CAREGIVER CHARACTERISTICS ASSOCIATED WITH PHYSICIAN-BASED PREVENTIVE ORAL HEALTH SERVICE (PB-POHS)

Alexandra AC Boudreau

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Approved by:

Jessica Lee

Kimon Divaris

William Vann

Gary Rozier

Diane Baker

ABSTRACT

Alexandra AC Boudreau: Caregiver Characteristics Associated with Physician-Based Preventive Oral Health Services (PB-POHS)
(Under the direction of Jessica Lee)

BACKGROUND: Most states have adopted Physician-Based Preventive Oral Health Services (PB-POHS) to address challenges related to the oral health care for young children. Our aims were to describe caregiver and child characteristics of children who received PB-POHS *versus* those who did not, while comparing characteristics of children receiving the optimal number of PB-POHS to those not.

METHODS: We examined a cohort of 1,405 child-caregiver dyads enrolled in the Carolina Oral Health Literacy (COHL) Study. Caregivers completed a structured interview and each child's Medicaid medical, dental and hospital claims for the three-year period of study was evaluated.

RESULTS: Our analytical sample included 831 children. Sixty-four percent received PB-POHS; only 11% received the optimal number of visits. Other than county of residence, there were no significant differences in caregiver characteristics among recipients and non-recipients of PB-POHS.

CONCLUSIONS: PB-POHS programs may overcome the traditional barriers to dental care noted in the literature.

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LIST OF ABBREVIATIONS

ECC	Early Childhood Caries
COHL	Carolina Oral Health Literacy
FPL	Federal Poverty Level
GED	General Educational Development
IMB	Into the Mouth of Babes
NC	North Carolina
NHANES	National Health and Nutrition Examination Survey
PB-POHS	Physician Based Preventive Oral Health Services
REALD-30	Rapid Estimate of Adult Health Literacy in Dentistry
WIC	Special Supplemental Nutrition Program for Women Infants and Children

INTRODUCTION

Overview of Early childhood caries (ECC)

t well-documented that early childhood caries (ECC) is the most common chronic disease of childhood[1,2] and despite many professional and public health initiatives to increase awareness and prevention, it remains an important public health problem[3].Importantly, the burden of ECC is characterized by marked disparities[4] and disproportionately affects children from low-income families[5]. As one example, children from families with incomes below 200% the federal poverty level (FPL) are three times more likely to have unmet *overall* healthcare needs, which are overwhelmingly of dental origin[6].

Up until recently the prevalence of caries had been increasing in pre-school aged children. NHANES data from 2011-2012 showed that 23% of 2-5 year olds had dental caries, a reduction from the previously reported 27% in 1999-2002[7,8]. The prevalence of caries had been increasing in North Carolina (NC) preschool aged children in the early 2000's but presently rates are declining[9]. Elevated birthrates and barriers in access to care among low-income families were cited as reasons for the increase in rates of decay in NC children ages 0-3[10]. Recent NC surveillance data reports both a 14% decrease in dmft scores and an increase in treatment of dental disease in preschool aged children from 2004-2009. However, while oral health conditions are improving state-wide, disparities still exist as 18 NC counties had 25% of children entering kindergarten with untreated disease[11].

Access to Dental Services for Young Children

Access to dental care is a major barrier for the prevention and treatment of dental caries. Mouradian and colleagues[12] reported barriers to dental services including a 1) scarcity of area dentists, 2) lack of area dentists accepting Medicaid, 3) shortage of pediatric dentists, 4) lack of individuals' knowledge and attitudes concerning oral health, and 5) the challenges of culturally diverse populations, and 6) problems intrinsic to Medicaid. In NC, barriers in access to care have not been studied systematically; however, 84 of the state's 100 counties are designated as dental shortage areas[13].

Models of Preventative Oral Health Services in the Medical Arena

The disparity in access to dental services has helped promote models of delivering preventative oral health services in medical practices. NC developed one of the first models in 2000. Called "Into the Mouths of Babes" (IMB), it is a physician-based oral health education, disease prevention, and referral program. It provides Medicaid reimbursement for physicians, nurse practitioners, and physician assistants to screen, perform oral health counseling, fluoride varnish application, and referral for dental care. A major aim of IMB is to identify children ages 0-3 who are at high risk for dental disease, with subsequent early referral and the timely establishment of a dental home [14 15]. To date, 45 additional states have developed such programs [16 17].

Physician-based preventative oral health service (PB-POHS) programs have the potential to circumvent traditional barriers of access to oral health care services and help improve young children's oral health. Primary care providers can identify dental caries in young children[18], combined with the caries-preventive effects of fluoride varnish[19] and a positive referral

environment, disease prevention and reduction are achievable[20] for high-risk children. Indeed, in defining optimal IMB utilization as ≥ 4 visits, Pahel and colleagues[10] simulated data to estimate a caries reduction as high as 49% in 17 month olds whereas the actual reduction in caries-related restorative treatments was 17% in 6 year olds.

PB-POHS from the Physicians' Perspective

All available evidence indicates that physicians are willing to incorporate aspects of oral health services into their practice. A national survey by Lewis and colleagues[21] reported that 90% of physicians believed they played an important role in identifying dental disease in their patients and 74% said that they would be willing to apply topical fluoride[22]. Lewis and colleagues also found that only 25% of physicians participating in a national survey received training in oral health and many providers cited this lack of instruction as a reason for not delivering oral health-related services[23].

Caregiver Characteristics of Children Receiving PB-POHS

To date, most studies of Physician-Based Oral Health Services (PB-POHS) examine the providers' viewpoint and less is known regarding characteristics of caregiver-child dyads receiving these services. Quinonez and colleagues[24] examined Socio-demographics characteristics, dental knowledge, and dental practices of caregivers of children with PB-POHS, have been examined, finding that earlier timing of the first IMB visit, more children in the family, and putting the child to bed with a bottle/sippy cup were associated with more visits. However, the study did not include caregivers of children who did not receive PB-POHS. County level variables have also been examined for both recipients and non-recipients finding that non metropolitan counties, counties with fewer dentists and counties with more family or pediatric

physicians had a higher likelihood for receiving PB-POHS. Counties with more dentists had a decreased likelihood of having PB-POHS[25]. The literature however is sparse regarding caregiver characteristics of non-recipients. Kranz and colleagues examined this population finding that distance from physician's office was not predictive of children receiving PBOHS while increased distance to dental office was predictive of fewer dental office visits[26]. Little else regarding this population has been reported.

Significance

A more detailed examination of caregiver characteristics of those children who do and do not receive PB-POHS is an important question from a practical and public health perspective because such data can guide the further deployment and scaling-up of PB-POHS programs. For example, such information might reveal barriers in terms of usage of PB-POHS such as geographical location, low caregiver literacy, low self-efficacy, etc. Insights into these characteristics could facilitate better access to care by developing strategies to increase the PB-POHS utilization. Increased penetration of PB-POHS in a community, region, or state could help maximize the program's effectiveness and ultimately improve young children's oral health.

Specific Aims

To summarize: the benefits of PB-POHS have been documented and although data are still emerging, available evidence suggests that these programs are effective in preventing early childhood dental disease. Program adoption from the perspective of medical providers has been underscored[22, 29, 23, 24], but examination of adoption by caregivers has received scant attention. Accordingly, the specific aims of this investigation were to:

1) Describe caregiver characteristics of children who do and do not receive PB-POHS visits.
2) Identify caregiver characteristics of children who receive an optimal number of (4 or more) POHS visits versus those receiving less-than-optimal and no visits.

METHODS

Study design and sample

This investigation built upon a cohort of families enrolled in the IRB-approved Carolina Oral Health Literacy (COHL), which enrolled 1,403 child-caregiver dyads in seven NC counties. A detailed description of the study enrollment procedure has been reported previously[27, 28]. COHL subjects were low-income, mostly female, and clients of the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Eligibility criteria included: 1) primary caretakers, 2) healthy children under age 5, 3) children eligible for Medicaid enrolled for at least 11 of 12 months annually, and 4) the family's primary language was English. The major outcome of interest in the present study was receipt of PB-POHS as measured using medical office Medicaid-paid claims for oral health services. For this reason, we limited our analytical sample to a sub-set of COHL-enrolled children who were eligible for PB-POHS at study enrollment and for the ensuing 12 months, effectively creating an additional exclusion criterion of age equal or less than 30 months.

Data collection

Each caregiver completed a structured interview under the guidance of one of the two trained study interviewers. The interview included questions on socio-demographic measures, health literacy, and oral health status/behaviors. Health literacy in the oral health domain was measured using the Rapid Estimate of Adult Health Literacy in Dentistry (REALD)-30, a word

recognition-based test[29]. At the time of the study, REALD-30 had been validated only in the English language. Medicaid medical, dental, and hospital claims during the calendar years 2008, 2009, and 2010 were obtained for each child enrolled in the COHL study.

Variable Definition and Measurement

PB-POHS were defined as a medical office visits with the submission of a Medicaid claim (J type) for oral health services during calendar years 2008, 2009, and 2012. This included oral evaluation/examination/screening (codes D0150, D0120, D0145), oral healthcare instructions (code D1330), and/or topical fluoride/varnish application (codes D1203, D1206). To enumerate PB-POHS and dental visits prior to study enrollment we collected and analyzed Medicaid claims data spanning the entire lifetime of the enrolled children. We relied upon two definitions of PB-POHS. First, we considered a dichotomous definition of POHS, having any *versus* no visits. Second, we examined another binary outcome of "optimal number of POHS", 4 or more visits *versus* less (0-3).

Our explanatory variables included the following caregiver characteristics: literacy, level of education, self-efficacy, oral health knowledge, number of children, and marital status. The child's age also served as an explanatory variable. Literacy was measured using the REALD-30 score in two ways. First we examined literacy using a continuous measure, where 0 is the lowest and 30 the highest level of literacy. Next we examined categorical definitions as previous studies have classified literacy as inadequate (<13) and *adequate (≥13)* [30].Self-efficacy was measured with the general self-efficacy scale [31]; self-efficacy scores range from 10 (lowest self-efficacy) to 40 (highest self-efficacy). Caregivers' education was self-reported and coded as 1= less than high school; 2= high school/GED; 3= some technical school or college; 4= college degree or higher.

Race was self-identified as white, African American, or American Indian. Age was measured in years and continuous and categorical definitions were explored. Marital status was defined as single, married; divorced/separated; other.

Analytical Strategy

We relied on descriptive methods to generate frequency distributions, simple proportions, and cross-tabulations of variables of interest. To test the associations between receipt of any (Specific Aim 1) and optimal number of PB-POHS (Specific Aim 2) and caregivers' characteristics we first used bivariate methods including chi-square for categorical variables and t-test for continuous variables. We also considered a 3-level categorical definition of PB-POHS wherein children were classified as having received no (0), "some" (1-3), or the "optimal number" (≥4) of visits, and examined its association with caregivers' characteristics with chi-square tests and analyses of variance (ANOVA). To disentangle possible associations between independent variables and receipt of PB-POHS we constructed logistic regression models, adjusting for covariates that were statistically associated ($P<0.05$) with PB-POHS at the bivariate level as well as children's age, county of residence, and follow-up time. We then reported adjusted predicted probabilities and 95% confidence intervals (CI) of having received PB-POHS for strata of interest using marginal effects estimation (Williams R, Stata J, 2012). To examine the robustness of our findings and gain additional insights on the group of children who were exclusive PB-POHS users (*i.e.*, had no dental office-based care evidenced by their Medicaid claims) we conducted additional analyses among that subset of participants. All analyses were conducted using the statistical software STATA version 13.1 (StataCorp LP, College Station, TX).

RESULTS

From the 1,403 child-caregiver dyads enrolled in the COHL cohort, 831 subjects met our inclusion criteria. The sample's descriptive information is presented in Table 1. Most children were African American (n=340, 41%), followed by white (n=322, 39%) and American Indian (n=161, 20%). The overwhelming majority of caregivers were female (96%) and their mean age was 26 years. At the time of the baseline interview, the majority of children were between the ages of 0-11 months (59%), with fewer falling in the 12-23 month (29%) and 24-29 month (13%) age groups. Most caregivers had high school/GED or higher level of education with only 24% having not completed high school. Two-thirds of caregivers reported themselves as single, with 23% reporting as married and 8% as divorce/separated or other.

The mean literacy score was 15.5 points on the 30-point REALD-30 scale, with the majority of caregivers having an adequate level of health literacy (≥13 score). The vast majority (97%) reported their children as having good, very good, or excellent oral health.

The analytical cohort was followed for an average 24 months (range: 18-30). During that follow-up period, 528 children (64%) received some PB-POHS. There were few differences between PB-POHS recipients and non-recipients. Race and health literacy were the only domains where a statistically significant difference were noted. A markedly higher percentage (77%) of American Indians received PB-POH services than blacks (66%) and whites (55%). A similar bivariate association was noted in the domain of health literacy, with low-literacy participants being more likely to have received PB-POHS versus those with higher literacy (70% versus

61%; P=o.03). However, the mean literacy score was slightly higher (15.7 versus 15.3) among non-recipients.

There were only 93 children (11%) who received the optimal (≥4) number of PB-POH visits (Tables 1A and B). Similar to the receipt of any versus no services, we found few statistically significant differences between those who did and those who did not receive the optimal number of visits. On average, those receiving the optimal number of visits were two months older than children who did not receive and were followed up for one month longer. We found no significant association of health literacy with receipt of optimal number of services. On the other hand, county of residence had a major influence on the receipt of services. Brunswick and Robeson counties had the highest percentage of receivers (82% and 81% respectively), while Buncombe and Orange had the fewest (41% and 36% respectively). Brunswick County had the most optimal receivers (41%) and again, Buncombe and Orange had the fewest. The other counties had more comparable breakdowns.

A substantial number of children (338, or 64%) received exclusively PB-POHS and no dental office-based visits. Fifty-seven (17%) of these children received the optimal number of visits. Again, there were very few statistically significant findings between those receiving fewer than optimal services and those receiving the optimal number of services (Table 3), and these were with regard to socio-demographic characteristics (caregivers' and children's age) and follow-up time. The average follow-up time was actually one month shorter in the optimal group as compared with the suboptimal group.

Table 4 presents the crude and adjusted logistic regression-predicted probabilities of PB-POHS receipt by race and county of residence. The final logistic regression model included

children's age *a priori* and follow-up time, and an additional term for health literacy. It was noteworthy that racial and health literacy differences diminished after adjustment, while county differences remained virtually unchanged.

DISCUSSION

In this study among a community-based cohort of approximately 800 child-caregiver dyads, we found that location (county of residence) was the main predictor of a child's receiving PB-POHS over a two-year period. With the exception of race (an association that diminished after adjustment for county of residence), caregivers' characteristics (*i.e.*, age and education) were not associated with receipt of these oral health services. This observation has important implications for improving young children's access to preventive oral health services because it underscores that PB-POHS may circumvent traditional barriers of dental care-seeking at the caregiver level (*e.g.*, education, number of children, general self-efficacy). Accordingly, PB-POHS may help decrease oral health disparities among this vulnerable population.

This is the first study to examine caregiver characteristics including children who received *versus* those who did not receive PB-POHS. The finding of essentially no differences in caregiver characteristics between the two groups other than county of residence is a finding of important significance. Visits to pediatricians' offices for routine well-care are virtually universal among this very young group of children, and caregivers' characteristics should not be a major influence, and this finding was illuminated in this study. At the same time, some caregivers' characteristics (including caregivers' dental neglect) are strong predictors of children's entry into the dental care (dental office-based) system and thus may contribute to barriers of access to timely and optimal (i.e., preventive *versus* problem-initiated) care. Further

examination of other characteristics specific to the caregiver and child, such as child's disease status or caregiver's reported oral health status may capture differences not found in this study.

The current findings are most noteworthy in demonstrating that preventative oral health services delivered in physicians' offices may be a means to overcome traditional barriers encountered with receiving dental care, including a paucity of dentists accepting Medicaid, a shortage of pediatric dentists, and lack of individuals' knowledge and attitudes concerning oral health[12]. This finding carries strong policy implications for state and federal support of PB-POHS. Although children are receiving more PB-POHS still only a small amount (11%) received the optimal number of visits programs and policies should be aimed to increase the number of children receiving the recommended four or more visits.

In light of these findings perhaps the focus should be shifted on to physicians to increase adoption and provision of these services. The literature supports that a positive dental referral environment leads to more physicians adopting preventative oral health services in their practices[32, 33] highlighting the importance of a collaborative relationship between community physicians and dentists. Implementation of office-based systems such as sticky note reminders in the charts; risk assessment tools, chart screening, flow sheets, enhances well child visit forms has been found to increase delivery of preventative services in physician offices[34] and changes in policy are more likely to result in lasting changes with provision of care[35],

Our findings should be viewed in the context of a few limitations. While this study boasts a relatively large, community-based non-dental care seeking study sample and a prospective design, the population studied was enrolled in and seeking program services, thus

selection bias may be an issues as our sample likely reflects characteristics found in a user population[36]. In NC PB-POHS are administered at roughly 40% of well-child visits, while we are not able to compare these statistics directly, 64% of our sample received some PB-POHS which may be interpreted as a high rate of utilization[9]. At the same time, the WIC population has also been found to be at the highest risk for dental disease[5]. Because our cohort comprised a convenience sample of WIC clients, inferences regarding the influence of the county of residence should be made with caution. Participant groups by county of residence should be best interpreted as "caregivers interviewed in WIC programs" in each county; moreover, it is likely that county-level differences are reflected or are influenced by medical practice characteristics; however, collection and examination of medical practice or provider level-specific information was beyond the scope this study. Future investigations should examine the influence of medical office and provider characteristics on the delivery of oral health services. An examination of systematic differences between our sample's composition, the WIC population and each county's population and use of medical and dental services could only be accomplished via the study of a sample designed to be representative of WIC programs and/or counties.

At the time of the study REALD-30 was only validated in English thus our sample comprised English-speaking families only—this precludes generalization of our findings to Spanish-speaking families. Reliance on Medicaid paid claims implies that free care or services sought outside the Medicaid network were not captured in the claims data. However, we anticipate that most care-seeking of Medicaid-enrollees would take place within the Medicaid network.

CONCLUSIONS

Under the conditions of this study we conclude that:

1) There are no significant differences in caregiver characteristics among those who did and not receive PB-POHS services.
2) County-level differences in receipt of services were noted and should be investigated further.
3) The PB-POHS program may overcome the traditional predisposing and enabling barriers noted in the literature.

TABLE 1.1 Sociodemographic Characteristics of the Analytical Cohort of COHL Child-Caregiver Dyads (n = 831)									
				No PB-POHS	PB-POHS			4+ visits	
		n^* (col. %)		n^* (row %)	n^* (row %)	$P^\dagger$		n^* (row %)	$P^\dagger$
Total		831 (100)		303 (36)	528 (64)			93 (11)	
Race						<0.001			0.1
White		322 (39)		145 (45)	177 (55)			28 (9)	
African American		340 (41)		117 (34)	223 (66)			46 (14)	
American Indian		161 (20)		37 (23)	124 (77)			19 (12)	
Caregiver's sex						0.4			0.1
Male		32 (4)		14 (44)	18 (56)			1 (3)	
Female		799 (96)		289 (36)	510 (64)			92 (12)	
Caregiver's age (tertiles; range)		mean (SD)				0.2			0.1
Q1 (18.0, 22.4)		20.4 (1.2)		91 (33)	186 (67)			23 (8)	
Q2 (22.4, 27.6)		24.8 (1.5)		102 (37)	176 (63)			39 (14)	
Q3 (27.6, 60.9)		34.2 (5.8)		110 (40)	166 (60)			31 (11)	
continuous		26.4 (6.8)		26.8 (6.6)	26.3 (6.9)	0.3		27.6 (7.8)	0.09
Child's age (months; at baseline interview)						0.8			0.06
0-11		487 (59)		174 (36)	313 (64)			45 (9)	
12-23		237 (29)		87 (37)	150 (63)			30 (13)	
24-29		107 (13)		42 (39)	65 (61)			18 (17)	
continuous		11.1 (9.0)		11.3 (9.0)	10.9 (9.0)	0.5		13.1 (8.9)	0.02
Education						0.7			0.6
<HS		196 (24)		67 (34)	129 (66)			19 (10)	
HS/GED		332 (40)		122 (37)	210 (63)			41 (12)	
Some college or higher		303 (36)		114 (38)	189 (62)			33 (11)	

Marital status						0.3			0.8
Single		572 (69)		199 (35)	373 (65)			66 (12)	
Married		193 (23)		76 (39)	117 (61)			21 (11)	
Divorced/separated/other		66 (8)		28 (42)	38 (58)			6 (9)	
Number of children						0.4			1.0
1		395 (48)		134 (34)	261 (66)			44 (11)	
2		248 (30)		92 (37)	156 (63)			28 (11)	
3		106 (13)		45 (42)	61 (58)			12 (11)	
≥4		80 (10)		32 (40)	48 (60)			9 (11)	
Health literacy						0.03			1.0
"low" READLD-30 (<13)		207 (25)		62 (30)	145 (70)			23 (11)	
"higher" READLD-30 (≥13)		624 (75)		241 (39)	383 (61)			70 (11)	
Mean READLD-30 (SD)		15.5 (5.2)		15.7 (5.1)	15.3 (5.2)	0.2		15.3 (4.8)	0.8
General self-efficacy									
Mean GSEF-10 (SD)		33.4 (4.2)		33.5 (3.9)	33.4 (4.3)	0.7		33.3 (4.5)	0.7
Children's oral health						0.3			0.3
Excellent/Very good/Good		460 (97)		172 (37)	288 (63)			63 (14)	
Fair/Poor		13 (3)		3 (23)	10 (77)			3 (23)	
Follow-up time (months)		23.5 (4.3)		23.4 (4.9)	23.6 (3.9)	0.5		24.6 (3.4)	0.007

*estimates among participants with non-missing information in stratum; †corresponding to X^2 tests for categorical and Student's *t* tests for continuous variables

TABLE 1.2 Sociodemographic Characteristics of the Analytical Cohort of COHL Child-Caregiver Dyads (n = 831)

				No PB-POHS	Some PB-POHS (0-3)	Optimal PB-POHS (≥4)	
		n^* (col. %)		n^* (row %)	n^* (row %)	n^* (row %)	$P^\dagger$
Total		831 (100)		303 (36)	435 (52)	93 (11)	
Race							<0.005
White		322 (39)		145 (45)	149 (46)	28 (9)	
African American		340 (41)		117 (34)	177 (52)	46 (14)	
American Indian		161 (20)		37 (23)	105 (65)	19 (12)	
Caregiver's sex							0.3
Male		32 (4)		14 (44)	17 (53)	1 (3)	
Female		799 (96)		289 (36)	418 (52)	92 (12)	
Caregiver's age (tertiles; range)		mean (SD)					0.1
Q1 (18.0, 22.4)		20.4 (1.2)		91 (33)	184 (58)	23 (8)	
Q2 (22.4, 27.6)		24.8 (1.5)		102 (37)	130 (50)	39 (14)	
Q3 (27.6, 60.9)		34.2 (5.8)		110 (40)	121 (48)	31 (11)	
continuous		26.4 (6.8)		26.8 (6.6)	26.0 (6.6)	27.6 (7.8)	0.07
Child's age (months; at baseline interview)							0.1
0-11		487 (59)		174 (36)	268 (55)	45 (9)	
12-23		237 (29)		87 (37)	120 (51)	30 (13)	
24-29		107 (13)		42 (39)	47 (44)	18 (17)	
continuous		11.1 (9.0)		11.3 (9.0)	10.4 (8.9)	13.1 (8.9)	0.03
Education							0.8
<HS		196 (24)		67 (34)	110 (56)	19 (10)	

HS/GED		332 (40)		122 (37)	169 (51)	41 (12)	
Some college or higher		303 (36)		114 (38)	156 (51)	33 (11)	
Marital status							0.6
Single		572 (69)		199 (35)	307 (54)	66 (12)	
Married		193 (23)		76 (39)	96 (50)	21 (11)	
Divorced/separated/other		66 (8)		28 (42)	32 (48)	6 (9)	
Number of children							0.7
1		395 (48)		134 (34)	217 (55)	44 (11)	
2		248 (30)		92 (37)	128 (52)	28 (11)	
3		106 (13)		45 (42)	49 (46)	12 (11)	
≥4		80 (10)		32 (40)	39 (49)	9 (11)	
Health literacy							0.06
"low" REALD-30 (<13)		207 (25)		62 (30)	122 (59)	23 (11)	
"higher" REALD-30 (≥13)		624 (75)		241 (39)	313 (50)	70 (11)	
Mean REALD-30 (SD)		15.5 (5.2)		15.7 (5.1)	15.3 (5.3)	15.3 (4.8)	0.2
General self-efficacy							
Mean GSEF-10 (SD)		33.4 (4.2)		33.5 (3.9)	33.4 (4.3)	33.3 (4.5)	0.9
Children's oral health							0.5
Excellent/Very good/Good		460 (97)		172 (37)	225 (49)	63 (14)	
Fair/Poor		13 (3)		3 (23)	7 (54)	3 (23)	
Follow-up time (months)		23.5 (4.3)		23.4 (4.9)	23.4 (3.9)	24.6 (3.4)	0.03

*estimates among participants with non-missing information in stratum; †corresponding to X^2 tests for categorical and ANOVA for continuous variables

TABLE 2.1 County of residence and receipt of PB-POHS services among the analytical cohort of COHL child-caregiver dyads (n = 831)

				No PB-POHS	PB-POHS			4+ visits	
		n^* (column %)		n^* (row %)	n^* (row %)	$P^\dagger$		n^* (row %)	$P^\dagger$
Total		831 (100)		303 (36)	528 (64)			93 (11)	
County						<0.0005			<0.0005
Brunswick		17 (2)		3 (18)	14 (82)			7 (41)	
Buncombe		83 (10)		49 (59)	34 (41)			3 (4)	
Burke		79 (10)		24 (30)	55 (70)			9 (11)	
New Hanover		165 (20)		60 (34)	105 (64)			27 (16)	
Orange		78 (10)		50 (64)	28 (36)			1 (1)	
Robeson		239 (29)		46 (19)	193 (81)			26 (11)	
Wake		157 (19)		64 (41)	93 (59)			18 (11)	

*estimates among participants with non-missing information in stratum; †corresponding to X^2 test

TABLE 2.2 County of residence and receipt of PB-POHS services among the analytical cohort of COHL child-caregiver dyads (n = 831)

				No PB-POHS	Some PB-POHS (0-3)	Optimal PB-POHS (≥4)	
		n^* (col. %)		n^* (row %)	n^* (row %)	n^* (row %)	$P^\dagger$
Total		831 (100)		303 (36)	435 (52)	93 (11)	
County							<0.005
Brunswick		17 (2)		3 (18)	7 (41)	7 (41)	
Buncombe		83 (10)		49 (59)	31 (37)	3 (4)	
Burke		79 (10)		24 (30)	46 (58)	9 (11)	
New Hanover		165 (20)		60 (34)	78 (47)	27 (16)	
Orange		78 (10)		50 (64)	27 (35)	1 (1)	
Robeson		239 (29)		46 (19)	167 (70)	26 (11)	
Wake		157 (19)		64 (41)	75 (48)	18 (11)	

*estimates among participants with non-missing information in stratum; †corresponding to X^2 test

TABLE 3 Sociodemographic Characteristics of children who received only PB-POH (and no dental office-based) services during the study period (n = 338)

		Some PB-POHS (1-3 visits)		Optimal PB-POHS (≥4 visits)	
		*n** (col. %)		*n** (row %)	*P*†
Total		338 (100)		57 (17)	
Race					0.13
White		112 (34)		19 (17)	
African American		131 (39)		28 (21)	
American Indian		91 (27)		10 (11)	
Caregiver's sex					0.10
Male		13 (4)		0 (0)	
Female		325 (96)		57 (18)	
Caregiver's age (tertiles; range)		mean (SD)			0.08
Q1 (18.0, 21.7)		19.9 (1.0)		12 (11)	
Q2 (21.8, 26.6)		23.7 (1.4)		24 (21)	
Q3 (26.6, 60.9)		32.4 (5.5)		21 (19)	
continuous		25.3 (6.8)		26.9 (7.5)	0.03
Child's age (months; at baseline interview)					0.02
0-11		241 (71)		32 (13)	
12-23		74 (22)		18 (24)	
24-29		23 (7)		7 (30)	
continuous		8.4 (8.0)		13.1 (8.9)	0.002
Education					1.0
<HS		91 (27)		16 (18)	
HS/GED		136 (40)		23 (17)	

Some college or higher		111 (33)		18 (16)	
Marital status					0.58
Single		256 (76)		41 (12)	
Married		61 (18)		13 (11)	
Divorced/separated/other		21 (6)		3 (9)	
Number of children					0.84
1		182 (54)		29 (16)	
2		89 (26)		15 (17)	
3		36 (11)		8 (22)	
≥4		30 (9)		5 (17)	
Health literacy					0.26
"low" READL-30 (<13)		98 (29)		13 (13)	
"higher" READL-30 (≥13)		240 (71)		44 (18)	
Mean READL-30 (SD)		15.1 (5.3)		15.7 (4.8)	0.32
General self-efficacy					
Mean GSEF-10 (SD)		33.4 (4.2)		33.3 (4.5)	0.82
Children's oral health					0.74
Excellent/Very good/Good		148 (98)		37 (25)	
Fair/Poor		3 (2)		1 (33)	
Follow-up time (months)		23.1 (3.8)		24.5 (3.5)	0.003

*estimates among participants with non-missing information in stratum; †corresponding to X^2 tests for categorical and Student's *t* tests for continuous variables

TABLE 4 Predicted (marginal) probabilities of receiving any PB-POHS for strata of race and county of residence after multivariate logistic regression modeling adjusting for caregivers' race, county of residence, health literacy, and children's age and follow-up time.

		Pr (%)		95% CI
		Unadjusted	Adjusted	
Race				
White		55	61	55-66
African American		66	69	64-73
American Indian		77	60	49-71
County				
Brunswick		82	80	61-100
Buncombe		41	40	29-51
Burke		70	74	65-84
New Hanover		64	61	53-69
Orange		36	34	24-44
Robeson		81	84	79-90
Wake		59	52	43-61
Health literacy				
"Low"		70	67	61-74
"Higher"		61	63	60-67

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