



The Columbia University

JOURNAL of GLOBAL HEALTH

Postpartum Guidance Amongst Women Living in the Dominican Republic Batey Communities in Accordance with World Health Organization Recommendations

Elizabeth Cammett, BS¹, Amy Steele, MSPH¹, Richard Feinn, PhD¹, Chandler Ford, BS¹, Elizabeth Brownell, PhD, MA^{1,2}

¹Frank H. Netter MD School of Medicine, Quinnipiac University, 370 Bassett Road, North Haven, CT 06473

²School of Nursing and Department of Pediatrics, University of Texas Health Science Center, San Antonio, 7703 Floyd Curl Dr, San Antonio, TX, 78229

ABSTRACT Inadequate or limited postpartum care potentially leads to significant maternal morbidity and mortality. Limited data exists regarding postpartum care among the women living in the DR batey communities. This mixed-method retrospective study assessed postpartum care received by women living in 13 bateyes through 65 structured and open-ended interview questions derived from the recommendations outlined in the 2015 World Health Organization *Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice*. Participants (N=57) included women < 24 months postpartum and at least 18 years old. 93.0% (n=53) of participants gave birth in a hospital and 7.0% (n=4) delivered in the bateyes. All participants reported contact with a skilled attendant during or immediately after delivery. In the immediate postpartum period, 91% of participants received inpatient care for at least 24 hours and 77% received counseling on breastfeeding. 39% were counseled on maternal nutrition. 31.6% were advised to obtain a postpartum follow up appointment and 24% of participants presented within 6 weeks of delivery. These percentages were lower than the 100% recommended by WHO guidelines. Overall, participants did not receive care in accordance with WHO postpartum recommendations. These findings support the need for healthcare reform, education, and advocacy regarding postpartum care which may aid in reducing postpartum complications and maternal mortality.

INTRODUCTION

Maternal mortality during the antepartum, intrapartum and postpartum periods is a global concern that has been the focus of legislative reform and medical intervention for decades. In 2017, the World Health Organization (WHO) estimated that the global maternal mortality ratio (MMR) was 211 maternal deaths per 100,000 live births while in underdeveloped nations the MMR was projected to be 415 per 100,000 live births¹, almost double the global ratio. In the Dominican Republic (DR), the MMR was estimated at 95 per 100,000 women¹ and is second only to Haiti² amongst the Caribbean nations. Within the Dominican Republic exist the batey communities—a collection of approximately 500 shanty towns that house roughly 250,000 individuals, 65-75% of whom are believed to be either Haitian migrants or Haitian descendants³. The population of the bateyes serves as a low-cost labor force in the DR, particularly within the sugarcane industry⁴. These communities often do not have access to clean water, electricity or basic health services and often have substantial disease burden, notably tuberculosis and HIV/AIDS⁴.

© 2021 CAMMETT, STEELE, FEINN, FORD, BROWNELL. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC-BY 4.0), which permits the user to copy, distribute, and transmit the work provided that the original author(s) and source are credited. Send correspondence to: Elizabeth.Cammett@quinnipiac.edu

The lack of reported access to health services is troubling not only for communicable diseases within the bateyes, but also regarding additional public health concerns such as maternal mortality in antepartum, intrapartum and postpartum periods of pregnancy. One WHO systematic analysis between 2003-2009 estimated that 73% of global maternal deaths were attributable to direct obstetric causes⁵. Inadequate or limited postpartum care can have an immense impact on maternal health outcomes and ultimately maternal mortality⁶. Hemorrhage was identified as the leading cause of maternal death with more than two thirds of cases occurring in the postpartum period⁵. Limited health data currently exists regarding postpartum care amongst the women living in the batey communities.

Over the course of the last decade, the WHO has published a litany of guidelines focused on antenatal, intrapartum and postpartum maternal care⁶⁻⁹. This study was developed with the primary purpose of obtaining information regarding the postpartum care received by women living in the batey communities surrounding La Romana, DR. It also aims to evaluate aspects of the postpartum care received by this population in accordance with the standards set by the 2015 *WHO Pregnancy, Childbirth, Postpartum and Newborn Care Guidelines*⁷.

METHODS

Enrollment criteria were satisfied by each participant prior to participation in this study. Sixty-two women who met inclusion criteria were invited to participate and 60 consented for interview. Participants included women over the age of 18, currently living within the bateyes, who had given birth within the preceding 24 months. No identifying information was collected from the participants in order to protect confidentiality. Participant age, newborn age, and general place of residence were documented. Access to this population was approved by the *Hospital El Buen Samaritano* (HBS) in La Romana, DR. This study received Institutional Review Board approval by the Quinnipiac University ethics review board.

Each participant was approached either after receiving medical services provided by HBS or within the community surrounding the mobile clinic. Verbal consent was obtained prior to interview initiation using an information sheet which was translated into both Spanish and Haitian Creole. Two female, trilingual English-Spanish-Haitian Creole speaking interpreters were employed to convey the information sheet and mediate the interview between each participant and the field-investigator (EC). Each interpreter was selected to participate in this study by HBS and was trained at either the Jacobs Institute or the New System Institute in La Romana. The research goals, study protocol, information sheet and interview questions were reviewed and clarified for each interpreter by the field-investigator (EC) prior to participant enrollment. Interviews took place between June-July 2018 within 13 different bateyes surrounding La Romana.

Interviews were recorded and documented in a field notebook. They were later transcribed with reference to the recordings as necessary for clarification of field notes. Each interview included open and closed-ended questions pertaining to the postpartum care of each participant after their most recent labor and delivery experience. The immediate postpartum and general postpartum interview questions were based on the WHO *Integrated Management of Pregnancy and Childbirth – Pregnancy, Childbirth, Postpartum and Newborn Care: A guide for essential practice*⁷ published in 2015. Interviews contained 65 main and subcategory questions depending on preliminary responses (Appendix 1). The questions were structured into 3 different sections. The first section pertained to birth setting and contained 11 questions used to assess the environment and mechanism of delivery, as well as any reported complications during the delivery process. The second section contained 40 questions focused on immediate intrapartum care. The third section was composed of 14 questions pertaining to the extended postpartum period, and specifically the care received at a postpartum appointment within the timeframe specified in the WHO guidelines⁷.

Each interview concluded with participant compensation in the form of women's multivitamins, which were pre-approved by HBS and the Institutional Review Board at Quinnipiac University. The average length of the interviews was 17.5 minutes, with the majority of each interview dedicated to the postpartum study questions. Participant interviews were categorized into either binary (e.g. yes, no, unspecified) or qualitative responses. Qualitative responses were converted into theory-driven codes¹⁰ based on the published WHO recommendations including the *Integrated Management of Pregnancy and Childbirth: Managing Complications in Pregnancy and Childbirth – A Guide for Midwives and Doctors*⁸. Codes were developed and refined in accordance to WHO guidelines which specifically encoded raw data responses involving complications that may have influenced the postpartum care that participants received while in the hospital. The remaining data were converted into binary responses and analyzed with descriptive statistics including frequencies and one-sample binomial nonparametric statistical

analysis using SPSS Version 25. Clopper-Pearson 95% confidence intervals (CI) were calculated. Binomial nonparametric analysis with a test value of 1 was used given the underlying assumption that in an ideal environment, all participants would have received postpartum care in accordance with the WHO guidelines^{7,9}.

RESULTS

Sixty women who met inclusion criteria were enrolled in this study. Upon preliminary review of the data, inclusion criteria further restricted the study population to include women who had given birth either within the bateyes or in a hospital setting in the Dominican Republic (N=57). This excluded 3 participants who had given birth in Haiti. Participant demographics included maternal (participant) age, newborn age, self-identified heritage, mode of delivery and birth setting (Table 1). Mean maternal age was 25.7 years (SD: 5.7 years) and mean newborn age was 10.4 months (SD: 6.6 months).

Table 1: Demographic characteristics of batey participants, Dominican Republic, 2018

Participant Demographics	Study Population, n (%)
Maternal Age (years)	
18-28	41 (71.9%)
29-39	14 (24.6%)
40+	2 (3.5%)
Newborn Age (months)	
0-12	43 (75.4%)
13-24	14 (24.6%)
Heritage	
Haitian National	13 (22.8%)
Haitian Descent	21 (36.8%)
Unspecified	23 (40.4%)
Mode of Delivery	
Cesarean	19 (33.3%)
Vaginal	38 (66.7%)
Birth Setting	
Public Hospital	29 (50.9%)
Private Hospital	4 (7.0%)
Unspecified Public or Private Hospital	20 (35.1%)
Home	4 (7.0%)

33.3% (n=19) of participants reported cesarean section as the mechanism of delivery and 66.7% (n=38) reported vaginal delivery. 45.6% (n=26) reported experiencing a labor complication. Of these, 4 identified complications coded as hypertensive disorders of pregnancy, which included self-reported hypertensive concern during labor, preeclampsia or eclampsia requiring invasive intervention (e.g. cesarean delivery) or medication intervention during labor (e.g. blood transfusion or blood pressure (BP) medication). One participant reported a complication coded as fetal malpresentation that necessitated additional maneuvers or cesarean delivery. She was quoted by the interpreter as saying *“the baby was too high in her abdomen so the doctor had to use his elbow to push the baby down into the proper place.”* Five participants reported complications coded as requiring blood transfusion due to a known or unknown process, including anemia or bleeding necessitating emergency cesarean section. Several participants reported that they needed a blood transfusion while in labor however could not afford it. One participant reported that she was told that she *“needed a blood transfusion and paid 5000 pesos for it but never received it.”* Two participants reported complications coded as fetal distress in labor which included responses containing descriptions of meconium and subsequent fetal aspiration or indication of fetal distress that required additional invasive labor intervention (e.g. cesarean section). Eight participants reported complications coded as an unclear mechanism of complication resulting in invasive delivery procedure (e.g. cesarean section) and six participants reported experiencing a combination of complications during delivery.

93.0% (n=53) of participants gave birth in a hospital setting and 7.0% (n=4) gave birth at home in the bateyes. Each of the women who gave birth at home either had a skilled attendant present or brought their newborns to a local hospital immediately postpartum. A skilled attendant is defined as an individual trained in midwifery skills or more specifically a midwife, doctor or nurse who is able to perform a normal delivery, diagnose labor abnormalities and refer patients with obstetrical complications to the appropriate treatment facility per the WHO 2015 guidelines⁷. All participants reported contact with a skilled attendant either during the delivery process or

immediately after. Non-parametric one-sample analysis of the immediate-postpartum care administered to each participant (N=57) with Clopper Pearson 95% confidence interval (CI) was conducted (Table 2). None of the postpartum parameters exhibited a proportion of 1 and therefore none were equivalent to the ideal paradigm outlined in the WHO guidelines⁷). However, a proportion of 0.91 participants (95% CI: 0.81-0.97) reported receiving inpatient care for at least 24 hours prior to discharge, 0.77 (95% CI: 0.64-0.87) reported receiving counseling on breastfeeding, and 0.39 (95% CI: 0.26-0.52) received counseling on maternal nutrition in the postpartum period. Participants noted that they also received postpartum dietary recommendations from several other sources within the bateyes including family, neighbors, and friends. Between 14.0-43.9% of participants received counseling on a variety of “danger signs” between postpartum depression and vaginal bleeding, which would prompt urgent or emergent medical assistance (Figure 1). None of the participants received a 3-month supply of iron in the form of a multivitamin or iron supplement (Table 2). 47.4% (n=27) of participants received variable amounts of iron or multivitamins postpartum with a mean of 17.6 days-worth of supplementation. Prior to discharge out of the care of a skilled attendant, 63.2% of participants received a physical exam, 77.2% had a blood pressure measurement, and 31.6% were counseled to have a postpartum follow up appointment.

Table 2: Nonparametric one-sample analysis of WHO immediate and extended postpartum guideline adherence amongst women living in the bateyes

Postpartum Parameter	Proportion of participants reporting adherence	95% Confidence Interval
Received inpatient care at least 24 hrs*	0.91	0.81-0.97
Counseled on breastfeeding*	0.77	0.64-0.87
Counseled on maternal nutrition*	0.39	0.26-0.52
Counseled on Danger Signs – Bleeding*	0.44	0.31-0.58
Counseled on Danger Signs – Headache*	0.26	0.16-0.40
Counseled on Danger Signs – Signs of TE*	0.26	0.16-0.40
Counseled on Danger Signs – Abnormal VD*	0.19	0.10-0.32
Counseled on Danger Signs – Signs of PPD*	0.14	0.06-0.26
Received 3-month supply Iron supplement or MV*	0.00	0.00-0.06
Received physical exam*	0.63	0.49-0.76
Received BP measurement*	0.77	0.64-0.87
Counseled on need for postpartum follow-up*	0.32	0.20-0.45
Received PP follow-up within 6 weeks of delivery	0.25	0.14-0.38

*refer to *immediate* postpartum care parameters delineated by the WHO guidelines (sections D1-D28) prior to discharge from inpatient care or departure of skilled attendant after delivery
Abbreviations: TE – thromboembolism, VD – vaginal discharge, PPD – postpartum depression, MV – multivitamin, BP – blood pressure, PP - postpartum

Twenty seven individuals reported the approximate timing of their first postpartum healthcare encounter, with a median of 4 weeks postpartum (Interquartile range: 3.43-10.0). Of the 27 individuals who reported, 51% (n=14) had appropriate follow-up time of less than 6 weeks postpartum. Of all 57 participants, 24.6% (n=14) reported follow-up within 6 weeks of giving birth. Non-parametric one-sample analysis with Clopper Pearson 95% confidence intervals was conducted for each participant who received postpartum care within 6 weeks of delivery (n=14) (Table 3). As with the immediate postpartum parameters, none of these exhibited a proportion of 1 which was necessary to elicit ideal concordance with WHO guidelines⁷. Of these 14 participants, 71% (n=10) and 28.6% (n=4) reported having their blood pressure and temperature measured, respectively. 64.3% (n=9) received a physical exam at the postpartum follow-up appointment. Of the 9 individuals who attended a postpartum appointment within 6 weeks of delivery, 7.1% were asked if they had been experiencing fever, 14.3% were asked about difficulty urinating and 28.6% were questioned regarding vaginal bleeding. These 14 participants noted that postpartum follow-up was prompted by a variety of reasons, including cesarean stitch removal, cesarean incisional infection, headache, fever, abdominal pain and family planning (to receive contraception).

Further supplemental findings were reported by several participants involving intrapartum and postpartum communication between the recruited women and medical personnel. Two participants reported adverse effects attributed to anesthesia used during the cesarean section, one of whom said that it “prevented her from talking for an hour” after the delivery while the other noted she “could not talk and her mouth and tongue felt heavy.” Another participant reported an emergent delivery “at 7 months gestation where she arrived at a hospital and they examined her and saw that she was anemic and they called somebody to sign, the family to sign a form, but nobody wanted to sign and she got a c-section...they ask her how many kids she has and she told him she had three kids at home and they told her no more children and

she says that she does not know if she had a tubal ligation.” A complete account of similar reports can be referenced in Appendix 2.

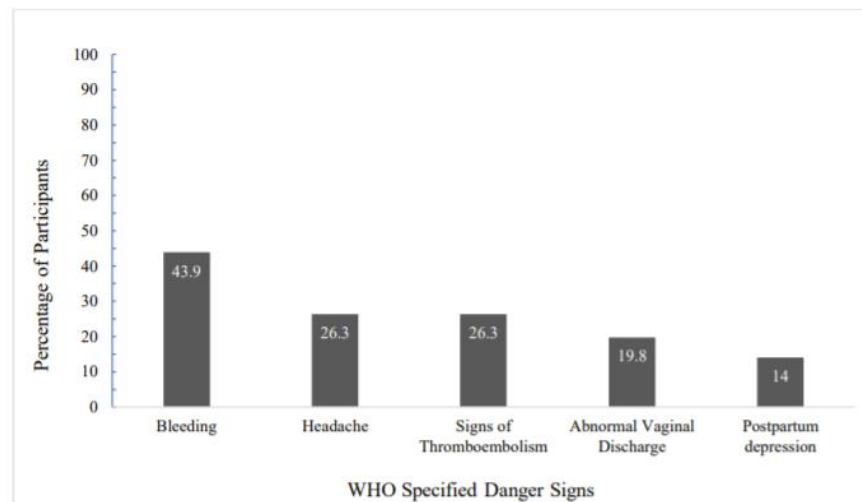


Figure 1: Percent of participants advised to return to the hospital or seek health assistance if they experienced "Danger Signs" specified in the WHO *Pregnancy, Childbirth, Postpartum and Newborn Care (2015)* guidelines

Additionally, one participant who delivered her newborn was interpreted as saying she *“didn’t have time to go to the hospital to deliver the baby, and she delivered the baby here, but when she got back to the hospital to ask them to give the paper for the children, for the baby, they don’t give the paper because they said...she delivered at home...because she Haitian...so now she doesn’t have identification.”*

DISCUSSION

To date, this is the first study known to the authors which evaluates the postpartum care received by women living in the batey communities surrounding La Romana, DR in the context of the WHO *Pregnancy, Childbirth, Postpartum and Newborn Care Guide* published in 2015. This study expands upon previous studies which have evaluated the prenatal and antepartum care access within this population¹¹. Based on our evaluation, the overall postpartum care of our sample population of women living in the bateyes is not within the 2015 WHO standards, in accordance with the poor access to maternal care identified in the aforementioned studies on antepartum care in the bateyes.

A 2015 meta-analysis of studies performed in low- and middle-income countries focused on identifying factors impacting utilization of postnatal care services¹². It identified level of education, occupation of household members, and geographical distance to services as significant determinants of postnatal care utilization. The variability in postpartum visit follow-up time among participants, interquartile range of 6.57 (3.43-10.0) highlights the variability in care within our sample population. Reduced utilization of postnatal care services within the 6-week postpartum period amongst women living in the batey communities and variability in follow-up time reflects the need for more standardized means of postpartum follow-up in this population. This requires further investigation as the variability in postpartum care may be attributed to factors similar to those investigated in the above meta-analysis.

Further, improving access to antenatal services by using community health workers or mobile phone applications have previously been used to improve labor outcomes and reduce complications¹³. A similar interventional approach could be beneficial within the population of the bateyes, as a more rural and isolated population, to increase access to care in a time when mobile phone access is almost ubiquitous. Although it would be necessary to survey those living in the bateyes to estimate mobile phone usage, this type of intervention may have the capacity to allow for more effective patient monitoring and rapid-response during the postpartum period should an emergency arise.

Additionally, the cesarean section rate in the study population was higher than WHO recommendations, which reference an ideal rate of 10-15%, but lower than previous reported cesarean section rates for the DR at 45%^{13, 14}. A recent study examining the trends in cesarean section suggests that low-income regions or countries generally have reduced cesarean rates and higher income regions are generally associated with increased rates¹⁵. Paradoxically, the Dominican Republic is identified as a low-income country yet has one of the highest cesarean section rates globally. Given this discrepancy, it may be important to examine the reasons behind the increased rate amongst women living in the bateyes due to the associated increase in perinatal and postpartum complications due to cesarean section¹⁶. Overuse of cesarean sections has been attributed to either individual preference, cultural belief, organizational incentives or medical convenience, litigious reasons, and other institutional influences¹⁵. Alternatively, the elevated cesarean section rate within our study population may be attributed to the increased number of reported complications as a driver for invasive delivery procedures. Regardless, further evaluation is required to assess the causative agents for the increased number of cesarean deliveries amongst women living in the bateyes.

In the immediate postpartum period, counseling on danger signs, which included bleeding, thromboembolism, abnormal vaginal discharge and postpartum depression were consistently lower than WHO guidelines. Knowing that the care in the antepartum and postpartum period is predominantly provided by healthcare workers such as nurses, further education in these quality measures can support a reduction in maternal mortality¹⁷.

None of the women interviewed received a 3-month supply of iron supplements or multivitamins. *WHO Guideline: Iron Supplementation in Postpartum Women (2016)* offers a conditional recommendation that oral iron supplementation may be provided for 6-12 weeks following delivery for reducing anemia risk in settings where gestational anemia is a public health concern¹⁸. Gestational anemia is one of the strongest predictors of anemia during the postpartum period. The current prevalence of anemia among pregnant women in the DR is 32.6%, slightly higher than all of Latin America and the Caribbean (29.3%), however lower than all low- and middle-income countries (41.6%)¹⁹. Given the prevalence of gestational and postpartum anemia are relatively unknown amongst women living in the bateyes, and especially in the setting of minimal postpartum iron supplementation, this may provide another area of investigation and intervention. Monitoring postpartum iron supplementation to guarantee the minimum amount recommended may benefit this population if it is not possible to ensure a full 12-week course.

Several anecdotal reports by participants were concerning for either unclear communication between themselves or family members with medical workers at the time of delivery. One particular report was concerning for discrimination based on participant ethnicity. Women in the batey communities are the subject of frequent discrimination due to ethnicity (Haitian descent) or socioeconomic status²⁰. Further, due to their low socioeconomic status, they often receive care in public hospitals. Compared to private facilities, the public facility is characterized by low-quality clinical care and lack of necessary supplies and resources²¹. In this setting, healthcare discrimination exists among persons coming from the batey communities²². Healthcare discrimination includes but is not limited to purposeful neglect, inadequate communication due to language barriers, and lack of timely clinical care and treatment. With these issues in mind, it is important to evaluate the barriers to receiving care within the WHO guidelines faced by mothers delivering at public hospitals in the DR. Discrimination or inadequate communication reported by participants from the bateyes could indicate or result in impaired provider-patient relationships. As such, poor communication between provider and patient can yield additional barriers to care and medical errors²³. These findings further demonstrate the need for additional investigations regarding immediate and extended postpartum care received by women in the bateyes.

Strengths

Although these findings should be interpreted with caution given the sample size, this study has several strengths. A key strength of the present study is the utilization of a valid assessment tool in the 2015 *WHO Pregnancy, Childbirth, Postpartum and Newborn Care Guidelines*⁷. Utilization of this assessment tool allows direct comparison among different communities, with the opportunity to recognize barriers to care, cultural differences, and unique issues related to socioeconomic status across populations. The authors' home institution has established a longitudinal relationship with the HBS, permitting the use of trusted interpreters, access to the batey communities and consistency in the recruitment of study participants. Further, the qualitative component of this study expanded our understanding of the challenges in postpartum care for the women of the bateyes.

Limitations

The limitations of this study include its retrospective nature and impact of recall bias by participants. All data were self-reported including birth setting, complications, prescriptions and postpartum counseling given the lack

of a known centralized data base containing these clinical records. The average age of the participants' newborns was 10.4 months, indicating the approximate lapsed time from delivery in which participants needed to recall events from the immediate and extended postpartum period. The inability to control timing of interviews likely contributed to the presence of participant recall bias. Participants were recruited from a convenience sample derived from 13 bateyes and may not be representative of all batey communities within the DR, which impacts generalizability of the data. Additionally, the multilingual nature of this study necessitated clarifications with variable script adherence. Lastly, though non-parametric one-sample analysis with Clopper Pearson 95% CI was used to assess for significance, all proportions measured were found to be significant because they varied from the ideal WHO proportion of 1 (a proportion of 1 would indicate that 100% of women achieved each postpartum parameter). Beyond statistical significance, how much the sample proportions are below one needs to be considered in assessing how well the WHO benchmarks are met.

CONCLUSION

While the WHO guidelines recommend all women receive necessary postpartum care, based on this report of several bateyes in the Dominican Republic, these communities may be consistently below the ideal paradigm, with margins large enough to suggest that significant systemic changes are necessary to improve the maternal health and safety of these women. Innovations in care can be extended through community health workers, improved skilled attendant education, mobile technologies, and further research to establish more baseline measurements on maternal and infant health within these communities. As the body of knowledge continues to grow in understanding the gaps in postpartum care for these women, study and implementation of interventions specific to the needs of this community will be necessary.

APPENDIX 1

Interview Structure and Question Components:

Screening Questions:

How old are you?

How old is your baby?

Where were you born?

Where were your parents born?

Do you live in this batey?

Interview Questions:

Section I: Access to Postpartum Services Prior to Birth, During Delivery, and Immediately After Birth:

1. Do you remember if you saw a doctor or healthcare worker while you were pregnant?
 - a. Was *your* health after the delivery of the baby ever discussed before the baby was born?
2. Did you deliver your most recent baby at home or in the hospital? Why?
 - a. Was a doctor, nurse, or midwife present?
 - b. If the delivery took place in a home, who was present at the birth?
 - c. What hospital? Was it a public or private hospital?
3. Do you remember if you had a cesarean section?
 - a. Do you remember if anyone at the hospital gave you any medications, lotions, or supplies to take care of the c-section? Were you given any instructions?
 - b. Did anyone tell you to use something else? What about advice from friends or family?
4. Do you know if there were any complications to your delivery?
 - a. Were any medications given during labor or delivery?
 - b. Did you require a blood transfusion?
5. Do you remember if you were given a product to catch the bleeding after you had your baby?
 - a. What was the product?
 - b. Were you given any extras to take home with you?
6. Do you remember if you were able to pee after giving birth?
 - a. Do you remember if you gave a urine sample?
7. Did anyone take blood from you?
 - a. Do you know what they tested for? If so, what?

Section II: Postpartum Care Given by Hospital Staff s/p Delivery Prior to Discharge:

8. If the delivery took place in a hospital how long were you and the baby in the hospital before going back home?
 - a. Do you remember if the hospital provided any supplies to you and your newborn?
 - i. What did they give you?
9. Do you remember if the hospital workers gave you any advice?
 - a. Do you remember if anyone talked to you about breastfeeding?
 - i. What did they say?
 - b. Do you remember if anyone gave you iron pills?

If yes:

- i. Who gave them to you?
 - ii. Did they give you some to take home?
 - iii. How often did you take them?
 - iv. Did you ever run out of the iron pills?
 - c. Do you remember if anyone gave you folic acid pills?
 - i. Who gave them to you?
 - ii. Did they give you some to take home?
 - iii. How often did you take them?
 - iv. Did you ever run out of folic acid pills?
 - d. Do you remember if anyone gave you aspirin?
 - e. Do you remember if anyone gave you calcium pills?
 - f. Do you remember if anyone gave you anti-malaria pills in the hospital?
 - i. When you are sleeping, are you protected by mosquitos? If yes, how?
10. Do you remember if anyone did a medical examination on you right before you were sent home?
11. Prior to discharge, were you given any shots? If so, do you remember what the names of them were?
12. Do you recall if the hospital workers took your blood pressure before you went home?
 - a. Do you remember if they did this more than once?
13. Do you remember if anyone in the hospital told you to return to the hospital or see a doctor if you started:
 - i. Bleeding
 - ii. Having headaches
 - iii. Having chest pain or calf pain
 - iv. Noticing pus or discharge from your private parts?
 - v. Do you remember if anyone told you to return to the hospital if you began to feel sad or nervous for no specific reason?^{13, 14}
14. Did anyone advise you on the foods you should eat after birth?
 - a. Who?
 - b. Do you remember what they said?

Section III: Postpartum Care Given at Follow-Up:

15. Were you advised to see a doctor for a check-up after the delivery?
16. Did you see a health worker at any time after you had your baby for your own needs?
 - a. If yes, do you remember how soon you went after you had your baby?
 - i. Do you remember if anyone took your blood pressure?
 - ii. Do you remember if anyone took your temperature?
 - iii. Do you remember if the health worker examined you?
 - iv. Did anyone take blood from you?
 - v. Did anyone give you any shots? If yes, do you remember what the names of

- them were?
- b. Do you remember if they asked you about bleeding?
 - i. Did they ask about vaginal discharge? Or Pus?
 - ii. Diarrhea?
 - iii. Difficulty holding urine?
 - iv. Fever?
 - c. Do you remember if they gave you any other information?
17. Do you have anything else you would like to share about your experience after you gave birth?

APPENDIX 2

Participant responses and quotations indicating communication barriers between recruited women and medical personnel as well as additional anecdotal experiences. Responses often recorded in answer to the final interview question: “Do you have anything else you would like to share about your experience after you gave birth?”

“She didn’t have time to go to the hospital to deliver the baby, and she delivered the baby here, but when she got back to the hospital to ask them to give the paper for the children, for the baby, they don’t give the paper because they said...she delivered at home...because she Haitian...so now she doesn’t have identification

“After she had the baby because of the anesthesia she couldn’t talk, she feel her mouth was like heavy, tongue too, and she was having dizzy spells...This was her first c-section and last one because she had a tubal ligation. She said that when she was going to have the c-section, the room was full of people cause everybody was afraid for her...afraid that she or the baby was going to die but she was not afraid about it.”

“...Because of the anesthesia she could not talk for one hour...one hour after the birth, and she was having a lot of pain after the anesthesia.”

“She had to pay 500 pesos for the ambulance to take her to La Romana, when she got to La Romana they examined her and saw that she was anemic and they called somebody to sign, the family to sign a form, but nobody wanted to sign and she got a c-section, they ask her how many kids she has and she told him she had three kids at home and they told her no more children and she says that she does not know if she had a tubal ligation.

“When she was at the hospital for some pain and they tell her she is not ready to have the baby, and when she came back to home she delivered...this was a bad experience.”

“When she get to the hospital, the womb broke and the blood pressure was very high and they do the c-section emergency because she was very bad, and they put her in the ICU for 5 days. She was 3 days where she can’t talk...”

“She said everybody was scared and also the doctor because maybe she would die...when she got to the hospital, her nurse told her that she has to go to the church and be Christian because she might die.”

REFERENCE

1. World Health Organization. (2019). Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division: executive summary. World Health Organization. Retrieved from <https://apps.who.int/iris/handle/10665/327596>
2. Kassebaum, N. J., Barber, R. M., Bhutta, Z. A., Dandona, L., Gething, P. W., Hay, S. I., ... Murray, C. J. L. (2016). Global, regional, and national levels of maternal mortality, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The Lancet*, *388*(10053), 1775–1812. [https://doi.org/10.1016/S0140-6736\(16\)31470-2](https://doi.org/10.1016/S0140-6736(16)31470-2)
3. Ferguson, J. (2003). *Migration in the Caribbean: Haiti, the Dominican Republic and beyond*. London: Minority Rights Group International.
4. Miller, A. S., Lin, H. C., Kang, C.-B., & Loh, L. C. (2016). Health and Social Needs in Three Migrant Worker Communities around La Romana, Dominican Republic, and the Role of Volunteers: A Thematic Analysis and Evaluation. *Journal of Tropical Medicine*. Research Article. <https://doi.org/10.1155/2016/4354063>
5. Say, L., Chou, D., Gemmill, A., Tunçalp, Ö., Moller, A.-B., Daniels, J., ... Alkema, L. (2014). Global causes of maternal death: a WHO systematic analysis. *The Lancet Global Health*, *2*(6), e323–e333. [https://doi.org/10.1016/S2214-109X\(14\)70227-X](https://doi.org/10.1016/S2214-109X(14)70227-X)

6. World Health Organization. (2010). WHO Technical Consultation on Postpartum and Postnatal Care. Retrieved May 7, 2020, from <https://www.ncbi.nlm.nih.gov/books/NBK310595/>
7. *Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice*. (2015). World Health Organization.
8. Unicef. (2017). *Managing complications in pregnancy and childbirth: a guide for midwives and doctors*. Geneva: World Health Organization.
9. World Health Organization, & Department of Maternal, N., Child and Adolescent Health. (2013). *WHO recommendations on postnatal care of the mother and newborn*. Retrieved from <http://www.ncbi.nlm.nih.gov/books/NBK190086/>
10. DeCuir-Gunby, J. T., Marshall, P. L., & McCulloch, A. W. (2011). Developing and Using a Codebook for the Analysis of Interview Data: An Example from a Professional Development Research Project. *Field Methods*, 23(2), 136–155. <https://doi.org/10.1177/1525822X10388468>
11. Ford, C. B., Batson, S. B., Zucconi, R. M., & Brownell, E. P., MA. (2019). Access to Antenatal Care and Hospital Delivery Among Haitian Migrant Mothers Within Batey Communities of La Romana. *Obstetrics & Gynecology*, Volume 133, Issue-p 23S. <https://doi.org/doi:10.1097/01.AOG.0000559396.71172.06>
12. Langlois, É. V., Miszkurka, M., Zunzunegui, M. V., Ghaffar, A., Ziegler, D., & Karp, I. (2015). Inequities in postnatal care in low- and middle-income countries: a systematic review and meta-analysis. *Bulletin of the World Health Organization*, 93(4), 259–270G. <https://doi.org/10.2471/BLT.14.140996>
13. Bonnell, S., Griggs, A., Avila, G., Mack, J., Bush, R. A., Vignato, J., & Connelly, C. D. (2018). Community Health Workers and Use of mHealth: Improving Identification of Pregnancy Complications and Access to Care in the Dominican Republic. *Health Promotion Practice*, 19(3), 331–340. <https://doi.org/10.1177/1524839917708795>
14. World Health Organization. (2015). WHO Statement on Caesarean Section Rates. World Health Organization: Department of Reproductive Health and Research.
15. Boatin, A. A., Schlottheuber, A., Betran, A. P., Moller, A.-B., Barros, A. J. D., Boerma, T., ... Hosseinpoor, A. R. (2018). Within country inequalities in caesarean section rates: observational study of 72 low and middle income countries. *BMJ*, 360. <https://doi.org/10.1136/bmj.k55>
16. Field, A., & Haloob, R. (2016). Complications of caesarean section. *The Obstetrician & Gynaecologist*, 18(4), 265–272. <https://doi.org/10.1111/tog.12280>
17. Foster, J., Regueira, Y., Burgos, R. I., & Sanchez, A. H. (2005). Midwifery curriculum for auxiliary maternity nurses: a case study in the Dominican Republic. *Journal of Midwifery & Women's Health*, 50(4), e45-49. <https://doi.org/10.1016/j.jmwh.2005.02.017>
18. Geneva: World Health Organization. (2016). *Iron Supplementation in Postpartum Women. Guideline: Iron Supplementation in Postpartum Women*. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK379978/>
19. World Development Indicators | DataBank. (n.d.). Retrieved November 11, 2020, from <https://databank.worldbank.org/reports.aspx?source=2&series=SH.PRG.ANEM>
20. Keys, H. M., Noland, G. S., De Rochars, M. B., Taylor, T. H., Blount, S., & Gonzales, M. (2019). Perceived discrimination in bateyes of the Dominican Republic: results from the Everyday Discrimination Scale and implications for public health programs. *BMC Public Health*, 19(1), 1513. <https://doi.org/10.1186/s12889-019-7773-2>
21. Rathe, M. (2010). *Dominican Republic: Can Universal Coverage be Achieved?* (World Health Report No. Background Paper, 10). World Health Organization. Retrieved from <http://digicollection.org/hss/documents/s18276en/s18276en.pdf>
22. Castro, A., Savage, V., & Kaufman, H. (2015). Assessing equitable care for Indigenous and Afrodescendant women in Latin America. *Revista Panamericana De Salud Publica = Pan American Journal of Public Health*, 38(2), 96–109.
23. Cannarella Lorenzetti, R., Jacques, C. H. M., Donovan, C., Cottrell, S., & Buck, J. (2013). Managing difficult encounters: understanding physician, patient, and situational factors. *American Family Physician*, 87(6), 419–425.