advies door vrouwen, financiële beperkingen); 2) zorgsysteem gerelateerde uitdagingen (frequente niet beschikbaarheid van logistiek, medicijnen en laboratoriumondersteuning, vertragingen in de zorgverlening en beperkingen in de dekking van de ziektekostenverzekering); 3) zorgverlener gerelateerde factoren (tekort aan zorgverleners en slechte houdingen). De context specifieke aanbevelingen ter verbetering van de kwaliteit van de zorg voor hypertensie bij moeders waren onder andere herstructurering van het gezondheidsstelsel om de vertragingen bij de zorgverlening te beperken, verbetering van de financiële dekking van de ziektekostenverzekering, aanmoediging van sociale en gezinsondersteuning, betere voorlichting over hypertensie bij zwangerschap, en een toename in het aantal zorgverleners en een verbetering van de arbeidsomstandigheden.

Deel III van het proefschrift evalueerde het bewijs voor respectloze zorg en mishandeling van vrouwen tijdens de bevalling en aanbevelingen voor het verbeteren van respectvolle geboortezorg. Daarom werd in **Hoofdstuk 6** het perspectief van vrouwen op mishandeling tijdens bevallingen in gezondheidsinstellingen in Ghana onderzocht, door middel van focusgroepgesprekken en diepte-interviews. De belangrijkste vormen van mishandeling die genoemd werden waren: verbaal geweld (schreeuwen, beledigen en denigrerende opmerkingen), fysiek geweld (knijpen, slaan) en verlating en gebrek aan steun. Mishandeling kwam vaak voor tijdens de tweede fase van de bevalling, vooral bij adolescenten. Onvermogen om goed te persen tijdens de tweede fase van de bevalling, ongehoorzaamheid aan instructies van verloskundigen en het niet meenemen van voorgeschreven spullen voor de bevalling (mama kit) gingen vaak vooraf aan mishandeling. De meeste vrouwen gaven aan dat slaan en knijpen aanvaardbare middelen waren om ongehoorzaam gedrag te “corrigeren” en het persen van de baby aan te moedigen. Het onderzoek geeft aan dat vrouwen het in de toekomst misschien zullen vermijden om in een gezondheidsinstellingen te bevallen vanwege hun eigen ervaringen met mishandeling, of omdat ze horen over de mishandelingservaring van een andere vrouw.

In **Hoofdstuk 7** werden de perspectieven van zorgmedewerkers en ziekenhuisbestuurders op de mishandeling van vrouwen tijdens de bevalling onderzocht, om mogelijkheden voor verbetering van de kwaliteit van de zorg voor moeders in gezondheidsinstellingen te kunnen identificeren. In deze studie rapporteerden zorgverleners en ziekenhuisbestuurders gemengde gevoelens over de kwaliteit van de zorg die vrouwen ontvangen. Bijna alle respondenten waren er zich bewust van dat mishandeling voorkwam, en noemden fysiek en verbaal geweld en het weigeren van de gewenste bevallingspositie en geboortebegeleiding

als typische voorbeelden. Als redenen voor mishandeling gaven de zorgmedewerkers onder meer de beperkte personeelscapaciteit, de hoge werkdruk, de perceptie dat vrouwen niet meewerken en de attitude van vrouwen tegenover het kraampersoneel. Gezondheidswerkers hadden gemengde antwoorden over de aanvaardbaarheid van mishandeling van vrouwen tijdens de bevalling, hoewel de meesten zich ertegen uitspraken. Uitbreiding van de personeelbezetting, het aantal zorgfaciliteiten, bijscholing van het zorgpersoneel en adequate voorlichting van vrouwen over zwangerschap en bevalling waren relevante suggesties om de respectvolle geboortezorg te verbeteren. **Hoofdstuk 8** onderzocht vier soorten mishandeling van vrouwen tijdens het vaginale touché (lichamelijk onderzoek) tijdens de bevalling in Ghana, Guinee en Nigeria: (1) zorg zonder toestemming, (2) delen van privé-informatie, (3) blootstelling van genitaliën en (4) blootstelling van borsten. Van alle vaginale onderzoeken werd bij 842 vrouwen (58,9%) vastgesteld dat zij zonder toestemming werden behandeld; van 233 vrouwen (16,4%) werd privé-informatie gedeeld; bij 397 vrouwen (27,8%) werden de genitaliën blootgesteld en bij 24,9% (n=356) de borsten. De waargenomen prevalentie van mishandeling tijdens vaginale onderzoeken varieerde van land tot land. Er waren verschillen op nationaal niveau in het gevonden verband tussen het ontbreken van privacy maatregelen en mishandeling. De afwezigheid van privacy maatregelen werd in verband gebracht met het delen van privé-informatie (Ghana: aangepaste OR (AOR) 3,8, 95% BI 1,6 tot 8,9; Nigeria: AOR 4,9, 95% BI 1,9 tot 12,7), blootstelling van genitaliën (Ghana: AOR 6,7, 95% BI 2,9 tot 14,9; Nigeria: AOR 6,5, 95% BI 2,9 tot 14,5), blootstelling van borsten (Ghana: AOR 5,9, 95% BI 2. 8 tot 12,9; Nigeria: AOR 2,7, 95% BI 1,3 tot 5,9) en vaginaal onderzoek zonder toestemming (Ghana: AOR 2,5, 95% BI 1,4 tot 4,7; Guinee: AOR 0,21, 95% BI 0,12 tot 0,38). Onze resultaten wijzen op de noodzaak van betere communicatie en toestemmingsprocedures voor vaginaal onderzoek tijdens de bevalling. In sommige settingen waren maatregelen zoals de beschikbaarheid van gordijnen nuttig om de blootstelling van vrouwen en het delen van privé-informatie te verminderen, maar er zullen context specifieke interventies nodig zijn om wereldwijd respectvolle geboortezorg te bereiken.

Hoofdstuk 9 is een algemene bespreking van hoe een passende implementatie van respectvolle geboortezorg de kwaliteit van de zorg voor vrouwen met hypertensieve aandoeningen in de zwangerschap kan verbeteren en de negatieve zwangerschapsuitkomsten kan minimaliseren.

Concluderend heeft dit proefschrift de last van, de klinische uitdagingen gevormd door en de kwaliteit van de zorg voor hypertensieve aandoeningen in de zwangerschap geëvalueerd in een omgeving met beperkte middelen, Ghana. Hoewel het klinisch behandelen van deze complicaties een uitdaging is, zijn ze potentieel te voorkomen, vooral als context-gerelateerde barrières in de gezondheidszorg optimaal worden aangepakt. Een passende

integratie van *evidence-based* respectvolle zorg principes in routine verloskundige zorg op alle niveaus en het aanpakken van uitdagingen in samenhang sociaal-culturele achtergronden van vrouwen, zorgmedewerkers en zorgsystemen kunnen mogelijk een ommekeer teweegbrengen in de maternale gezondheidszorg in Ghana. Dit advies is in het belangrijk voor lage- en middeninkomenslanden waar de respectloze zorg en mishandeling van vrouwen een aanzienlijke impact hebben op patient uitkomsten.

Acknowledgements

I genuinely feel this acknowledgement constitutes the "tip of the iceberg" and cannot adequately honor the tremendous dedication and support I received in producing this thesis. To commence, I declare these words of appreciation represent my heartfelt expression of immeasurable gratitude for all the assistance I received throughout my academic endeavors to this acme and beyond. I do not know exactly where to begin my appreciation from considering the enormous contributions, dedication, support, constant prayers and love, push and best wishes I received from various angles and sectors.

First and foremost, I am forever grateful to the Almighty God considering my life journey from our village, my transition to city life till this notable point of completing my PhD. This academic achievement has been possible through God's abundant grace and mercy he bestowed on me throughout my academic adventure.

Secondly, my special gratitude goes to my supervisors for believing in me and giving me the opportunity to pursue this academic voyage: Prof.dr. Diederick Grobbee, Prof.dr. Arie Franx, Prof Evelyn Korkor Ansah and Dr Joyce Browne. I am eternally grateful to you all for lending me your intellectual and research support and experience which have yielded the desired results. I cannot forget the initial discussions Dr Joyce Browne and I had at Korle Teaching Hospital, Ghana in 2014 concerning my interest in pursuing PhD in Epidemiology following my Fellowship training in Obstetrics and Gynecology. She has been the engine and all the initial credit goes to her. To Prof.dr Kerstin Klipstein-Grobusch, I am profoundly grateful to you: I cannot forget your unique roles in diverse ways including your dedicated assistance in filling out my TSA form and the continuous encouragement to continue.

To all my colleagues and mentors from the WHO multi-country mistreatment team, I am incredibly grateful for your support and the international exposure: Dr Ozge Tuncalp, Prof Meghan Bohren, Prof Joshua Vogel and Ms Hedieh Mehrtash. Considering my experience with WHO, I cannot forget Prof Richard Adanu who believed in me and linked me to my first research experience with Dr Ozge Tuncalp in 2010 following my Membership (OBGYN) training. He has been a fantastic mentor and my all-time "*research father.*"

My special thanks go to the administrative staff of the Julius Global Health, University Medical Center Utrecht/Utrecht University: Jestke Hartman, Giene de Vries, Anna Marza Florensa, Wout de Nooij and Josephine Rees, Niki Giron, Iris Homan and Gina Melis. I am highly grateful for your tremendous clerical assistance in making my PhD journey a blissful history. Lotte Drinka: Thank you very much, for translating the Dutch version of my thesis summary.

Prof J. D. Seffah: What do I say and how do I say it? You took me at once as a son in the wilderness without knowing my background. You told me all the relevant stories I needed to navigate through my life journey and you were always there whenever I thought I was alone. Your support for my personal, economic, social and academic growth and family has been exceptional and unthinkable. I thank you differently and may the good Lord continue to bless you and your family abundantly.

Prof E. Y. Kwawukume: I am eternally grateful for your words of encouragement. You told the story about "falling from the back of a horse" in 2010 and the wisdom in the story contributed significantly to the success today. In addition, I am particularly grateful for accepting to work with me at your hospital; the experience and skills gained were phenomenal. I salute you! May the good Lord continue to bless you bountifully.

Dr R. A. Kwame-Aryee: I have not forgotten you at all and I cannot. The father-child relationship started during my medical school days through housemanship, residency, and post fellowship training. I am still amazed about all the time and resources you spent on me. You gave me confidence and taught me higher-level surgical skills (my clinical mentor). Your extraordinary support and encouragement to my family and myself are exceptional. I am forever grateful.

Prof S. A. Obed (of blessed memory): Why will I forget your tremendous contribution to the commencement of my PhD, when you were the Head of Department? Unfortunately, you are not around to witness this great day, my PhD graduation. You were my academic mentor and supervised both my MPhil (Physiology) and Fellowship (OBGYN) theses in 2011 and 2014 respectively and facilitated my appointment as a lecturer at the University of Ghana Medical School in 2016. Subsequently, you emailed and followed it up with a text message that you wanted to travel with me to the United States for a conference which I accepted. We had extremely memorable travel experiences and discussions including future research agenda in Galveston, Texas, with our new collaborators in May 2017. We tabled highly ambitious immediate, medium and long-term plans during our short-lived travel interaction. However, I returned home lonely and sorrowfully, and we could not conclude our programs. I was stunned and completely devastated, to say the least. How I wish I had heard your last words. I am eternally grateful for everything you did for me. May the good Lord continue to keep you in his bosom!

In addition, my special appreciation goes to all the Consultants at the Department of Obstetrics and Gynaecology, Korle Bu Teaching Hospital (Ghana) who in diverse ways mentored, supported and guided me during the years of my Fellowship training and clinical practice. I sincerely appreciate the unique role you all played in my life journey up to this

point. Furthermore, I am incredibly thankful to Dr. Kareem Mumuni (my clinical teacher), Dr. B.D.R.T. Annan (my special father), and Dr. T. Boafor (my inspirator), Prof Nkyeker (my special teacher), Dr Ali Samba (my special motivator and teacher), Prof SA Oppong (my academic HOD and research advisor), Dr Michael Ntumy (my supervisor), Dr Jerry Coleman (my special clinical advisor), Dr Isaac Koranteng (my clinical HOD and advisor) and Dr N.R.K Damale (my clinical motivator and teacher). The immense support they contributed during my Fellowship training served as a springboard for my PhD training.

Global Health peer support: I wholeheartedly appreciate the peer support and varied contributions I received from my colleagues in the Global Health program at the Julius Center, UMC, Utrecht: Dr Klaartje Olde Loohuis, Dr Titus Beyuo, Dr Kwaku Asah-Opoku, Dr Natasha Housseine, Dr Engelbert Nonterah, Dr Daniel Boateng, Dr Emmanuel Srofenyoh, Dr Fred Wekessah, Dr Roberta Lamptey. Dr Hannah Amoakoh-Brown. Mr Salim Sulley, Dr Salisu Ishaku and Dr Mary Amoako-Coleman. I learnt different skill sets from all of you and cherish all our interactions we had in Utrecht. I am particularly grateful to Mansour Alghamdi who dedicated his time and helped me with my R codes during my MSc Epidemiology Course. I learnt a lot from you and appreciated your selfless support and guidance. In addition, I am particularly grateful to Miss Evelyn Tamma for being my personal assistant and working with me earnestly. I appreciate your immeasurable support and may God bless you abundantly.

My extended family: I feel biologically proud to be part of this great family: Prof Yaw Kyei, Mr. Geoffrey Oti, Ms. Mercy Oti, Mr Emmanuel Amponsah (#10), and Ms. Patricia Duku (#11); Your support, love and prayers have been instrumental from my infancy, back in our hometown (Asuafu), through my medical education and specialization up to this acme. God bless you all. Prof Isaac Abunyuwah, I am forever grateful for your tremendous support and persistent encouragement throughout my education.

To my parents, I say a big *ayekoo* for sowing the vital seed and nurturing it with all you had in *Asuafu/Nsuta*. My father (of blessed memory) fought beyond his strength for all my siblings and me: I'll always remember your struggles for the family. May the good Lord continue to keep you safe! My mother, *Maame*, has been extremely supportive and caring. I appreciate their care, love, support, guidance, protection and prayers since my pre-embryonic era till now. Long live *Maame!*

Finally, I owe everything to my nuclear family. The support, love, prayers, sacrifices, tolerance and understanding they demonstrated were unimaginable and cannot be expressed with words alone. I genuinely love you all and thank you for supporting me all these years. You always took me to the airport in unity, stayed with me till departure,

and picked me up on all the trips to the Netherlands for my studies. Mrs Monica Adu-Bonsaffoh, you are a superwoman and godsent. You kept the family going and gave me all the support I needed to successfully pursue my academic, clinical and social responsibilities. Thank you very much. God bless you exceptionally. To my children, I love you all; Nana Otti Adu-Bonsaffoh, Owura Adu Adu-Bonsaffoh, Bon Nti Adu-Bonsaffoh and Sermon Serwaa Adu-Bonsaffoh. All your prayers worked effectively. God bless you all. Long live the *Bonsaffoh family*!

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About the author

"Education is not the learning of facts but the training of the mind to think" Albert Einstein 1879-1955

Kwame Adu-Bonsaffoh was born on the 1st January 1977 in Asuafu-Nsuta in the Ashanti Region of Ghana. He is the eighth born out of 11 children, in addition to four other step-siblings of paternal origin. His parents, Opanin Kwabena Oti Dapaah (of blessed memory) and Maame Akosua Addai, were uneducated but strived fervently to support their children's education. Kwame lived with his uncle when he was between 9 and 15 years of age and had his primary education at the Essuehyia D.C Junior High School in the Central Region of Ghana. He enrolled in Nsutaman Catholic Senior High School, a day school in the Ashanti Region of Ghana, where he pursued Science Education and completed in 1995. He excelled and began his tertiary education at the University of Ghana (UG) in 1997 and finally gained admission into Medical School in 1999. He completed his medical education in February 2005, followed by Housemanship training for two years and later worked as a medical officer at Catholic Hospital Battor in the Volta Region, Ghana. Kwame commenced his postgraduate specialization training in Obstetrics and Gynecology in October 2007 and completed the West African College of Surgeons Fellowship in April 2014. Subsequently, he was promoted to Senior Specialist at the Korle-Bu Teaching Hospital in Accra, Ghana.

To achieve his long-standing goal of becoming a renowned teacher, Kwame embarked on a Master of Philosophy (MPhil) in Human Physiology at UG alongside his specialization training and graduated in 2011. Teaching at the University was his ultimate dream which was partly and wholly realized following his official appointment by the University of Ghana Medical School (UGMS) as a part-time (Department of Physiology) in August 2013 and full-time Lecturer (Department of Obstetrics and Gynaecology) in November 2016. He was subsequently promoted to Senior Lecturer in 2019 and Professorial rank in February 2022. Dr Adu-Bonsaffoh is currently an Associate Professor/consultant at the Department of Obstetrics and Gynecology, University of Ghana Medical School/Korle-Bu Teaching Hospital in Accra, Ghana.

Since his appointment, Dr Adu-Bonsaffoh has taught both undergraduate and graduate courses in Physiology, and Obstetrics and Gynaecology with significant successes in both fields. Given the immense importance of Epidemiology in Medical education and research, Kwame embarked on an MSc/PhD in Epidemiology at the University of Utrecht, Netherlands and completed the MSc (Epidemiology) in November 2021. More recently (2020-2021 academic year), he was appointed to coordinate and teach Academic Writing II course (University of Ghana Required Course) at the Medical School based on his endowed

background in Clinical Epidemiology and research. He firmly believes that teaching is a lifelong process of learning, sharing perspectives and experiences. He has been actively involved in the supervision of both undergraduate and postgraduate students' theses at local and international levels.

Dr Adu-Bonsaffoh has extensive clinical and basic science research experience in the field of maternal health, with about 70 peer-reviewed publications. His special research interest relates to maternal-fetal medicine, hypertensive disorders of pregnancy (preeclampsia), preterm birth, respectful maternity care (RMC) and Reproductive/Endocrine Physiology. His clinical research on hypertensive disorders of pregnancy has determined the prevalence, morbidities and underlying causes of maternal deaths attributable to maternal hypertension in Ghana. He has also been involved in international collaborative research with Scientists from the World Health Organization (WHO) with specific mention of Respectful Maternity Care (RMC).

In addition, Dr Adu-Bonsaffoh has served the University of Ghana Medical School (UGMS) in various capacities. He was initially appointed a Hall Tutor for the Medical students' hostel in 2017. In January 2019, he was appointed to senior-level management as the Senior Tutor of the medical students' hostel for three years. His appointment was renewed in 2022 for another term of office. In addition, he was appointed by the College of Health Sciences (CHS) UG as the Chairman of the CHS's students' hotel in 2019. Kwame has acted as the Chief Invigilator for the Medical School on several occasions.

In terms of contribution to national development, Dr Adu-Bonsaffoh was appointed as the Chair of the committee that reviewed the National Guidelines on postpartum hemorrhage which resulted in the inclusion of heat-stable carbetocin and tranexamic acid in the treatment protocol for Ghana in 2020. Also, he was appointed as the country focal person for the International Federation of Gynecology and obstetrics (FIGO) project on the introduction and development of job aids for the management of PPH with a special focus on tranexamic acid and carbetocin. Currently, Dr Adu-Bonsaffoh is the principal investigator for the Concept Foundation/Merck for mothers' sponsored implementation research involving the integration of tranexamic acid and heat-stable carbetocin in four facilities in Ghana.

Dr Adu-Bonsaffoh has extensive international exposure and has presented at several international conferences: International Family planning conference (Dakar-Senegal in 2011 and Addis Ababa 2013), International Federation of Gynecology and obstetrics FIGO (2012), Global Maternal Health Conference in Arusha-Tanzania 2013, International society for the study of hypertension in pregnancy (New Orleans-USA in 2014 and France in 2022),

Preterm birth international collaborative (PREBIC Global) Annual Meeting (Texas-USA in 2017, Guanzhou-China in 2018 and Dubrovnik-Croatia in 2019). He was awarded a FIGO Fellowship in 2012 and had his clinical Fellowship training at the Universita Catholica del Sacro Cuore in Rome, Italy. In addition, he was awarded Young Investigator Travel Award by the International Society for the Study of Hypertension in pregnancy (ISSHP) in October 2014. Dr Adu-Bonsaffoh also pursued a three-month clinical attachment at Michigan University in 2014. In addition, he served as Consultant for WHO on Maternal and Reproductive Health projects in 2014, 2015, 2016 and 2017.

Dr Adu-Bonsaffoh is an active Member of several local and international professional organizations: Ghana Medical Association, Medical and Dental Council, Ghana Fertility Society of Ghana (FERSOG), Ghana College of Physicians and Surgeons, Society of Obstetricians and Gynaecologists of Ghana, West African College of Surgeons, European Society of Human Reproduction and Embryology (ESHRE), Preterm Birth International Collaborative (PREBIC Global), Society for Reproductive Investigation (SRI) and American Society for Reproductive Medicine (ASRM).

Dr Adu-Bonsaffoh is a christian and an active member of the Salvation Army Church, Mamprobi Corps in Accra.

Dr Adu-Bonsaffoh is the Chief Executive Officer (CEO) of the Holy Care Specialist Hospital in Ghana, a private health facility with a special focus on women's health and Fertility treatment. He has been actively involved in maternal health advocacy and health screening programs for breast and cervical cancers in Ghana.

Dr Adu-Bonsaffoh is a family man: married to Mrs Monica Adu-Bonsaffoh and they have been blessed with four children; three strong boys (Nana Otti, Owura Adu and Bon Nti) and a beautiful girl (Sermon Serwaa).

List of publications

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