Disparities in Primary Care Access for Infants: Implications for Medical Home Development for Infants

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Abstract: *Background:* Medical homes are proposed to provide a new standard of primary care that is comprehensive, family centered, and coordinated. Disparities in access to medical homes may affect healthcare outcomes among populations that include infants, children, and caregivers. This study examined disparities among pregnant mothers in a Midwestern state in the United States of America (USA) with regard to self-reported medical home access for their infants.

Method: Data from the 2004-2008 Oklahoma Pregnancy Risk Assessment Monitoring System (PRAMS), a population-based survey of maternal behaviors, were analyzed. Medical home access was determined by the respondents answering a question about whether their child had a personal doctor or nurse familiar with their medical history.

Results: A series of Cochran-Mantel-Haenszel Chi-Square (χ^2) tests revealed that medical home access differed significantly across race, marital status, education, age, income, insurance status of infant, and prenatal care transportation availability. Multiple logistic regression results showed that mothers who had education higher than a high school diploma, mothers with an annual household income of $50,000 or more and mothers whose infants had health insurance were more likely to report access to a medical home for their infant. Mothers with an annual income of less than $20,000 and no transportation were less likely to report access to a medical home.

Conclusion: Similar to other disparity research, our analyses highlighted that pregnant mothers with less education, less income, mothers without insurance for their infants, and pregnant mothers without transportation reported less access to a medical home. The present study indicates a need to continue to examine implications of medical home access for pregnant mothers.

Keywords: Maternal and infant health, disparities, medical home, PRAMS.

1. INTRODUCTION

In recent years, new standards for medical care of children have emphasized the establishment of a "medical home." In a medical home, a family physician or pediatrician is expected to establish rapport with a family and to deliver comprehensive, family centered primary care services [1]. Originally marketed for children with special health care needs, the medical home is theorized not only as a setting, but as a system of care that entails seven components: accessibility, continuity, comprehensiveness, family centeredness, coordination, compassion, and cultural effectiveness [2]. Research has aimed to clarify the meaning of a medical home and to support its effectiveness in healthcare. Overall, conclusions have highlighted that medical homes are more effective, less expensive, and accepted more genuinely by families than emergency room visits, walk-in clinics, urgent care clinics and other similar healthcare venues [2]. Medical homes have also been proposed as more effective in reducing disparities in prenatal care, specialty referrals, and stroke mortality across populations than other healthcare delivery options [3]. Furthermore, disparities in access and quality of medical care were smallest among adults who, though representing different racial and ethnic groups, both participated in a medical home and had health insurance [4]. Given this evidence, it is essential that all populations, including children, have equal access to a medical home.

Healthcare issues with children often begin during infancy. Furthermore, disparities in availability of primary care and access to prenatal care affect health outcomes among several populations including children and adults. Disparities in maternal health include, but are not limited to, more prevalent smoking in younger, less educated mothers, [5] poorer maternal dental care for African American and Hispanic mothers, and higher self-reported ratings of postpartum depression in Asian and Pacific Islander mothers when compared to white women in the United States of America (USA) [6]. Increasing reports of disparities related to health have led to recent studies emphasizing that sociodemo-

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graphic differences (e.g., socioeconomic status (SES), race/ethnicity, and gender) are too influential to be ignored in research [7-9]. Indeed, investigation across different social statuses is imperative to explore those factors' effects on access to care and infant health outcome.

It is noted that many initiatives have started in the USA to eliminate disparities and increase use of medical homes. The National Survey of Children's Health (NSCH) and the National Survey of Children with Special Health Care Needs (NS-CSHCN) are two population based surveys that assess medical home use in the USA. Findings have found that among children of all health statuses, half (44.0% to 57.5%) meet criteria for having a medical home. Results also documented that children with higher income families and of non-Hispanic White origin had higher access to a medical home [10]. Less research has been focused on medical home access of pregnant mothers. Of the research in the USA, North Carolina, Wisconsin and Texas launched programs between 2011–2013 implementing medical homes for pregnant mothers. But to date, research has not been found to examine the onset of medical home usage for children.

The purpose of the present study was to examine disparities among new mothers in a Midwestern state in the USA with regard to medical home access for their infants. Indeed, we were interested if trends already found in other surveys of medical home usage were also found in pregnant mothers. In addition, maternal variables (maternal race, age, education, marital status, household income, transportation and insurance coverage) were investigated to determine if they were associated with differential access to a medical home.

2. MATERIALS AND METHODS

A sample of 13.619 mothers with live births were administered the Pregnancy Risk Assessment Monitoring System (PRAMS) survey from 2004 to 2008 and 9,829 mothers responded for a response rate of 72.2%. PRAMS is an ongoing, population-based survey designed to collect information about maternal behaviors and experiences before, during, and after pregnancy. On a monthly basis, PRAMS samples between 200 and 250 recent mothers of live births between the ages of 8 weeks to 8 months from the state of Oklahoma within the United States of America (USA) live birth registry. Mothers are sent as many as three mail questionnaires seeking their participation, with follow-up phone interviews for non-respondents. A systematic stratified sampling design based on birth weights is used to yield sample sizes sufficient to generate population estimates for groups considered at risk for adverse pregnancy outcomes. The very low birth weight babies (less than 1500gm) are all sampled. The PRAMS dataset includes the questionnaire data and selected birth certificate information.

Data on the mother's race (White, African American, and American Indian), marital status (married or other), education (less than high school, high school diploma, more than high school), age (less than 20, 20–29, 30 years and older), income (increments ranging from $10,000 to over $50,000 annually), insurance coverage of infant, previous live births, and transportation availability for prenatal care (PNC) were used for this analysis. Survey respondents were considered to have medical home access if they responded "yes" to the following question from the PRAMS survey: *Do you have a doctor that you can get in contact with 24 hours a day, 7 days a week, who will take care of your baby for both sick and "well baby" care?*

Bivariate analyses of maternal characteristics and infant medical home access were conducted using Cochran Mantel–Haenzel Chi-Square test. Multiple logistic regression analysis helped determine effects of the mothers' socio–demographic characteristics on infants' medical home access. Adjusted odds ratios (OR) and 95% confidence intervals (CI) were calculated. Significance was assessed at $p < 0.05$. All analyses were performed using SAS–Callable SUDAAN.

3. RESULTS

Among the respondents in the 2004–2008 (N = 9.829) Oklahoma PRAMS, 76.1% of the mothers indicated access to a medical home for their infants. Table **1** displays the distribution of medical home access by maternal socio-demographic groups. Medical home access differed significantly across race, marital status, education, age, income, insurance status of infant, and prenatal care (PNC) transportation availability. Having previous live births was not significantly associated with access to a medical home.

Table 1: Medical Home Access by Maternal Characteristics, Oklahoma PRAMS, 2004–2008, N = 9.829

		Weighted Prevalence of Access to Medical Home	95% CI.
Race*	Caucasian	77.9%	76.2-79.4
	Black/African American	70.2%	64.5-75.4
	American Indian/Alaskan Native	69.3%	64.4-73.9
Marital Status*	Married	82.2%	80.5-83.7
	Other	66.8%	64.1-69.4
Education*	Greater than high school	86.9%	85.1-88.5
-At least 18 years of age	High school graduate	72.3%	69.8-74.7
	Less than high school graduate	58.0%	53.5-62.3
Age*	Less than 20 years of age	64.9%	69.0-69.5
	20–29 years	74.8%	72.9-76.6
	30 years of age or older	84.9%	82.4-87.1
Income*	Less than $10,000	62.0%	58.3-65.6
	$10,000 - $14,999	65.4%	60.3-70.2
	$15,000 - $19,999	68.3%	62.6-73.4
	$20,000 - $24,999	77.5%	72.3-81.7
	$25,000 - $34,999	78.4%	74.1-82.2
	$35,000 - $49,999	85.4%	81.5-88.9
	$50,000 or more	95.0%	93.3-96.3
Infant Health Insurance*	Has coverage	77.5%	76.0-79.0
	No coverage	57.7%	50.89-64.3
Previous Live Births	No other live births	76.3%	73.9-78.5
	Other live births	76.1%	74.2-78.0
Transportation to access PNC*	No transportation	55.1%	48.3-61.8
	Had transportation	78.3%	76.8-79.8

Note: * Indicates significant association at $p < 0.05$.

Table **2** presents the results of the multivariate logistic regression analysis. Mothers who had education beyond a high school diploma were 1.5 times (95% CI: 1.2–1.9) more likely to report access to a medical home compared to mothers who were high school graduates with no additional education. Mothers with an annual household income of $50,000 or more were 3.4 times (95% CI: 2.2–5.4) more likely to have access to a medical home for their infant compared to mothers earning between $20,000 and $24,999. Mothers with an annual income less than $20,000 (OR 0.6, 95% CI: 0.4–0.9) and mothers without transportation for accessing PNC (OR 0.6, 95% CI: 0.5–9.9) were less likely to report access to a medical home than mothers earning $20,000–$24,999 and mothers with transportation for PNC, respectively. Lastly, access to a medical home was 1.6 times higher among mothers whose infants had health insurance (95% CI: 1.1–2.3)

Table 2: Adjusted Odds Ratios from Multivariate Logistic Regression Modeling Medical Home Access, Oklahoma PRAMS, 2004–2008**

Variable	Adjusted Odds Ratio (OR)	95% Confidence Intervals
Race		
White	Reference	
Black/African American	1.0	(0.7-1.3)
American Indian/Alaskan Native	0.7	(0.5-1.0)
Marital Status		
Married	Reference	
Other	0.9	(0.7-1.1)
Education -at least 18 years of age		
Greater than high school *	1.5	(1.2-1.9)
High school graduate	Reference	
Less than high school	0.8	(0.6-1.0)
Age		
Less than 20 years	1.2	(0.9-1.5)
20-29 years	Reference	
30 years of age or older	0.9	(0.7-1.2)
Income		
Less than $10,000*	0.6	(0.4-0.8)
$10,000-14,999 *	0.5	(0.4-0.8)
$15,000-19,999 *	0.6	(0.4-0.9)
$20,000-24,999	Reference	
$25,000-34,999	0.9	(0.6-1.0)
$35,000-49,999	1.4	(0.9-2.1)
$50,000 or more*	3.4	(2.2-5.4)
Infant Health Insurance		
Has coverage *	1.6	(1.1-2.3)
No coverage	Reference	
Transportation to Access PNC		
No transportation*	0.6	(0.5-9.9)
Had transportation	Reference	

Note: *Notable odds ratio. **Odds ratios are adjusted for all variables in Table **2**.

compared to mothers without health insurance for their infant.

4. DISCUSSION

Similar to other surveys investigating medical home access in children, results from the present study highlighted that mothers with less education, less income, mothers without insurance for their infants, and mothers without transportation for prenatal care (PNC) were less likely to have access to a medical home for their infant. Race, marital status, and age did not alter the odds of reporting medical home access after adjustment of other factors.

Although access to a medical home has been found effective for reducing disparities, [3] the current findings indicated that pregnant or new mothers of lower SES status were not accessing a medical home equally. Strickland and colleagues (2011) discuss a another disparity finding in their study indicating that individuals with poorer health were less likely to report access to a medical home [13]. In another study, Hispanic and African American children (ages <18) were less likely to have an established medical home compared to non-Hispanic white children (ages <18) [13, 14].

Recently Fedele and colleagues [15] found that minority caregivers experienced more practical barriers

within their medical home for their children characterized by caregiver time spent off work, clinic wait time, and financial strains of healthcare.

Given the complexity of defining a medical home, discussion of national researching of medical home access is warranted. The operational definition of a medical home [2] is reported differently across different surveys and consequently across scholarly research. Much research in the USA has been dedicated to determining medical home measurement and usage for children [10]. Medical home was operationally defined for the current study using a single question from a population based maternal survey and is not directly comparable to the extensive definitional characteristics of a medical home that include seven components [2]. Additionally, the multi-dependent relationship among socio-economic factors, although critically imperative to take into account [7-9], creates an issue of analytical overlap and difficulty delineating specific socio-economic factors contributing more than others to disparities across medical home access.

Limitations specific to the current study also warrant discussion. The population based maternal survey in the current study measured only one component of a medical home: access to primary care from a single question. Data were collected from 2004 through 2008 surveys, prior to the implementation of medical home advances across the nation that included funded operations to measure medical home components, recruitment of mothers for medical home usage, and increased transportation availability for PNC [16]. Despite shortcomings, the current study contains strengths and ideas for future investigations that are noteworthy and are discussed below.

Having medical home access and insurance has been reported to reduce racial and ethnic health disparities in access and quality of medical care among adults [9]. The current study does indeed shed light on overlapping socio-economic factors by finding that race, marital status, and age were not associated with differences in medical home access for mothers but less income, less education, no insurance or transportation were associated with less medical home access. It is also noted that the current study measured medical home for pregnant mothers which is a step ahead of measuring medical home for children. The data from the present study can be used as a baseline for subsequent studies or projects to study longitudinal trends and create medical home initiatives from fetus to adolescence.

Continued efforts to quantify and measure proposed components of a medical home as it is experienced by the patient is another area for further study. Studies with more advanced assessment of the medical home, compared to the current study, still have been confounded by assessing family perceptions of a “comprehensive” or “compassionate” medical home [13].

Additionally, delineating which socio-economic factors for mothers for certain areas limit access to the medical home more than others would be helpful for specifying and creating interventions. Further analysis of the relationship between medical home access and insurance coverage, particularly among less educated, low income mothers for the above population would be warranted. In the current study, interventions aimed at recruiting less educated and poorer families seems justifiable when compared to focusing on race, age, or marital status. Action plans to inform these targeted mothers which transportation avenues to utilize or where to obtain and maintain insurance would initially allow them better chances at accessing a medical home. Conclusively, as efforts continue to improve healthcare, assessment of access to a medical home is critical for all populations, especially those with healthcare disparities.

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