ORIGINAL RESEARCH ARTICLE

Birth and Emergency Planning: A Cross Sectional Survey of Postnatal Women at Korle Bu Teaching Hospital, Accra, Ghana

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Abstract

Birth and emergency planning encourages early decision making, helps overcome barriers to skilled maternity care and reduces preventable maternal and newborn deaths. A facility based postnatal survey of 483 childbearing women in Accra, Ghana determined birth and emergency planning steps, awareness of obstetric danger signs, reported maternal and newborn complications and birth outcome based on length of hospital stay. Supervised antenatal care and delivery were nearly universal. Overall, 62% had a birth plan, 74% had adequate knowledge of danger signs, while 64% and 37% reported maternal and newborn complications respectively. Accompaniment by a birth companion and saving money were considered the most useful planning steps. Knowledge of danger signs was associated with birth and emergency planning, and birth and emergency planning was associated with reported birth outcome. Birth and emergency planning as a critical component of antenatal care can influence birth outcomes and should be extended to all pregnant women. (*Afr J Reprod Health 2013; 17[1]: 27-40.*

Résumé

La planification des naissances et d'urgence encourage la prise de décision rapide, aide à surmonter les obstacles aux soins de maternité qualifiés et réduit les décès maternels et néonatals évitables. Une enquête post-natale qui a été basée sur l'établissement, et auprès des 483 femmes en âge de procréer à Accra, au Ghana a déterminé les étapes de planification des naissances et d'urgence, la sensibilisation des signes de danger obstétrical, a rapporté des complications maternelles et néonatales et les résultats des naissances selon la durée du séjour à l'hôpital. Les soins prénatals et l'accouchement surveillés étaient presque universels. Dans l'ensemble, 62% avaient un plan de naissance, 74% avaient une connaissance adéquate des signes de danger, tandis que 64% et 37% ont déclaré des complications maternelles et néonatales, respectivement. Le fait d'être accompagné par un compagnon de naissance et d'économiser de l'argent ont été considérés comme les étapes de planification les plus utiles. La connaissance des signes de danger a été associée à la naissance et à la planification d'urgence et la planification des naissances et d'urgence a été associée à des résultats des naissances déclarées. La planification des naissances et d'urgence comme un élément essentiel des soins prénatals peuvent influer sur les résultats de grossesses et devrait être mis a la portée de toutes les femmes enceintes (*Afr J Reprod Health 2013; 17[1]: 27-40).*

Keywords: pregnancy, obstetric complications, birth plan, Accra, Ghana

Introduction

The desired outcome of pregnancy and childbirth is to have a healthy mother and a healthy baby. When this happens, pregnancy can be regarded as a joyful event. However, at least 40% of women globally may develop acute obstetric problems. In developing countries, 300 million women are estimated to suffer from short or long term illness resulting from pregnancy and childbirth[1]. Previous studies indicate that more than half a million women die annually in pregnancy and childbirth from mostly preventable reasons, with Southern Asia and sub-Saharan Africa accounting for 99% [2,3]. Recent estimates suggest a lower value of 300,000 women globally [4]. These facts support the observation by the World Health Organization (WHO) that, pregnancy and childbirth have been "major contributors to death and disability among women" [5]. Inadequacy or lack of birth and emergency preparedness is one of several factors contributing to maternal deaths [1]. Birth and emergency preparedness is an integral component of focused antenatal care which involves planning

for a normal birth and anticipating the actions needed in the event of an (obstetric) emergency [6]. It is based on the theory that preparing for childbirth minimizes delays in obtaining skilled attendance at birth. A birth and emergency plan involves identifying among other elements: a skilled birth attendant, the location of the nearest facility that will offer supervised delivery, funds for birth related and emergency expenses, transport to the health facility for birth and in the case of an obstetric emergency, a birth companion and a compatible blood donor in case there is blood loss requiring a blood transfusion [1,7-9]. Evidence exists that promoting birth and emergency planning improves preventive behaviour, increases awareness of mothers about danger signs and leads to improvement in care seeking behaviour in the case of obstetric complications [10-12]. Birth and emergency planning is important because of the unpredictability of obstetric complications [11]. It has been acknowledged that receiving care from a skilled provider is the single most important intervention in safe motherhood but often women are confronted with delays in seeking care [11].

Thaddeus and Maine hypothesized three main delays that influence the provision and use of obstetric services to prevent maternal deaths: delay in decision making to seek care when a complication arises, delay in reaching a facility that can provide emergency obstetric care and delay in initiating care [13]. The Maternal and Neonatal Health progamme of JHPIEGO developed the birth preparedness and complication readiness matrix to address these delays across the pregnancy, delivery and postpartum periods by involving the pregnant woman, her family and community, health facilities and policy-makers[14]. Since 2001, WHO has recommended and promoted this intervention as a fundamental component of antenatal care programmes and the integrated management of pregnancy and childbirth[7,15]. Birth planning and emergency preparedness has been introduced as part of focused antenatal care in African countries such as Burkina Faso, Ghana, Kenya, Malawi, Nigeria, South Africa, Tanzania, Uganda, Zambia and Zimbabwe [15,16].

As part of birth and emergency planning, women are encouraged to have a skilled provider at every birth. Women and their families can identify a skilled provider at a health facility ahead of the birth, and plan ahead to access care before any potential complication sets in during childbirth. Awareness of danger signs enhances early recognition of complications and promotes early care-seeking from a skilled provider. Identifying a compatible blood donor ensures that blood will be available when it is needed for transfusion, all other factors being equal. This is often required in the case of anaemia, haemorrhage or a caesarean section. The presence of a birth companion of the woman's choice has been shown to be desired by women[17] and has positive effects [17,18]. Birth and emergency preparedness has the advantages of contributing to the increased use of health services by making women and their families or partners aware of the potential for unexpected complications. The success of birth preparedness in relation to preventing maternal morbidity and mortality is difficult to prove as the strategy exists in a plethora of other interventions available (or unavailable) to women. For instance, it may not address facility based delays but if transport is available, the pregnant woman can try to reach another appropriate facility if there are any unforeseen challenges at the previously identified health facility. Little evidence exists to show a relationship between birth preparedness and complication outcomes or their usefulness as reported by women. This paper presents the results of a descriptive survey which sought to identify the birth and emergency planning steps taken by women in Accra, Ghana, during their most recent pregnancy. Their awareness of danger signs, experience of obstetric and newborn complications, and the outcome of complications are discussed.

Materials and Methods

Study site

Ghana is a country located on the Atlantic coast of West Africa. It occupies a land mass of 238, 537 square kilometres and has a total population of 24.2 million [19, 20]. This cross sectional study was

conducted at the postnatal clinic of the Korle Bu Teaching Hospital (KBTH). Situated in Accra, the capital city of Ghana, KBTH is the third largest hospital in Africa and the leading national referral centre in Ghana. It caters for the maternal health needs of women referred from mainly southern Ghana through the Department of Obstetrics and Gynaecology. The Obstetrics unit has a capacity of 316 beds. The annual postnatal attendance in 2009 was 16,943 women and 18,878 women in 2010 [21]. Focused antenatal care is offered to pregnant women during antenatal visits. Birth preparedness and complication readiness (referred to as birth and emergency planning in this paper) is one of the components of focused antenatal care.

Sample

Women aged 15 - 49 years who attended the postnatal clinic at Korle Bu Teaching Hospital, Korle Bu, had a birth in the two months preceding the survey and accepted to participate in the study were included in the sample. The sample size was calculated using the expression, $n = Z^2 pq/d^2$ (where z = confidence limit of 95%, p = prevalence or proportion with the attribute, q = 1-p, and d = sampling error of 5%) [22]. The proportion of women aware of at least one obstetric complication from a previous study was 51.1% [23]. Substituting for p in the formula, the latter was used as a proxy measure for birth and emergency planning. Allowing for a non-response rate of 20%, the final required sample size was 461. Women were recruited serially from the postnatal clinic based on the inclusion criteria and their willingness to participate. A total of 483 women participated in the study which took place from March to December, 2011.

Data collection

A pre-tested, structured, interviewer administered questionnaire was used for data collection. All data were based on the most recent delivery report. Women were interviewed during waiting sessions at the clinic by two trained field staff that were fluent in the local dialects as well as English. Information obtained included socio-demographic characteristics, birth planning steps, antenatal care and birth place, complications during pregnancy and childbirth, complications in the newborn, the number of danger signs during pregnancy and childbirth, and in the newborn that can be mentioned spontaneously, whether birth plans made were considered useful and the outcome of the birth based on the length of hospital stay and type of delivery.

A woman was considered to have a birth plan if she had taken any three of six steps: identified a preferred birth place (health facility), arranged for transport to the birth place, arranged for transport in the case of an emergency, saved money for a potential emergency, identified a compatible blood donor and a birth companion or accompaniment to the birth place. Awareness of danger signs was measured separately for pregnancy and childbirth and for the newborn. The ability to spontaneously mention at least one danger sign and a maximum of five was regarded as awareness. Adequate knowledge of danger signs was defined as the ability to spontaneously mention at least 3 danger signs during pregnancy and child birth and at least 2 danger signs in the newborn. Correct responses were based on options enumerated in the literature[11, 14].

Complications during pregnancy and childbirth were indicated by answering 'yes' to any of the following: labour for > 12 hours, waters broke but no labour after 6 hours, heavy bleeding (> 2-3 pads in 15 minutes or having a blood transfusion or intravenous fluids) placenta not expelled 1 hour after birth, convulsion, birth canal injuries; and in the newborn: did not cry at birth, not able to feed within 1 hour, convulsions, excessive bleeding, too hot or too cold(<35.5◦C or >38◦C), very small (<1,500gm or <32 weeks). Outcomes of complications were assumed to be stable if the mother baby pair was discharged within 48 hours in a normal delivery or 5 days for an elective C/S or unstable if the mother baby pair stayed longer than the period indicated for a stable outcome.

Data analysis

Collected data were coded, then validated and analyzed using SPSS for Windows version 17. A descriptive analysis was carried out. The means and standard deviation were calculated for continuous variables such as respondents' age.

Numerical frequencies and simple percentages were presented for categorical variables, while associations between categorical variables were determined with the Pearson Chi Square test. Statistical significance was assumed at $p < 0.05$.

Ethical considerations

Ethical approval was obtained from the Ethical and Protocol Review Committee of the University of Ghana Medical School. Informed verbal consent was obtained from the respondents before the interview. Confidentiality of recorded information was maintained by ensuring that only members of the research team had access to the questionnaires during the survey. The right of respondents to refuse to participate in the study without any negative repercussion on care was respected and any questions arising from the survey were addressed.

Results

Socio-demographic characteristics

The total number of interviewed mothers was 483 and Table 1 shows the socio-demographic characteristics of the study participants. The age of the respondents ranged from 15 to 47 years with a mean and standard deviation of 29.2 ± 5.6 years. Of the respondents, 333 (68.9%) were in a marital union, 106 (21.9%) were co-habiting and 42 (8.7%) were single. The major ethnic groups were Akan 240 (49.7%) and Ga 99 (20.5%). The predominant religions were Christianity 429 (88.8%) and Islam 51(10.6%). Most women and their partners had secondary level education, 319 (66.0%) and 268 (55.5%) respectively. Post-secondary education was attained by 78 (16.2%) women and 124 (25.7%) partners respectively. With regards to occupation, most women were engaged in services/artisanship 185 (38.3%) and trading 181 (37.5%), similar to their partners 266 (55.1%) and 95 (19.7%) respectively. Sixty four (13.3%) women and 83 (17.2%) men were formally employed. The number of children a woman had at the time of the survey ranged from 1 to 9 with a mean and standard deviation of 2 ±1 child (ren).

Table 1: Socio-demographic characteristics of women attending postnatal clinic at Korle Bu Teaching Hospital, Accra, Ghana, March – December, 2011 (n = 483)

Characteristics	Number (%)
Age (years)	
<20	22(4.6)
20-29	231(47.8)
30-39	214(44.3)
40-49	16(3.3)
Marital status	
Never married	42(8.7)
Married	333(68.9)
Divorced/separated/widow	2(0.4)
Cohabiting	106(21.9)
Religion	
Christian	429(88.8)
Moslem	51(10.6)
African traditional religion	3(0.6)
Ethnicity	
Ga	99(20.5)
Akan	240(49.7)
Ewe	68(14.1)
Mole-Dagbon	28(5.8)
Hausa	25(5.2)
Others	16(3.3)
Non-Ghanaian	7(1.4)
Educational status	
Non-formal	34(7.0)
Primary	52(10.8)
Secondary	319(66.0)
Post-secondary	78(16.2)
Occupation	
Trading	181(37.5)
Services/artisanship	185(38.3)
Government employee	64(13.3)
Homemaker	48(9.9)
Others	5(1.0)
Number of children	
1-2	347(71.8)
3-4	107(22.2)
≥5	29(6.0)
Partners' educational status	
Non –formal/Not sure	77(15.9)
Primary	14(2.9)
Secondary	268(55.5)
Post-secondary	124(25.7)
Partners' occupational status	
Artisanship/services	266(55.1)
Trading	95(19.7)
Government employee	83(17.2)
Farming/fishing	9(1.8)
Others	29(6.0)
Unemployed	1(0.2)

Maternity care characteristics

Receiving antenatal care and delivering at a health facility were almost universal for respondents. Four hundred and seventy eight (99.0%) women received antenatal care, and 482 (99.8%) women delivered at a health facility as shown in Table 2. During the antenatal period, health providers discussed birth plans with three quarters of the respondents, but nearly a quarter did so at every visit and in the month before delivery as indicated by 132 (27.3%) and 129 (26.7%) women respectively. Four hundred and seven women (84.3%) had the same provider throughout care providing the opportunity to share information at every visit and in the month before the birth as required in this standard of care.

Over three quarters of the women (77.8%) lived within 8 kilometres or 1 hour travel from the health facility where they delivered their baby and the main mode of transport to the birth place was taxi (58.4%). The modal cost of transport was less than or equal to three Cedis (approximately USD 6). Nearly a third (34.5%) of the deliveries was operative (elective and emergency caesarean section) with emergency caesarean section reported by 76 (15.7%) women. Among vaginal deliveries, nearly half (51.6%) were normal births, while 13.9% were assisted vaginal births. Although, the National Health Insurance Scheme covers four antenatal visits and delivery costs for childbearing women, 429 (88.8%) had made some form of payment. Among the known items or care options paid for: women paid for medicines for themselves or their babies (34.6%), consumables (16.8%), operative procedures (12.4%), registration (11.2%), investigations (10.8%) while some women did not know what they paid for (30.6%) (Not shown).

Birth and emergency planning steps

Table 3 shows that four hundred and seventy three (97.9%) women planned to deliver in a health facility. Among other steps, most women saved money towards any potential emergency, 356 (73.7%) and arranged for accompaniment or a birth companion, 295 (61.1%). Identifying a compatible donor and advanced arrangement for

Table 2: Maternity care characteristics of women at the postnatal clinic, Korle Bu Teaching Hospital, Accra, Ghana (n = 483)

Variables	Number (%)
Place of antenatal care	
Health centre/hospital	478(99.0)
Maternity home	3(0.6)
Others	2(0.4)
Had the same provider throughout care	
Yes	407(84.3)
No	76(15.7)
Health provider discussed birth plan	
Yes	361(74.7)
No	119(24.6)
Not sure	3(0.6)
Birth plan discussed at every visit	
Yes	132(27.3)
No	346(71.6)
Others*	5(1.0)
Birth plan discussed the month before delivery	
Yes	129(26.7)
No	349(72.3)
Others*	5(1.0)
Delivery place	
Health centre/hospital	482(99.8)
Others	1(0.2)
Distance to delivery place (≤8km/1hr travel)	
Yes	376(77.8)
No	104(21.5)
Not sure	3(0.6)
Transport to delivery place	
Public bus ('tro-tro')	91(18.8)
Taxi	284(58.4)
Community ambulance	7(1.4)
Personal car	79(16.4)
Walked	22(4.6)
Transport cost	
≤GH₵ 3	141(29.2)
GH₵ 4-7	117(24.2)
≥GH₵ 8	117(24.2)
Others**	108(22.3)
Type of delivery	
Spontaneous vaginal delivery	249(51.6)
Assisted vaginal delivery	67(13.9)
Elective caesarean section	91(18.8)
Emergency caesarean section	76(15.7)
Payment during delivery	
Yes	429(88.8)
No	54(11.2)

Others (responses were 'not sure' or 'not applicable'); Others** (respondents who walked, came in personal cars, or did not know how much was paid).*

Table 3: Birth and emergency planning among women at the postnatal clinic, Korle Bu Teaching Hospital, Accra, Ghana (n = 483)

Variables	Number (%)
Planned to deliver at a health facility	473(97.9)
Saved money	356(73.7)
Identified a compatible blood donor	103(21.3)
Advanced arrangement for transport to the birth place	120(24.8)
Advanced arrangement for transport in event of an emergency	103(21.3)
Arranged for accompaniment/birth companion	295(61.1)

**Numbers provided for 'yes' responses only*

transport in the event of an emergency were each the least reported by 103 (21.3%) women. Table 4 shows birth and emergency planning steps for which information was provided and the proportion of respondents who found them useful. Four hundred and twenty two (87.4%) women were told what items to bring along for the birth but few (6.2%) acknowledged this was useful in their birth plan. Three hundred and one (62.3%) women received information about saving funds for investigations, drugs and consumables, while 290 (60.0%) women reported they were advised to save funds for operative procedures. Their usefulness as part of the birth and emergency plan was acknowledged by 325 (67.3%) and 314 (65%) respondents respectively. The step found most useful by the 345 (71.4%) women was having a birth companion or accompaniment for the birth. However, just over a third (34.2%) of women acknowledged that information about a birth companion was shared with them.

Danger signs during pregnancy and childbirth

Danger signs during pregnancy and childbirth spontaneously mentioned by respondents up to a maximum of five are listed in Table 5. The top five danger signs mentioned were: haemorrhage (60.7%), excessive vomiting (33.1%), swelling of face, hands and feet (28.8%), severe headache (21.5%) and severe abdominal pain (21.1%). The least mentioned sign was prolonged labour by 17 (3.5%) women. Sixty four women (13.3%) did not mention any danger sign and 21 (4.3%) women mentioned five danger signs. Four hundred and nineteen (86.7%) could mention at least one danger sign.

Table 4: Information shared by the health provider on birth planning and usefulness of information as reported by respondents, Korle Bu Teaching Hospital, Accra, Ghana (n = 483)

Components of birth plan	Information shared by health worker	Usefulness of component in birth plan
	Number* (%)	Number* (%)
Blood donation	262(54.2)	61(12.6)
Tansport to the birth place	163(33.7)	90(18.6)
Transport in the event of an emergency/referral	158(32.7)	99(20.5)
Funds for investigations, drugs, consumables	301(62.3)	325(67.3)
Funds for obstetric emergencies (e.g. operative procedures)	290(60.0)	314(65.0)
Accompaniment/birth companion	165(34.2)	345(71.4)
Items to bring for delivery	422(87.4)	30(6.2)
Others	14(8.3)	74(15.3)

** Numbers provided for 'yes' responses only; multiple responses present.*

Danger signs in the newborn

Table 6 shows danger signs in the newborn that were spontaneously mentioned by the respondents up to a maximum of five signs. The top five danger signs mentioned were: extremes of temperature (either too hot or too cold) (59.6%), inability to suck or sucking poorly (31.1%), excessive or weak cry (30.2%), skin lesions (21.7%) and fast breathing (20.5%). The least mentioned sign was swollen or discharging eyes by 17 (3.5%) women. Seventeen (3.5%), 430

(89.0%) and 53 (11.0%) women could mention five, at least one, and no danger sign respectively.

Table 5: Awareness of maternal danger signs during pregnancy and childbirth among women at the postnatal clinic, Korle Bu Teaching Hospital, Accra, Ghana (n = 483)

Danger signs	Number*(%)
Haemorrhage	293(60.7)
Swelling of face, hands, feet	139(28.8)
Blurred vision/dizziness	56(11.6)
Convulsions	38(7.9)
Prolonged labour	17(3.5)
Premature drainage of liquor	65(13.5)
Reduced fetal movement	22(4.6)
Excessive vomiting	160(33.1)
Severe headache	104(21.5)
Elevated blood pressure	23(4.8)
High grade fever	37(7.7)
Anaemia	22(4.6)
Breathless/weakness	20(4.1)
Severe abdominal pain	102(21.1)
Retained placenta	32(6.6)
Others**	69(14.3)
Awareness of danger signs	
One danger sign	76(15.7)
Two danger signs	115(23.8)
Three danger signs	107(22.2)
Four danger signs	100(20.7)
Five danger signs	21(4.3)
Not aware of any danger sign	64(13.3)

'Yes' responses only; multiple responses present; others (genital discharge, jaundice, loss of appetite, any abnormality, severe cough, fast heart beat)*

Maternal and newborn complications

Three hundred and nine women had complications during pregnancy and childbirth. Table 7 shows that prolonged labour ranked highest, followed by premature drainage of liquor reported by 180 (37.3%) and 118 (24.4%) women respectively. Convulsion was the least reported maternal complication reported by 4 (0.8%) women. One hundred and eighty women reported their newborn had complications in the immediate postnatal period. Inability to feed within one hour ranked highest, followed by babies who did not cry at birth reported by 138 (28.6%) and 46 (9.5%) women respectively. Convulsion was the least reported newborn complication reported by 1 (0.2%) woman.

Table 6: Awareness of danger signs in the newborn among women at the postnatal clinic, Korle Bu Teaching Hospital, Accra, Ghana (n = 483)

Danger signs	Number*(%)
Convulsion	46(9.5)
Fast breathing	99(20.5)
Very small baby	27(5.6)
Lethargic	27(5.6)
Too hot/cold	288(59.6)
Inability to suck/sucks poorly	150(31.1)
Bleeding from umbilicus or other areas	22(4.6)
Swollen, red or purulent eyes	17(3.5)
Skin lesions	105(21.7)
Yellow eyes or skin	37(7.7)
Excessive or weak cry	146(30.2)
Others**	75(15.5)
Awareness of danger signs	
One danger sign	118(24.4)
Two danger signs	162(33.5)
Three danger signs	89(18.4)
Four danger signs	44(9.1)
Five danger signs	17(3.5)
Not aware of any danger signs	53(11.0)

'Yes' responses only; multiple responses present; Others (macrocephaly, diarrhoea, inability to pass stool, undescended testes in a male neonate, anything unusual in the baby, baby is bigger than normal)*

Table 7: Maternal and newborn complications reported by women at the postnatal clinic, Korle Bu Teaching Hospital, Accra, Ghana (n = 483)

Complications	Number*(%)
Maternal complications during pregnancy and childbirth	
Prolonged labour	180(37.3)
Premature drainage of liquor	118(24.4)
Haemorrhage	27(5.6)
Retained placenta	23(4.8)
Convulsion	4(0.8)
Birth canal injuries	28(5.8)
Not applicable	171(35.4)
Newborn complications	
Did not cry at birth	46(9.5)
Did not feed within 1 hour	138(28.6)
Convulsion	1(0.2)
Too hot or too cold	4(0.8)
Very small baby	10(2.1)
Others**	26(5.4)
Not applicable	300(62.1)

**'Yes' responses only; multiple responses present; **Jaundice, irregular breathing, big baby.*

Birth outcomes

Table 8 shows the birth outcomes, the proportion of women who had a birth plan and considered it helpful for maternal or newborn complications. It also shows significant associations between the birth outcome and birth and emergency planning, and knowledge of danger signs and birth and emergency planning. Two hundred and ninety nine (61.9%) women had a birth and emergency plan. While 281 (58.2%) women found the plan useful for maternal complications, 164 (34.0%) women found it useful for newborn complications. Among 236 women who had a stable birth outcome, the difference between those who had a birth plan, 162 (68.6%) and those who did not have a birth plan, 74 (31.4%) was statistically significant ($\chi^2 = 8.766$; df = 1; p = 0.003).

Among women who had a birth plan, the difference between those who had adequate knowledge of danger signs, 236 (78.9%) and those who did not have adequate knowledge, 63(21.1%) was also statistically significant ($\chi^2 = 11.051$; df = 1; p = 0.001). Furthermore, the difference in birth outcomes – stable and unstable, was statistically significant whether or not respondents reported maternal (($\chi^2 = 6.334$; df = 1; p = 0.012) or newborn complications ($\chi^2 = 20.391$; df = 1; p = 0.000). If they did not have a birth plan, the difference in outcomes was due to chance (not shown).

Although 361 (74.7%) women admitted that their health providers had discussed a birth and emergency plan with them, only 260 (53.8%) women considered this helpful for their births. Among those who considered it helpful, the main reasons suggested by the respondents were: 'to be better prepared or enable providers assist them better' and 'to be better informed or improve knowledge'. These were suggested by 133 (27.5%) and 87 (18.0%) women respectively. Among those with a negative response, the main reason proffered was that 'it was personal, so there is no need', as indicated by 61 (12.6%) women (not shown).

Discussion

Antenatal care in Ghana and in the present study exceeds 95%. Antenatal coverage exceeding 90% has been reported in other African countries such as Tanzania[24], and Democratic Republic of Congo[25]. This is good because antenatal care affords women the opportunity to benefit from effective interventions such as serologic screening for syphilis, chemoprophylaxis for malaria prevention, anti-tetanus immunization and prevention of mother to child transmission of HIV[26]. Screening for pre-eclampsia and treatment for symptomatic bacteriuria have also been shown to be cost effective antenatal care interventions in Africa[27]. Lower rates (32%) of antenatal care have been reported in Kenya[27].

Table 8: Outcome of the birth plan reported by women at the postnatal clinic, Korle Bu Teaching Hospital, Accra, Ghana (n = 483)

Variable	Number *(%)
Decided on a birth plan	369(76.4)
Had a birth plan†	299(61.9)
Reported maternal complications	309(64.0)
Birth plan considered helpful for maternal complications	281(58.2)
Reported newborn complications	180(37.3)
Birth plan considered helpful for newborn complications	164(34.0)
Birth outcome $	n = 280
Stable	236(84.3)
Unstable	44(15.7)
Women with a stable outcome who had a birth plan	162(68.6)
Women with a stable outcome who did not have a birth plan	74(31.4)
$\chi^2 = 8.766$; df = 1; p = 0.003	
Women with a birth plan who had adequate knowledge of danger signs	236(78.9)
Women with a birth plan who did not have adequate knowledge of danger signs	63(21.1)
$\chi^2 = 11.051$; df = 1; p = 0.001	

'Yes' responses only unless otherwise indicated; Others (saved money); †Any 3 of 6 steps: planned to deliver at a health facility, saved money, identified a compatible blood donor, arranged for transport to the birth place, arranged for transport in the event of an emergency, arranged for a birth companion/accompaniment; $Based on length of hospital stay: a stable outcome is assumed if mother-baby pair was discharged within 48 hours of a normal delivery and 5 days of a Caesarean section, otherwise an unstable outcome was assumed; χ^2 = chi square statistic, df = degree of freedom, p = p value.*

Birth and emergency planning

Although three quarters of the women acknowledged that their health providers had discussed making a birth plan with them, 27% were reminded about this at every visit and in the month before delivery. It is particularly important that women discuss their birth plans especially in the month before delivery in order to identify critical problems that could interfere with access to prompt care at birth. The pregnant woman can then be counseled, receive an intervention or be appropriately referred if the solutions lie outside the scope of the clinical setting. The prevalence of birth preparedness estimated in this study of 61.9% is higher than 47.8% in Indore City, India[8], 35% in Uganda[28], 17% in Ethiopia[1], 7% in Kenya[29] but lower than 75.4% reported in Uttar Pradesh, India[12]. When individual birth and emergency planning steps were considered, planning to deliver at a health facility ranked highest 97.9%. This is much higher than 8.1% reported in Ethiopia, where the majority planned for a home birth[1]. The difference may be attributed to the nature of the study. The study in Ethiopia was a community survey, while the present survey was facility based. Furthermore, 36% of the women in the community survey achieved primary level education or higher compared with 93% of women in the present study. Ample evidence exists that education increases health facility use for delivery[30-32]. Education increases the likelihood that women will make better and informed choices, develop and implement a birth plan, and be better empowered take critical decisions in the event of an obstetric emergency[9]. Next in order was saving money for a potential emergency, 73.7%. This was lower than 83.3% in Burkina Faso[11], 80.1% in Nigeria[33], 81. 9% in Uttar Pradesh [12] and 76.9% in Indore City[8], India, but higher than 34.5% in Ethiopia[1] and 63% in Kenya[29]. Saving money may be helpful for services, supplies, transport or other unforeseen costs [14]. Arranging for accompaniment or a birth companion was not reported in most studies reviewed. In the present study, 61.1% were estimated to have made arrangements for a birth companion. This social aspect of birth and emergency planning has been shown to be desired by pregnant women and often associated with a positive outcome [17]. A quarter of the women in the present study made advanced arrangements for transport to the birth place and 21% made arrangements in the event of an emergency. Higher estimates were reported in Nigeria 83.5%[33], Uganda 61%[28], 46.1% in Burkina Faso[11], 29.5% in Indore City, India[8] and 76.8%[12] in Uttar Pradesh, India. However, estimates in Ethiopia were far lower at 7.7% [1]. Twenty one per cent of women had identified a compatible donor compared to 2.3% in Ethiopia[1] and 29% in Kenya [29]. At KBTH, women are counseled to identify a donor who will donate blood ahead of the birth, so the women are able to get a blood transfusion if this becomes necessary. Some women opt to purchase a pint of blood from a blood bank, if they are unable to get a donor. The practice of blood donation ahead of the birth is aimed at reducing delays in obtaining blood in the event that a blood transfusion is required. This is important because blood transfusions may be required in the event of anemia, obstetric haemorrhage and cesarean section. Haemorrhage accounts for 34% of maternal deaths in sub-Saharan Africa[34] and there is a strong association between maternal mortality and availability of blood [35].

Respondents were asked about birth and emergency planning steps that they found useful. Although accompaniment to birth or having a birth companion was discussed with only 34% of respondents, 71% of women regarded it as the most useful birth planning and emergency step. This desire for support at the critical time of childbirth is well acknowledged in most western countries [36-38] and has gained ground in African countries as well[17, 39, 40]. In the African context, accompaniment or birth companions can contribute to a positive birth experience in various ways: offering words of encouragement, prayer or other spiritual support, physical support, communication, being available to run errands or offer other assistance among others [17]. The need for companionship during birth is an observation which deserves further exploration to ensure that patient centered care can be provided to improve birth experiences without risk to mother or baby.

Saving money, be it for investigations, drugs, consumables or operative procedures proved

useful to most women unlike blood donation which some women did not utilize in the long run. While nearly a third of women acknowledged receiving information about advanced arrangement for transport, no more than one fifth found this useful. Likely reasons include the fact that some women had arrived for their routine antenatal visit and ended up with a delivery; easy access to transport as 78% lived within 8km or 1 hour travel distance to the hospital and some had personal cars. The fact that most women still required money and found this information useful in spite of the fact that the National Health Insurance scheme makes maternity services free indicates that there are difficulties in women utilizing the scheme which could be user or provider based. This was not explored in the present study. Evidence from Burkina Faso, Nepal and India indicate that promoting birth and emergency planning improves the knowledge of mothers about danger signs and motivates care seeking during obstetric emergencies [12-14]. With regards to danger signs, 86.7% and 89.0% of respondents respectively knew at least one obstetric and one newborn danger sign respectively. This is comparable to about 80% awareness of maternal/newborn complications reported in Indore City, India [8]. In Uganda, awareness of danger signs in pregnancy was 52%, and 72% each during childbirth and postpartum [28]. These values were lower than those found in the present study. In India, skilled attendance at birth was three times higher among women who had taken at least three out of four steps (identified a trained birth attendant, identified a health facility, arranged for transport and saved money for emergency) [8]. In the present study, the association with skilled attendance at birth was not relevant as nearly all the women delivered in a health facility. In the survey by Agarwal et al[8], 80% of respondents were aware of danger signs and about 50% were well prepared. In our facility based study, a higher proportion of women 62%, had a birth plan or could be considered well prepared. In a community based survey in Uganda, 35% were considered birth prepared which was defined as accomplishing three of four practices: identifying a skilled health provider, saved money, identified transport and had delivery kit/materials [28]. In Nigeria, Ekabua et al, estimated 71% of women were aware of the concept of birth preparedness but observed that knowledge of specific danger signs was low [33]. In the latter study, the traditional risk based approach to maternity care was in practice unlike other studies where focused antenatal care is practiced. In the present study, respondents who spontaneously mentioned at least 3 danger signs during pregnancy and childbirth and at least 2 danger signs in the newborn were deemed to have adequate knowledge of danger signs and comprised 74% of respondents. Kabakyenga et al estimated that 19% of women knew 3 or more danger signs during pregnancy, childbirth and postpartum [28].

Among the danger signs, the best known during pregnancy and childbirth in the present study was severe vaginal bleeding (haemorrhage) mentioned by 60.7% of respondents. This compares favourably with the report by Kabakyenga et al [28], where severe vaginal bleeding was also the best known danger sign during pregnancy 49.2%, childbirth 63.8% and postpartum 56.7% [28]. Ekabua et al also reported corresponding estimates of 48.8%, 58.7% and 53.7% [33]. The least known danger sign in pregnancy and childbirth in the present study was prolonged labour mentioned by 3.5% of respondents. This is much lower than 18.3% reported by Kabakyenga et al [28] and 52.4% reported by Ekabua et al [33]. It is possible that the difference may arise from the nature of the study sites: our study is based on women nearly all of whom received care in a health facility and had supervised delivery. Among these women, complications that may result in a prolonged labour may have been identified earlier and such women prepared for an elective cesarean section which may account for the high elective cesarean section rate (18.8%) found. In the study by Kabakyenga[28], a community based survey was conducted which allowed for a more variable experience of maternity care. Women may have been more familiar with prolonged labour, especially in non-facility based options of care. Kashari and Rwampara where the respondents resided were largely rural counties and only 32% of women in rural Uganda deliver under the care of skilled birth attendants [28]. In the study by Ekabua et al, 55.1% of respondents resided in rural

areas and 51.6% delivered outside the health facility (church/traditional birth attendant/home) [33]. Compared to 51.4% of women who reported swollen hands and face as a danger sign in the study by Ekabua et al [33], the corresponding estimate in our study was 29%. Kabakyenga et al, reported a much lower proportion of 8.7% [28]. Haemorrhage and eclampsia are key causes of maternal deaths which along with sepsis and obstructed labour account for 64% of all maternal deaths [34]. It is important that pregnant women know and recognize danger signs to enable them access interventions promptly. As regards danger signs in the newborn, the best known was the baby feeling too hot 59.6%, followed by inability to suck or sucking poorly 31.1%. In the study by Ekabua et al[33], difficult or fast breathing was the most reported danger sign 49.7% compared to 20.5% in the present study. The least mentioned danger sign in the newborn was red, swollen eyes with or without purulent discharge mentioned by 3.5% of respondents. This is usually indicative of reproductive tract infections in the mother and may not have been commonly observed as nearly all the women benefitted from supervised care in health facilities.

The actual experience of complications indicates that prolonged labour (37.3%) and premature drainage of liquor (24.4%) were the most reported complications, while convulsion was the least reported (0.8%). Ekabua et al in a multi-centric study of women attending child welfare clinics in southern Nigeria, reported a lower proportion with prolonged labour, 22.4% but similar to our study, convulsion was the least reported complication in their study (4.3%) [33]. Nahar et al, in a study of obstetric complicated referrals in Dhaka, Bangladesh reported a higher proportion (46.2%) with prolonged labour, while eclampsia (4.1%) and pre-eclampsia (4.0%) were the least reported among the single life threatening and non-life threatening complications [41]. Compared to 11.6% reported by Nahar et al [41], and 11.1% during pregnancy and 19.1% after delivery reported by Ekabua et al [33,] 27(5.6%) women suffered severe vaginal bleeding in the present study. This disparity may be attributed to the blood donation policy at KBTH. This advanced arrangement for blood helps reduce the impact of blood loss by ensuring that blood is available for transfusion on demand. In addition, the high antenatal coverage offers women an opportunity for prompt intervention. Among the newborn complications, inability to feed within the first hour was most reported (28.6%) followed by the baby not crying at birth (9.5%). In contrast, Ekabua et al reported stillbirths (5.2%) followed by difficult or fast breathing (4.2%) [33]. The high rate of newborn unable to feed within the first one hour in our study may reflect among other possibilities that effect of anaesthesia from cesarean sections which was relatively high, 34.5%.

Hospital delivery recorded was 99.8%. This is comparable to the rate in Kinshasa 97% [25], but much higher than rates found in other African countries such as 48.4% in southern Nigeria[33], 57.2% in Kenya[2], 43% in Tanzania[24] and 31% in rural Burkina Faso[42]. Skilled care for all pregnant women, especially during delivery and access to emergency obstetric care for all women and newborn with life threatening complications are some of the health sector strategies critical to reducing maternal and early neonatal deaths [41,43]. The high rates may be overestimated since the present study was facility based and in a national referral centre. Institutional birth rates are relatively lower, 57% in Ghana as indicated by the 2008 Demographic and Health Survey [20]. The recommended cesarean section (C/S) range of 5-15% was exceeded in our study due to the fact that the study site is a national referral centre. The total C/S rate was 34.5% comprising 18.8% elective cesarean sections and 15.7% emergency cesarean sections. 'Elective' usually refers to a planned cesarean section delivery, while 'emergency' refers to a planned vaginal birth that ends up in a cesarean section [44]. A higher total C/S rate of 40% was reported by Guest and Stamp in rural southern Australia comprising 25% elective cesarean section deliveries and 15% emergency cesarean section deliveries [44]. However, our estimates are similar to 33% in a zonal tertiary hospital in Tanzania reported by Sorbye et al [45].

Birth outcomes and emergency planning

Overall, 62% of women had a birth plan and 53.8% felt it was helpful discussing this with their

health provider. The latter has not been reported in previous studies reviewed in this paper. Respondents who had a positive attitude about discussing their birth plans felt it helped them prepare adequately, enabled their provider assist them better and improved their knowledge. However, one in eight women felt a birth plan was a personal issue and did not require discussion. Some of these respondents felt that antenatal education had already been provided and it was their choice to decide what to do about their birth. The desire not to make their birth plans known may reflect cultural beliefs about vulnerability in pregnancy observed in previous African studies [46,47]. Respondents who reported either maternal or newborn complications tended to find their birth plan useful in those circumstances (maternal complications 64.0% vs usefulness 58.2%; newborn complications 37.3% vs. usefulness 34.0%).

In the present study, a stable outcome was defined as a hospital stay less than 5 days for a caesarean birth and 48 hours for a normal birth. This differed from a hospital stay exceeding 9 days after the day of delivery used as proxy for maternal complications in Tanzania [45]. The shorter length of hospital stay in the present study could reflect the pressure on hospital beds as it is a national referral centre. However, the length of hospital for normal delivery compares with the 3 days described in another study in Ghana [46]. The results of this study indicate that birth and emergency planning is associated with birth outcome as defined by length of hospital stay and may be independent of the actual occurrence of complications. This will be explored further in an upcoming paper. It points to the need for all women irrespective of complication status to be well prepared. This indeed is the basis for birth and emergency planning.

Conclusion

Based on set criteria, 74% of respondents had adequate knowledge of danger signs; but taken separately few women knew five danger signs during pregnancy and childbirth (4.3%) or in the newborn (3.5%). Sixty two per cent of women had a birth plan. Birth planning steps included planning to deliver at a health facility, saving money for emergencies, making advanced arrangements for transport, identifying a birth companion and a compatible blood donor. Accompaniment by a birth companion and saving money were considered the most useful steps in birth planning. Most women who reported either maternal or newborn complications found their birth plan useful. Having a birth plan was associated with birth outcome based on length of hospital stay, whether or not women reported complications. Further research is required to determine predictors of a stable outcome. Findings support the need for all expectant women to have a birth and emergency plan.

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Declaration of Interest

The authors report no declarations of interest.

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