

## CLINICAL ARTICLE

## Obstetrics

# Preparedness to deal with maternal mortality among obstetric providers at an urban tertiary hospital in Ghana

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## Abstract

**Objective:** This study explores the impacts of managing frequent maternal mortalities on obstetric healthcare providers in Ghana.

**Methods:** Two hundred and seventy obstetric providers at the Komfo Anokye Teaching Hospital in Ghana completed an electronic survey. Questions included coping strategies, sources and adequacy of support, training, and emotional impact. Logistic regression assessed predictors of perceived preparedness to manage maternal mortalities.

**Results:** Over half of participants (55.1%) did not report adequate support to deal with maternal death and only 35.9% received training. The vast majority (96.4%) agreed that managing maternal deaths takes a large emotional toll—27.6% considered giving up their obstetric practice, half experienced guilt or shame, and half worried about legal or disciplinary action. After adjusting for age, gender, years in practice, and annual maternal mortalities managed, perceived adequacy of support (odds ratio [OR] 6.6, 95% confidence interval [CI] 3.0–14.7,  $P < 0.001$ ) and receiving training (OR 9.5, 95% CI 3.5–25.8,  $P < 0.001$ ) were significantly associated with preparedness to deal with maternal mortality.

**Conclusion:** Managing maternal mortalities has significant emotional impact on obstetric healthcare providers. Preparedness to deal with maternal death is significantly improved when providers receive adequate support and training.

## KEYWORDS

Ghana, low- and middle-income countries, maternal death, maternal mortality, obstetric provider

## 1 | INTRODUCTION

Maternal mortality is a devastating consequence of systems failures, gender inequalities, and healthcare disparities.<sup>1,2</sup> The 1987 Safe Motherhood Initiative established maternal mortality as a key international health indicator,<sup>3</sup> and the Millennium Development Goals reaffirmed reduction in maternal mortality as a global priority.<sup>1,4</sup>

Though maternal mortality is decreasing globally, it remains high in developing countries, including sub-Saharan Africa.<sup>5–7</sup> Maternal mortality has far-ranging consequences that are often unexplored, including its impact on doctors and midwives.

Maternal mortalities are often very profound events because of their sudden and unanticipated nature, their occurrence among young women, and the perception that childbirth should be natural

and safe. The death of a patient is an intense event for healthcare providers, both clinically and emotionally,<sup>8,9</sup> and many providers feel unprepared.<sup>10</sup> Related research on the impact of stillbirths on healthcare providers demonstrates a large emotional toll, self-blame, and guilt.<sup>10-12</sup> Providers involved in maternal deaths are often not offered, or are unaware of, institutional sources of support,<sup>13</sup> and many are concerned about perceptions of weakness or blame.<sup>14</sup> These providers are more likely to have low job satisfaction and leave the medical field.<sup>14</sup> Additionally, healthcare providers in low- and middle-income countries (LMICs) are challenged to provide care in inherently stressful environments with limited medical and financial resources and institutional support.

Little research has been done on the impact of maternal mortality on obstetric healthcare providers in LMICs, including Ghana. The current study evaluates the impact of managing frequent maternal mortalities on emotional well-being; utilization of coping strategies; exposure and adequacy of training; and sources for, helpfulness of, and gaps in support.

## 2 | MATERIALS AND METHODS

This study was conducted at the Komfo Anokye Teaching Hospital (KATH), Ghana's second largest tertiary teaching hospital. The maternity unit conducts about 10 000 deliveries, with 120-140 maternal mortalities, yearly. Patients managed at KATH include attendants from the urban center of Kumasi, as well as referrals from surrounding district hospitals, private health centers, and more distant facilities across central Ghana. Ethical approval was granted by the Institutional Review Boards at Komfo Anokye Teaching Hospital (KATH-IRB/AP/019/20) and the University of Michigan (HUM00175461).

Participants were obstetric providers—defined as midwives, house officers rotating on the Obstetrics and Gynecology (OBGYN) service, and OBGYN physicians at all levels of training and practice. Exclusion criteria were roles other than midwife, house officer, and OBGYN, and primary site of clinical work other than KATH. Participants were recruited using electronic WhatsApp groups for relevant roles at KATH, which included 390 total members. WhatsApp groups serve as electronic messaging platforms and are commonly used in Ghana. Compensation for participation was 20 cedis of cellphone credit (US\$ 3.50). Electronic informed consent was obtained.

A survey was generated using REDCAP and distributed using WhatsApp groups between July 9, 2020 and July 22, 2020. Questions were asked in English, an official language in Ghana. The survey consisted of four sections. Section 1 (demographics) included questions on gender, age, family structure, role, trainee status, and years in practice. Approximate number of yearly deliveries and maternal mortalities handled were asked categorically. Final demographic questions included frequency of religious activities, personal experience with maternal death, and experience with traumatic workplace events. In section 2 (support and coping), participants indicated all

sources of support used to cope with maternal death, selected the single most helpful source, and indicated whether their support was overall adequate. Helpfulness of support from work colleagues, work supervisors, family/friends, and religious community were each ranked on a four-point Likert scale ranging from very helpful to very unhelpful. This section also included questions about use of alcohol and recreational drugs to cope. In section 3 (training), participants reported whether they received any training on coping with maternal death. Those who responded yes were asked if that training was provided during school, while in clinical training, or in the workplace, and whether this training was adequate. Preparedness to deal with maternal death was assessed on a four-point Likert scale that ranged from strongly agree to strongly disagree. In section 4 (emotional impact of maternal death), participants responded to seven statements on a four-point Likert scale ranging from strongly agree to strongly disagree. Statements included the impact of maternal deaths on emotional toll, thoughts of giving up obstetric practice, self-blame, and worry about disciplinary action.

Data were transferred from REDCAP to Stata (Version 16.0 StataCorp., College Station, TX, USA). Age and number of years of practice were collected and analyzed as continuous variables. Other demographic variables, use of alcohol and recreational drugs, type of support received, and presence and adequacy of training were asked as multiple choice questions and analyzed as categorical variables. For logistic regression, responses to preparedness to deal with maternal death were collapsed into two response categories: agree versus disagree.

Our primary outcome was perceived preparedness to deal with maternal death. Demographics, support and coping, training, and emotional impact were calculated for the total population using means and proportions. Bivariate logistic regression evaluated predictors of preparedness to deal with maternal death (agree, disagree). Variables that were significantly associated with the outcome in bivariate analysis were included in a final adjusted logistic regression. The final model was adjusted for age, gender, years in practice, and annual maternal mortalities managed. Simple and adjusted odds ratios (OR) with 95% confidence intervals (CI) were calculated. A *P* value <0.05 was considered statistically significant.

## 3 | RESULTS

The survey was distributed to 390 potential respondents—134 physicians (OBGYNs and house officers) and 256 midwives. Surveys were excluded if more than 50% of responses were missing; a total of 270 surveys were analyzed. Completion rate was 36% for physicians, 87% for midwives, and 69% for the total study population. Due to missing responses among the individual responses, total *N* does not equal 270 for each question.

Of the total participants, 21 (7.8%) were house officers, 27 (10.0%) were OBGYNs, and 222 (82.2%) were midwives (Table 1). The majority of participants were female (226, 84%), married (167, 62.3%), and had children (172, 63.9%). Mean age was 32.4 years,

TABLE 1 Demographics<sup>a</sup>

Characteristic	Responses <sup>b</sup>
Gender	
Male	43 (16.0)
Female	226 (84.0)
Age, years	32.4 ± 5.9
Family structure	
Married	167 (62.3)
Children	172 (63.9)
Clinical role	
House officer	21 (7.8)
Obstetrician/gynecologist specialist	14 (5.2)
Obstetrician/gynecologist resident	13 (4.8)
Midwife	222 (82.2)
Medical training status	
Current trainee	47 (17.5)
Completed training	222 (82.5)
Years in practice	6.5 ± 4.7
Average deliveries managed annually	
1–25	48 (17.8)
26–50	57 (21.2)
51–75	47 (17.5)
≥76	117 (43.5)
Average maternal mortalities managed annually	
<5	185 (71.7)
5–10	48 (18.6)
11–16	10 (3.9)
>16	15 (5.8)
Personal experience (friend/family) with maternal death	
Yes	120 (49.6)
No	122 (50.4)
Experience of other traumatic clinical event in the workplace	
Yes	164 (68.1)
No	77 (32.0)

<sup>a</sup>Data presented as number (percentage) or as mean ± standard deviation.

<sup>b</sup>Due to missing responses among the individual responses, total *N* does not equal 270 for each question.

mean years in practice was 6.5 years, and most (222, 82.5%) had completed their medical training. Most participants (185, 71.7%) reported managing fewer than five maternal mortalities in a typical year, but 15 participants (5.8%) reported managing 16 or more. Half of the participants (120, 49.6%) had personal experience with maternal death among their close friends or family, and 68.1% (154) had experienced traumatic clinical events in their workplace apart from maternal death.

Table 2 illustrates coping strategies and perceived support. Participants reported a wide range of coping strategies, of which talking with friends and family (180, 66.7%) and prayer or religious

TABLE 2 Support and coping<sup>a</sup>

Characteristic	Responses <sup>b</sup>
Support is overall adequate	
Yes	199 (44.9)
No	146 (55.1)
Coping strategies used	
Talking to friends/family	180 (66.7)
Prayer or religious activities	147 (54.4)
Formal case review	128 (47.4)
Talking informally with colleagues	114 (42.2)
Trying not to think about it	100 (37.0)
Staying busy/distracted	65 (24.1)
Enjoyable hobby (exercise, etc.)	40 (14.8)
Seeing a counselor or therapist	31 (11.5)
Leaving work as soon as possible	11 (4.1)
Using alcohol, drugs, or tobacco	1 (0.4)
Most helpful coping strategy used	
Formal case review	63 (23.8)
Prayer or religious activities	53 (20.0)
Talking to friends/family	43 (16.2)
Trying not to think about it	33 (12.5)
Talking informally with colleagues	32 (12.1)
Staying busy/distracted	17 (6.4)
Seeing a counselor or therapist	13 (4.9)
Enjoyable hobby (exercise, etc.)	11 (4.2)
Leaving work as soon as possible	0 (0.0)
Using alcohol, drugs, or tobacco	0 (0.0)
Started or increased alcohol use to cope	
Yes	0 (0.0)
No	264 (98.9)
I don't know	3 (1.1)
Started or increased recreational drug use to cope	
Yes	3 (1.1)
No	260 (97.4)
I don't know	4 (1.5)

<sup>a</sup>Values are given as number (percentage).

<sup>b</sup>Due to missing responses among the individual responses, total *N* does not equal 270 for each question.

activity (147, 54.4%) were most commonly used, followed by formal case review (128, 47.4%) and talking informally with colleagues (114, 42.2%). Formal case review was the most helpful coping strategy (63, 23.8%). The majority of participants (146, 55.1%) did not feel that they had adequate support in dealing with maternal death. Most participants felt that support from work colleagues, work supervisors, family/friends, and their religious communities were all helpful (Figure 1).

Figure 2 illustrates receipt of and adequacy of training to cope with maternal death. One-third of participants (94, 35.9%) received training to cope with maternal death—of those, 76.6% (72) reported

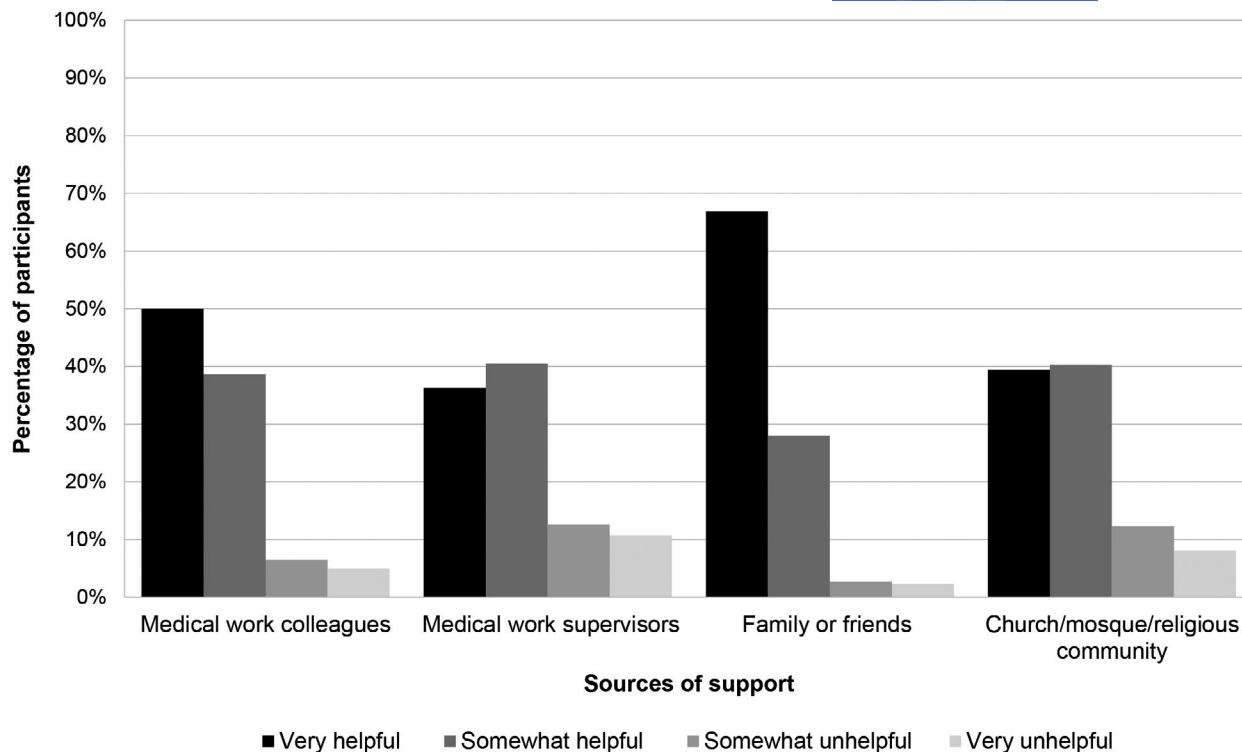


FIGURE 1 Reported helpfulness of sources of support

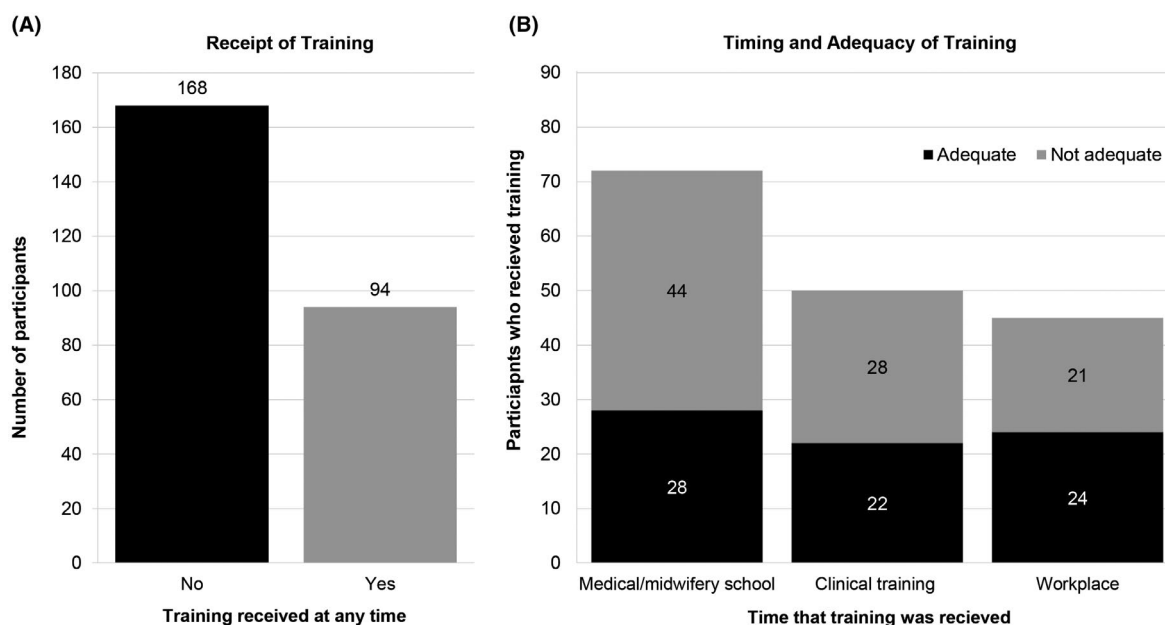


FIGURE 2 Training to cope with maternal death. (A) Training received at any time; (B) timing and adequacy of training

training during medical/midwifery school, 54.3% (50) during clinicals, and 48.9% (45) in the workplace. Perceived adequacy of that training was 38.9% (28), 44.0% (22), and 53.3% (24), respectively. Of all participants, 67.6% (177) somewhat agreed or strongly agreed that they personally were prepared to cope with maternal death (Figure 3).

Figure 4 illustrates the emotional impact of maternal death on providers. The vast majority of participants strongly agree (190, 76.6%) or somewhat agree (49, 19.8%) that managing maternal deaths takes a large emotional toll, with 27.6% (69) having considered giving up their obstetric practice as a result of their experience managing maternal death, 51.8% (129) having experienced guilt or

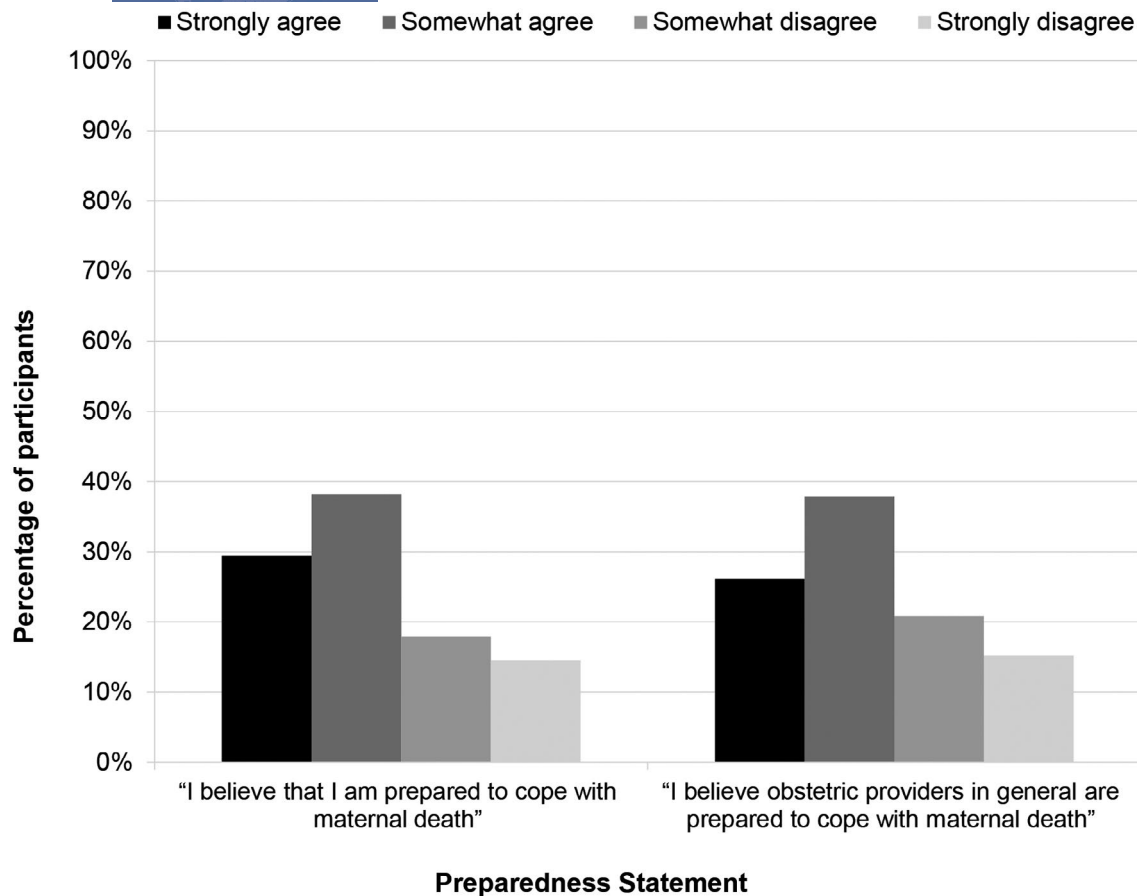


FIGURE 3 Preparedness to cope with maternal death

shame, and 49.0% (150) having worried about legal or disciplinary action.

Finally, factors associated with preparedness to deal with maternal death were evaluated. Clinical role, having children, whether training was complete, adequacy of support, and presence of training were significantly associated in the bivariate analysis, and were subsequently included in a final adjusted logistic regression model. Gender, age, marital status, religious activity, personal experience with maternal mortality, experience of other workplace trauma, years in practice, yearly deliveries, and yearly maternal mortalities were not significant in the bivariate model. After adjusting for age, gender, years in practice, and annual maternal mortalities managed, adequacy of support to cope with maternal death (OR 6.6, 95% CI 3.0–14.7,  $P < 0.001$ ) and receiving training to cope with maternal death (OR 9.5, 95% CI 3.5–25.8,  $P < 0.001$ ) remained significantly associated with perceived preparedness to deal with maternal death (Table 3).

#### 4 | DISCUSSION

The number of maternal deaths handled by individual providers in Ghana is substantial. Although most participants deal with fewer

than five maternal mortalities in a typical year, 22.5% handle 5–16 and 5.8% handle 16 or more. Providers employ a wide range of coping strategies, of which talking with friends/family and religious activity are the most common. Formal case review is felt to be the most helpful coping strategy. The majority of participants do not feel that they have adequate support in dealing with maternal death. Only 35.9% have received training to cope with maternal death and 32.4% do not feel prepared to deal with it. The vast majority of participants agree that managing maternal deaths takes a large emotional toll. After adjusting for age, gender, years in practice, and annual maternal mortalities managed, providers are 6.6 times more likely to feel prepared to cope with maternal death if they receive adequate support and 9.3 times more likely to cope if they have received training to do so.

In our study, 96.4% of participants reported that managing maternal deaths takes a large emotional toll, half have experienced guilt or shame, and half worry about legal or disciplinary action. This is consistent with a qualitative study of midwives in Ghana that demonstrated emotional distress and negative impact on well-being associated with witnessing a maternal death.<sup>9</sup> A study of anesthesiologists in the UK reported that the effects of maternal death include depression, experiencing a culture of blame, and concern about litigation.<sup>13</sup> More than one-quarter of participants in our

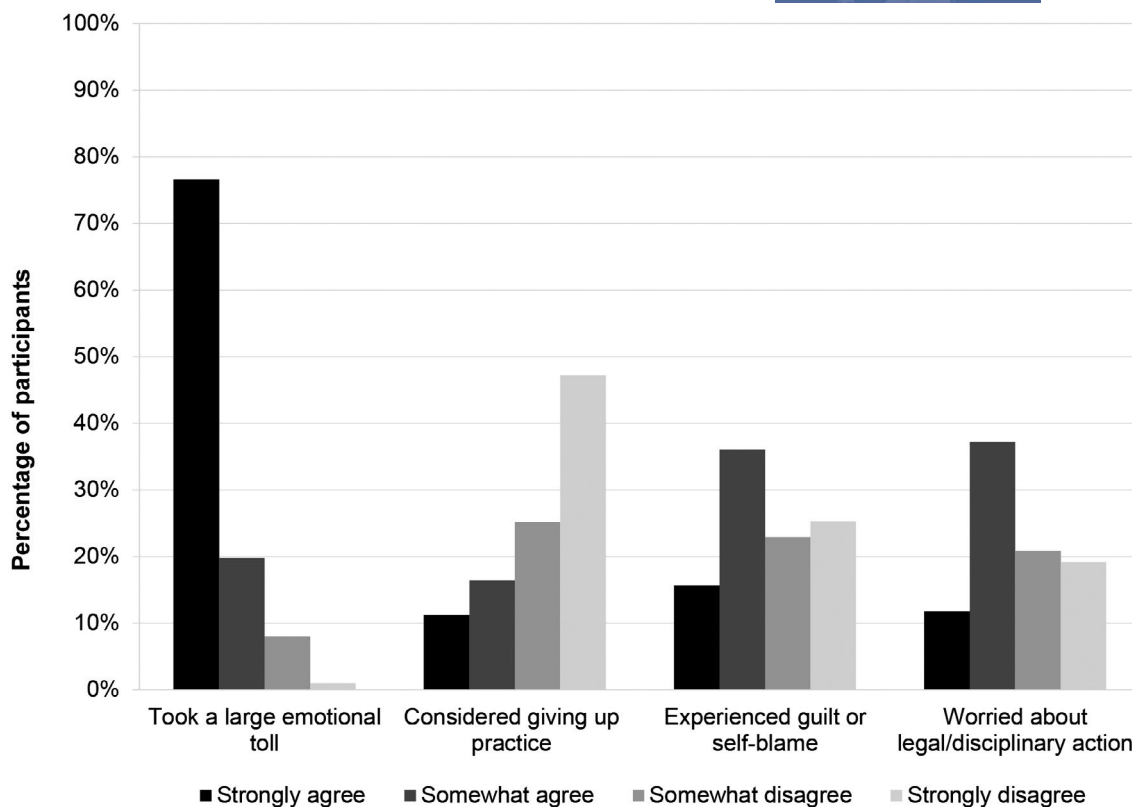


FIGURE 4 Impacts of managing maternal mortalities

TABLE 3 Predictors of preparedness to deal with maternal death<sup>a</sup>

Predictor	Adjusted OR	95% CI	SE	P value
Role				
House officer	1.9	0.2–17.0	2.2	0.55
Obstetrician/gynecologist specialist	3.0	0.2–52.4	4.4	0.46
Obstetrician/gynecologist resident	3.3	0.2–52.9	4.7	0.40
Midwife	REF	–	–	–
Training complete (vs currently a trainee)	3.77	0.9–15.5	2.7	0.07
Children (vs not having children)	1.3	0.6–2.8	0.5	0.57
Support received to cope with maternal death is adequate (vs not adequate)	6.6	3.0–14.7	2.7	<0.001
Training received on coping with maternal death (vs no)	9.5	3.5–25.8	4.9	<0.001

Abbreviations: CI, confidence interval; OR, odds ratio; SE, standard error.

<sup>a</sup>Adjusted for gender, age, years in practice, and average maternal mortalities managed annually.

study have considered giving up their obstetric practice as a result of their experience managing maternal deaths. This compares with 8% in a study on the impacts of stillbirths<sup>10</sup>—highlighting the significant impact that managing maternal deaths has on providers.

We demonstrate that the majority of obstetric providers do not feel that they have adequate support to deal with maternal death. When received, support from medical colleagues, work supervisors, family/friends, and religious communities is helpful to most. In a study of anesthesiologists who experienced maternal death, the most commonly cited source of support was medical colleagues.

Participants desired improved access to and awareness of support, along with departmental guidelines. Despite many who felt that increased support was important, others felt that additional support would not have been helpful and some were skeptical about the benefits of professional counseling.<sup>13</sup> Experiences of healthcare providers who care for children with life-threatening conditions demonstrated that initiation of bereavement debriefing sessions aimed at providing emotional support and managing grief were helpful.<sup>15</sup> Similarly, in a qualitative study of midwives in Ghana, participants desired the creation of hospital support programs.<sup>9</sup>

We also demonstrate the importance of training on coping with maternal deaths in low-resource settings. American OBGYNs who reported adequate training on coping with death were less likely to feel guilty about a death, less likely to consider giving up their obstetric practice because of the emotional toll of death, and less likely to worry about disciplinary or legal action.<sup>10</sup> In a UK study, obstetric healthcare providers who experienced maternal death expressed a desire for training to better prepare themselves to respond emotionally.<sup>16</sup> Until our survey of Ghanaian providers, comparable studies had not been conducted in LMICs. In our study, only one-third of participants reported experiencing training in their schooling, clinical training, and workplace. Those who did receive training were significantly more likely to feel prepared to deal with maternal death.

Participants in our study reported that formal case reviews are the most helpful coping strategy in dealing with maternal death. The World Health Organization (WHO) launched a Maternal Death Review in 2004, recommending that all obstetric providers complete this in-depth investigation into every maternal death.<sup>17</sup> The importance of debriefing following a traumatic medical event is well documented<sup>18</sup>; however, formal debriefs often do not occur following maternal mortality.<sup>13</sup> In a study of UK anesthesiologists who experienced maternal death, the presence of risk management discussions and presentation of cases in departmental morbidity and mortality meetings was constructive for some, but humiliating for others.<sup>16</sup> Finding a balance between investigating clinical decisions surrounding a poor outcome and providing support to involved healthcare providers can be challenging.<sup>19</sup>

Our study is limited by our response rate, which may introduce response bias—particularly among our sub-group of doctors. Our method of survey distribution reached the vast majority of all obstetric providers at our target hospital. Diversity of respondents was reflected in the range of clinical roles, trainee status, and years in practice. Our study was conducted at a single tertiary care hospital in Ghana, which has the potential to limit generalizability. This hospital was intentionally selected given the high rates of maternal morbidity and mortality, which are comparable to other LMIC tertiary hospitals. As a tertiary hospital, high numbers of maternal deaths result from clinical volume, antenatal referrals of medically complex pregnancies, and peripartum transfer of critically ill patients. This was the ideal environment for our study for the purpose of exploring the impact of managing frequent mortalities. Consistency between our findings and themes from the existing literature suggests that lessons learned from our findings can be considered globally.

Our study fills an important gap in the literature by exploring impacts of maternal mortality on obstetric providers in a low-resource setting where maternal death is common. We demonstrate that preparedness to deal with maternal death may be increased by instituting formal case reviews after maternal mortalities, providing training on coping with maternal death during medical/midwifery school and in the workplace, and increasing sources of departmental support. Additional research is needed to explore the impact of frequent

management of maternal mortality on clinical decision making, including mode of delivery, in low-resource settings.

## CONFLICTS OF INTEREST

None of the authors have any conflicts of interest to disclose.

## AUTHOR CONTRIBUTIONS

ERL, AS, and MY conceptualized the study. ERL and MY applied for ethical approval. AS, ERL, and CAM developed the survey instrument and all authors edited and approved the survey instrument. MY and JAK implemented data collection. ERL performed data analysis with assistance of CAM. ERL primarily drafted the manuscript, with feedback and approval from all authors.

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