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

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

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23 care

24 **ABSTRACT**

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

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

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

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

44 **BACKGROUND**

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

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

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

67 quality of care,²⁰ receipt of preventative care,²¹ timely measles-mumps-rubella vaccination,²²
68 increased likelihood of taking medications correctly and having problems identified,¹⁷ decreased
69 emergency department use,^{11, 12, 23-25} and lower likelihood of hospitalization²⁶ and overall health
70 care costs.²⁷⁻²⁹

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

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

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

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

93

94 **METHODS**

95 This research is a sample of a larger prospective, community-based cohort study on
96 maternal stress, birth outcomes and infant health. As part of the larger study, this research was
97 approved by the Institutional Review Boards at Thomas Jefferson University and the University
98 of Pennsylvania. The overall cohort consisted of women receiving prenatal care from February
99 2000 to November 2002 at Philadelphia community-based health centers, described previously³⁶
100 and consisting of Federally Qualified Health Center Look Alikes (FQHC-LAs) and FQHCs. The
101 enrollment criteria included having an intrauterine pregnancy and the ability to speak English or
102 Spanish. Of 1,984 women with live births in the overall cohort, 1,670 (84%) women lived with
103 their child and were interviewed at least once during the postpartum period, 4% had moved too
104 far away, 5% refused interviews, 1% were excluded after enrollment for reasons such as child
105 death, and 6% were lost to follow-up (Figure 1). When compared with all Philadelphia women
106 who gave birth in 2001, these women were slightly younger, less educated, and economically
107 more disadvantaged. Details of our cohort study have been described previously.^{36,37}

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

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

116 Figure 1 is a flow diagram of study participants. Of the 1,670 women living with their
117 child, 947 (57%) completed all four (1 prenatal and 3 postpartum) surveys. The remaining 724
118 (43%) completed the prenatal survey and some (one or two) of the postpartum surveys. When
119 compared to those completing all postpartum surveys, those completing some were more likely
120 to be foreign-born and to have their surveys conducted in Spanish. These 2 groups did not differ
121 for the following characteristics: maternal age, education, race/ethnicity, marital status, annual
122 household income, insurance status, car access; or child gender, birthweight, gestational age, or
123 birth order (data not shown). Of the 947 women who completed all surveys, 53 (6%) women
124 were dropped due to missing information on their child's source of care. Our final sample
125 consisted of 894 mother-child dyads with a usual source of care at each postpartum survey.

126

127 *Study Variables*

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

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

136 potential confounding variables: 1) antepartum survey data: maternal age, education,
137 race/ethnicity, Spanish-speaking prenatal care site, language of survey, nativity, marital status,
138 insurance status, income, and child's birth order; 2) PP1 data: maternal access to and ownership
139 of a car (not asked at PP2 or PP3), having a regular source of pre-pregnancy care, having a main
140 prenatal care provider, being told that the pregnancy was high-risk, and having a check-up at 6
141 weeks postpartum; and child's site of initial hospitalization (intensive care versus newborn
142 nursery), special needs, and site of initial well-child care (community-based health center,
143 private practice, and hospital-based clinic – defined elsewhere³⁶); 3) PP3 data: child's age; 4)
144 data from PP1 to PP3 – residence stability (stable residence = 0 moves) and child health
145 insurance stability (stable insurance = 0 changes in type [i.e., none, Medicaid, via work or self-
146 pay]). The child's sex, birthweight, and gestational age were obtained from linked, birth
147 certificate data.

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

159 the National Household Education Survey, which is used to report national rates of reading;^{39, 40}
160 4) Not using corporal punishment at PP2 was based on a response of “0” to, “About how many
161 times, if any, have you had to spank your (11 ± 1 mos old) child in the past week?” 5) Use of
162 stair gates at PP3 (mean age ± SD: 24 ± 2 mos) was based on an affirmative response to “There
163 are gates on stairs in your house when [child] is at home;” 6) Use of electric outlet covers at PP3
164 was based on an affirmative response to, “There are protectors in the electrical sockets in your
165 house.” The six parenting practices that we studied are well-accepted recommendations by
166 national child health experts, including several task forces and committees of the American
167 Academy of Pediatrics.^{4, 34, 41-46} These recommendations have been shown to be important in the
168 health and development of young children. While use of “spanking” is controversial for some,
169 most experts would agree that corporal punishment use in infancy, as measured in our study, is
170 not recommended.

171

172 *Statistical Analyses*

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

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

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

198

199 **RESULTS**

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

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

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

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

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

229

230 **DISCUSSION**

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

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

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

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

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

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

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

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

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

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Figure 1. Flow Diagram of Study Participants

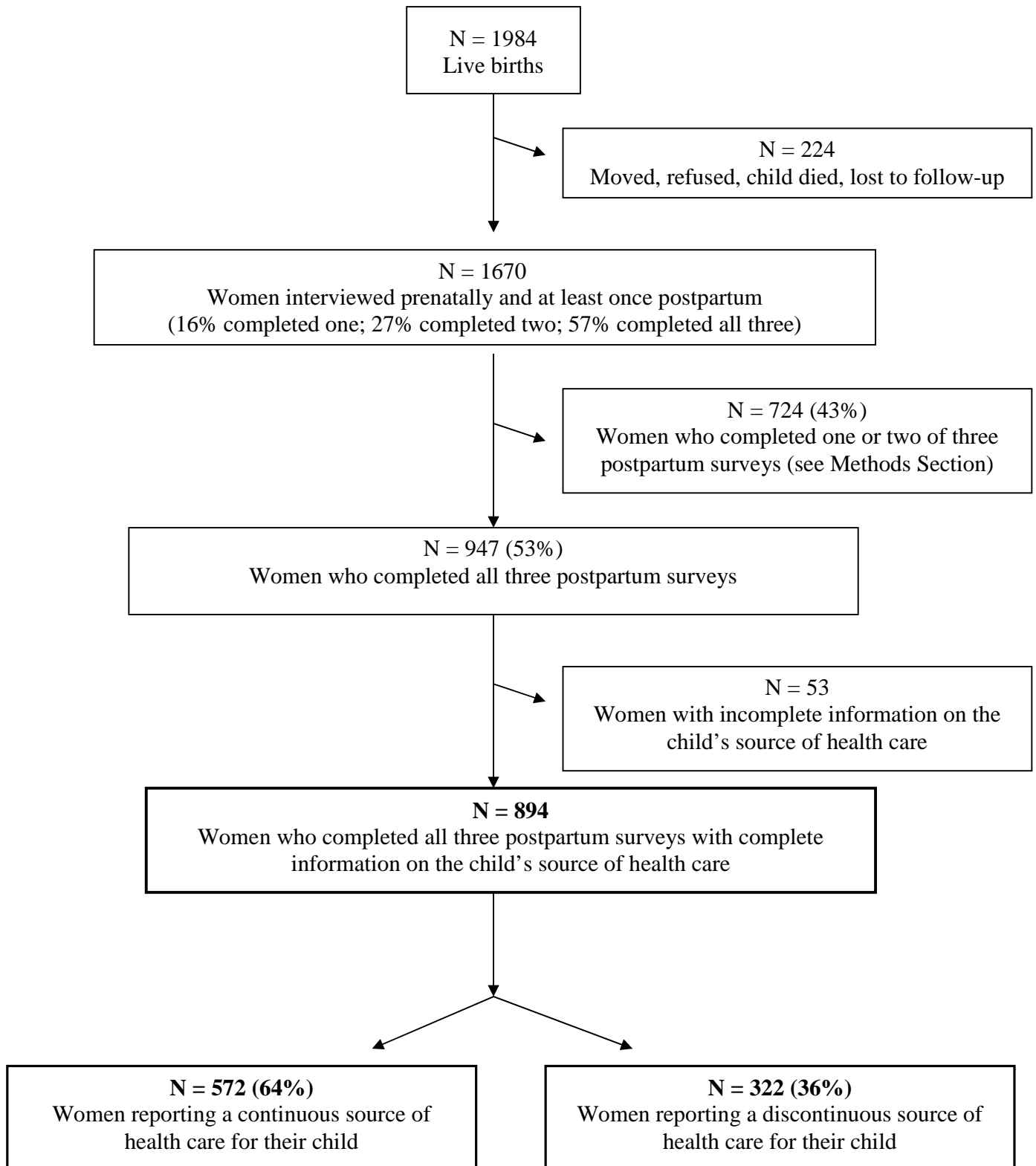


Table 1. Sociodemographic and Health Characteristics for the Overall Study Population, and a Comparison of Those with and without a Continuous Source of Care (CSOC).

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) ¹ , years	24 \pm 6	24 \pm 6	24 \pm 6	NS
Education ¹ , %				
Less than high school	39	39	39	0.003
High school/GED	43	46	38	
College or more	17	14	23	
Race/Ethnicity ¹ , %				
African American	71	71	72	NS
Latina	15	16	15	
White	10	10	10	
Other	3	3	3	
Prenatal care at Spanish-speaking site ¹	14	15	12	NS
Language of survey in Spanish ¹	6	6	6	NS
Nativity ¹ , US born, %	81	83	77	0.015
Marital status ¹ : single, %	76	77	75	NS
Annual household income ¹ , %				
< \$2,150				NS
\$2,150 - \$6,191	24	24	25	
\$6,192 - \$11,609	24	23	25	
> \$11,609	26	27	23	
Uninsured ¹ , %	59	60	57	NS
Stable residence ⁴ , %	48	52	46	NS
Car access ² , %	91	92	90	NS

SD: standard deviation; GED: General Educational Development credential

¹ At antepartum visit.

² At PPI.

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

³ At PP3.

⁴ Based on PP1, 2, and 3.

⁵ 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 punishment	86	87	85	NS
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)¹ 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	1.66 (1.06, 2.60)
High school/GED	1.80 (1.18, 2.74)
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	1.69 (1.06, 2.70)
Foreign-born	1.00
Language of survey	
Spanish	1.47 (0.65, 3.33)
English	1.00
Had postpartum check-up	
Yes	1.74 (1.12, 2.70)
No	1.00
Child health insurance during study period	
Stable	2.03 (1.45, 2.85)
Changed	1.00
Site of initial well-child care	
Private practice	2.44 (1.65, 3.60)
Hospital-based clinic	2.03 (1.43, 2.88)
Community-based health center	1.00

Statistically significant findings are in bold font.

¹ 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.