

**PERCEIVED SAFETY AND SUPPORT FOR LOW-RISK PREGNANCIES IN THE
BIRTH CENTER CONTEXT**

by

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ABSTRACT

Fewer than 1% of births in the United States occur in birth centers, which produce excellent outcomes for the thousands of women cared for in this setting. Birth centers are independent health care facilities, typically managed by midwives, and often with collaborating physicians. A national study demonstrated a 6% rate of cesarean section, and a 1.1% rate of preterm birth. Much of the literature surrounding how a pregnant woman chooses her birth site highlights the client's perception of safety and control. In the United States, the medical model has dominated in prenatal care, focusing on screening and intervention in an effort to avert poor birth outcomes. Consequently, physician-managed care during pregnancy has become the default. However, given that an estimated 85% of pregnancies are considered low-risk, a specialized environment like the hospital is not always necessary. In fact, some studies show that hospitals are statistically less safe for this low-risk population, given the increased chance for unnecessary medical interventions. The present study was a secondary analysis of data provided by a single birth center, containing information about the timing and reasoning for clients' birth site selection. These data were used to meet the two specific aims of the study: 1) identify variables associated with low-risk birth center clients planning for elective hospitalization; and 2) describe this low-risk case group by their rationale for choosing to deliver in hospital. Chart review and questionnaire data were collected for the case group in order to evaluate those clients' decision-making processes. Results

revealed that sampled clients were primarily concerned about the stress of a potential transfer to a hospital during labor. Perceived social support was also a major theme, not only regarding clients' birth plan but also for their maternal responsibilities in the postpartum period. Clients expressed anxiety over potential complications in labor and birth, as well as challenges in adequate communication between client and provider. The public health significance of these findings lies in the furthered understanding of the factors that influence birth site, particularly in the low-risk pregnant population.

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PREFACE

I owe my professional interest in midwifery care and reproductive health, as well as my renewed interest in research, to my experiences with clients and staff at The Midwife Center in Pittsburgh, Pennsylvania. This freestanding, independent birth center has been a part of the Pittsburgh landscape since its founding in 1982. It currently serves women at its location in the Strip District neighborhood, with all nine midwives have admitting privileges to the collaborative hospital, UPMC Mercy in the case of a transfer.

Although I joined the administrative staff in 2013, my role in data collection at TMC did not begin until late 2014, when the organization became interested in our relatively high attrition rate. As a part of this task force committee, I developed a process to isolate the cases of interest – namely clients who came to us wanting out-of-hospital birth, and later deciding on elective hospitalization – and review the course of their care in an attempt to determine why and how they came to this decision. Our committee also agreed that reaching out to clients directly to ask them about their decisions could yield additional insight.

After the first wave of data collection, this information proved invaluable to our staff. I presented a summary of the findings, including client feedback, at a staff meeting. As might be imagined, the presentation sparked a great deal of discussion among staff about potential solutions to the “problem” of elective hospitalization. Furthermore, providers felt compelled to dive a little deeper when clients with healthy pregnancies expressed a preference for hospitals; especially after seeing the number of women that came to us generally unsure about out-of-hospital birth, or the impact that simple miscommunication could have for a client’s empowerment in her birth.

In short, this informal venture into data collection and analysis eventually brought me to a graduate program in public health, where I would come to dedicate my professional life to challenging the medical model of pregnancy and birth, alongside midwives and birth centers. This includes amplifying the voices of the fewer than 2% of mothers who deliver out-of-hospital in the United States and promoting the multitude of benefits that could come from increased integration of midwifery care and the birth center model.

To the mothers and midwives at The Midwife Center, thank you for sharing your wisdom and experience with me.

1.0 INTRODUCTION

As prenatal care and delivery sites for pregnant women, birth centers produce excellent outcomes when it comes to maternal and infant health. Specific to a birth center in Washington, D.C., researchers demonstrated the reduced risk of preterm birth (birth before 37 weeks' gestation) for birth center clients (7.9%) when compared to a similarly healthy sample under usual obstetric care (11.0%), representing a 3.1 percentage point reduction (Benatar, Garrett, Howell, & Palmer, 2013). In this same population, results showed a cesarean rate of 19.7% in the birth center sample, compared to 29.4% in the control group (Benatar et al., 2013).

National samples have also illustrated these reduced rates for adverse outcomes in birth center client pools. Stapleton, Osborn, and Illuzzi (2013) used national data to demonstrate low incidence of preterm birth (1.1%) for birth center clients. In addition, referrals for surgical births are not nearly as common for birth center clients. Only 6% of birth center clients in this national sample ended up having a cesarean birth in a hospital, compared to an estimated 25% nationally in a similar low-risk pool receiving conventional care in a hospital setting (Stapleton et al., 2013).

Fewer than 1% of births in the United States occur in birth centers, despite the mounting literature showing a higher level of risk for healthy pregnant women in hospitals (Benatar et al., 2013; Martin et al., 2012; Overgaard, Fenger-Gron, & Sandall, 2012; Thornton et al., 2016). Independent birth centers in the United States are typically based on collaborative models, with primarily certified nurse midwives (CNMs) working as the care providers for women with low-

risk pregnancies, in addition to certified midwives (CMs) and certified professional midwives (CPMs) in many cases. The American Association of Birth Centers (AABC) highlights the birth center's role as a "first-level entry into a health-oriented system" that also has access to tertiary care services when indicated (Centers, 2016; Davis et al., 2011). Physicians act as consultants in risk assessment and complication management, and sometimes as supervisory staff (Stapleton et al., 2013). Birth centers are usually located outside of hospitals, although several in the US are housed within hospital facilities, albeit separately from acute care departments (Stapleton et al., 2013). The midwifery model relies on viewing pregnant people, clients, or women from a holistic perspective, which includes not only taking into account the level of risk in their pregnancy, but also their level of social and emotional support in making decisions about their prenatal care (Davis et al., 2011).

The differences in outcomes for healthy pregnant women who deliver in hospitals, compared to out-of-hospital births, are revealing when we consider the nation's maternal and infant mortality rates. The Centers for Disease Control and Prevention (CDC) reported an infant mortality rate (IMR) of 5.9 infant deaths per 1,000 live births in 2015; and a maternal mortality rate of 17.3 pregnancy-related deaths per 100,000 live births in 2013 (Y Li et al., 2015; Yangmei Li et al., 2014; US Department of Health and Human Services, 2017). Maternal and child health in the United States are in danger, with a national IMR higher than 25 other industrialized countries, including Hungary, Israel, and Portugal (Haelle, 2014). Consequently, researchers and practitioners are advocating for increased integration of the birth center model, as well as highlighting the potential cost savings of collaborating with midwives to care for healthy women with low-risk pregnancies (Howell, Palmer, Benatar, & Garrett, 2014; Overgaard et al., 2012; Stapleton et al., 2013).

Birth centers have demonstrated their beneficial effects for women experiencing low-risk pregnancies, estimated to be 85% of all pregnancies (Jolles et al., 2017; Stapleton et al., 2013). For these women, the birth center model provides a statistically safer environment compared to a hospital (Benatar et al., 2013; Stapleton et al., 2013). The issue of choice in birth site becomes complicated, however, when we consider client values and preferences and how those might be compromised or confronted. Given the dominance of birth in hospitals, some researchers do not consider there to be a true choice in birth site (Coxon, Chisholm, Malouf, Rowe, & Hollowell, 2017).

One of the top concerns for pregnant women is the safety of their birth environment (Adams, 2016; Coxon et al., 2017; Coxon, Sandall, & Fulop, 2014; Thompson & Wojcieszek, 2012). This can be interpreted in many different ways; for some women, there is safety in avoiding the hospital environment, where there is a higher risk of medical intervention, even for healthy pregnancies (Benatar et al., 2013; Boucher, Bennett, McFarlin, & Freeze, 2009; Thornton et al., 2016). For other women, safety consists of the availability of medical equipment and qualified staff, in case of an emergency that requires intervention (Coxon et al., 2014; Thompson & Wojcieszek, 2012).

In the United States, values regarding birth have developed in the context of an increasingly medicalized field of obstetrics, as well as the public's medicalized understanding of the risks involved in pregnancy and birth (Barker, 1998; Coxon, Sandall, & Fulop, 2014). This shift toward physician-led care has also been related to decreased individual autonomy in medical decision-making, particularly regarding pregnancy (Fox & Worts, 1999). Despite the aforementioned statistics regarding risk of adverse outcomes for healthy pregnant women choosing to deliver in hospitals, the medical model of pregnancy and birth continues to dominate. Birth centers

subsequently remain alternative birth sites in the United States, compared to their proliferation in many European countries (Declercq, 2018).

The present study involves secondary analysis of data from a single birth center in an effort to understand the decision-making processes of birth center clients who decide on elective hospitalization, despite experiencing low-risk pregnancies. By describing histories behind both the medicalization of pregnancy, and utilization of midwifery care in the United States, this paper attempts to describe the social and political phenomena that may underlie birth center clients' hesitations or concerns about pregnancy and birth outside a hospital.

1.1 OUT-OF-HOSPITAL BIRTH IN PITTSBURGH: A CASE STUDY

The Midwife Center for Birth and Women's Health (TMC) in Pittsburgh, Pennsylvania, noted in 2014 that its attrition rate, particularly non-medical attrition, differed from the aforementioned national sample. At TMC, attrition is defined as a client ceasing prenatal care at the birth center without provider referral; this can include clients who move or transfer their care to another provider. Medical attrition encompasses clients who experience miscarriages or choose to terminate the pregnancy.

The national sample showed that 58% of mothers who started care at a birth center experienced an out-of-hospital (OOH) birth (Stapleton et al., 2013). In contrast, data provided by TMC for this secondary analysis show that approximately 38% (n=784) of the clients who registered at the center (n=2058) experienced a birth at TMC between 2013 and 2016. In the same time period, its attrition rate was approximately 18.3% (n=377).

TMC formed a task force in order to properly address the relatively lower rate of successful OOH births, which is to say, labors that progressed at the birth center without a hospital transfer. This task force's main objective was to collect data and review all cases of clients who came to TMC planning an OOH birth, and consequently chose to deliver in the hospital for non-medical reasons, or plainly by choice. These included, but were not limited to, transferring to another prenatal care practice, feeling that the hospital was safer, and encountering insurance restrictions.

Determining strategies for decreasing this attrition rate was important for the practice for two reasons. Firstly, TMC does not receive facility fee reimbursement from insurance providers for deliveries that occur at the collaborating hospital. In order for TMC to remain financially stable, and an accessible OOH option for southwestern Pennsylvania, increasing the number of births occurring at the center is essential. Secondly, non-medically indicated attrition represents an opportunity for improvement; studies show that 85% of pregnancies are low risk, and thus require minimal medical intervention (Stapleton et al., 2013). Just as communicating prenatal risk to clients is important and ever-present in a midwife's clinical assessments, it is important that birth centers also communicate the benefits of OOH birth, and the hazards of hospital care for low-risk pregnancies.

The TMC task force was established to evaluate how the staff could better support clients in this decision-making. As described previously, the objective of the present secondary analysis was to review data and information gathered by TMC in an effort to describe the phenomenon itself in the context of Pittsburgh's birth center. The findings may help to generate hypotheses for future cohort studies regarding risk comprehension for birth center clients, and ultimately how women decide on their birth site.

The second chapter is a discussion surrounding prenatal care and the waning of maternal autonomy across decades of technological development and the public's increased interest and investment in preventing fetal or infant death. Medicalization of pregnancy is a phenomenon that has evolved with increased medical practice across the industrialized world. This background chapter concludes with a review of the limited research available regarding perceived maternal autonomy in the medicalized context.

In chapters 3 and 4, TMC's data collection approach is detailed, along with the plan for secondary analysis, and the statistical results produced. The dataset provided for the present study consisted of demographic and clinical variables for comparison and case groups, as well as questionnaire responses from clients within the case group. This paper concludes with a discussion of these findings in the context of existing literature that explains maternal decision-making behavior during pregnancy, and their implications for further research.

1.2 SPECIFIC AIMS

Aim 1: Identify demographic and clinical variables associated with a birth center client planning for elective hospitalization during labor, despite experiencing a low-risk pregnancy.

Aim 2: Describe nuances among the case group sample of low-risk pregnant women, regarding the timing and rationale for their decision to deliver at a hospital, using data from medical chart reviews and client questionnaires.

2.0 BACKGROUND

2.1 MEDICALIZING PREGNANCY IN THE UNITED STATES

One way to differentiate the medical and midwifery models is to associate the former with pathology, and the latter with normal biological processes (Our Bodies, 2014). In other words, the medical model encompasses a framework of diagnosing potential complications during pregnancy and birth using different screening methods, and treating them with medical procedures in an effort to avoid adverse outcomes (Our Bodies, 2014). The efforts of modern midwives to advocate for the normalization of pregnancy and birth is not a new trend, but rather a call to compromise between the 20th century rise in medicalization and the documented benefits of shared decision-making and maternal empowerment in this natural process.

As Barker (1998) emphasized, criticizing the medical model is not equal to condemnation of medical management during pregnancy and birth. However, in an effort to understand the measured negative impacts of the medical model and how the modern practice of midwifery attempts to reverse these, it is important to critically review how the medicalized paradigm became the authority regarding the best interests of the mother and fetus. Furthermore, understanding the proliferation of the medical model of birth helps to contextualize client decisions, particularly those who seek out midwife-led care in a birth center.

After slave emancipation in the United States in the mid-19th century, Black women renewed their traditional practices as midwives, serving both Black women and poor White women (Rooks, 2012). With the rise of regulated medicine and academically trained physicians during this period, the public began to view midwives as uneducated and in competition with qualified

physicians (Rooks, 2012). By the turn of the 20th century, physicians were attending over half of the births in the country, namely those who had enough wealth or resources to afford such care (Feldhusen, 2000).

Infant and maternal mortality rates at the turn of the century were dismal; these figures were used to justify the trend toward the medical model (Barker, 1998). Research by the CDC estimated these rates to be 100 infant deaths and six to nine maternal deaths per 1,000 live births at the beginning of the 20th century (US Department of Health and Human Services, 1999). The increasingly routine use of antiseptic techniques during birth produced considerable drops in mortality; the CDC measured a 90% and 99% reduction in infant and maternal mortality, respectively, between 1900 and 1997 (US Department of Health and Human Services, 1999). Upon the proliferation of these antiseptic methods, however, many experts and professionals falsely attributed these reductions to the advocacy surrounding increased attention from a physician during pregnancy (Barker, 1998).

Feminist and sociological critiques alike attribute the increased medicalization of pregnancy to this turn-of-the-century cultural shift. At this time, millions of families had access to texts, like “Prenatal Care,” published by the United States Children’s Bureau in 1913, that advocated for physician monitoring throughout the entirety of pregnancy (Barker, 1998). The capabilities of obstetrical providers to obtain “unseeable” measurements, like blood pressure or heart rate, further distanced pregnant mothers from understanding their own pregnancies, let alone making informed decisions based on these measurements and relevant scientific research (Barker, 1998).

In contrast, the midwifery model continues to emphasize the care provider’s role as a “supportive assistant” (Fox & Worts, 1999) as opposed to a manager of production, where

pregnant mothers are the metaphorical producers. This approach values maternal autonomy, and takes her personal values into account when considering intervention options and their associated risks. Fox and Worts (1999) facilitated interviews with 40 women after the birth of their first child, all in the hospital setting. These interviews revealed how medicalized birth removed some women's agency in their new maternal roles; in addition, anxiety surrounding decisions and the outcome was a major element in these discussions (Fox & Worts, 1999).

In a more recent study, Vedam et al. (2017) demonstrated how increased time spent with midwives was associated with increased reports of autonomy in decision making during pregnancy. Conversely, increased discussion of pathology, as opposed to natural phenomena during pregnancy and birth, was associated with reduced feelings of autonomy (Vedam et al., 2017).

Research also shows that provider perceptions of client autonomy can differ depending on their training and certification as either midwives or physicians. In one study, doctors were significantly more likely to support the notion that they are more competent than midwives to make a final decision in collaboratively managing a birth (Kruske, Young, Jenkinson, & Catchlove, 2013). In addition, doctors who responded to this survey indicated that they see themselves as ultimately responsible for the legal repercussions of a birth outcome, even in collaborative provider models (Kruske et al., 2013). Not only is this assumption false¹, these particular survey responses indicate the buy-in that physicians themselves have in the medical model of pregnancy (Kruske et al., 2013). Nevertheless, this study also illustrated that both

¹Elliott v Bickerstaff (1999) NSWCA 453 states that all health practitioners working collaboratively as a team are legally responsible for their actions.

physicians and midwives feel, philosophically, that medical decisions should rest with the mother, showing general respect for the client's autonomy (Kruske et al., 2013).

2.2 MEDICALIZATION TARGETS MISMANAGED RISK

Returning to “Prenatal Care” in the early 20th century, Barker (1998) makes the critique that this text emphasized the need for intervention only during the perinatal period, and left the “private responsibility” of motherhood to the woman. This concept is evident in modern feminist arguments against the fetocentric approaches to medical screening and intervention during pregnancy, as in, those which value the health of the fetus over the health of the mother, physical, mental, or otherwise (Baker, Choi, Henshaw, & Tree, 2005). Multiple articles have addressed this barrier to perceived autonomy, as mothers struggle with weighing the risks of a particular choice for themselves and their unborn babies (Garel, Gosme-Seguret, Kaminski, & Cuttini, 2002; Lyerly et al., 2007; Walton et al., 2014).

The very definitions involved in discussions of risk to the fetus have been up for debate and have undergone significant transformations in the country's management of vital statistics. Fordyce (2013) examined the ways that the categorizations of stillbirth and fetal death in the United States have evolved, starting in the middle of the 20th century. This analytical article presents the argument that redefinitions of fetal death, as well as additions to data collected via birth certificates, coincided with increased monitoring of pregnancy and birth; and consequently, increased medicalization (Fordyce, 2013).

During the same mid-century time period, preventative medicine and public health were becoming household concepts, further encouraging methods that enabled providers to not only

monitor certain conditions, but also intervene to prevent adverse outcomes, like stillbirth (Fordyce, 2013). The shift in vital statistics in the middle of the 20th century introduced the monitoring of fetal deaths, as opposed to using the previous label of “stillbirths” (Fordyce, 2013). This arguably led to the obstetrical focus on using scientific measures to monitor different conditions throughout the pregnancy in an effort to prevent fetal death, now characterized as both tragic and preventable (Fordyce, 2013). In that vein, the redefinition supports the medical model of pregnancy and birth where potential risk to the fetus justifies physician management in a hospital (Coxon et al., 2014). This concept is captured well in a quote from Declercq (2018): “The emphasis on childbirth as a potential medical disaster that could only be prevented by treating every laboring mother as a high risk patient shaped twentieth-century maternity care practice” (p. 3).

2.3 INFLUENTIAL FACTORS IN CHOOSING A BIRTH SITE

So far, this chapter has regarded how pregnant women navigate a medicalized birth culture in the United States in an effort to preserve their autonomy and assess the risks presented by various choices or procedures. More specifically, the present study examines the factors that influence how a birth center client weighs her birth site options in the context of a healthy, low-risk pregnancy.

Multiple studies highlight safety as the primary concern for a client in choosing her birth environment (Adams, 2016; Boucher et al., 2009; Miller & Shriver, 2012). However, evidence has shown that different populations may have distinct interpretations of safety and risk. Research featuring participants opting for a hospital birth described this environment as safe because of the services offered in case of an emergency (Coxon, Sandall, & Fulop, 2015; Miller & Shriver, 2012; Thompson & Wojcieszek, 2012). In contrast, other women have focused on the perceived risks of

hospital birth, including nosocomial infections and increased utilization of medical interventions that also involve a set of risks (Boucher et al., 2009; Coxon et al., 2015; Miller & Shriver, 2012). In short, a safe birth environment represents one well equipped for rare emergency situations (eg. a hospital); for others, the safety of a birth environment depends on the mother's sense of control and comfort (Boucher et al., 2009; Miller & Shriver, 2012; Thompson & Wojcieszek, 2012). Table 1 below outlines factors cited by various authors as being influential in selecting a birth site.

Table 1. Literature table illustrating factors that influence birth site selection.

| Authors | Year | Location | Study Design | Planned birth site(s) | Influential factors/themes |
|-------------------------|-------------|-----------------|---------------------|------------------------------|---|
| Adams | 2016 | United States | Narrative Review | Any | Avoiding technology Comfortable, familiar space Access to hydrotherapy Perceived safety Opinions of family and friends Insurance coverage Access to different care models Freedom to move during labor Cultural and spiritual background |
| Boucher et al. | 2010 | United States | Qualitative | Home | Safety Avoiding unnecessary interventions Previous negative experience in hospital Control Comfortable environment |
| Coxon, Sandall, & Fulop | 2015 | United Kingdom | Qualitative | Obstetric unit (OU) | Parity Complex pregnancy Previous OU birth |
| Coxon et al. | 2017 | United Kingdom | Systematic Review | Birth center, home, OU | Availability of medical staff Pain relief options No indication of transfer Previous negative experiences Proximity to home Stress of OU environment Relaxed environment Social opposition to home birth Positive support for out-of-hospital birth |
| Miller & Shriver | 2012 | United States | Qualitative | Home, hospital | Perceived safety of hospitals Religious beliefs about pain during labor Avoiding technology Control Access to different birth sites Socioeconomic standing |

Table 1. Continued.

| Authors | Year | Location | Study Design | Planned birth site(s) | Influential factors/themes |
|---------------------------|-------------|-----------------|-------------------------------------|------------------------------|---|
| Sperlich, Gabriel, & Seng | 2016 | United States | Cross-sectional, secondary analysis | Birth center, home | Age Socioeconomic standing Education level |
| Thompson & Wojcieszek | 2012 | Australia | Cross-sectional survey | Any | Accommodations for family Recommendations from friends Control over laboring position Aesthetic of facility NICU availability Model of care options Proximity to home Shared-decision making Pain relief options Provider-client ratio Prenatal education Postpartum stay Privacy Availability of technology Insurance coverage Etc. |

In a longitudinal study, a client's ultimate place of birth showed more influence on decisions for future pregnancies than the original birth plan (Coxon et al., 2015). Despite originally planning to deliver out-of-hospital, if a participant eventually delivered at the hospital, this was associated with a preference for hospital birth later on (Coxon et al., 2015; Coxon et al., 2014). In a way, these clients are assessing present risk based on what was harmful or successful in the past.

Coxon et al. (2017) contextualized this preference for hospital care during labor and birth by highlighting elective hospital birth as a "definitive" decision, requiring no further deliberation. Even in the UK, where OOH births account for nearly 13% of deliveries, there is consistent uncertainty about OOH birth plans (Coxon et al., 2017). While this environment might not exactly parallel the circumstances in the United States, many of the factors influencing women's planned birth site are applicable, including beliefs about risks and safety, as well as the perspectives of a client's social circle (Coxon et al., 2017). In an Australian-based study, 96.6% of the women surveyed considered a friend's recommendation regarding birth site to be important or extremely important (Thompson & Wojcieszek, 2012).

Literature surrounding birth site selection in the Australia, New Zealand, the UK, and the US reveal other social and emotional factors that come into play for pregnant women: previous experiences in a hospital, distance and travel time to the chosen birth site, pain relief options, acceptability of health insurance, and issues surrounding hospital transfers (Boucher et al., 2009; Coxon et al., 2017; Miller & Shriver, 2012; Thompson & Wojcieszek, 2012). As will be detailed later, all of these concepts came up in the secondary analysis, both in the medical chart reviews and questionnaire responses from clients.

3.0 METHODS

3.1 STUDY DESIGN

This project involved a secondary analysis of existing data provided by the only independent, accredited birth center in Pittsburgh, Pennsylvania. The demographic and clinical data points were all taken from the center's entries in a validated database, called the Perinatal Data Registry™ (Stapleton, 2011). All clients participating in the PDR provided written consent to allow their information to be recorded in this national database. Entries were provider-authored and prospective; this project analyzed data entries both for women who delivered between January 1st, 2013 and December 31, 2016, and women who registered for prenatal care with due dates in the same time period (n=2058).

Administrative staff and trained student interns conducted chart reviews for all individuals in the case group using a structured Google Form so that the same information was extracted from each chart. The different rationale behind elective hospitalization during labor were determined by TMC staff, based on topics they expected to find in these chart reviews. Appendices A and B of this paper show the slight changes in data points to be collected between 2015 and 2016, including the addition of postpartum stay as a categorical rationale for elective hospitalization.

All medical charts reviewed for births or pregnancies with due dates in 2013 were on paper. This was also the case for the majority of charts from 2014; during this year, the practice transitioned to an electronic medical record system, called Maternity Neighborhood™, meaning all medical charts reviewed for deliveries and pregnancies due in 2015 and 2016 were electronic.

While this did not change the content found in the charts, the source formats differed slightly, as did the providers' methods of entering information.

Table 2 displays the data points collected in the chart reviews. Some of these measures are objective, while others are subjective. In the case of determining possible reasons for transfer or departure from care, administrative and intern staff reviewed all prenatal encounter notes throughout the participant's length of care, searching for keywords or comments that could indicate the underlying reason for the non-indicated change in their birth plan.

Table 2. Variable measurements determined in medical chart review.

| Variable | Unit/Coding | Determination |
|--|---|---|
| Distance from birth center | Minutes driving time (continuous) | Calculated using Google Maps and address provided in medical chart |
| Birth plan at intake | 0 = Planned birth center 1 = Unsure 9 = Unknown/missing | Reported by intake staff, recorded by provider in medical chart |
| Pregnancy history at TMC | 0 = No previous births with TMC providers 1 = At least 1 TMC birth 2 = At least 1 hospital birth with TMC providers (no history of TMC birth) | Recorded by client in medical chart |
| Birth plan at first prenatal appointment | 0 = Planned birth center 1 = Planned hospital 2 = Unsure 9 = Unknown/missing | Recorded by provider in medical chart |
| Birth plan by 36 weeks gestation | 0 = Planned birth center 1 = Planned hospital 2 = Unsure 3 = Changed provider by 36 weeks 9 = Unknown/missing | Recorded by provider in medical chart |
| Documentation of orientation attendance | 0 = Orientation previously attended 1 = Orientation discussed only 2 = Orientation attended 9 = Unknown/missing | Recorded by provider in medical chart |
| Documentation of class attendance | 0 = Multiparous, classes not required 1 = Attended at least 1 class 2 = Attended at least 2 classes 3 = Attended all required classes 4 = Discussion only 9 = Unknown/missing | Recorded by provider in medical chart |
| Timing of transfer | Gestational age at moment of transfer, or at last appointment attended if moment of transfer unknown (continuous) | Recorded by provider in medical chart |
| Possible reason for non-medically indicated transfer, or departure from care | 0 = Desiring early induction 1 = Desiring postpartum stay at hospital 2 = Discontent with TMC care 3 = Expressing that hospitals feel safer 4 = Home birth preference 5 = Insurance restrictions 6 = Pressure from family and/or partner 7 = Too far from TMC 8 = Desiring epidural (decision before labor) 9 = No reason documented/discerned 11 = Other | Recorded by provider in medical chart, interpreted from encounter notes by researcher |

Table 3 below presents the other demographic and clinical data abstracted from the PDR entries.

Table 3. Variables determined from provider-authored PDR entries.

| Variable | Unit/Coding |
|---|--|
| Age | Years (continuous) |
| Payment Method | 0 = Private insurance 1 = Public insurance 2 = Military insurance 3 = Self-pay (includes sliding scale) |
| Education | Years of schooling (continuous) |
| Ethnicity | 0 = Non-Hispanic 1 = Hispanic |
| Race | 0 = White 1 = Black/African-American 2 = Asian 3 = American Indian or Alaskan Native 4 = Native Hawaiian or Pacific Islander 5 = Mixed 9 = Unknown/missing |
| Parity | 0 = Primiparous 1 = Multiparous |
| Timing of prenatal care | Gestational age at first visit (continuous) |
| Indication for non-medical attrition | 0 = Changed mind regarding OOH birth 1 = Changed provider 2 = Insurance restrictions 3 = Was “unsure” at intake 4 = Moved out of area 5 = Non-compliance, provider decision 6 = Other 9 = Unknown/missing |
| Use of jacuzzi tub at birth center | 0 = Yes 1 = No 2 = Never admitted to birth center |
| Use of nitrous oxide at birth center | 0 = Yes 1 = No 2 = Never admitted to birth center |
| Place of birth | 0 = TMC 1 = Referral hospital (UPMC Mercy) 2 = Other 9 = Unknown/missing (transferred) |
| Type of birth | 0 = Vaginal 1 = Cesarean 9 = Unknown/missing (transferred) |
| Indication for pre-admission intrapartum transfer to hospital | 0 = Client choice (not medically indicated) 1 = Delivered at home or enroute 2 = Medical indication 9 = No pre-admit transfer |
| Indication for intrapartum referral to hospital | 0 = Client choice (not medically indicated) 1 = Medical indication 9 = No IP transfer |
| Incidence of preterm birth | 0 = Delivery after 37 weeks gestation 1 = Delivery before 37 weeks gestation |
| EPDS score at 6 weeks postpartum | 0 = Score below 7 1 = Score at or above 7 9 = Unknown/missing |

After chart reviews were complete, each participant selected for chart review was contacted via email or telephone by administrative staff or student interns to complete a brief, open-ended questionnaire, detailed in Table 4. This allowed participants to describe their own care experiences during the specified pregnancy and birth, as well as explain the reason they decided to deliver at the referral hospital. Clients had the option of remaining anonymous in responding to this questionnaire, and all responses were de-identified for the purposes of this secondary analysis.

Table 4. Questionnaire item content and response types.

| Questionnaire item | Response type |
|---|--|
| Choose the response that best matches why your birth plan changed. | Multiple choice 1. I decided before labor that I wanted to birth at the hospital. 2. I decided during labor that I wanted to continue labor at the hospital. 3. I decided during my pregnancy that I no longer wanted to deliver with The Midwife Center. 4. Other (please explain in last question) |
| Which choice best describes your reason for changing your birth plan? | Multiple choice 1. The hospital seemed like a safer place to give birth. 2. I wanted an epidural. 3. I wanted a home birth. 4. I wanted a water birth. 5. My partner was not comfortable with an out-of-hospital birth. 6. My family was not comfortable with an out-of-hospital birth. 7. The Midwife Center was too far from my home. 8. My insurance restricted my options. 9. Other (please explain in last question) |
| Give any additional details to explain why you changed your birth plan. | Open-ended |

The Midwife Center staff provided the final de-identified dataset for this secondary analysis, as well as qualitative responses (n=45) received for the same 2013-2016 time period.

3.2 SAMPLE SELECTION FOR CASE AND COMPARISON GROUPS

Since TMC had already limited the dataset to include complete PDR entries for deliveries and due dates between January 1, 2013, and December 31, 2016, no other inclusion criteria were needed for the purposes of this study. Exclusion criteria for the comparison group consisted of both medical and non-medical indications for hospital birth: antepartum referral, induced abortion, history of cesarean section, non-medical attrition, pre-admission intrapartum referral, and spontaneous miscarriage. Non-medical attrition circumstances included contact with client being lost; moving outside of the TMC service area; transferring care due to insurance restrictions; non-compliance with TMC protocols; and being undecided or changing one's mind about the birth plan.

The case group to be compared was selected according to the following exclusion criteria: antepartum provider referral, history of cesarean section, induced abortion, intrapartum referral (pre- or post-admission to TMC), live birth at TMC, planned hospital delivery upon intake registration, and spontaneous miscarriage. Furthermore, clients who ultimately moved out of the birth center's service area were not included in the case group, despite being examples of non-medical attrition. Contrary to cases categorized as "lost to follow-up", clients who moved were considered without OOH options, rather than deliberately deciding *not* to deliver at TMC.

3.3 ANALYSIS PLAN

All statistical tabulations and tests were performed using Stata/SE 15.0 (StataCorp, 2017). Distributions were determined for all continuous variables. Descriptive statistics for the case and

control groups are presented as means and standard deviations for normally distributed continuous variables and as number and percent for categorical variables.

In addition to descriptive statistics, independent t-tests were calculated within the case group by stratifying this sample by their status at intake (sure vs. unsure) in an effort to understand differences between these groups regarding the following continuous variables: age, distance from TMC, gestational age at transfer, and years of education. Unequal variances were taken into account when applicable. The same testing was carried out for strata related to whether or not clients had successfully attended TMC orientation, which is required for all clients; the same continuous variables were used in these t-test calculations.

Analysis between the case and comparison groups required labeling the non-medical change-of-mind scenarios as positive outcomes, with certain demographic and clinical data collected labeled as “exposures.” This way, significant associations between these categorical exposures and case group outcomes could be determined by performing relative risk ratio calculations. The exposures examined included being 35 years old or older, Black race, Hispanic ethnicity, private insurance, public insurance, timely prenatal care initiation (by 13 weeks’ gestation), and young age (25 years or younger).

Lastly, because the responses to the questionnaire are partially qualitative and open-ended, these responses are analyzed according to the reported timing of the client’s decision and key concepts mentioned. The different rationale options for elective hospitalization, such as distance from TMC and desiring early induction, from the Google Forms were used as starting points for reviewing and analyzing the concepts present in the questionnaire responses, which allowed for some comparison to the chart review findings. Details regarding major themes highlighted in these responses are provided after the quantitative results.

4.0 RESULTS

4.1 DESCRIBING THE CASE AND COMPARISON GROUPS

A total of 2,058 completed PDR entries were included in TMC's dataset, for delivery and due dates between January 1, 2013 and December 31, 2016. Using the exclusion criteria described previously to isolate the cases that were eligible for OOH birth before labor began, the final comparison group consisted of 1,084 cases. The case group to be compared resulted in 172 cases selected from the original sample, after accounting for exclusion criteria. However, 19 of these cases were not included in the final case group sample; reasons for ineligibility at this stage included a hospital-based birth plan upon registration, incorrectly coded provider referral, or a lack of reference to a specific patient case, which would be necessary for chart review. The final case sample consisted of 153 cases. The flowchart in Figure 1 shows how the dataset was organized into case and comparison groups, with the bolder arrows showing how samples were formed, and thin arrows showing which samples were directly compared in the analysis.

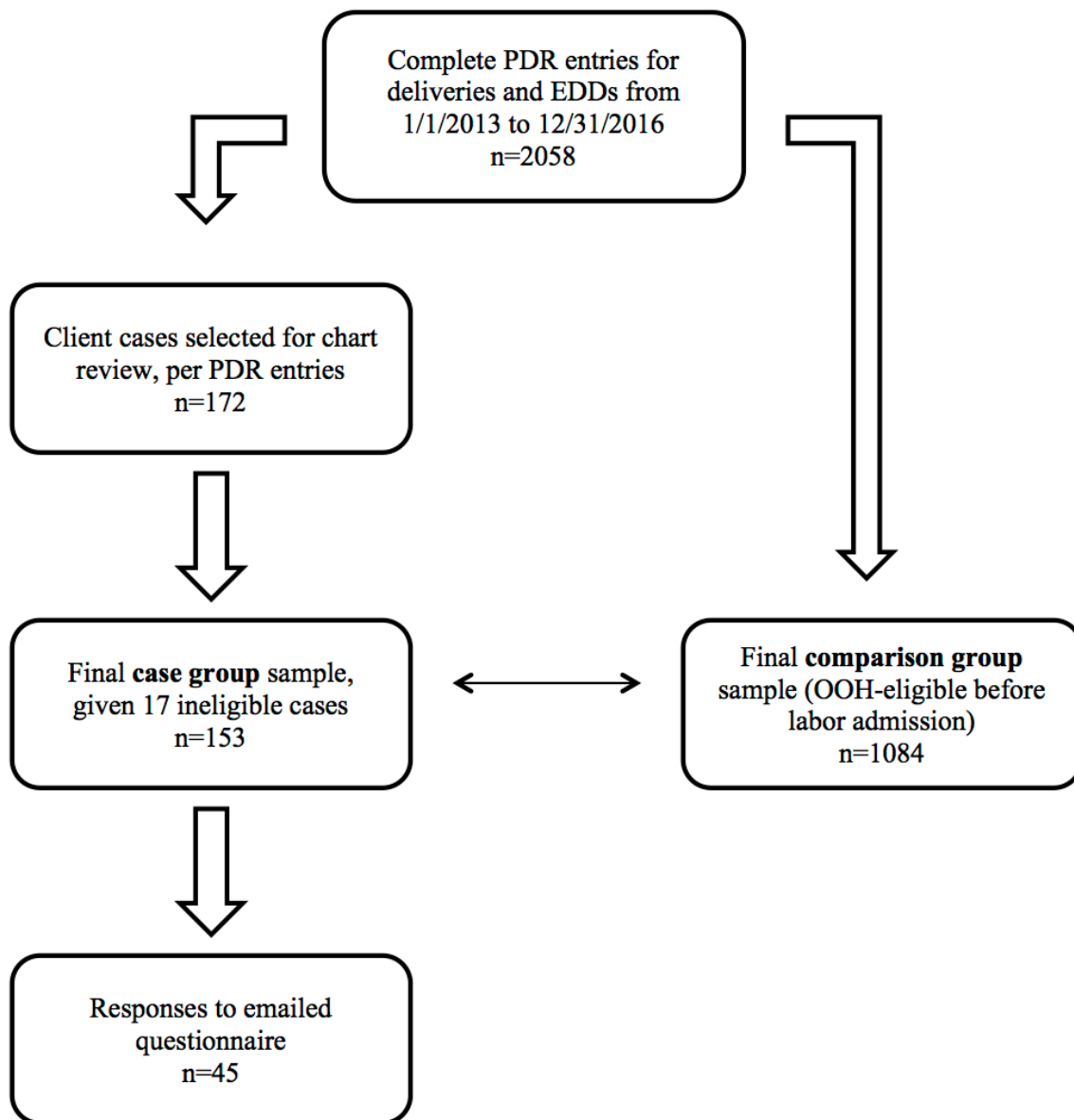


Figure 1. Flowchart illustrating the selection process for case and comparison groups.

As detailed in Table 5, the comparison group of clients from TMC who were eligible for OOH birth before going into labor was largely White (92.9%), educated (mean of 16 years' education), and privately insured (85.15%). Save for the relatively lower rate of clients with

Medicaid and Hispanic ethnicity in the comparison group, these statistics are similar to those reported in the national birth center dataset (Stapleton et al., 2013). Outcomes for this comparison sample were also similar to those reported by Stapleton et al. (2013), with the latter reporting a vaginal birth rate of 92.8%.

Table 5. Descriptive statistics for the case and control groups.

| Variable | Control (n=1084) | | | Case (n=153) | | | p |
|---|------------------|-------|------|--------------|-------|------|----------------------|
| | % (n) | Mean | SD | % (n) | Mean | SD | |
| Age (years) | | 30.01 | 4.23 | | 30.06 | 4.74 | 0.888 |
| Years of education | | 16.08 | 2.02 | | 15.63 | 1.96 | 0.009* |
| BMI | | 23.68 | 4.33 | | 25.17 | 5.06 | 0.157 |
| Gestational age at start of care (weeks) | | 10.60 | 2.99 | | 10.28 | 3.37 | 0.286 ^a |
| Private insurance | 85.15 (923) | | | 79.08 (121) | | | 0.053 |
| Public insurance | 12.45 (135) | | | 15.69 (24) | | | 0.263 |
| Military insurance | <1 (10) | | | 2.61 (4) | | | 0.084 ^b |
| Self-pay (includes sliding scale) | 1.48 (16) | | | 2.61 (4) | | | 0.297 ^b |
| Hispanic | 1.11 (12) | | | <1 (1) | | | 1.000 ^b |
| White | 92.90 (1007) | | | 88.24 (135) | | | 0.043* |
| Black | 2.86 (31) | | | 7.19 (11) | | | 0.006* |
| Asian | 1.38 (15) | | | <1 (1) | | | 0.709 |
| Native Hawaiian or Other Pacific Islander | <1 (2) | | | <1 (1) | | | 0.124 ^b |
| Mixed Race | 2.40 (26) | | | 1.96 (3) | | | 1.000 ^b |
| Primiparous | 37.27 (404) | | | 39.22 (60) | | | 0.642 |
| Multiparous | 62.73 (680) | | | 60.78 (93) | | | 0.642 |
| Admitted to TMC for labor | 99.17 (1075) | | | 1.31 (2) | | | <0.001 ^{b*} |
| <i>Used Jacuzzi tub at TMC</i> | 39.63 (426) | | | 0.50 (1) | | | <0.001 ^{b*} |
| <i>Used nitrous oxide at TMC</i> | 3.53 (38) | | | 0 (0) | | | 0.011 ^{b*} |
| TMC birth | 72.73 (783) | | | n/a | | | n/a |
| Cesarean birth | 3.69 (40) | | | 5.88 (9) | | | 0.193 |
| Intrapartum transfer | 13.01 (141) | | | 1.31 (2) | | | <0.001 ^{b*} |
| Preterm birth | <1 (1) | | | 0 (0) | | | 0.232 |
| Positive depression score at 6 weeks postpartum | 10.24 (111) | | | 8.50 (13) | | | 0.502 |

^aIndicates unequal variances, t-test calculation was adjusted accordingly. ^bIndicates use of Fisher's Exact Test.

Table 4 also displays significant differences between the control and case groups, including years of education (p=0.009), White race (p=0.043), Black race (p=0.006), and other factors related to admission of labor at the birth center and intrapartum transfer. The rate of admission to TMC for labor in this population is reduced (1.31%) alongside the same calculation for the

comparison group (99.2%). While this statistic is biased since nearly a third of case group participants transferred out of the practice completely, it is still relevant to highlight, as it explains the low utilization rates of the Jacuzzi tub and nitrous oxide during labor for the case group.

Table 6 shows the chart review findings. On average, case group clients decided on elective hospitalization during labor around the beginning of the third trimester (28.38 weeks' gestation). Less than one third of the case group had a previous history of delivery with TMC midwives, at the birth center or hospital. While just under 70% of case group clients were sure about their OOH birth plan upon registration, this rate dropped to 49.67% by the first prenatal visit; and then to 22.22% by 36 weeks' gestation.

Table 6. Descriptive statistics for chart review data in case group; n=153.

| Variable | % (n) | Mean | SD |
|--|------------|-------|-------|
| Distance from TMC (minutes driving) | | 28.00 | 21.31 |
| Gestational age at transfer (weeks) | | 28.38 | 10.21 |
| Unsure at intake | 30.72 (47) | | |
| History of TMC birth | 14.38 (22) | | |
| History of hospital birth with TMC provider(s) | 19.61 (30) | | |
| Plan at first prenatal visit | | | |
| <i>TMC</i> | 49.67 (76) | | |
| <i>Hospital (UPMC Mercy)</i> | 9.80 (15) | | |
| <i>Unsure</i> | 36.60 (56) | | |
| Plan at 36 weeks | | | |
| <i>TMC</i> | 22.22 (34) | | |
| <i>Hospital (UPMC Mercy)</i> | 40.52 (62) | | |
| <i>Unsure</i> | 7.84 (12) | | |
| <i>Changed providers by 36 weeks</i> | 28.76 (44) | | |
| Transfer reason discerned from encounter notes | | | |
| <i>Desiring early induction (by 39 weeks)</i> | 1.96 (3) | | |
| <i>Desiring postpartum stay at hospital</i> | 4.58 (7) | | |
| <i>Discontent with TMC care</i> | 1.31 (2) | | |
| <i>Expressing that hospitals feel safer</i> | 8.50 (13) | | |
| <i>Desiring a home birth</i> | 1.96 (3) | | |
| <i>Insurance restrictions</i> | 11.11 (17) | | |
| <i>Pressure from family or partner</i> | 2.61 (4) | | |
| <i>Living too far from TMC</i> | 3.27 (5) | | |
| <i>Desiring epidural (decision before labor)</i> | 8.50 (13) | | |
| <i>No reason documented or discerned</i> | 28.10 (43) | | |
| <i>Other</i> | 28.10 (43) | | |

The most common themes in prenatal encounter notes related to reasons for opting out of OOH birth included insurance restrictions (11.11%), expressing that hospitals feel safer (8.5%), and the prenatal plan for an epidural once labor begins (8.5%). It is also important to note that over a quarter of the charts revealed no discernable reason for the change of mind (28.1%).

Considering that 43 of the case group chart reviews resulted in coding the reason for non-medical transfer as “other,” it was helpful to perform ad hoc analysis of the comments provided in the dataset from TMC for this subsample. Some of these chart reviews revealed attempts to induce natural labor at TMC (n=5, 3.27%), using methods like breast pumping and Foley bulb procedures. All labor induction attempts at the birth center were followed by non-emergent transfers to hospital, seemingly because clients did not want to return home to wait for labor to progress.

The subgroup labeled “other” included several cases when the client appeared to be concerned enough about rapidly progressing labor, making TMC an unsafe option because of its distance from them at the time (n=6, 3.92%); two of these situations resulted in delivery in a car. In addition, there was considerable comment about clients’ anxiety surrounding the possibility of complications or potential transfer scenario, with 13 (8.5%) women opting for a hospital birth seemingly due to these fears, despite being eligible for OOH birth. Overall, the variety of reasons discerned from the chart review reveal the multitude of concerns that women factor into their birth plan.

4.2 ANALYZING ASSOCIATIONS BETWEEN VARIABLES

In an attempt to understand how confidence in one’s birth plan may affect later decision-making, the case group was stratified according to their status of “sure” or “unsure” about OOH birth upon registering for prenatal care at TMC. Table 7 shows significant differences in the means for years of education ($p=0.048$), distance from TMC ($p=0.003$), and gestational age at transfer ($p=0.008$). It was not a surprise to see that clients who were “unsure” upon registration tended to change their mind earlier about OOH birth. Clients who were “unsure” upon registration were, on average, more educated and lived closer to TMC compared to those that were “sure.” No significant differences in these variables were found when the case group was stratified by previous orientation attendance.

Table 7. Statistical differences in mean values among case group, based on intake status.

| | Sure (mean) | Unsure (mean) | p |
|--|--------------------|----------------------|----------|
| Age (years) | 29.77 | 30.70 | 0.265 |
| Years of education ^a | 15.39 | 16.15 | 0.048* |
| BMI | 25.66 | 23.30 | 0.422 |
| Distance from TMC (minutes driving) ^a | 30.67 | 21.96 | 0.003* |
| Gestational age at transfer (weeks) | 29.83 | 25.12 | 0.008* |

^aIndicates unequal variances, t-test calculation was adjusted accordingly.

4.3 THEMES IN QUALITATIVE RESPONSES

All of the participants in the case group ($n=153$) were contacted via email or telephone about the opportunity to respond to a brief questionnaire regarding their justification for choosing not to

deliver at the birth center; a total of 45 responses (29.4%) were collected for births and estimated due dates in the study time period.

Of these, 22 women (48.9%) reported that their decision to deliver at the hospital was made before labor; two women (4.4%) reported making their decision during labor; seven women (15.6%) reported a change of providers during their pregnancy; and the remaining 14 women (31%) categorized their experience as “other” in response to the first question. Only one respondent (2.2%) specified a lack of family support as her reason for planning a hospital birth; and two others (4.4%) reported that restrictions in their insurance coverage prevented them from planning an OOH birth.

Similar to the data gleaned from the medical chart reviews, the clients’ responses to this questionnaire varied widely in terms of how they made their decisions during pregnancy and labor. Reasons included feeling fear and anxiety surrounding the experience of a hospital transfer; feeling dismissed or ignored by providers; having a previous traumatic birth experience; lacking social support; and desiring a home birth experience.

4.3.1 Fear of transfer to a hospital

One questionnaire respondent explained, “I had a concern that if my labor should have complications, it would be very stressful for me to make the transition to the hospital in the middle of the labor process.”

Some respondents also mentioned how their decision to deliver at the hospital was validated by subsequent complications. One mother said, “My gut instinct was right as my son had the cord wrapped around his neck and his heartbeat almost flatlined [sic] after twenty hours of labor. Luckily his life was saved by an emergency c-section.” Similarly, the first-hand experience

of a previous traumatic birth that required an emergent hospital transfer could further increase maternal anxiety; one questionnaire respondent cited her experience of an emergent transfer due to a shoulder dystocia in delivering her first child.

4.3.2 Desire for postpartum support

Similar to the fear of adverse perinatal events that would require transferring to a hospital during a potentially uncomfortable period like labor, clients repeatedly mentioned the different aspects of postpartum support that might be lacking in a birth center environment.

While postpartum stay was not among the leading reasons for TMC clients opting against OOH birth, chart reviews showed it to be a relevant concern in at least seven cases (4.5%). Questionnaire respondents expanded on this topic, mentioning relief at having the availability of a NICU department and/or additional newborn care support at the hospital.

One client explained how her lack of social support made a minimum 24-hour postpartum stay at the hospital even more inviting:

I was not comfortable returning home so quickly. I have a very busy house with lots of people and did not feel I would get the support I needed with a newborn at home. It was comforting to know that I would have a few days at the hospital with nursing staff to help me adjust to the requirements of taking care of a new baby.

4.3.3 Social support in birth plan

Pressure from significant others or other family members was not mentioned frequently in the chart reviews (n=4, 2.6%). This concept also appeared in the questionnaire responses, sometimes in conjunction with other factors that made OOH birth less appealing or appropriate. One client

stated: “There were a few factors that influenced our decision. My husband was definitely less on board with the birth center. I even had to talk him into seeing a midwife...”

4.3.4 Communication issues

In their responses to the questionnaire, some clients made comments about feeling that their providers did not take them seriously:

I told [the midwife] that I knew I was progressing quickly and that I needed to come then before rush hour traffic started...I pretty much argued with her and told her I was not comfortable waiting.

I came in using a cane to support my weight, and explained the level of my pain and that I am a runner (so I understand the difference between soreness and an injury). I did not feel taken seriously at all; I was told that I could 'maybe' go see a physical therapist, but was basically brushed off.

Other responses consisted of less explicit complaints, like feeling that TMC was “too busy” to care about their concerns.

In many of the cases reviewed in this study, it seemed as if miscommunication occurred but was not readily recognized. For example, a client cites her discomfort with “TMC's position of not vaccinating our newborn with the recommended vaccines.” According to the CDC (2018), the only vaccine recommended within 24 hours of birth is Hepatitis B immunization, but it is difficult to know to which vaccines the client was referring. TMC does not offer this vaccine, but no statement can be found on its website or in its client handbook that specifies its position against CDC-recommended immunizations (Health, 2018).

In addition, some clients were preoccupied with the potential for complications, despite their absence at the time. Their responses showed a mix of anxieties; one client even acknowledged the spectrum of risk and the potential for her status to change: “I was becoming high risk and

wanted to see my regular ob-gyn to get established with them before I delivered.” Some of these responses represented anxieties surrounding hospital transfer, like when one client expressed:

As my pregnancy progressed, I was more comfortable with TMC and interested in a midwife center birth, but by then my blood pressure was of concern. My blood pressure remained a concern, especially in the last few weeks and I knew that if it was elevated during delivery I would have to be transferred. Being transferred to Mercy while in labor seemed like much worse of an option than just starting and staying there.

Considering that over half of the case group (n=1206, 69.3%) had either changed providers or changed their birth plan to include a hospital delivery by 36 weeks’ gestation, the discussion of potential risk becomes very relevant. While these data are not explicitly available for the present analysis, many of these women may have consulted a physician per their midwife’s referral, a common practice in collaborative models (Stapleton, et al., 2013). In post-hoc analysis of the comments recorded by TMC staff and included in the chart review dataset, it appears that potential risk was a concern for several clients, with comments mentioning complications in previous pregnancies and wavering confidence about OOH birth, all despite continuous risk assessment at TMC that confirmed they were eligible for such a plan.

5.0 DISCUSSION

5.1 FACTORS THAT INFLUENCE BIRTH SITE SELECTION

As previously mentioned, the chart reviews of the case group revealed the following factors to be most influential for birth center clients to plan for elective hospitalization: insurance restrictions (11.11%), desiring an epidural (8.50%), and expressing that hospitals feel safer (8.5%). In addition, post hoc analysis of cases labeled as “other”, as well as content from the questionnaire responses, revealed a prominent concern around hospital transfer. Lesser represented factors included the longer postpartum stay in a hospital, distance from TMC, pressure from family and friends, desiring early induction, and discontentment with TMC care. These findings are in agreement with much of the literature, based in the US and abroad, regarding how women decide on their birth sites (Coxon et al., 2017; Miller & Shriver, 2012; Thompson & Wojcieszek, 2012).

Some factors from the literature were not explicitly expressed in this study. In Thompson and Wojcieszek (2012), 93.2% of participants named the aesthetic of a facility as either important or extremely important in their birth site selection. Although this was not explicitly mentioned in any of the cases detailed in the dataset, 15.6% of the questionnaire respondents were clients that transferred their care from TMC completely. Consequently, there could be a considerable lack of representation in this dataset of women who transferred out of TMC care because of the aesthetics of the facility.

Another influential factor mentioned in the literature, but not in this study, was religion or spirituality (Miller & Shriver, 2012). As mentioned in chapter 3, TMC staff searched for key terms or concepts in the medical chart reviews and questionnaire responses, which were decided upon

by the task force committee engaging in this research. However, these expectations were not explicitly influenced by literature review, and so may not have included previously researched factors, like religion.

5.2 RISK OF COMPLICATIONS

Anxieties surrounding hospital transfers seemed to be pronounced in both the data retrieved from chart reviews of the case group and the responses from client questionnaires. This has also been echoed by previous research (Coxon et al., 2017). The national birth center study reported an intrapartum transfer rate of 12.4%, with less than 1% being emergent transfers (Stapleton et al., 2013). Similarly, just 13.01% of the birth center labor admissions in the present comparison group resulted in medically indicated transfers to the hospital. Despite very low rates of emergent transfer in birth center client pools, TMC clients seem to be making their decisions based on fears of an unlikely, albeit stressful, event.

Furthermore, post hoc analysis of the comparison group showed that use of the Jacuzzi tub or nitrous oxide at TMC was significantly associated with successful delivery at TMC. However, only two clients (1.3%) from the case group were admitted to the center in labor, meaning that a vast majority did not have the opportunity to benefit from these methods of pain relief and relaxation. Perhaps additional counseling on the benefits of these relaxation methods, particularly for clients anxious about a potential transfer, could prove beneficial.

As mentioned previously, much of the literature surrounding OOH birth is based outside the United States. Nonetheless, research based in the UK and New Zealand has demonstrated a significant relationship between planned birth site in a low-risk population and subsequent place

of birth (Davis et al., 2011; Y Li et al., 2015; Yangmei Li et al., 2014). For example, Davis et al. (2011) compared outcomes for women planning a home birth versus delivery in a hospital, showing a significantly increased risk of intervention, surgical birth, and NICU admissions in the latter sample. All of the participants in this study were being cared for by midwives. The authors attempted to explain the significant findings by positing that hospital-based midwives may be more likely to recommend medical intervention during labor, and/or that clients who opt for OOH birth may be more likely to deny or delay any kind of intervention (Davis et al., 2011).

Similarly, a study involving a secondary analysis of data from the Birthplace study in the UK showed increased risk of labor intervention for low-risk pregnant women that plan to deliver in a hospital; this significant finding was present at all ages (Yangmei Li et al., 2014). Another secondary analysis of the same dataset showed a reduced risk of intrapartum morbidity or newborn transfer in a sample of women who originally planned for OOH birth, but later presented as “higher risk,” indicating a hospital delivery (Y Li et al., 2015). While this study cited the need for a larger sample to more adequately demonstrate this significant relationship, the findings contribute to the broader argument that planned birth site, be it hospital, birth center or home, has an impact on later outcomes (Y Li et al., 2015).

While the present dataset provided by TMC did not allow for a parallel analysis of planned birth site for both comparison and control samples, this explanation of plans manifesting outcomes still applies to this study’s findings. TMC midwives also practice and deliver at the collaborative hospital, exposing them to increased utilization of medical intervention, as well as a clientele potentially more amenable to intervention. Furthermore, as described in the previous chapter, some clients justified their plan for elective hospitalization with narratives about complications that occurred during labor at the hospital.

Clients in the case sample studied revealed that experience with hospital birth encouraged them to follow the same plan with a future pregnancy. This is in line with research demonstrating that previous delivery in a hospital environment reinforces clients' perceptions of risk during labor and birth if they had previously delivered in a hospital environment (Adams, 2016; Coxon et al., 2015; Coxon et al., 2014). Some TMC clients mentioned their previous positive experiences with midwives in the hospital environment as their reason for choosing hospital birth. Previous birth history with TMC was not included for the comparison sample, making comparative analysis of this variable impossible in the present study.

5.3 EXTERNAL SUPPORT IN BIRTH PLAN

Declercq (2018) cited a 66% increase in OOH births across the United States from 2004 to 2015, as well as a poll where a majority of women (64%) expressed interest in OOH birth. However, midwives attend just a tenth of the births in the US, and birth center deliveries account for less than 1% of all births (Declercq, 2018; Martin et al., 2012). The women who choose this approach to care for their pregnancies remain in the minority, which is in stark contrast to European countries, where midwives attend a majority of births (Declercq, 2018). Further research is needed to understand the nuances of how birth center clients navigate an environment that systematically prefers physicians and hospital care during pregnancy.

Analyzing the differences in variable measurements between case group clients who were "sure" about their OOH birth plan and those who were "unsure" was strategic in that it served as a proxy for examining confidence in one's birth plan; this analysis produced three significant results. Clients who were "unsure" upon starting the intake and registration process with TMC

were more educated ($p=0.048$), lived closer to TMC ($p=0.003$), and transferred at an earlier gestational age ($p=0.008$).

The absolute difference between the calculated means for years of education was just 0.76 years. While significantly different from one another, these mean values were no surprise, as birth center clients are generally well educated (Stapleton et al., 2013).

The differences found between the “sure” and “unsure” subpopulations of the case group, regarding gestational age at transfer, are potentially revealing. In the case of gestational age, it appears that clients who were “sure” from the beginning were more likely to delay their change of mind, which makes logical sense. However, the data provided for this secondary analysis did not allow for further investigation into possible confounders.

Regarding distance from TMC, it seems counterintuitive that clients living further from the birth center should feel more confident in their OOH birth plan, considering some clients’ fears of quickly progressing labor. Again, the data provided limits the conclusions that can be drawn about this finding. Another interpretation is that clients living further away are making a more concerted effort to seek out birth center care.

In addition to a mother’s personal sense of confidence in her birth plan, the present findings suggest that further investigation may be warranted of how clients’ perceptions of risk are distorted by the opinions of others in their social circle, particularly the non-pregnant parent. The rate of clients reporting such pressures against OOH birth was more prominent in the questionnaire responses, compared to its minimal appearance in the chart review data. This might indicate that while these conflicts are not discussed during prenatal visits, or at least not documented with detail, they remain somewhat prevalent in mothers’ reflections of why they made these decisions during pregnancy. It is also important to note that there may be self-selection bias present in the qualitative

sample, which could lead to overrepresentation of some experiences, like interpersonal conflict with a partner or family member over birth site.

5.4 RACIAL DIFFERENCES PERVADE THE BIRTH CENTER MODEL

Significant differences were found in the representation of White ($p=0.048$) and Black women ($p=0.006$) between the case and comparison samples, where Black women were overrepresented in the case group. In the United States, Black mothers are experiencing infant mortality at a rate over two times that of White mothers: 11.3 and 4.9 infant deaths per 1,000 live births, respectively (Yangmei Li et al., 2014; US Department of Health and Human Services, 2015). In the context of these racial disparities in birth outcomes, this section covers a brief discussion of how these differences persist even under a model that seeks to close gaps in care.

One question would be whether the racial disparity in infant mortality sets the stage for Black women to increasingly accept the medical model of pregnancy and birth, in an effort to avoid adverse outcomes. To the contrary, recent literature revealed no significant difference between the perspectives of Black and White mothers when it comes to understanding safety in OOH birth (Sperlich, Gabriel, & Seng, 2016). In a similar vein, Attanasio, Hardeman, Kozhimannil, and Kjerulff (2017) found no association between race and positive attitudes toward unassisted vaginal delivery. While there are factors that may influence these opinions and attitudes, such as at what point in the pregnancy you ask a mother about her confidence in her birth plan or what the different interpretations of “safe” could be, it seems that other elements are at play when it comes to Black women choosing OOH birth (Sperlich et al., 2016).

The present secondary analysis echoed previous findings of low representation of Black women in birth centers across the United States; Sperlich et al. (2016) noted that approximately 2% of OOH births in general, and 6% of birth center births specifically, are to Black mothers. Previous qualitative research has revealed Black women's reservations about their care providers, citing general mistrust and a sense of figurative distance between client and provider (Bryant, Nakagawa, Gregorich, & Kupperman, 2010; Lori, Yi, & Martyn, 2011; Tucker Edmonds, Mogul, & Shea, 2015).

While this historical mistrust has typically been in medicalized settings, it may extend to the environment that TMC offers. One study of midwifery care in Ohio demonstrated that Black women were more likely to be transferred to physician-led care, compared to White women who also began prenatal care in a midwife-led practice, after adjusting for risks and complications (Weisband, Gallo, Klebanoff, Shoben, & Norris, 2017). The authors suggest cultural competency education for midwives and increasing the racial diversity of the profession (Weisband et al., 2017). In a similar vein, the present findings at TMC could be due to Black women's continuing mistrust or skepticism surrounding the racial and cultural sensitivities of the birth center staff.

Perceptions regarding birth site for Black clients at TMC are difficult to discern from the chart review data provided, and qualitative feedback did not include race information. More insight is needed into how these phenomena play out specifically under midwife-led care and in the OOH birth environment. TMC should consider deliberately reaching out to Black women, both in the practice and the community in general, to better understand their perspectives on and concerns regarding birth center care.

5.5 COMMUNICATION IS KEY

The present secondary analysis revealed many reasons and justifications for TMC clients choosing not to deliver at the birth center, despite experiencing healthy pregnancies and being eligible for delivery at the birth center, as they had originally intended. While communication is a difficult concept to measure, this seemed to be an underlying theme across all conflicts and misunderstandings highlighted in the chart review data and questionnaire responses.

Previous literature shows that inadequate communication or lack of mutual trust is related to lower client satisfaction (Dahlem, Villarruel, & Ronis, 2015; Vedam et al., 2017). Race intersects here as well, given the literature that spells out the ways racism has pervaded obstetrical practice, resulting in patient mistrust of the healthcare system and a strained patient-provider relationship (Bryant et al., 2010; Lori et al., 2011; Tucker Edmonds et al., 2015). For example, one study cited a common concern for African American participants seeking prenatal care: the missing relationship or connection that they longed for with their providers; more specifically, they mentioned the failure of providers to treat them “as fully human and listened to” (Tucker Edmonds et al., 2015). This response rings familiar when considering the aforementioned experiences of pregnant mothers who felt as if they were simply producers of infants, rather than human beings themselves (Fox & Worts, 1999).

Another more common example of miscommunication lies in the apparent self-diagnosis that several clients engaged in during their care at TMC. Lyerly et al. (2007) might attribute this to the misuse of the high versus low risk dichotomy. In other words, once a client is consulted about potential risk, either in her medical history or family history, this can taint her perception of her own pregnancy. Vedam et al. (2017) described this association, where discussion of any

pathology leads to reduced autonomy in medical decision-making, perhaps due to a lack of information or understanding.

Without scientific evaluation of prenatal care content at TMC, it is difficult to determine the reasoning behind clients' interpretations of risk assessment in birth centers. What is apparent however, is the continued need for improved communication methods, especially in a collaborative model where clients may receive input from various professionals and experts throughout their pregnancy.

5.6 EMPOWERING BIRTH CENTER CLIENTS

The background chapter of this paper began with a historical contextualization of medicalized pregnancy, and the dominance of the medical model in labor and birth, over the last 150 years in the United States. While the data collected by TMC and the present secondary analysis did not specifically address medicalization, its impact can be interpreted from the findings.

Generally, the perceived risk surrounding pregnancy and birth is somewhat mythical. Previous research not only shows that 85% of pregnancies are considered low-risk, but also that incidence of medical intervention increases in the hospital environment in low-risk populations (Benatar et al., 2013; Davis et al., 2011; Jolles et al., 2017; Yangmei Li et al., 2014). However, the dominance of the medical model in prenatal care requires the conceptualization of pregnancy as a potentially pathological condition, rather than a normal circumstance. As previously mentioned, the hospital environment is seen as the definitive setting for birth, eliciting no further debate about its appropriateness (Coxon et al., 2017). Consequently, for TMC clients, their OOH birth plan may become questionable.

One potential approach for TMC staff would be to further educate women in the research that shows the impact of using a medicalized lens to view normal pregnancy. Jolles et al. (2017) demonstrated the impact of a peer support program, called Strong Start, which was implemented in birth centers across the country. In addition to evaluating program outcomes, this article also cited the potential for similar initiatives to facilitate “conversion of preference” (Jolles et al., 2017) for behaviors proven beneficial for mom and baby in a population that typically does not engage in or have access to these behaviors. By educating TMC clients in how historical and cultural elements can influence their personal sense of authority during pregnancy and birth, the midwives may better facilitate empowered decision-making that takes the risks of elective hospitalization into account.

Since only Medicaid beneficiaries were eligible for the Strong Start program, this population reflected a relatively higher risk profile, compared to the general birth center client pool (Jolles et al., 2017). Nonetheless, analysis of Strong Start data revealed increased acceptance of beneficial behaviors, such as attending prenatal education classes and initiating breastfeeding; and a decreased incidence of adverse outcomes (Jolles et al., 2017). This challenges the notion that certain demographic factors predict poor outcomes. TMC can further empower women in these vulnerable populations to trust themselves and their own bodies, instead of accepting the supposed risky fate of their births.

6.0 CONCLUSIONS

This study involved secondary analysis of chart review and questionnaire response data provided by TMC, offering a glimpse into the concerns and conflicts that come up for pregnant women seeking OOH care, specifically in the Pittsburgh, Pennsylvania, area. Results echoed much of the conclusions drawn in previous literature, which describe varying perceptions of safety, control, and comfort to be at the root of clients' birth site preferences. In addition to further research that can examine the influential factors that came up in this study, like postpartum support in the first few days after birth, these findings also highlight the need for further analysis of how pregnant clients interpret and facilitate safety in their birth environments.

Furthermore, these findings highlighted a persistent racial disparity between Black and White mothers. While the intention of this study was not to measure differences in birth outcomes between these two populations, analysis revealed a barrier between Black women and OOH birth. This finding, backed up by other studies that seem to illustrate racialized differences not only in care content but also client perceptions, implores researchers and practitioners to further investigate how these gaps can be reduced with improved communication and cultural competency training (Dahlem et al., 2015; Lu et al., 2010; Sperlich et al., 2016).

6.1 STRENGTHS AND LIMITATIONS

The present analysis had many strengths. While it is not the first of its kind to investigate decision-making processes within the OOH context, or the first paper to discuss the environmental factors that influence birth plans, this study is the first to provide both provider and client insight into the various reasons that a pregnant person makes certain decisions that are not based on statistical evidence. Furthermore, the multiple methods approach offered a comprehensive picture of hundreds of women's experiences in a Pittsburgh birth center; this method can be easily extended to other birth centers, as well as more conventional perinatal contexts, like hospitals.

One of the main limitations of the data collection process involved the use of medical chart reviews to determine client cognitive processes. Not only is there room for subjective bias in the provider's documentation of the prenatal visit, but there is further risk of bias in the staff's data coding processes. Since these data were collected for quality assurance purposes, there were no measures to ensure process validity or interrater reliability. However, as mentioned previously, this approach sets the stage for further research regarding risk perception in the OOH environment.

Other limitations include selection bias in the qualitative questionnaire, as differences between those who chose to respond and those who did not cannot be determined. In a similar vein, clients who transferred out of the TMC practice may not have had the same opportunity to reveal their reasons to providers, who would subsequently make these details available in the medical chart.

Lastly, as mentioned previously, TMC's data collection objectives were not based on a methodological research approach, but rather an effort to evaluate and improve care experiences for clients. Future studies examining the phenomenon of elective hospitalization during labor in a

low-risk population should be modeled from previous findings, including an evidence-based plan for data collection and analysis.

6.2 FUTURE IMPLICATIONS

As Barker (1998) emphasized, challenging the assumptions and risks inherent in medicalization of natural processes is not to reject the benefits that technology and scientific practice offer in preventing medical tragedies, like infant mortality. However, the negative impact that elements of medicalization can have during pregnancy and birth, as demonstrated by several studies, implores researchers and practitioners to continually assess the power dynamic between provider and client, as well as between a facility and its clientele.

Furthermore, in order to emphasize the need for improved prenatal education regarding the spectrum of risk and how pathologies are determined, researchers must demonstrate that increased client knowledge and empowerment result in fewer complications and improved birth outcomes. This is a highly complicated issue in the study of maternal health, with many medical and social factors interacting to form the mother's pregnant experience. In short, risk comprehension deserves a similar level of coverage in research and medical practice if practitioners are to understand the entirety of these interactions.

Ultimately, TMC presents a viable and safe option for women experiencing low-risk pregnancies in Pittsburgh. However, as a birth center, the institution is also working against engrained cultural perceptions regarding pregnancy and birth. In addition to providing their clientele with evidence-based practices, TMC staff must also engage clients in how they have come to view their pregnant bodies, which are continually monitored and assessed according to a

medicalized model of pregnancy. As the present findings reveal, TMC clients trust the care that TMC offers, but not always their own capabilities of following through with natural childbirth.

APPENDIX A: 2015 DATA COLLECTION FORM

Task Force - Chart Review 2013-2015

This chart review only examines births that fit the following criteria:

- planned at TMC but did not occur there
- involved non-medical transfers/plan changes
- occurred between in 2013, 2014 and 2015

* Required

Client's Name *

Type of transfer recorded in stats *

Date of Delivery (or EDD if tx'd) *

Age at intake *

Distance from TMC (minutes driving) *

Insurance Type *

- Highmark BCBS
- Highmark Community Blue
- Out of State BCBS
- UPMC
- Aetna
- Tricare
- UPMC For You
- Gateway
- United HC Community
- Self Pay
- Other:

Race & ethnicity (according to client) *

- Caucasian, non-hispanic
- Hispanic
- Black

- Asian
- Pacific Islander
- Native American
- Other:

Unsure at intake? *

- Yes
- No

Birthed with TMC before? *

- No
- Yes - at TMC
- Yes - at hospital

Prime or multip? *

- Prime
- Multip

Birth plan at NOB *

- TMC
- Mercy
- Unsure

Birth plan at 36w *

- TMC
- Mercy
- Unsure
- Changed providers before 36w

Documentation of orientation? *

- Attendance documented
- Only discussion documented
- Nothing documented
- N/A - return client/previously attended

Classes Documented *

- CBE
- HB
- NBC
- BF
- CBR
- Classes done elsewhere (see notes for location)

None documented

N/A - return client

GA at transfer (or GA at last appt.) *

Possible reason mentioned in notes *

Insurance restrictions/changes

Pressure from partner

Pressure from family

Expressing that hospitals feel safer

Discontent with TMC care

Too far from TMC

Home birth

Water birth

Wants epidural (opinion before labor)

Other reason (see notes)

No reason documented

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APPENDIX B: 2016 DATA COLLECTION FORM

Task Force - Chart Review 2016

This chart review only examines births that fit the following criteria:
-planned at TMC but did not occur there
-involved non-medical transfers/plan changes
-occurred in 2016

* Required

Client's Name *

Date of Delivery (or EDD if tx'd) *

Age at intake *

Distance from TMC (minutes driving) *

Insurance Type *

- Highmark BCBS
- Highmark Community Blue
- Out of State BCBS
- UPMC
- Aetna
- Tricare
- UPMC For You
- Gateway
- United HC Community
- Self Pay
- Other:

Race & ethnicity (according to client) *

- Caucasian, non-hispanic
- Hispanic
- Black
- Asian
- Pacific Islander
- Native American

Other:

Unsure at intake? *

- Yes
- No
- Not documented on roster

Birthed with TMC before? *

- No
- Yes - at TMC
- Yes - at hospital

Prime or multip? *

- Prime
- Multip

Birth plan at NOB *

- TMC
- Mercy
- Unsure
- Not documented

Birth plan at 36w *

- TMC
- Mercy
- Unsure
- Changed providers before 36w
- Not documented by 36w

Documentation of orientation? *

- Attendance documented
- Only discussion documented
- Nothing documented
- N/A - return client/previously attended

Classes Documented *

- CBE
- HB
- NBC
- BF
- CBR
- Classes done elsewhere (see notes for location)

- None documented
- N/A - return client

GA at transfer (or GA at last appt.) *

History of sexual assault? *

- Yes, documented
- No, documented
- Not documented

Possible reason mentioned in notes *

- Insurance restrictions/changes
- Desiring PP stay at hospital
- Desiring early induction
- Pressure from partner
- Pressure from family
- Expressing that hospitals feel safer
- Discontent with TMC care
- Too far from TMC
- Home birth
- Water birth
- Wants epidural (opinion before labor)
- Other reason (see notes)
- No reason documented

Noteworthy comments

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