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**Continuous Source of Care among Young Underserved Children:**

**Associated Characteristics and Use of Recommended Parenting Practices**

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Key words: usual source of care; maternal and child health; medical home; parenting; primary care

## ABSTRACT

**Objectives:** 1) Assess sociodemographic and health characteristics associated with having a continuous source of care (CSOC) among young children, and 2) determine the relationship between having a CSOC and use of parenting practices.

**Design/Methods:** Prospective, community-based survey of women with prenatal care at Philadelphia community health centers. We conducted surveys at the first prenatal visit and at a mean age  $\pm$  standard deviation (SD) of  $3 \pm 1$ ,  $11 \pm 1$ , and  $24 \pm 2$  months postpartum, obtaining information on sociodemographic and health characteristics, child's health care provider, and six parenting practices. Group differences were tested between those with and without CSOC using the Chi-square test for categorical variables, and the student's t test for continuous variables. Logistic regression analysis was conducted to adjust for potential confounding variables.

**Results:** Our sample consisted of 894 mostly young, African American, single women and their children. In the adjusted analysis, mothers of children with when compared to those without a CSOC were more likely to have a high school education or less, be born in the US, have a postpartum check-up, have stable child health insurance, and initiate care for their child at a site other than a community-based health center. Use of parenting practices was similar for children with and without a CSOC.

**Conclusions:** Maternal nativity, postpartum care, child health insurance, and initial site of infant care were associated with a CSOC, but infant health characteristics were not. Use of parenting practices did not differ for those with and without a CSOC.

## BACKGROUND

One basic tenet of primary care is to ensure that all people have a usual source of care consisting of a single or group of healthcare providers.<sup>1</sup> This concept is central to “the medical home,” defined by the American Academy of Pediatrics (AAP) as a place promoting access and coordinating care.<sup>2</sup> As part of a medical home, pediatricians promote *longitudinality*, the presence and use of a regular source of care over time, and *continuity*, the sequence of visits in which there is a mechanism for information transfer.<sup>1</sup> Another basic tenet of pediatric primary care is that the usual source of care, be it a single provider or group, offers anticipatory guidance to the family and promotes the use of recommended parenting practices, such as breastfeeding and injury prevention measures.<sup>3-5</sup>

Having a continuous source of care (CSOC) resonates with healthcare providers, yet measuring it and its effects is not straightforward. This difficulty is evident in the lack of uniformity and distinction in what is measured. Some investigators measure having “a usual source of care,” defined as care received in emergency rooms on one extreme and in private offices on the other.<sup>6-8</sup> Other investigators assess “continuity of care” based on self report or based on one of 32 continuity-of-care indices, which have great deal of heterogeneity and measure different aspects of care.<sup>9-13</sup>

Despite definition and measurement variations and overlap, there is evidence that having a usual source of care and having continuity of care are associated with health benefits. Numerous studies report beneficial effects of having a usual source of care, including higher rates of preventative care use,<sup>7, 8, 14</sup> fewer acute care visits and hospitalizations, and receipt of symptom-based care among adolescents.<sup>15</sup> Continuity of care -- self-reported, or with a single site or provider – has been associated with increased patient satisfaction,<sup>9, 16-19</sup> better perceived

quality of care,<sup>20</sup> receipt of preventative care,<sup>21</sup> timely measles-mumps-rubella vaccination,<sup>22</sup> increased likelihood of taking medications correctly and having problems identified,<sup>17</sup> decreased emergency department use,<sup>11, 12, 23-25</sup> and lower likelihood of hospitalization<sup>26</sup> and overall health care costs.<sup>27-29</sup>

Few investigators have determined sociodemographic and health characteristics associated with having a usual source of care or continuity of care. Reported risk factors for lacking continuity include living in low-income neighborhoods, maternal young age, single marital status, residential mobility, and inadequate prenatal care.<sup>30</sup> Despite a general desire for a continuous source of care, maintaining one may be difficult for patients, particularly if they experience employment, residence and health insurance changes.

There are no known studies, to date, that assess the relationship between having a usual or continuous source of care and the use of recommended parenting practices. Previous studies, however, have shown that physician recommendations strongly impact parental use of a number of recommended early childhood practices, including use of the back sleep position for infants, exclusive breastfeeding at 4 weeks of life, breastfeeding duration, and reading to young children.<sup>31-35</sup>

To promote the medical home and to encourage adoption of a CSOC for children, it is important to understand maternal and child sociodemographic and health characteristics associated with having a CSOC, particularly among those at greatest risk for lacking continuity. We conducted this study to do the following: 1) to assess sociodemographic and health characteristics associated with having a CSOC among low-income women and their children who report having a usual source of care, and 2) to determine the relationship between having a CSOC and use of recommended parenting practices in early childhood. Considering the

previously reported benefits of continuity, we hypothesized that those with a CSOC, when compared with those without a CSOC, would be more likely to use recommended parenting practices.

## **METHODS**

This research is a sample of a larger prospective, community-based cohort study on maternal stress, birth outcomes and infant health. As part of the larger study, this research was approved by the Institutional Review Boards at Thomas Jefferson University and the University of Pennsylvania. The overall cohort consisted of women receiving prenatal care from February 2000 to November 2002 at Philadelphia community-based health centers, described previously<sup>36</sup> and consisting of Federally Qualified Health Center Look Alikes (FQHC-LAs) and FQHCs. The enrollment criteria included having an intrauterine pregnancy and the ability to speak English or Spanish. Of 1,984 women with live births in the overall cohort, 1,670 (84%) women lived with their child and were interviewed at least once during the postpartum period, 4% had moved too far away, 5% refused interviews, 1% were excluded after enrollment for reasons such as child death, and 6% were lost to follow-up (Figure 1). When compared with all Philadelphia women who gave birth in 2001, these women were slightly younger, less educated, and economically more disadvantaged. Details of our cohort study have been described previously.<sup>36,37</sup>

This investigation utilized data from four surveys; the first was administered to women at their first prenatal care visit. Three additional face-to-face, postpartum surveys were conducted at their targeted times at a mean  $\pm$  standard deviation of  $3 \pm 1$  (postpartum survey 1; PP1),  $11 \pm 1$  (PP2), and  $24 \pm 2$  months (PP3) in the participants' homes. The structured surveys were conducted in English and Spanish by trained, female interviewers using standardized

questionnaires. At PPI, we assessed sociodemographic factors and behavioral practices. The postpartum surveys contained information about the child's health, including use of child health services and six recommended parenting practices.

Figure 1 is a flow diagram of study participants. Of the 1,670 women living with their child, 947 (57%) completed all four (1 prenatal and 3 postpartum) surveys. The remaining 724 (43%) completed the prenatal survey and some (one or two) of the postpartum surveys. When compared to those completing all postpartum surveys, those completing some were more likely to be foreign-born and to have their surveys conducted in Spanish. These 2 groups did not differ for the following characteristics: maternal age, education, race/ethnicity, marital status, annual household income, insurance status, car access; or child gender, birthweight, gestational age, or birth order (data not shown). Of the 947 women who completed all surveys, 53 (6%) women were dropped due to missing information on their child's source of care. Our final sample consisted of 894 mother-child dyads with a usual source of care at each postpartum survey.

### *Study Variables*

Having a CSOC was defined as having the same site of care for all 3 postpartum surveys based on the question, "Where do you take [child] for well-baby care?" At each of the postpartum surveys, mothers were asked for their child's health care provider's name and the practice name, affiliated hospital, address and telephone number. Prior to data analysis, responses to this question at each of the visits were reviewed in detail, subject-by-subject, to determine if a CSOC was maintained for the entire study period.

We considered the following sociodemographic and health-related characteristics, outlined by timing of collection, as factors that may contribute to having a CSOC and as



potential confounding variables: 1) antepartum survey data: maternal age, education, race/ethnicity, Spanish-speaking prenatal care site, language of survey, nativity, marital status, insurance status, income, and child's birth order; 2) PP1 data: maternal access to and ownership of a car (not asked at PP2 or PP3), having a regular source of pre-pregnancy care, having a main prenatal care provider, being told that the pregnancy was high-risk, and having a check-up at 6 weeks postpartum; and child's site of initial hospitalization (intensive care versus newborn nursery), special needs, and site of initial well-child care (community-based health center, private practice, and hospital-based clinic – defined elsewhere<sup>36</sup>); 3) PP3 data: child's age; 4) data from PP1 to PP3 – residence stability (stable residence = 0 moves) and child health insurance stability (stable insurance = 0 changes in type [i.e., none, Medicaid, via work or self-pay]). The child's sex, birthweight, and gestational age were obtained from linked, birth certificate data.

We studied 6 well-accepted and recommended parenting practices that were defined by the following questions: 1) Breastfeeding for 1 month or longer was based on the question, “How long did you breastfeed?” that was asked at PP1 (mean age  $3 \pm 1$  mos); 2) Use of the back sleep position at PP1 was based on the response of “back” to the question, “In what position do you usually put [child] down to sleep?” Other potential answers were “side” and “stomach.” This question resembles the one used in surveys that assess national rates of back sleep position use,<sup>38</sup> 3) Reading three times or more per week at PP2 (mean age  $\pm$  SD:  $11 \pm 1$  mos) was based on, “How often do you get a chance to read stories to or look at picture books with [child]?” The response of “about three times a week” or “every day” qualified as “reading three or more times per week,” while “never,” “several times a year,” and “once a week” were classified as reading less than three times per week. This question and answer categorization is similar to that used in

the National Household Education Survey, which is used to report national rates of reading;<sup>39, 40</sup>

4) Not using corporal punishment at PP2 was based on a response of “0” to, “About how many times, if any, have you had to spank your ( $11 \pm 1$  mos old) child in the past week?” 5) Use of stair gates at PP3 (mean age  $\pm$  SD:  $24 \pm 2$  mos) was based on an affirmative response to “There are gates on stairs in your house when [child] is at home;” 6) Use of electric outlet covers at PP3 was based on an affirmative response to, “There are protectors in the electrical sockets in your house.” The six parenting practices that we studied are well-accepted recommendations by national child health experts, including several task forces and committees of the American Academy of Pediatrics.<sup>4, 34, 41-46</sup> These recommendations have been shown to be important in the health and development of young children. While use of “spanking” is controversial for some, most experts would agree that corporal punishment use in infancy, as measured in our study, is not recommended.

### *Statistical Analyses*

Group differences were tested between those with and those without a CSOC using the Chi-square test for categorical variables. The Fisher’s exact test was used if the expected values in the cells were less than 5. We also tested group differences between those in our final sample and those who were not included because they did not complete all of the postpartum surveys (see above). For the dependent variable, CSOC, we conducted a logistic regression analysis to adjust for potential confounding variables and to derive maximum likelihood estimates of combined relative odds with 95% confidence intervals.

Risk factors and confounders for potential inclusion in our final regression model were identified *a priori* based on our literature review and theoretical considerations. To obtain our

final model, we included all variables from our literature review, assessed if the model fit with these variables included, and subsequently dropped all variables not contributing to the overall model fit. The final logistic regression adjusted for maternal age, education, race/ethnicity, marital status, language of survey, nativity, residential stability, having a postpartum check-up, having access to a car; and the child's birth order, health insurance, age at PP3, and site of initial well child care. Alpha was set at 0.05 (two-sided), and Stata 8.2 was used for all analyses.<sup>47</sup> Since the prevalence of CSOC was relatively high (64%), using a logistic regression model could produce inflated odds ratios (ORs), and this would be problematic if the ORs were interpreted as relative risks. To account for this possibility, we also modeled the data using a Poisson regression approach with robust standard errors. It was found that the relative risks generated by the Poisson model were slightly less than the ORs provided by the logistic regression model. Also, all the terms that were significant in the logistic model were significant at approximately the same level in the Poisson model. Since we were more interested in associations rather than the magnitude of the OR or relative risks, we present the data from the logistic regression model. The Hosmer-Lemeshow goodness-of-fit Chi-square statistic was calculated for the model to assess the logistic regression model fit.<sup>48</sup>

## RESULTS

The sociodemographic and health characteristics for our overall sample are shown in column 2 of Table 1. The women in our sample were mostly low-income, young, African American, uninsured, and single. Ten percent of children had low birthweight (<2500 grams), comparable to national percentages of 7.6% overall and 13% for African Americans; 11% were preterm (<37 weeks gestation) with national percentages being 11.6% overall;<sup>49</sup> and 14% were

hospitalized in an intensive care setting. For their initial well-child care site, approximately 37% of children attended community-based health centers at PP1, while the remainder went to private practices and hospital-based clinics. The majority of the women (64%) in our sample identified a continuous source of care (see Figure 1). Table 1, columns 3 through 5, shows the unadjusted comparison of those with and without a CSOC. The two groups differed with respect to maternal education, nativity, residential stability, receipt of a postpartum check-up, child health insurance stability, and site of initial well-child care.

Overall, as shown in Table 2, only 26% of women breastfed for 1 month or longer, which is less than the 44% of African American mothers and much less than the 63% of mothers overall who reported breastfeeding at 1 month in a national sample.<sup>50</sup> Just over half of our sample reported using the back sleep position, comparable to the 50% to 75% prevalence found in a national study.<sup>51</sup> Only 57% of mothers reported reading to their child (at a mean age of 11 mos) at least three times per week, which is substantially less than the 76% of mothers in a national survey who read to their 10- to 18-month-old children at least three times per week.<sup>32</sup> Although the majority reported not using corporal punishment, as many as 14% reported corporal punishment use at PP2. Just over half of mothers reported using electric outlet covers, and only one-fifth used stair gates. Comparable national data were not available for the latter 3 parenting practices. We compared each of the 6 parenting practices for mothers reporting CSOC with those without CSOC, and there were no statistically significant differences (Table 2).

In the multivariate analysis, children of women with a high school education or less, US nativity, receipt of a postpartum check-up, stable child health insurance, and site of initial well-child care were more likely to have a CSOC than were their counterparts (Table 3). The

Hosmer-Lemeshow goodness-of-fit Chi-square statistic was 4.77 with a p-value of 0.78, showing that the model fits the data well.

## **DISCUSSION**

In this study, we explored the concept of having a continuous source of care or having the same primary care office or group of healthcare providers throughout early childhood. We determined which maternal and child sociodemographic and health characteristics were associated with having a CSOC based on face-to-face surveys at three time points in early childhood. Maternal low level of education was independently associated with a CSOC. Educated women may be more familiar than their counterparts with alternate sites of care, may have more resources to change sites, or may be more capable of changing practices if their needs are not met. We found that maternal nativity, but not race/ethnicity or language of survey, was independently associated with having a CSOC. Specifically, mothers who were born in the US were more likely to have a CSOC. The Western concept of continuity of care may seem obvious to those born in the US, but for those born elsewhere the emphasis on continuity may not be as strong. Qualitative studies assessing the views of US- versus foreign-born women on CSOC may help further our understanding of how culture impacts continuity of care.

Previous studies have linked maternal health services use with child health services use. For example, women with poor prenatal care were less likely to have a continuous source of care for their children.<sup>30</sup> We similarly found that women who had a postpartum check-up were more likely to have a continuous source of care. It is unknown whether this association reflects something about the mother's approach to healthcare or reflects information exchanged between the mother and her healthcare providers, or both.

Having stable child health insurance was associated with having a CSOC. In today's healthcare environment, fluctuations in health insurance coverage by employers, changes in healthcare-system-insurer contracts, limitations on accepted insurances at healthcare provider offices, and changes in employment force some patients to involuntarily switch healthcare providers. Initiation of care at sites other than community-based health centers was associated with a higher likelihood of having a CSOC. Some families may view community-based health centers as temporary sites of care, as one study found that the majority of women left community-based health centers and went elsewhere for newborn care.<sup>36</sup> In addition, care sites may vary in practice and philosophically on how CSOC is viewed.

Our study has several limitations. Our investigation was based on survey data; therefore, though we were able to comment on associations, we were unable to comment on cause and effect. CSOC was based on maternal report, and we did not validate whether or not the mothers actually took their children to the stated healthcare providers, or how often they were seen. The women in our study had familiarity with their child's healthcare provider and were able to give detailed contact information. Because we did not have data on the number of well-child care visits throughout the study period, we were not able to assess whether the children had "adequate well-child care." We determined use of parenting practices only by maternal report, which could have resulted in reporting bias; however, there is no reason to suspect that the reporting accuracy would differ for the comparison groups. Our use of self-reported parenting practices is consistent with previous, large-scale national studies as mentioned earlier.<sup>38, 40, 50</sup> There may have been other confounding factors that were not measured in our study. Our participants were low-income, Philadelphia mothers who identified a healthcare provider for their child at all time points, and our findings may not be generalizable to other urban underserved communities. We

may have underestimated the prevalence of “no CSOC” as those who did not complete all of the surveys were more likely to be foreign-born; and in our study, those who were foreign-born were less likely to have CSOC.

A major strength of this study is that we obtained information about each participant’s source of care from longitudinal data. National surveys assessing usual source of care generally use cross-sectional data based on a single question asking if the child has a usual source of care.<sup>52, 53</sup> Other studies that use administrative data may be limited in that the physician listed may not be a physician known to the mother, and may not even be the physician who met directly with the mother. Our study looks at maternal responses that detail the practice name, location, and phone number at three time points to determine if the child actually had a CSOC.

We had hypothesized that having a CSOC would be associated with an increased use of recommended parenting practices. This hypothesis was largely based on the idea that continuity of care implies a trusting and devotional relationship between the parent and a practice or provider. It may be that other influences -- such input from family members and friends, other health professionals, and public health messages on broadcast media -- play significant roles in the use of the parenting practices that we studied. For example, with infant sleep position, it is known that influencing factors other than physician recommendations include the presence of a grandmother in the household, observed practices of health professionals in the newborn nursery, and recommendations from non-physician sources.<sup>31, 35, 51, 54, 55</sup> It may be that simply having a usual source of care, independent of being the same one or continuous, affects whether or not mothers use the parenting practices that we studied. For the low-income women in our sample, rates for breastfeeding 1 or more months and rates of reading were much lower than national

rates. This warrants further investigation, and suggests the need for further intervention in this underserved population.

In summary, there are six major findings from our study of low-income women who access care for their children in the first two years of life: 1) maternal nativity, 2) maternal low-level of education, 3) stable child health insurance, 4) having a postpartum check-up, and 5) initiating child healthcare at a site other than a community-based health center were associated with a higher likelihood of having CSOC, and 6) use of parenting practices did not differ for those with and without a CSOC.



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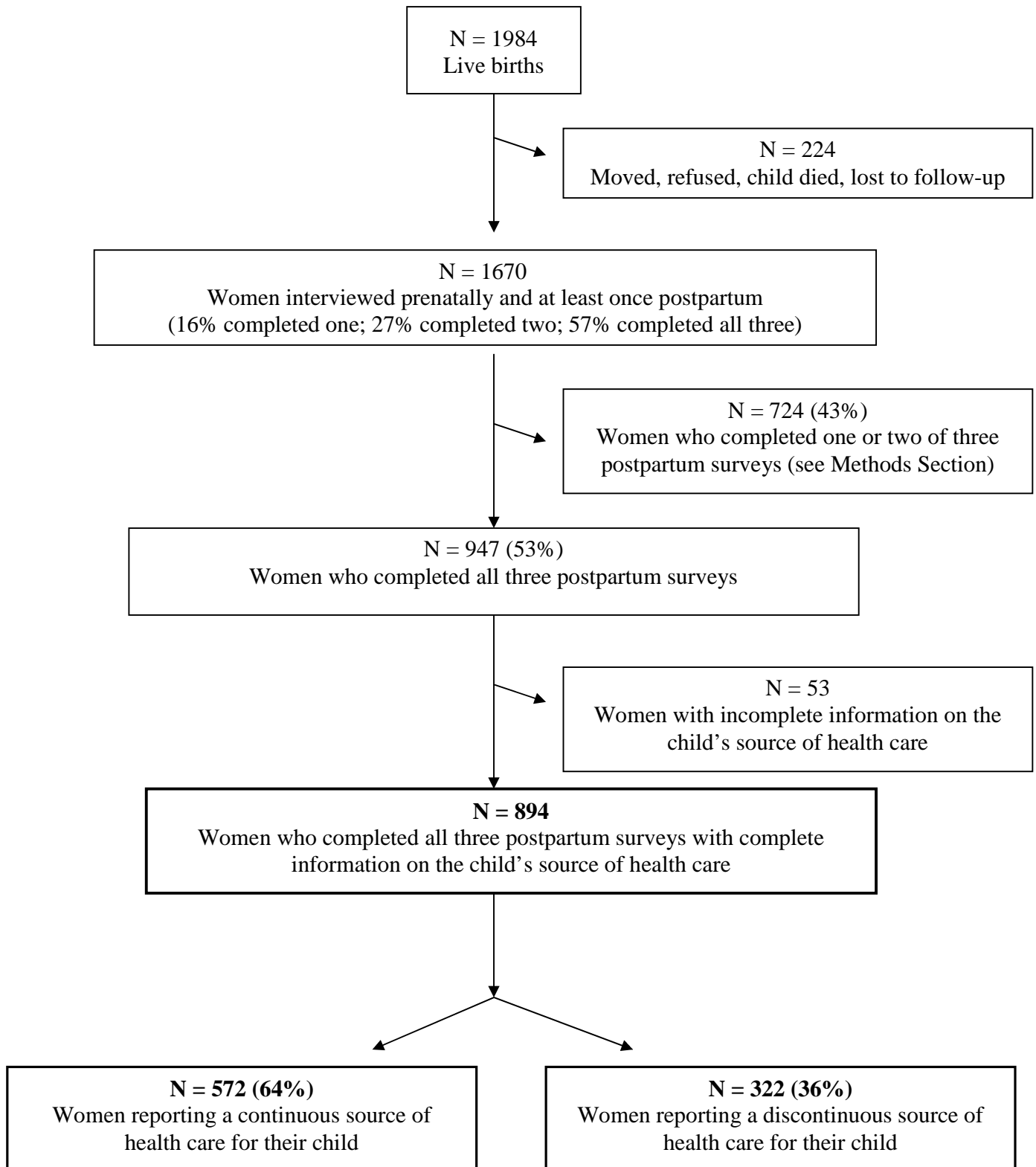
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**Figure 1. Flow Diagram of Study Participants**





**Table 1. Sociodemographic and Health Characteristics for the Overall Study Population, and a Comparison of Those with and without a Continuous Source of Care (CSOC).**

Maternal Characteristics	Overall Study Population (N = 894)	CSOC (N = 572)	No CSOC (N = 322)	CSOC versus No CSOC P-value
Mean maternal age ( $\pm$ SD) <sup>1</sup> , years	24 $\pm$ 6	24 $\pm$ 6	24 $\pm$ 6	NS
Education <sup>1</sup> , %				
Less than high school	39	39	39	<b>0.003</b>
High school/GED	43	46	38	
College or more	17	14	23	
Race/Ethnicity <sup>1</sup> , %				
African American	71	71	72	NS
Latina	15	16	15	
White	10	10	10	
Other	3	3	3	
Prenatal care at Spanish-speaking site <sup>1</sup>	14	15	12	NS
Language of survey in Spanish <sup>1</sup>	6	6	6	NS
Nativity <sup>1</sup> , US born, %	81	83	77	<b>0.015</b>
Marital status <sup>1</sup> : single, %	76	77	75	NS
Annual household income <sup>1</sup> , %				
< \$2,150				NS
\$2,150 - \$6,191	24	24	25	
\$6,192 – \$11,609	24	23	25	
> \$11,609	26	27	23	
	26	26	27	
Uninsured <sup>1</sup> , %	59	60	57	NS
Stable residence <sup>4</sup> , %	48	52	46	NS
Car access <sup>2</sup> , %	91	92	90	NS

SD: standard deviation; GED: General Educational Development credential

<sup>1</sup> At antepartum visit.

<sup>2</sup> At PP1.

Had a usual source of pre-pregnancy care <sup>2</sup> , %	62	63	61	NS
High risk pregnancy <sup>2</sup> , %	27	27	26	NS
Had a postpartum check-up <sup>2</sup> , %	87	89	84	<b>0.024</b>
Had a main prenatal care provider <sup>2</sup> , %	40	39	41	NS
<b>Child Characteristics</b>				
Age <sup>3</sup> , months				
< 23.5	24	23	26	NS
23.6 – 26.1	51	53	47	
> 26.1	25	24	27	
Birth order <sup>1</sup>				
First	50	49	52	NS
Second	27	28	25	
Third or more	23	23	24	
Gender <sup>5</sup> : male, %	51	49	53	NS
Low birthweight <sup>5</sup> (< 2500 grams), %	10	10	11	NS
Preterm birth <sup>5</sup> (< 37 wks gestation), %	11	11	12	NS
Has special needs <sup>2</sup> , %	10	9	12	NS
Stable child health insurance <sup>4</sup> , %	74	80	65	<b>&lt;0.001</b>
Initial site of hospitalization <sup>2</sup> : intensive care nursery, %	14	13	15	NS
Site of initial well-child care <sup>2</sup> , %				
Private practice				<b>&lt;0.001</b>
Hospital-based clinic	29	33	24	
Community-based health center	33	36	28	
	37	31	48	

<sup>3</sup> At PP3.

<sup>4</sup> Based on PP1, 2 , and 3.

<sup>5</sup> Linked birth certificate data.

**Table 2. Prevalence Rates of Recommended Parenting Practices Among Overall Study Participants, Those with CSOC and Those without CSOC.**

	Parenting Practice	Overall Percent (N = 894)	CSOC Percent (N = 572)	No CSOC Percent (N = 322)	P-value*
At 2-4 months	Breastfeeding for $\geq 1$ month	26	24	28	NS
	Use of back sleep position	54	54	54	NS
At 10-12 months	Reading $\geq 3$ times/week	57	57	57	NS
	Not using corporal	86	87	85	NS
	punishment				
At 22-26 months	Use of stair gates	22	21	24	NS
	Use of electric outlet covers	57	56	58	NS

\*Based on Chi-square testing to assess for group differences between those with CSOC and those without CSOC.

**Table 3. Logistic Regression Estimates (Odds Ratios)<sup>1</sup> of Maternal and Infant Characteristics Associated with a Continuous Source of Care (CSOC), N = 894**

Characteristic	Adjusted Odds Ratio for CSOC (95% Confidence Interval)
Education	
Less than high school	<b>1.66 (1.06, 2.60)</b>
High school/GED	<b>1.80 (1.18, 2.74)</b>
College or more	1.00
Maternal race/ethnicity	
African American	1.23 (0.73, 2.09)
Latina	1.77 (0.88, 3.54)
White	1.00
Other	2.25 (0.82, 6.09)
Maternal nativity	
US-born	<b>1.69 (1.06, 2.70)</b>
Foreign-born	1.00
Language of survey	
Spanish	1.47 (0.65, 3.33)
English	1.00
Had postpartum check-up	
Yes	<b>1.74 (1.12, 2.70)</b>
No	1.00
Child health insurance during study period	
Stable	<b>2.03 (1.45, 2.85)</b>
Changed	1.00
Site of initial well-child care	
Private practice	<b>2.44 (1.65, 3.60)</b>
Hospital-based clinic	<b>2.03 (1.43, 2.88)</b>
Community-based health center	1.00

Statistically significant findings are in bold font.

<sup>1</sup> In addition to those shown, we adjusted for the following variables that were not statistically significant: maternal age, marital status, residence stability, car access, and child birth order and age at PP3.