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Engagement in Home Visiting Services during the Transition from Pregnancy to Postpartum: A Prospective Mixed Methods Pilot Study

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Abstract

Objectives This pilot study used a prospective mixed methods approach to examine predictors of retention in services during the transition from pregnancy to postpartum. Home visiting programs that serve pregnant women are an important means of improving child and maternal well-being. Providing services to women during the transition from pregnancy to postpartum is particularly important, because children under the age of 1 are at high risk for mortality. Morever, mothers face amplified levels of stress during the postpartum period. Unfortunately, home visiting programs in the United States that support pregnant and postpartum women suffer from high rates of attrition. General research on home visiting engagement suggests that the client-provider relationship is an important factor in predicting client engagement in services; however, few studies have examined factors related to maternal engagement during the transition from pregnancy to postpartum.

Methods Measures administered during pregnancy for 39 pregnant women were used to predict attrition up to 15 months postpartum. Semi-structured interviews were conducted at 3 months postpartum with 33 of the original 39 women to qualitatively assess factors related to engagement in services during the transition from pregnancy to postpartum.

Results Both quantitative and qualitative analyses indicated that clients' perceptions of the client-provider relationship was a critical factor in maintaining mothers' engagement in services. Both types of analyses indicated that perceived provider reliability was related to mothers' engagement in services. Quantitative analyses also found that perceived provider cultural competence predicted engagement in services. Other findings from qualitative analyses indicated that mothers' perception of the home visitor as trustworthy/supportive, personable/having good communication skills, knowledgeable, and collaborative/flexible, were factors that mothers noted when discussing engagement in services.

Conclusions These results advance the literature on engagement in home visiting services by overcoming some of the limitations of previous literature and may have implications for home visitor training.

Keywords Home visiting services · Pregnancy · Postpartum · Engagement in services

Home visiting programs have been found to be an effective vehicle for improving child and maternal well-being through reducing a host of negative child outcomes (e.g., infant mortality, child maltreatment) as well as improving child development (Meghea et al. 2015; Miller 2015; Olds et al. 1998). Home visiting services that target pregnant women are particularly promising for preventing negative outcomes to infants because they can assist mothers with the transition from pregnancy to postpartum (Meghea et al. 2015; Shaw et al. 2006). Support for mothers during this period is critical, given the stressful nature of the transition from pregnancy to postpartum, including increased demands on mothers' time, energy, emotional resources, and finances (Cowan and Cowan 2000; Holland et al. 2013; Salmero-Aro 2012), as well as reduced satisfaction with romantic relationships (Claxton and Perry-Jenkins 2008).

The literature on home visiting programs in general has found high rates of client attrition (Ammerman et al. 2006; Gomby et al. 1999; O'Brien et al. 2012). Although few

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studies have examined attrition specifically during the transition from pregnancy to postpartum, some data suggest that engagement may drop off during this time period (Kothari 2015; Wen et al. 2016). Stressors during the perinatal period and increased demands on time and energy can make it challenging to engage mothers. Indeed, women are at high risk for experiencing significant symptoms of depression or anxiety during the postpartum period (Centers for Disease Control and Prevention 2012; Ross and McLean 2006), and maternal mental health problems during the first year of a child's life can have lasting effects on children's development (Avan et al. 2010; Lovejoy et al. 2000). Thus, support for at-risk women during the transition from pregnancy to postpartum is crucial in promoting child well-being. An understanding of the factors that contribute to maternal attrition during the transition from pregnancy to postpartum is needed so that services can be modified to better engage mothers during this period in which infants are at risk.

The Integrated Theory of Parent Involvement (McCurdy and Daro 2001) provides a framework for understanding factors related to home visiting service engagement, in which caregiver, neighborhood, provider, and program factors contribute to the likelihood of engagement in several phases, including intent to enroll, enrollment, and retention. Quantitative studies examining engagement in home visiting services in general (without a specific focus on the transition from pregnancy to postpartum) have found that parent, family, and program factors contribute to enrollment, frequency of participation, and completion rates. Regarding program factors, studies have found that variables such as lower caseloads and use of manualized interventions are related to greater engagement in services (Daro et al. 2003; Damashek et al. 2011). Findings have been mixed regarding the relation of caregiver demographic variables to engagement. Some studies have found that demographic "risk" variables (e.g., lower socioeconomic status, younger age) predict greater engagement, whereas other studies have found that such factors predict lower engagement in services (Daro et al. 2003; Duggan et al. 2000; Damashek et al. 2011; Josten et al. 2002; McCurdy et al. 2003; Raikes et al. 2006). For example, researchers have found that low socioeconomic status is related to greater likelihood to enroll in services but lower engagement in services once enrollment has occurred (Brand and Jungmann 2014: Josten et al. 2002; Marsden et al. 2013). Research on general caregiver risk variables (e.g., mental health, substance use, domestic violence) has also been somewhat inconsistent; however, several studies do indicate that indicators of poor mental health, substance use, and domestic violence predict *longer* retention in services (Ammerman et al. 2006; Damashek et al. 2011; Duggan et al. 2000; Girvin et al. 2007; Latimore et al. 2017).

Although findings on caregiver and family demographic and risk variables have been somewhat mixed, a consistent finding in the literature is that *provider variables* are strong predictors of client engagement in services (Damashek et al. 2012; Damashek et al. 2011; Josten et al. 2002; Korfmacher et al. 2007; O'Brien et al. 2012). Indeed, in some cases, provider characteristics have been found to be stronger predictors of client engagement than family characteristics (Latimore et al. 2017; Wen et al. 2016). In particular, several indicators of clients' perception of services such as general satisfaction with services, perception of the client worker alliance or relationship, and perception of provider cultural competence, have been found to be related to greater likelihood of completing goals and services (Damashek et al. 2012; Damashek et al. 2011; Girvin et al. 2007; Korfmacher et al. 2007). A limitation of studies in this area, however (with the exception of Korfmacher et al. 2007), is that perceptions of services were typically assessed at the end of services, rather than prospectively, making it difficult to determine the degree to which perception of services was causally related to lack of engagement. Prospective studies would help to clarify the power of these factors to predict later attrition.

Recent studies have utilized qualitative methods to understand factors related to engagement from a client perspective. A common theme in these studies is that provider characteristics (e.g., caring, supportive, warm, reliable, conscientious, persistent, flexible, motivational), and the perceived relationship (e.g., collaborative) between the provider and the client were key to mothers' decisions about whether to continue services (Beasley Silovsky et al. 2014; Brookes et al. 2006; Jack et al. 2005; O'Brien et al. 2012). For example, O'Brien et al. (2012) interviewed nurses across several home visiting sites that served pregnant and postpartum women and found that nurses in high retention sites adapted the program to their clients' needs and were more collaborative. Other research by Beasley et al. (2014, 2018) used focus groups of mothers for two evidence-based home visiting services (i.e., SafeCare and Nurse Family Partnership). The authors reported that mothers endorsed several home visitor personality characteristics, (e.g., reliable, personable, trustworthy, caring, nonjudgmental, flexible, persistent, supportive) as being important to initial engagement and maintenance in services. Mothers also indicated that provision of education and information during visits was important to maintaining their engagement in services.

These qualitative data are valuable in understanding risk for attrition; however, it is important to examine these factors *quantitatively* to understand their relative effect in predicting mothers' engagement in services. Relationship variables may be particularly important during the immediate postpartum period in the midst of increased

demands on mothers' time. In addition, it's unclear whether there may be additional relationship factors that might be important in maintaining clients during the transition from pregnancy to postpartum.

In summary, infants are a highly vulnerable population, and home visiting services for pregnant women are an important method to promote healthy child development (Meghea et al. 2015; Miller 2015; Olds et al. 1998). Unfortunately, little, if any, data exist about factors related to attrition and retention during the transition from pregnancy to postpartum. Literature on general engagement in home visiting services indicates that provider and client variables play a role in client engagement. In particular, the client's perception of services and relationship with the provider may be a key variable to understanding risk for attrition (Beasley et al. 2014, 2018; Damashek et al. 2011; Korfmacher et al. 2007; O'Brien et al. 2012). However, several of the studies examining the client-provider relationship are qualitative, and the relative importance of these relationship variables in predicting risk for attrition is unknown (Beasley et al. 2014, 2018; O'Brien et al. 2012). Moreover, quantitative studies examining the role of the provider-client relationship in engagement in services often assess clients' perceptions of services at the end of services, rather than prospectively. Thus, the importance of these client perception variables in predicting subsequent engagement in services is unclear. To address these limitations, the present pilot study used a prospective mixed methods approach to examine the role of client and provider variables in women's engagement in home visiting services during the transition from pregnancy to postpartum.

Methods

Participants

Participants were recruited from two home visiting programs, including Healthy Babies Health Start (HBHS) and Nurse Family Partnership (NFP). Participation included 2 data collection appointments, one during pregnancy and one at postpartum. A total of 39 women participated in the initial data collection appointment (26 from HBHS and 13 from NFP), and 33 women participated in postpartum semi-structured interviews, which provided data for our qualitative analyses. Of the 33 women who participated in the interviews, 27 were still enrolled in services (12 HBHS and 11 NFP), and 6 had been discharged from services (5 from HBHS and 1 from NFP). The six women who did not participate in our semi-structured interviews were all mothers who had been enrolled in HBHS. Of the women who we were not able to contact for the qualitative interview, two had been discharged from home visiting services.

Table 1 Participant demographic characteristics

Maternal demographic characteristics	Mean or percentage
Mean age (in years)	22.8 ($SD = 4.7$; range 15–31)
Race/ethnicity	
Caucasian	48.7% ($n = 19$)
African-American	30.8% ($n = 12$)
Hispanic	5.1% ($n = 2$)
Biracial	10.3% ($n = 4$)
Other	5.1% ($n = 2$)
Marital status	
Never married	41.0% ($n = 16$)
Living with partner	28.2% ($n = 11$)
Married	20.5% ($n = 8$)
Divorced/separated	10.3% ($n = 4$)
Educational level	
Grade School/some high school	30.8% ($n = 12$)
High school graduate	20.5% ($n = 8$)
Some college	35.9% ($n = 14$)
College graduate/ post undergraduate education	10.2% ($n = 4$)
Other	2.6% ($n = 1$)
Gross annual income	
<$15,000	49% ($n = 16$)
$15,000–30,000	30% ($n = 10$)
>$30,000	21% ($n = 7$)
Missing	15% ($n = 6$)

$N = 39$

Bivariate analyses (chi-square and Mann-Whitney tests) indicated that women who did not participate in the semi-structured interview did not differ from the rest of sample on demographic, maternal risk, or on client perception of service variables.

Demographic characteristics of mothers can be seen in Table 1. Mothers were primarily either Caucasian or African American. The majority of mothers were low-income; almost 50% of participants reported earning less than $15,000 yearly. Educational and marital status varied. Approximately one third of the sample had not completed high school; however, 46% of the sample reported completing some college or graduating from college. Nearly half of participants were married or living with a partner.

Procedure

This pilot study used a mixed methods design, with an explanatory-sequential approach that began with in-person structured surveys during pregnancy that were followed by semi-structured one-on-one interviews during early postpartum (Ivankova et al. 2006; Fetters et al. 2013).

Administrative records were abstracted for program participation variables, including postpartum program enrollment.

We partnered with two home visiting programs (Healthy Babies Healthy Start, Nurse Family Partnership) that are delivered by the local County Health Department in a mid-sized Midwestern town (population 75,000). The two programs serve families at risk of poor health outcomes because of socioeconomic or psychosocial risk factors and provide services to families of children during pregnancy through age 18 months (HBHS) to 2 years (NFP). Healthy Babies Healthy Start (HBHS) employs paraprofessionals with at least a high school education, and Nurse Family Partnership (NFP) employs bachelor's level nurses. HBHS serves women in low-income zip codes, and NFP serves only first-time mothers, with a focus on those receiving Medicaid. Families enrolled in HBHS receive a variable number of visits with their home visitor, depending on the needs of the family. They receive a minimum of one visit per month until the child reaches age one, but visits can occur as often as weekly. After the child reaches age 1, visits must occur a minimum of once every other month. Families in NFP typically meet with their home visitors biweekly, but frequency can vary from weekly to monthly based on families' needs. Families are referred to both services through a variety of agencies including hospitals, churches, or social service agencies in addition to being referred by other clients or through self-referral.

Women who were eligible to participate in the study had to be English speaking, at least 15-years-old, at least 24 weeks pregnant (to ensure that they could participate in the postpartum interview within the timeframe of the study), and had engaged in at least 2 appointments with their home visitor. The two appointment criteria was used to ensure that they had enough time to form a relationship with their provider so that they could complete questionnaires about their relationship with their provider. The minimum amount of time that any mother received home visiting services during our study period was 3 months, and the maximum amount of time that any study participants received services was 15 months.

Home visiting clients were recruited over a nine month period, from January through September 2016. Home visitors were instructed to read a study recruitment script to all of their clients who were eligible to participate. Women who were interested in learning more about the study signed a release of information form, and the home visitors provided the women's information to study staff. A graduate research assistant then called referred women and read a recruitment script over the phone. Research staff then scheduled an initial consent and data collection appointment with women who were interested in participating. Study enrollment began at this initial data collection appointment. Approximately half ($n = 5$) of the home visitors from HBHS referred women who participated in the study, and all of the home visitors from NFP ($n = 6$) referred women who participated in the study.

The study consisted of two data collection appointments. The first data collection appointment occurred with 39 mothers when they were at least 24 weeks pregnant. During this appointment, mothers consented to participate in the study and then completed questionnaire measures about demographics, general risk factors (e.g., depression, substance use, domestic violence) and their perception of services. At 3 months postpartum, we conducted the second data collection appointment, which consisted of semi-structured interviews about mothers' experiences with their home visitors. We were able to reach 33 (85%) of the original 39 participants.

Women were provided with a $25 gift card to a local grocery chain for each of the two data collection appointments. To minimize study attrition between the first and second data collection appointment, research personnel called mothers monthly to check as to whether they still had the same phone number. When needed, research staff communicated with home visiting staff to get new contact information.

Measures

Demographics

A demographic measure was administered during the first data collection session to assess maternal race/ethnicity (i.e., Caucasian, African American, Asian American, Hispanic, Biracial, other), educational background (i.e., grade school, some high school, high school graduate, some college, college graduate, post undergraduate education, other), marital status (i.e., married, living with partner, divorced/annulled, separated, never married, widowed), and gross annual income (i.e., options were in $5,000 increments starting with <$5,000 and ending with $55,000+). For all of these variables, mothers responded by choosing one answer among several categories.

Maternal Risk Factors

We used four short screening measures to examine maternal risk variables, or those variables that are typically associated with negative maternal and child outcomes (i.e., depression, alcohol use, drug use, and interpersonal violence). Below we include information about the measures' common cut-off scores to assist in interpreting the severity of mothers risk variables; however, continuous scale scores were used in bivariate analyses and regression models.

The *Edinburgh Depression Scale* (EDS; Murray and Cox 1990), is a 10-item measure that assesses pregnant and post-

partum women for symptoms of depression for the past 7 days (e.g., "I have been so unhappy that I have had difficulty sleeping," "I have felt sad or miserable." Mothers rate the severity of symptoms on a 0–3 scale. The measure has been found to have diagnostic validity; a score of 12 or greater has been recommended as a cut-off for identifying women who likely meet criteria for depression (Cox et al. 1987); however, a total score was used in subsequent analyses. Internal reliability for the present sample was high (alpha = 0.88).

The *AUDIT-C* (Bush et al. 1998) is a 3-item measure that assesses alcohol use during the past 3 months. The measure asks about the frequency with which respondents drink overall, per day, and their frequency of binge drinking (e.g., "How often do you have a drink containing alcohol?) on a 0–4 scale (e.g., "0 = never to 4 = four or more times a week"). The AUDIT-C has been found to be sensitive for detecting heavy drinking, as well as active alcohol abuse or dependence; it is recommended that a cut-off score of 3 be used to identify individuals with alcohol abuse or dependence (Bush et al. 1998). Research has found that the measure has high specificity but somewhat low sensitivity for detecting drinking among pregnant women (Chang 2001). A total score was used in subsequent analyses. Internal consistency for the present study was good (alpha = 0.76).

The *Drug Abuse Screening Test* (DAST-10; Skinner 1982) is a drug use screening instrument. This measure includes 10 items related to substance abuse symptoms (e.g., Have you used drugs other than those required for medical reasons?", "Are you always able to stop using drugs when you want to?") that allow adults to answer "yes" or "no" (no is scored as 0, and yes is scored as 1). A review has found the measure to have good internal reliability and validity (Yudko et al. 2007), and it has been found to have good sensitivity when used with mothers of young children (Kemper et al. 1993). A score of 3–5 on the DAST-10 indicates that the person likely meets DSM criteria for a substance abuse problem. A score higher than 5 indicates substantial to severe substance abuse problems (Yudko et al. 2007). A total score was used in subsequent analyses. Internal reliability for the present study was moderate (alpha = 0.61).

The *HITS* (Sherin et al. 1998*)* is a 4-item screening measure that assesses interpersonal violence (e.g., "How often does your partner physically hurt you?", "How often does your partner scream or curse at you?"). The HITS assesses the frequency with which women's partners physically hurt, insult, and threaten them with harm on a 1–5 scale where "1 = never" and "5 = frequently." Scores on this measure have been found to be highly correlated with the Conflict Tactics Scale (another common measure of interpersonal violence; $r = 0.85$; Sherin et al. 1998). A score of 10.5 or higher has been found to differentiate women experiencing domestic violence from those not experiencing domestic violence (Sherin et al. 1998); however, a total score was used in subsequent analyses. Internal reliability for the present sample was good (alpha = 0.75).

Client perception of services

Three measures were used to assess clients' perceptions of services.

The *Client Satisfaction Survey* (CSS) is a 13-item measure that assesses parents' perceptions of the helpfulness of home visiting services and is appropriate for parents of children ages 0–5. Clients rated each item regarding their perceptions of services (e.g., "Overall, how satisfied are you with the service you received?") on a 1–4 Likert scale (e.g., "1 = very satisfied to 4 = quite dissatisfied.") The measure has been found to be positively correlated with families' likelihood of completing home visiting services (Damashek et al. 2011). Internal reliability for the present study was high (alpha = 0.88). A total score for this measure was used in subsequent analyses.

The Client Cultural Competence Inventory (CCCI; Switzter et al. 1998) is a 12-item measure that assesses clients' perceptions of providers' level of cultural competency via 1–5 Likert scale responses (e.g., "the provider accepts our family and treats us with respect"), where "1 = never true" and "5 = always true." The measure was originally designed to be used in outpatient settings (Switzter et al. 1998) but has been adapted to be used in home visiting services research (Damashek et al. 2011). The original measure was designed to have 4 subscales, including respect for cultural differences, family and community involvement, access to care, and client-provider ethnic match. The present study used only a total of 9 items including those from the respect for cultural differences (3 items – i.e., "The home visitor uses everyday language that we can understand," "the home visitor respects my family's beliefs, customs, and ways that we do things in our family," "the home visitor makes negative judgments about us because of ways that we are different from him/her") and family and community involvement subscales (6 items - e.g., "The home visitor accepts our family as important members of the team that helps my child," "The home visitor makes it clear that we as a family, not the professional, are responsible for deciding what is done for our child and family," "The home visitor encourages us to meet with other community professionals"). However, because alpha for the respect for cultural differences subscale was low (alpha = −0.11), we used the total of the two subscales in our analyses (alpha = 0.70). In previous research, the measure has been found to have a low susceptibility to social desirability bias in a sample of high-risk caregivers of

children ages 0–5 (Switzter et al. 1998) and has been found to be correlated with ratings on the Client Satisfaction Survey (Damashek et al. 2012).

The *Client Perceptions of Home Visitors* measure (*CPHV;* Damashek et al. 2018) was developed by the investigators to quantitatively assess factors that have been found to be important to clients' engagement in home visiting services in qualitative studies (Beasley et al. 2014, 2018; O'Brien et al. 2012). Factor analysis indicated that the 12-item measure has three subscales assessing the client's perception of the degree to which their home visitor is trustworthy/supportive, reliable, and collaborative (Damashek et al. 2018). Each of the three subscales was used in subsequent analyses. The overall measure has good reliability (alpha = 0.70), and the subscale reliabilities range from 0.62–0.81 (Damashek et al. 2018).

Engagement in services

Our primary outcome variable, engagement in services, was assessed by reviewing electronic program file charts. We used the variable discharge from services because this was the way in which attrition from services was coded in the client files. Charts indicated whether or not mothers had been discharged from services, date of discharge, and reason for discharge. An abstraction form was used to record whether or not mothers had been discharged from services by their home visitor at the date of our 3-month interview and at our final file abstraction, which occurred on June 1, 2017 (up to 15 months postpartum). Discharge from services reflected home visitors' difficulty engaging clients in services because service provision in the two programs is designed to continue up until a child reaches the age of 18 months to 2 years. We coded engagement in services as "1" for discharged from services and "0" for not discharged from services. For our second outcome, we assessed engagement *up to* 15 months postpartum because mothers were enrolled in the study for various lengths of time; thus, the length of time since giving birth differed among mothers at the date of our final data abstraction. At the final data abstraction the average time since giving birth was 9.5 months and ranged from 3.5 to 15 months postpartum. Thus, in our results section we will refer to engagement *up to* 15 months postpartum.

Qualitative interview

The interview included questions that encouraged mothers to provide information about factors that contributed to their continuation or discontinuation in services after they had their baby, including their perception of services and their relationship with their provider. Interview questions were developed in collaboration with a qualitative research consultant and were purposively broad in order to reduce the likelihood of imposing any a priori ideas about what factors might maintain mothers in services. However, questions were also informed by previous research on factors that are related to mothers' engagement in home visiting services; input was also sought from home visiting supervisors in developing the interview. We started each interview with an introduction explaining that we were interested in understanding why mothers either remained in services or discontinued services after they had their baby. The introduction was worded as follows:

> "We're interested in finding out about how home visiting programs can be more helpful to families, especially to mothers of new babies. As you know, things change so much after you have a new baby, and it's often a challenge to manage your everyday life activities. It's also harder to attend appointments."
>
> *For those who remained in services*: "We'd like to hear from you about what aspects of the program that you are enrolled in (*say name of program)* may have helped to keep you involved in services after you had your baby. We'd also like to know about any other life factors that may have kept you involved in services."
>
> *For those who did not remain in services:* "We'd like to hear from you about what kept you from continuing in services after you had your baby. We know that there are many different things that could be involved, including aspects of your home visitor, the program itself, or other life factors that just get in the way."

We then asked 15 interview questions about: how the home visiting services were "working out" for mothers; what the home visitor's job included; mothers' expectations for services; whether the actual services were meeting mothers' expectations; what the home visitor did to help the mother and baby; what mothers found to be helpful about the services; what they thought in general about their home visitor; what they liked and didn't like about their home visitor; and whether there was anything that made it easier or harder for them to remain in services after they had their baby. For those mothers who were no longer enrolled in services, we asked questions specifically about what made it harder for them to stay enrolled in services after they had their baby, whether there was anything that their home visitor could have done to help them stay engaged in services, and why they stopped meeting with their home visitor. Interviews were audio recorded and later transcribed by undergraduate research assistants; 10% of transcripts were checked for accuracy.

Data Analyses

Quantitative analyses

We first present our quantitative data and then present findings from the qualitative data analyses. The quantitative analyses were based on 39 mothers. Below we describe descriptive statistics for our predictor and two outcomes variables. We then present bivariate relations between our two engagement outcome variables (discharge from services prior to 3 months postpartum and discharge up to 15 months postpartum) and demographic variables, maternal risk variables, and maternal perception of services. Variables that were significantly related to our two outcomes were used as predictors in logistic regression analyses predicting service engagement.

Qualitative analyses

Qualitative data analyses on semi-structured interviews were conducted by 3 coders using Atlas.ti software. We conducted semi-structured interviews with 33 mothers. Coding was conducted using an iterative grounded theory approach. Each coder independently memoed 3 transcripts and then discussed the memos together and developed an initial code book. The coders used the codebook to code 3 transcripts. Coders then met to discuss disagreements and make revisions to the codebook. When disagreements occurred, coders discussed the disagreement and came to a consensus about how to code the section of transcript. Sometimes this process involved making revisions to the codebook. The coders then independently coded an additional set of transcripts and met to discuss revisions to the codebook. The coders then coded the remaining transcripts and met periodically to discuss and revise the codebook when needed.

Results

Given that this was a pilot study with a relatively small sample size, we adjusted our criteria for statistical significance to $p < 0.10$.

Descriptive Statistics

Risk variables

Scores on the depression screener indicated that nearly 80% of women reported that they were in the "likely depressed" range. On other risk measures, 10.26% of mothers reported that they drank alcohol once per month or less, and one person scored in the "probable alcohol use or abuse" range. On our drug abuse measure, 10.3% of mothers indicated that they probably met criteria for a drug abuse problem. One mother scored above threshold on the domestic violence measure. See Table 2 for variable means.

Maternal perception of services

Descriptive statistics for client perception variables can be seen in Table 2. Average scores on measures of perception of services were high, particularly scores on client satisfaction. Scores on the three subscales of the Client Perceptions of Home Visitor measure were also quite high, especially for the trust/support and the collaborative subscales.

Engagement in services

In terms of maternal engagement in services, 21% ($n = 8$) of mothers were discharged from services at the time of our follow-up interview (at approximately 3 months

Table 2 Descriptive data for maternal risk and client perception variables

	Mean (SD)	Min, max	Total possible
Maternal risk variables			
Edinburgh Depression Scale	16.46 (5.28)	10, 28	30
AUDIT-C measure of alcohol use	0.21 (0.61)	0, 3	12
Drug Abuse Screening Test (DAST-10)	1.05 (1.32)	0, 5	10
HITS Measure of Domestic Violence Victimization	4.66 (1.62)	4, 13	20
Client perception variables			
Client Cultural Competency Inventory	38.9 (5.6)	25, 45	45
Client Satisfaction	45.9 (5.2)	33, 52	52
Client Perceptions of Home Visitors Trustworthy/Supportive	19.3 (1.5)	13, 20	20
Collaborative	9.1 (1.6)	4, 10	10
Reliable	27.5 (3.8)	16, 30	30

$N = 39$

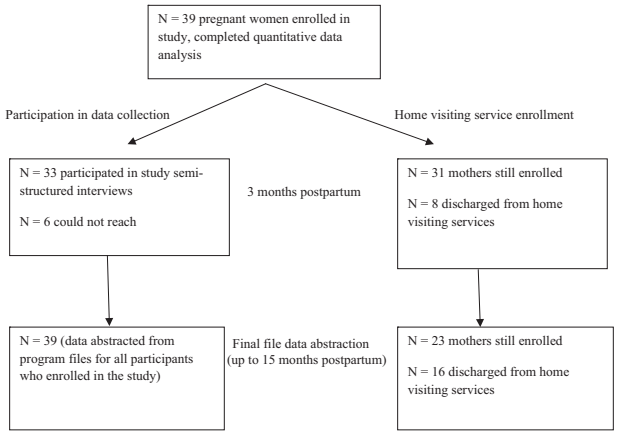

Fig. 1 Flowchart of participant engagement in home visiting services and participation in data collection. $N = 39$

postpartum) and 41% ($n = 16$) were discharged at the date of our file review (up to 15 months postpartum; inclusive of those who were discharged at 3 months postpartum, see Fig. 1). The average infant age at time of discharge from services was 3.7 months. Reasons for discharge included excessive missed appointments/could not engage (38%), unable to locate (19%), refused new provider (19%), and other (24%). The average number of days between clients' last completed home visit and their discharge date was 45 and ranged from a minimum of 0 to a maximum of 115 days.

Results of Bivariate Analyses

We examined bivariate relations between predictor variables (i.e., demographic, maternal risk, client perceptions of services) and our two outcomes measures, including discharge from services prior to 3 months postpartum (yes/no) and discharge up to 15 months postpartum (yes/no). Table 3 includes correlations of maternal risk and client perception variables.

Demographic variables

We used chi-square analyses to examine the relation of maternal race, educational level, gross annual income, and marital status to discharge from services by 3 months and up to 15 months postpartum. Demographic variables were dichotomized because several cells were too small for conducting chi-square analyses. Thus, race was dichotomized as "white" or "of color"; educational level was dichotomized as "high school education or above" or "less than a high school education"; gross annual income was dichotomized as earning "less than $25,000 yearly" or "more than $25,000 yearly"; and marital status was dichotomized as "married/living with partner" or "single." Marital status was significantly related to enrollment at 3 months postpartum such that women who were married or partnered were significantly *less* likely to be enrolled in services at 3 months postpartum than were women who were not married or partnered ($X^2 = 4{,}0$, $p = 0.05$); however, marital status was not related to engagement up to 15 months postpartum. No demographic variables were significantly associated with discharge from services up to 15 months postpartum.

Maternal risk variables

All of the maternal risk variables (maternal depression, alcohol use, drug use, victim of domestic violence) were non- normally distributed; thus we used Mann-Whitney tests to examine the relation of these variables to discharge prior to 3-months post-partum and up to 15 months post-partum. None of the risk variables were associated with either outcome variable.

*Client perception variables (*client satisfaction, perceived provider cultural competency, perceptions of home visitor) were non-normally distributed; thus, we used Mann-Whitney tests to examine whether these variables were associated with discharge from services. None of the variables were associated with discharge prior to 3 months; however, the Client Cultural Competency Inventory and the reliable subscale from the Client Perceptions of Home Visitor questionnaire were both significantly associated with discharge from services up to 15 months post-partum. Mothers who were discharged from services up to 15 months postpartum rated their providers lower on perceived cultural competence ($M = 36.1$) than those who were not discharged ($M = 40.9$; $z = -2.\ 1$, $p = 0.03$). These mothers also rated their providers lower on the reliability subscale of the Client Perceptions of Home Visitors measure ($M = 25.8$) than those who were not discharged ($M = 28.7$; $z = -1.8$, $p = 0.09$). We also examined whether race was associated with any of the client perception variables; however, we found no significant associations.

Results of Logistic Regression Analyses

Variables that were significantly related to our outcome variables in the bivariate analyses were included in one logistic regression analysis (see Table 4). Given that perceived provider cultural competence was one of our primary predictor variables, we controlled for race (coded as "white" and "of color"). Perceived provider cultural competency predicted engagement in services up to 15 months postpartum such that those who perceived their provider to be less culturally competent were more likely to be discharged from services. Mothers' perceptions of their home visitors' reliability also significantly predicted engagement such that

Table 3 Bivariate relations between risk and client perception variables

	Alcohol use	Drug use	Domestic violence	Provider cultural competency	Client satisfaction	Trust subscale	Collaborative subscale	Reliable subscale
Depression	−0.19	0.23	0.49	0.00	−0.19	−0.04	−0.12	−0.13
Alcohol use		−0.01	−0.14	0.13	0.09	0.17	−0.02	0.14
Drug use			0.02	0.05	0.07	0.27*	−0.27*	0.19
Domestic violence				−0.05	−0.33**	−0.19	0.10	−0.40**
Provider cultural competency					0.45***	0.25	−0.15	0.30*
Client satisfaction						0.51	−0.32*	0.52****
Trust subscale							−0.20	0.54****
Collaborative subscale								−0.25

$N = 39$. The trust, collaborative and reliable subscales are scales from the Client Perceptions of Home Visitors measure

*$p < 0.10$; ** $p < 0.05$; ***$p < 0.01$; ****$p < 0.001$

Table 4 Logistic regression results: predicting likelihood of being discharged from services up to 15 months postpartum

Variable	Adjusted OR	95% Confidence interval
Maternal race	0.44	0.10, 2.05
Client cultural competency total score	0.83**	0.70, 0.99
Reliable	0.80*	0.63, 1.03

$N = 39$. For odds ratios, 0 = not discharged from services up to 15 months postpartum. 1 = discharged from services up to 15 months postpartum. For race, 1 = white, 0 = of color

OR odds ratio

*$p < 0.10$; ** $p < 0.05$;

Table 5 Frequency with which themes arose in semi-structured interviews

Theme	% of participants whose interview included theme		
	Positive comment	Negative comment	Total
Trusting/close relationship	84%	0%	84%
Available/reliable/responsive	41%	13%	54%
Provides information/ knowledgeable	97%	1%	98%
Personable/good communication skills	81%	1%	82%
Collaborative/flexible	63%	1%	64%

mothers who rated their provider as less reliable were more likely to be discharged from services up to 15 months postpartum.

Qualitative Data Analysis

During the semi-structured interviews, the majority of the mothers (88%) generally spoke positively about their experiences in services, including several of those who were discharged from services. Thus, many of the themes from our data analysis include positive aspects of services; however, we also included quotes from women who reported negative experiences. We have noted below when comments came from mothers who were still enrolled or who were discharged from services. We identified five primary themes from the maternal interviews at 3 months postpartum. Primary themes centered on the clients' relationships with their home visitor and qualities of the home visitors that promoted a strong client-provider relationship. Primary themes included: having a trusting/close relationship with the home visitor; the home visitor being available/reliable/responsive; the home visitor providing information and being knowledgeable; the home visitor being personable/having good communication skills; and the home visitor being collaborative and flexible. Table 5 shows the frequency with which each theme arose; in many cases participants spoke positively with regard to each theme. However, in some cases participants' comments regarding a particular theme were negative (e.g., home visitor was not reliable). Table 6 shows an overview of themes and quotes.

Trusting/close relationship

Mothers were asked generally what their experience was with the home visiting services that they received, and several of the clients focused on their relationship with their home visitor. They often noted that they enjoyed having a trusting and close relationship with their home visitor. Quotes from mothers indicated that they felt comfortable sharing personal information with their home visitor and that the home visitor seemed like she

Table 6 Primary themes from qualitative interviews and representative quotes

Primary theme	Quotes
Trusting/close relationship Engaged mothers	"…they don't just do a job. They seem like you know they actually care about your well-being and your family and stuff like that. So to know that people actually care about you and your family and are making efforts to make sure you're okay and between the sessions…they'll text like hey are you okay? like how's your day? how are things going? Like how are you and the baby?"
	"I'm able to tell her stuff that I'm ashamed of from my past, and she made me feel comfortable about it, and instead of telling me what I should've done, she helped me get past it, and helped me understand what I need to do to move forward."
	"…so just them being there for emotional support…my workers actually, you know, care about what I'm doing from day to day, what I'm going through and stuff like that, and we got, you know, to know each other on a personal level."
	"Just certain information that I talked to her, like I know she's not a counselor, or nothing like that, but we sit back, we have girl chat all the time, and I confide in her a lot of like, relationship problems and stuff, and she'll just sit there and listen to me. Just something that I need, somebody just letting me vent for a minute, she's just like, 'Go ahead. Just talk, I'm just gonna sit here and listen, but I'm gonna give you my input.' And I'm like, 'I already know you will.'"
Available/reliable/responsive Engaged mothers	"Oh, they're perfect. Like, she goes above and beyond what she's supposed to do… she tells me like, 'If you need to talk or anything, just call me or text me. I'll tell you if I'm with a client, I'll call you back, or just leave a message.' And she gets right back to me as soon as possible."
	"And like if we don't meet for like a long period of time, she will contact me, because …it'll slip my mind, she'll be like 'hey want to reschedule our appointment?' Or, you know, 'we missed this one, so you want to try it again?' So, I mean she's … like making sure like 'hey I haven't seen you in a while; let's schedule a meeting.'"
	"Like just, I mean she followed through and was thorough all the time… especially… if I called her and said 'hey, like can I meet with you, like I need support.' or just because you know, I'm going through a hard time, she be like 'okay, cool, you know, come and we'll figure out something to help you.' And just because she would like just fit me in right then and there, that was pretty cool, instead of making me wait for like 'oh no you can come in next week.' …just for me to even reach out to someone is super hard. So it's nice that she makes herself available."
	"And she makes sure she keeps in contact with me and she communicates very well. Like if she had an emergency and couldn't come, she would text me and be like, 'Hey. I'm not able to make it. I'll let you know.' And I'm like, 'Okay.' Cause ya know some people just disappear and you don't hear from them and you're like, 'Um, what happened?' But she communicates really good."
Not Available/reliable/responsive Unengaged mothers	"Um [I expected] that she would like check-up more than she usually did…we've only met up like twice since the baby's been born."
	"No, actually, they were supposed to–ok, so, I was seeing one, and - she actually switched programs, and… somebody was supposed to contact me, and I still haven't heard back from anybody…And like it was kinda weird to me too though, because she started kinda slacking a little bit, and stopped like contacting me to tell me what was going on and everything like, I was just sitting there wondering– like she just stopped contacting me and it was weird."
	"She takes forever to call me back… When she has family emergencies and we're supposed to have an appointment, she don't call and cancel that appointment. There's been a couple of times that I've showed up to the office and "oh well she's not even in the building today"
	"I didn't like how she sometimes would be late and stuff like that…it's like, she would change stuff at the last minute and not let me know ahead of time. So, it's like, if I had something that was going on, it's like she would change my day… so, that was kinda not a good thing…I would be waiting and waiting and waiting and waiting."
Personable/good communication skills Engaged mothers	"Um just that she's helpful in general, you know she's a really sweet person and cares and…. always checking up and making sure everything's okay…."
	"It was real fun, so she's a real personable, uh, young lady. So I like that about her…"
	"She's cool, if I could keep her around forever I would. Yeah she's real cool, just a super easy person to talk to, just makes me feel real comfortable and helps me in every way she can and just… she's a real cool person."
	"She's like down to Earth. I can talk to her ya know? Some people you're not comfortable with talking to or ya know, if she asks you a question, you just looking at her like 'I don't want to tell you my business.' But her, I can just talk to her. She makes it easy. It's not like, 'Oh, this lady's coming. I don't feel like talking to her.' It's like, 'Oh XXX is coming. Cool! Hey girl!'"

Table 6 (continued)

Primary theme	Quotes
Not personable/poor communication skills Unengaged mothers	"…she's boring - she should be more entertaining than she is."
	"She was pretty happy most of the time. Except for I wouldn't know because like I wouldn't be able to tell unless she actually spoke because she didn't show any facial expression, which kind of made me awkward."
Knowledgeable/provides information Engaged mothers	"…She really helped me a lot. She tell me all the details about when I was pregnant. She told me what to eat, how to act, how with the baby inside me, and how big she is… so she give me a lot of information I didn't know about it. And even after the baby's born, she came and she told me how to act with the baby, what is the safe thing for her, what is…how should she sleep, how's nursing, so yeah. She help me a lot."
	"Anything I have a question about she's like, 'I'll figure that out for you. Let me look that up…' And she'll have like a whole packet on something in like nutrition or anything I ask her about. It's really, it's really helpful."
	"…I have like answers to questions like weekly…as opposed to like waiting 'til I have like a doctor's appointment…So I can–I can ask her anything um, about like the baby or my health and if she like doesn't have the answer she'll find the answer."
	"… this obviously is my first child and I didn't know what to expect and I didn't know exactly how to handle it, so she was there, explained what was gonna happen and showed some videos and pretty much helped me with it."
Not knowledgeable/ information not helpful Unengaged mothers	"It was pretty good, but after a while, after we got through the stuff that I didn't know, all the rest of it was kind of like common sense, but so I didn't wanna do it anymore."
Collaborative/flexible Engaged mothers	"she works around my schedule which is nice, around both of our schedules."
	"Yeah she was like coming over to my mom's house for example cause I normally meet with her at my house but then once I needed help with my mom she would… um come over to my mom's house."
	"Um, like I said, just her helping me with the doctor appointments, she makes sure it's convenient for me when she do schedule appointments for me. Um, sometimes, like, when it's summer time, like um, she'll be like, 'Well, how about we don't have the appointment at the house? How about we just take the kids all out to the park?' And we'll just go out to the park, and they'll just go play, and we'll just sit back and talk and stuff."
	"She's really…good about texting me and like reminding me about um, appointments and re-scheduling which for me I need because…I'm a mess clearly…Um, I'm all over the place so, um just being able to like work with me being…flexible if it weren't for that I probably wouldn't have been able to continue services especially you know, after having a baby."
	"…she lets me pick topics and stuff that I want to learn about so that's cool."
	"…you can ask what you need to ask about and then if you already know about some stuff you don't have to like relearn about it."
Not collaborative/flexible Unengaged mothers	"Just sometimes it's very inconvenient…they have so many hours that they have to meet with you… and it's not always con- in my busy life not always can I manage that."
	"They can't help with like transporting you to like doctor's appointments and such. The only thing that they can really do is like give you bus tokens but they have a limited amount that they can help you with."

genuinely cared about the client. Moreover, clients reported that the home visitors provided valuable emotional support. There were no negative comments regarding this particular theme.

Engaged Mothers

> … they don't just do a job. They seem like you know they actually care about your well-being and your family and stuff like that. So to know that people actually care about you and your family and are making efforts to make sure you're okay and between the sessions…they'll text like hey are you okay? like how's your day? how are things going? Like how are you and the baby?

> I'm able to tell her stuff that I'm ashamed of from my past, and she made me feel comfortable about it, and instead of telling me what I should've done, she helped me get past it, and helped me understand what I need to do to move forward.

…so just them being there for emotional support…my workers actually, you know, care about what I'm doing from day to day, what I'm going through and stuff like that, and we got, you know, to know each other on a personal level.

Just certain information that I talked to her, like I know she's not a counselor, or nothing like that, but we sit back, we have girl chat all the time, and I confide in her a lot of like, relationship problems and stuff, and she'll just sit there and listen to me. Just something that I need, somebody just letting me vent for a minute, she's just like, 'Go ahead. Just talk, I'm just gonna sit here and listen, but I'm gonna give you my input.' And I'm like, 'I already know you will.'

Available/reliable/responsive

Mothers were asked what they liked or didn't like about services they received as well as what they found to be helpful about home visiting services. A common theme that emerged was that mothers indicated that they appreciated home visitors' responsiveness to their concerns and their ability to make themselves available when mothers needed them via telephone or text. For example, mothers indicated that they appreciated it when home visitors would call them back promptly or would make sure to provide resources or information that clients needed. They also indicated that home visitors would follow up if there was a long lapse in communication.

Engaged mothers

Like, she goes above and beyond what she's supposed to do… she tells me like, 'If you need to talk or anything, just call me or text me. I'll tell you if I'm with a client, I'll call you back, or just leave a message.' And she gets right back to me as soon as possible.

And like if we don't meet for like a long period of time, she will contact me, because …it'll slip my mind, she'll be like 'hey want to reschedule our appointment?' Or, you know, 'we missed this one, so you want to try it again?' So, I mean she's … like making sure like 'hey I haven't seen you in a while; let's schedule a meeting.'

Like just, I mean she followed through and was thorough all the time… especially… if I called her and said 'hey, like can I meet with you, like I need support.' or just because you know, I'm going through a hard time, she be like 'okay, cool, you know, come and we'll figure out something to help you.' And just because she would like just fit me in right then and there, that was pretty cool, instead of making me wait for like 'oh no you can come in next week.' …just for me to even reach out to someone is super hard. So it's nice that she makes herself available.

Unengaged mothers

In contrast, a few mothers indicated that their provider was not available enough. For example, some mothers indicated that home visitors did not call them back, would be late for appointments, would forget to cancel appointments, or would meet with them infrequently. One mother who had been discharged prior to 15 months postpartum reported, "Um [I expected] that she would like check-up more than she usually did…we've only met up like twice since the baby's been born." Other representative quotes can be seen below:

No, actually, they were supposed to–ok, so, I was seeing one, and - she actually switched programs, and… somebody was supposed to contact me, and I still haven't heard back from anybody…And like it was kinda weird to me too though, because she started kinda slacking a little bit, and stopped like contacting me to tell me what was going on and everything like, I was just sitting there wondering– like she just stopped contacting me and it was weird. *(client was discharged from services prior to 3 months post-partum).*

She takes forever to call me back… When she has family emergencies and we're supposed to have an appointment, she don't call and cancel that appointment. There's been a couple of times that I've showed up to the office and "oh well she's not even in the building today *(client was discharged from services prior to 3-months postpartum).*

I didn't like how she sometimes would be late and stuff like that…it's like, she would change stuff at the last minute and not let me know ahead of time. So, it's like, if I had something that was going on, it's like she would change my day… so, that was kinda not a good thing…I would be waiting and waiting and waiting and waiting.

Personable/ good communication skills

Several clients indicated that certain aspects of the home visitor's personality or communication style made it enjoyable to participate in home visiting sessions and made

it easier to talk to the home visitor. Common aspects of home visitors' personalities and communication styles that clients seemed to enjoy included being "sweet," "easy to talk to," "helpful," and "personable." For example one engaged mother remarked, ""Um just that she's helpful in general, you know she's a really sweet person and cares and…. always checking up and making sure everything's okay…." and another engaged mother noted, "It was real fun, so she's a real personable, uh, young lady. So I like that about her…" Other representative comments from mothers are included below:

Engaged mothers

> She's cool, if I could keep her around forever I would. Yeah she's real cool, just a super easy person to talk to, just makes me feel real comfortable and helps me in every way she can and just… she's a real cool person.

> She's like down to Earth. I can talk to her ya know? Some people you're not comfortable with talking to or ya know, if she asks you a question, you just looking at her like 'I don't want to tell you my business.' But her, I can just talk to her. She makes it easy. It's not like, 'Oh, this lady's coming. I don't feel like talking to her.' It's like, 'Oh xx is coming. Cool! Hey girl!'

Unengaged mothers

A few mothers indicated that their provider was not very personable or had poor communication skills, and this may have impacted their ability to successfully engage in services. For example, one mother who was discharged from services prior to 15 months postpartum remarked, "…she's boring - she should be more entertaining than she is." Another client who was discharged from services prior to 3 months postpartum reported, "She was pretty happy most of the time. Except for I wouldn't know because like I wouldn't be able to tell unless she actually spoke because she didn't show any facial expression, which kind of made me awkward."

Knowledgeable/provides information

Mothers were also asked about what they found to be helpful about the services they were receiving. Many mothers noted the helpfulness of the information that home visitors provided about pregnancy, childbirth, and parenting. Most clients indicated that their home visitor was very knowledgeable, which they found to benefit their daily lives. Mothers indicated that home visitors were also diligent about finding answers when they weren't able to answer a question immediately.

Engaged mothers

> …She really helped me a lot. She tell me all the details about when I was pregnant. She told me what to eat, how to act, how with the baby inside me, and how big she is… so she give me a lot of information I didn't know about it. And even after the baby's born, she came and she told me how to act with the baby, what is the safe thing for her, what is…how should she sleep, how's nursing, so yeah. She help me a lot.

> …I have like answers to questions like weekly…as opposed to like waiting 'til I have like a doctor's appointment…So I can–I can ask her anything um, about like the baby or my health and if she like doesn't have the answer she'll find the answer.

> … this obviously is my first child and I didn't know what to expect and I didn't know exactly how to handle it, so she was there, explained what was gonna happen and showed some videos and pretty much helped me with it.

Unengaged mothers

One mother who was discharged prior to 3 months postpartum indicated that the information that she received was not particularly helpful by remarking, "It was pretty good, but after a while, after we got through the stuff that I didn't know, all the rest of it was kind of like common sense, but so I didn't wanna do it anymore."

Collaborative/flexible

Mothers were also asked about what aspects of the home visiting services made it either easier to stay in services after they had their baby or harder to remain in services. Several mothers indicated the importance of their home visitors' flexibility, particularly with regard to scheduling meetings and being willing to meet in various locations. For example, one woman noted that "she works around my schedule which is nice, around both of our schedules." Regarding location another mother remarked, "Yeah she was like coming over to my mom's house for example cause I normally meet with her at my house but then once I needed help with my mom she would… um

come over to my mom's house." Other quotes can be seen below:

Engaged mothers

> Um, like I said, just her helping me with the doctor appointments, she makes sure it's convenient for me when she do schedule appointments for me. Um, sometimes, like, when it's summer time, like um, she'll be like, 'Well, how about we don't have the appointment at the house? How about we just take the kids all out to the park?' And we'll just go out to the park, and they'll just go play, and we'll just sit back and talk and stuff.

> She's really…good about texting me and like reminding me about um, appointments and re-scheduling which for me I need because…I'm a mess clearly…Um, I'm all over the place so, um just being able to like work with me being…flexible if it weren't for that I probably wouldn't have been able to continue services especially you know, after having a baby.

Women also indicated that they appreciated the collaborative nature of their relationship with their home visitor, such as being able to help decide the focus of their sessions. For example one engaged mother noted, "…she lets me pick topics and stuff that I want to learn about so that's cool." Another engaged mother reported that "…you can ask what you need to ask about and then if you already know about some stuff you don't have to like relearn about it."

Unengaged mothers

In contrast, a few mothers indicated that a lack of flexibility/collaboration was a barrier to participating, such as inconvenient scheduling and inability to provide transportation to mothers. For example, one mother remarked, "Just sometimes it's very inconvenient…they have so many hours that they have to meet with you…and it's not always con- in my busy life not always can I manage that." Another mother who was discharged prior to 3 months postpartum reported, "They can't help with like transporting you to like doctor's appointments and such. The only thing that they can really do is like give you bus tokens but they have a limited amount that they can help you with."

Summary of results

Both the quantitative and qualitative results indicated that clients' perceptions of their home visitors were important in their engagement in services. Quantitative analyses indicated that greater perceived provider cultural competence and reliability predicted engagement in services. Qualitative data also echoed the finding of the importance of provider reliability and provided additional information about important aspects of the provider-home visitor relationship (i.e., having a trusting/close relationship with the home visitor; the home visitor being personable/good communication skills; the home visitor providing information and being knowledgeable; and the home visitor being collaborative and flexible).

Discussion

The transition from pregnancy to postpartum is often a highly stressful time for families physically, emotionally, and financially (Cowan and Cowan 2000; Holland et al. 2013; Salmero-Aro 2012). Support for caregivers during this time period is critical, given the vulnerability of newborn infants and the importance of providing a safe and nurturing environment. Home visiting services stand to provide needed support to low-income and at-risk families during pregnancy and the transition to postpartum. Unfortunately, attrition from home visiting services limits the effectiveness of such programs, and attrition may significantly reduce the amount of social and tangible resources that families receive during this stressful time period. Although researchers have examined predictors of engagement in home visiting services in general, the literature has some limitations. For instance, few, if any, studies have examined factors affecting engagement during the transition from pregnancy to postpartum. Moreover, previous studies have assessed client perceptions of services at the end of services, rather than prospectively. The present study is novel in that it used data collected during pregnancy to prospectively predict engagement in services during the postpartum period. Finally, although previous qualitative studies have provided a rich picture of relationship variables that contribute to clients' engagement in services, limited quantitative research has been conducted on themes that have emerged in these qualitative analyses. To address these limitations in the literature, we conducted a pilot study using a prospective mixed methods approach to examine factors related to engagement in services during the transition from pregnancy to postpartum.

Both quantitative and qualitative analyses suggested that the clients' perceived relationship with the provider was an important factor related to mothers' engagement in services during the transition from pregnancy to postpartum. In both quantitative and qualitative analyses we found that clients' perceptions of their providers as reliable was related to greater engagement in services. This finding is consistent with themes that emerged in several purely qualitative studies (Beasley et al. 2014, 2018). In addition, quantitative

findings from the present study indicated that greater perceived cultural competence during pregnancy predicted greater likelihood of remaining in services up to 15 months postpartum, which is consistent with previous research (Damashek et al. 2012). However, the specific topic of cultural sensitivity did not emerge in qualitative interviews; thus, this finding should be interpreted with caution. The fact that neither perceived provider reliability nor cultural competence predicted engagement at 3 months postpartum may be related to changes in mothers' relationships with providers that may occur over time. Previous research would support this idea (Wen et al. 2016). It is also possible that findings were not significant at 3 months because there were fewer unengaged mothers at this time point.

Our qualitative analyses also found that other indicators of the client-provider relationship were important factors related to engagement, including having a trusting and close relationship. Other factors included home visitor qualities such as being personable and having good communication skills as well as being collaborative and flexible. Finally, mothers noted that they were appreciative of providers who were knowledgeable and who provided valuable information about infants and resources in the community. These findings are similar to previous qualitative studies that did not focus specifically on the transition from pregnancy to postpartum (Beasley et al. 2014, 2018; Brookes et al. 2006; O'Brien et al. 2012). Some of these themes were included in our questionnaire measure (i.e., trustworthy/supportive, collaborative/flexible) but were not predictive in our quantitative analyses. This may be partly due to the small sample size for our quantitative analyses. Moreover, mothers' scores on these indicators were quite high with little variability, which may also explain why the variables did not predict engagement. Previous research has cited similar ceiling effects when asking home visiting clients to complete questionnaires about their relationship with their home visitor (Korfmacher et al. 2007). The two themes of being personable/having good communication skills as well as provision of information were not included in our quantitative measure; however, our findings may suggest that these variables should be assessed quantitatively in subsequent research.

Our general finding regarding the importance of the provider-client relationship in mothers' engagement in services is consistent with prior studies that did not focus specifically on the transition from pregnancy to postpartum. Indeed, previous quantitative research has found that clients' perceptions of their relationship with their home visitor, especially provider cultural competence, are critical predictors of clients' engagement in services (Damashek et al. 2012). Of note is that previous quantitative studies have examined perceptions of services at the end of services; thus, it's difficult to know whether perception of services was truly a *predictor* of engagement in a temporal sense. However, the present study assessed perceptions of services prospectively during pregnancy, several months prior to assessing engagement in services. Thus, this study provides stronger evidence that client perceptions of services *predict* engagement in services during the transition from pregnancy to postpartum.

Notably, none (with the exception of marital status) of the demographic variables were associated with engagement at 3 months or up to 15 months postpartum. Despite the fact that socioeconomic status is often found to be associated with engagement in the literature (Brand and Jungmann 2014: Josten et al. 2002; Marsden et al. 2013), we did not find an association in the present study. However, there was little variability in income levels in our sample because the programs focus on recruiting low-income families. Moreover, given the pilot nature of our study, our sample size was small and may have limited our ability to find effects of other demographic variables.

We also did not find an association between any of the risk variables (depression, substance use, domestic violence) and engagement in services. One potential reason may be our small sample size. In addition, with the exception of depression, few mothers endorsed active use of alcohol or current experience of domestic violence. A slightly higher percentage endorsed use of drugs; however, this didn't appear to interfere with engagement in services. We did not collect data on type of drug use; however, community focus group data suggest that marijuana use during pregnancy is relatively common in this community (Damashek and Geist 2017), which may interfere less with engagement in services than use of other illicit drugs (Barnard and McKeganey 2004).

Strengths, Limitations and Future Research Directions

The present study has several strengths including a prospective and mixed methods approach, a focus on the transition from pregnancy to postpartum, and data collection from two evidence-based home visiting programs. Another strength of the study was that, although 8 mothers were discharged from services prior to 3 months postpartum, we were still able to interview the majority of those mothers to gather qualitative information about barriers to service engagement.

Despite these strengths, the study has some limitations as well. First, given the pilot nature of our study, our sample size for the quantitative analyses was small. Thus, although we were able to address several limitations of the previous literature (i.e., temporal ordering of mothers' assessment of services, lack of focus on the transition from pregnancy to postpartum), our small sample size for quantitative analyses

limits our ability to draw strong conclusions about significant predictors of engagement. Thus, our quantitative results should be interpreted with caution. Future research would benefit from using a prospective approach with a larger sample size. However, the fact that we found predictive effects of client perception variables, despite our small sample provides preliminary support for the importance of these variables in predicting engagement in services during the transition from pregnancy to postpartum.

A second limitation is the variability in the time period that passed between the mothers' birth of their child and our final data abstraction. This resulted in a range of time points at postpartum in which we were able to examine engagement in services. For a few women, we were only able to assess engagement at a time point less than 6 months postpartum; thus, it is possible that additional women would have been discharged from services if we had been able to assess them at a later point in time. This may have altered the relation between some of our predictor and outcome variables. However, as noted in the results section, the average age of the infant at discharge was 3.7 months. A third limitation is the method of sampling. We were not able to recruit a random sample, and there may have been some selection bias involved in our sampling procedure. Home visitors provided referrals for the study, and while we asked them to read the recruitment script to all eligible mothers, they may have selected those who they thought were more likely to participate. Moreover, those mothers who did participate in the study may have been those who were generally more likely to remain in services. Relatedly, there was a subset of home visitors who provided referrals for the study. Only about half of the home visitors from HBHS provided referrals for mothers who agreed to participate, while all of the NFP home visitors provided referrals for mothers who participated. Thus, mothers' responses are not completely representative of all of the home visitors who were providing services. Fourth, we were not able to corroborate our quantitative findings about the role of cultural competency in mothers' engagement in services with our qualitative findings; mothers did not specifically mention cultural competence during their interviews, and we did not ask specifically about cultural competence during our semi-structured interviews. We attempted to keep our interview questions broad so as to avoid imposing any of our own preconceived notions on participants; however, in retrospect, it may have been helpful to ask specifically about mothers' perceptions of their providers' cultural competence. Fifth, although our alcohol use measure has been found to be sensitive for detecting alcohol abuse or dependence, it has not been found to have high sensitivity for detecting any drinking among pregnant women. A more sensitive measure that assesses any level of drinking may have provided more useful information about the percentage of our pregnant population who engaged in any drinking behavior during pregnancy (Bush et al. 1998; Chang 2001). Sixth, it is possible that some of the themes that emerged in our qualitative interviews were not directly related to mothers' engagement in services. Although we explained at the beginning of each interview that we were seeking to understand factors that were related to mothers' engagement in services, mothers rarely explicitly stated that their perceptions of services (e.g., having a trusting relationship with their provider) were related to their engagement in services. Thus, there was some presumption on our part in linking these themes with maternal engagement in services. Finally, our study may have limited generalizability because our data collection was circumscribed to one community within Michigan and only included mothers in prevention services. Factors related to engagement for families participating in other communities or services that are not voluntary may differ from the present study.

Despite some methodological limitations, we were able to combine both quantitative and qualitative data to examine the relation of clients' perception of services to their likelihood of remaining in services during the transition from pregnancy to postpartum. Although previous studies have found that these variables are important in keeping families engaged in home visiting services, these studies have not focused specifically on the transition from pregnancy to postpartum and have not used a prospective design. Focusing specifically on the transition from pregnancy to postpartum is important because service provision during the early postpartum period can be critical in supporting parents in dealing with high levels of demands on their emotional and financial resources (Cowan and Cowan 2000; Holland et al. 2013; Salmero-Aro 2012). In addition, previous studies have typically assessed client perceptions of services at the end of services (Damashek et al. 2012; Damashek et al. 2011; Girvin et al. 2007), whereas we assessed perception of services during pregnancy and found that it predicted later retention in services (during the postpartum period). Thus, although we had a small sample, our prospective methodology provided stronger support for the important role of maternal perception of services in predicting retention in services. Finally, we quantitatively examined factors that have only been qualitatively examined in previous literature and found some preliminary evidence that such variables are important in maintaining clients in services (i.e., provider reliability).

In conclusion, our results add to previous literature that has found that maternal perceptions of services are critical to mothers' engagement in home visiting services by using a prospective design, focusing on the transition from pregnancy to postpartum, and quantitatively examining variables that have only been examined in qualitative studies previously. Our study indicates that such maternal

perceptions of their relationship with their home visitor are predictive of engagement during the transition from pregnancy to postpartum, which is a vulnerable period for infants and their caregivers. Given that the average infant age at discharge was 3.7 months, results may have implications for training home visitors in methods to keep women engaged in services when transitioning from pregnancy to postpartum. Findings point to the importance of providers being culturally sensitive and reliable (e.g., returning phone calls, checking in on clients regularly, etc.).

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Institutional Review Board approval was provided by Western Michigan University.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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