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Diaper Need and Its Impact on Child Health

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Pediatrics; originally published online July 29, 2013;
DOI: 10.1542/peds.2013-0597

Diaper Need and Its Impact on Child Health

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KEY WORDS

diapers, infants, mental health, poverty

ABBREVIATIONS

CI—confidence interval
MOMS—Mental health Outreach for MotherS
OR—odds ratio
SNAP—Supplemental Nutrition Assistance Program
TANF—Temporary Assistance for Needy Families
UTI—urinary tract infection
WIC—Women, Infants, and Children

Dr Smith conceptualized and designed the study, drafted the initial manuscript, and approved the final manuscript as submitted; Ms Kruse conducted the analyses, reviewed and revised the manuscript, and approved the final manuscript as submitted; Dr Weir critically reviewed the manuscript, authored sections of the manuscript, and approved the final manuscript as submitted; and Ms Goldblum designed the data collection instruments, critically reviewed and edited the manuscript, and approved the final manuscript as submitted.

www.pediatrics.org/cgi/doi/10.1542/peds.2013-0597

doi:10.1542/peds.2013-0597

Accepted for publication May 21, 2013

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

FINANCIAL DISCLOSURE: *Ms Goldblum and Dr Weir are employees of the National Diaper Bank Network, which receives partial financial support from Kimberly Clark. Dr Smith is a board member of the National Diaper Bank Network, and Huggies/Kimberly Clark is a sponsor of that organization. Ms Kruse indicated she has no financial relationships relevant to this article to disclose.*

FUNDING: All phases of this study were supported by K12 DA031050 (M.V.S.) and the US Department of Health and Human Services, Office of Women's Health grant 1CCEWH111021 (M.V.S.). Funded by the National Institutes of Health (NIH).

WHAT'S KNOWN ON THIS SUBJECT: Although studies have examined family socioeconomic status as income and educational and employment status, emerging research suggests indicators of material hardship, such as diaper need, are increasingly important to child health. Diaper need has not been examined in the scientific literature.

WHAT THIS STUDY ADDS: This study quantifies diaper need, proposes a method to measure diaper need, and explores psychosocial and demographic variables associated with diaper need in a large sample of low-income families.

abstract

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BACKGROUND: This is the first peer-reviewed study to quantify diaper need, propose a method to measure diaper need, and explore psychosocial variables associated with diaper need in a large sample of urban, low-income families.

METHODS: Data were derived from a cross-sectional study in 877 pregnant and parenting women. Mothers completed surveys on topics related to mental health, basic needs, and health care use. Logistic regression was used to estimate the relationship between diaper need and psychosocial correlates.

RESULTS: Almost 30% of mothers reported diaper need. Hispanic women were significantly more likely to report diaper need than African American women (odds ratio [OR]: 1.96; 95% confidence interval [CI]: 1.51–3.33), and women ≥45 years of age were significantly more likely than women between the ages of 20 and 44 years to report diaper need (OR: 2.53; 95% CI: 1.21–5.28). Women who reported mental health need were significantly more likely than women who did not report mental health need to report diaper need (OR: 1.89; 95% CI: 1.16–3.09).

CONCLUSIONS: Although a majority of studies have examined family socioeconomic status as income and educational and employment status, emerging research suggests that indicators of material hardship are increasingly important to child health. This study supports this premise with the suggestion that an adequate supply of diapers may prove a tangible way of reducing parenting stress, a critical factor influencing child health and development. There is potential for pediatric providers to inquire about diaper need and refer families to a local diaper distribution service as 1 method to reduce parenting stress. *Pediatrics* 2013;132:253–259

Twenty-one percent of children in the United States live in "poverty" using the federal government's official measure of poverty, a rate that has increased annually since 2006.[1,2] There is robust evidence that financial hardship is consistently associated with negative outcomes in the domains of health and academic achievement for children, with more pernicious and persistent effects demonstrated among younger children.[3–5] Sustained poverty in the form of income and material hardship (food insecurity, residential instability) has significant negative effects on children's developmental outcomes, with extant research articulating the role parenting quality plays in mediating the effects of poverty on child outcomes, particularly at early ages.[3,4,6–9] Although a majority of studies examine family socioeconomic status as income and educational and employment status, emerging research suggests that material hardship is increasingly important in family studies.[9,10]

The current US system of antipoverty programs and polices has served to reduce poverty, yet the child poverty rate remains persistently high. Current federal antipoverty programs targeting families take many forms including the following: Temporary Assistance for Needy Families (TANF; targeted voucher programs as well as cash assistance), the Supplemental Nutrition Assistance Program (SNAP; food stamps); and the Women, Infants, and Children program (WIC; nutrition supplements for pregnant women and young children). Although results are not conclusive and depend on study methodology, several programs demonstrate moderate impact on short-term and longer-term family economic stability and child health and developmental outcomes.[11–15]

Notably absent from the antipoverty efforts targeting families is an essential staple for the health of children, diapers. Diapers are a necessity for every infant, yet diapers are not allowable expenses for SNAP or WIC. Additionally, the majority of early child care programs require an adequate supply of diapers for child attendance, but, with the exception of Early Head Start, do not provide diapers to families in need. An adequate supply of diapers costs an average of $18 per week, or $936 per year, per child (J.G., written correspondence, April 2012).[16] A single mother working full time at the federal minimum wage of $7.25 makes $15 080 annually; thus, the cost of diapers represents >6% of her gross pay.

Families unable to afford an adequate supply of diapers may provide less frequent diaper changes to their child in an attempt to maximize their supply of diapers. In addition to the more obvious links between the failure to provide adequate diaper changes and diaper dermatitis and urinary tract infections (UTIs),[16,17] there are other potential associations between diaper need and parenting stress. Specific domains of parenting quality such as parental stress levels and depressive symptoms have been implicated as key mediators in the poverty and child outcome pathway.[18–21] Parents experiencing poverty in the form of income and material hardship, for example in the form of diaper need, are subject to increased parenting stress.[9,10,22–25] Children whose parents manifest high levels of stress or depression are at greater risk of social, emotional, and behavioral problems.[22,25–30]

Given the inextricable links between diapers and child health and potential links between diapers and parental mental health, there is value in quantifying diaper need and in understanding its associated characteristics. The aims of this study are to examine (1) the percentage of low-income mothers reporting diaper need in a large, urban cohort and (2) the demographic and psychosocial correlates associated with diaper need among these mothers. This study is unique in its examination of the prevalence of diaper need and the factors that are associated with diaper need among a large cohort of urban, low-income families.

METHODS

Overview

Data were derived from a large cross-sectional study of pregnant and parenting women in an urban, Northeast city between November 2010 and September 2012 with the primary aims of assessing the mental health needs of low-income African American and Hispanic pregnant and parenting women. Women were recruited through direct, in-person outreach by trained research assistants. For this study, women were interviewed in person at a single time point. This study was part of a larger community-based participatory research partnership, the New Haven Mental health Outreach for MotherS (MOMS) Partnership, a community-academic partnership between Yale University and 7 local and state agencies.

Recruitment

Bilingual (Spanish-English) trained research assistants, themselves mothers living in New Haven, consecutively recruited women across the city. The goals of the study were to target women and mothers who may be outside of the usual clinical systems of care. Thus, in addition to recruiting pregnant and parenting women through obstetric, pediatric, and primary care providers and community health centers, systematic efforts to conduct outreach evenly across neighborhoods in the city and at places where families live (public housing), learn (schools, early childhood learning centers, adult education centers), interact (bus stops, hair and beauty salons, grocery stores, churches, libraries), and play (playgrounds, parks, fairs) were undertaken. Research

assistants familiar with local neighborhoods, trained in participant engagement and outreach, and hired for their familiarity with local culture approached potential participants at the aforementioned locations and requested the participant's time to complete the survey. All research assistants used standard, scripted language.

Inclusion/Exclusion Criteria

Women were eligible to participate if they were at least 18 years of age; lived in the city of New Haven; were pregnant, parenting, or had primary custody of a child under the age of 18 years; and were willing to provide written informed consent. Women were ineligible if they did not speak English or Spanish. Women could only complete the interview process once. This study was approved by the Yale University institutional review board and institutional review boards of participating agencies on the MOMS Partnership.

Assessment Procedures

Trained research staff administered the structured survey to women. The majority of needs assessments were completed by women as self-report (70%); however, research assistants read the questionnaires to women who either requested it or who demonstrated difficulty reading or interpreting the questions. Research assistants obtained informed written consent from all participating mothers. Mothers were compensated with $10 gift cards for their time.

Quality Control

Research assistant training included a minimum of 1.5 days of didactics, the completion of at least 5 practice surveys, and a minimum of 5 supervised surveys before becoming eligible to conduct independent outreach and administration. Research assistants were supervised on an ongoing basis, and quality control was performed on a subset of 10% of the surveys.

Exposure and Outcome Measures

The survey asked women questions about their mental health; substance use; trauma histories; basic needs such as food, housing, and diapers; health care and social service use; and basic demographics. Diaper need was assessed with the question, "If you have children in diapers, do you ever feel that you do not have enough diapers to change them as often as you would like?" Women who responded "yes" were then asked what they do when they do not have enough diapers. Response choices included the following: (1) borrow diapers or money from family or friends, (2) get diapers from an agency, (3) stretch the diapers I have, and (4) other "please explain." Women could select as many responses as they deemed appropriate.

Women who responded "yes," they did not have enough diapers to change their children as often as they would like, and/or indicated they used $\geq$1 of the above methods to obtain diapers, were considered to report diaper need. Women who responded "no," they feel they do have enough diapers to change their children as often as they would like, and did not indicate that they use any of the above methods to obtain diapers were considered to report no diaper need.

A variable for mental health need was created as a composite of 3 separate items from the survey. Mental health need was defined on the basis of ratings given to the following statements: "I have the skills to manage/control my stress," "Managing my sadness or depression is …," and "Coping with the traumatic things that have happened to me is …". The first statement was rated on a scale from 1 to 10 with 1 indicating "No, not really" and 10 indicating "Yes, excellent stress management." The remaining 2 statements were rated on a scale from 1 to 10 with 1 indicating "Hard for me" and 10 indicating "Easy, no problem." Women who responded with a rating of 1 to 4 on $\geq$1 of these items were considered to report mental health need. Women who responded with a rating of 5 to 10 on all of these items were considered to report no mental health need.

Health care and social service use for women and their children was assessed by 3 separate survey items. Pertaining to children's use we asked, "Do you feel your child(ren) have a doctor or other health care provider who knows him or her?" Pertaining to a mother's own use of health care we asked, "Have you seen a health care provider in the past year?" and "Have you ever received treatment for stress, sadness/depression, or anxiety?" Response options included yes or no. Demographic factors captured through the survey included self-reported race, age, primary language, and the number of children under 18 years living with the woman in her home.

Statistical Procedures

Diaper need was the outcome of interest. Clinical and demographic predictors of interest included the number of children under 18 years living with the woman, age, race, primary language, mental health need, use of mental health treatment, a visit with a health care provider in the past year, and the woman's report of a pediatric provider whom she felt knew her child well. Bivariate analyses were conducted by using χ^2, Fisher's exact, or the 1-sample binomial test to explore the association between diaper need and the clinical and demographic variables of interest. Variables from the bivariate analyses that were significant at $P < .10$ and variables that had theoretical plausibility were included in the multivariable logistic regression model.

Primary language and receipt of mental illness treatment were excluded from the model due to multicollinearity with race and emotional health need. The final multivariable logistic regression model contained race/ethnicity, the number of children under 18 years living with the woman, age, and mental health need. Odds ratios (ORs) and 95% confidence intervals (CIs) were estimated for this model. All analyses were performed by using SAS version 9.3 (SAS Institute, Cary, NC).

Participant characteristics are presented as means (SD) for continuous variables and as percentages for categorical variables. Logistic regression models were fit for statistical significance, which was determined at the α = .05 level.

RESULTS

Descriptive characteristics for the sample (N = 877) appear in Table 1. The majority of women surveyed were African American (56.4%) or Hispanic (29.4%). Close to 15% (14.7%; n = 129) of women spoke Spanish as their primary language, with the remainder speaking English. Most women were between the ages of 20 and 44 years (65.8%) with a mean age of 36.2 years (SD = 11.0). The majority of women had 2 to 3 children under the age of 18 years living with them (45.6%), with a mean of 2.1 children (SD = 1.2).

Mental Health and Health Service Use

Thirty percent of women (31.7%; n = 278) reported mental health need. With respect to service use, 30% of women had seen a mental health clinician in the past year (n = 269) and 31% (n = 276) had seen a general health care provider in the past year. We examined whether the women who reported mental health need were also the women engaged in mental health treatment. Only 10% (n = 28) of the women reporting mental health need reported attendance at mental health treatment in the past year. The majority of women felt that their child (or children) has a doctor who knows him or her well (77.3%; n = 678).

TABLE 1 Participant Characteristics

Variable	n (%)
Race	
African American	495 (56.4)
Hispanic	258 (29.4)
White	80 (9.1)
Number of children <18 years living with mother	
1	284 (32.4)
2–3	400 (45.6)
≥4	76 (8.7)
Age	
20–44 years	577 (65.8)
≥45 years	182 (20.8)
Primary language	
English	739 (84.3)
Spanish	129 (14.7)
Diaper need	
Yes	241 (27.5)
No	209 (23.8)
Emotional health need	
Yes	278 (31.7)
No	495 (56.4)
Received treatment of stress, sadness, or anxiety	
Yes	269 (30.7)
No	569 (64.9)
Health care provider visit in past year	
Yes	276 (31.5)
No	22 (2.5)
Child(ren) has a doctor who knows him/her well	
Yes	678 (77.3)
No	124 (14.1)

N = 877. Percentages may not sum to 100% due to rounding and missing values.

Diaper Need

Close to 30% of women reported diaper need (27.5%; n = 241). Of the women who reported lacking an adequate supply of diapers, 10% (n = 88) reported that they received additional diapers from an agency, 10% (n = 86) reported that they borrow diapers or money from family or friends, and 3% (n = 29) reported using some other method to obtain enough diapers such as seeking the assistance of a church. Almost 8% of women (n = 64) reported that they stretch the diapers they have when their supply is running short.

Psychosocial and Demographic Variables Associated With Diaper Need

Bivariate analyses are presented in Table 2. Bivariate analyses revealed that being Hispanic and Spanish speaking were associated with diaper need (P = .02 for both). Age was also related to diaper need, such that being ≥45 years of age (our proxy for grandparents raising grandchildren) was associated with diaper need (P = .02). Additionally, reporting mental health need and having received treatment of a mental illness were significantly associated with diaper need (P = .01 and P = .002, respectively).

Results from the multivariable logistic regression model are shown in Table 3. In the logistic model, Hispanic women were significantly more likely to report diaper need than African American women (OR: 1.96; 95% CI: 1.51–3.33), and women ≥45 years of age were significantly more likely than women between the ages of 20 and 44 years to report diaper need (OR: 2.53; 95% CI: 1.21–5.28). Specific to maternal mental health, women who reported mental health need were significantly more likely than women who did not report mental health need to also report diaper need (OR: 1.89; 95% CI: 1.16–3.09). There was a trend toward significance such that white women were more likely to report diaper need than African American women (OR: 2.27; 95% CI: 0.92–5.58) and women with 2 to 3 children under 18 years living with them more were more likely to report diaper need than women with 1 children under 18 years living with them (OR: 1.68; 95% CI: 0.96–2.95).

DISCUSSION

To our knowledge this is the first peer-reviewed research study to examine diaper need and its associated maternal

TABLE 2 Demographic and Psychosocial Correlates of Diaper Need in a Community Sample of Low-Income Pregnant and Parenting Women

Variable	Diaper Need Reported, *n* (%)	No Diaper Need Reported, *n* (%)	*P*[a]
Race			.02
African American	125 (53.4)	131 (65.8)	
Hispanic	82 (35.0)	55 (27.6)	
White	27 (11.5)	13 (6.5)	
Number of children <18 years living with mother			.20
1	57 (27.0)	61 (32.8)	
2–3	128 (60.7)	96 (51.6)	
≥4	26 (12.3)	29 (15.6)	
Age			.02
20–44 years	151 (78.2)	161 (87.5)	
≥45 years	42 (21.8)	23 (12.5)	
Primary language			.02
English	191 (79.9)	182 (87.9)	
Spanish	48 (20.1)	25 (12.1)	
Emotional health need			.01
Yes	94 (60.7)	61 (39.4)	
Received treatment of stress, sadness, or anxiety			.002
Yes	92 (62.6)	55 (37.4)	
Health care provider visit in past year			.93
Yes	73 (50.7)	71 (49.3)	
Child(ren) has a doctor who knows him/her well			.10
Yes	195 (54.5)	163 (45.5)	

N = 877. Percentages may not sum to 100% due to rounding.
[a] *P* value for χ^2, Fisher's exact, or 1-sample binomial test.

characteristics. The finding that close to 30% of mothers reported diaper need and that the need may be particularly acute for grandparents raising grandchildren and for Hispanic women needs to be confirmed in additional samples but has several implications. First, the majority of children (77%) in our sample had a consistent relationship with a pediatric provider. Thus, there is potential for pediatric providers to inquire about diaper need as a risk factor for not only child health but also caregiver mental health. Pediatricians could become familiar with diaper banks in their local area and refer families in need. Currently, there are >100 diaper banks in the country and a national organization established to provide technical assistance with creating diaper banks in every region of the United States. Our finding that Hispanic mothers reported higher levels of diaper need than African American mothers is similar to other national studies on material hardship in which Hispanic populations report greater food insecurity and housing instability than African American and white populations.[31,32]

Second, our findings could have potential ramifications for federal antipoverty programs. For example, TANF assistance is often tied to attendance at work or training programs, but families without diapers may be unable to obtain child care (because families are required to provide diapers as a condition of child care at many facilities), potentially affecting the parents' attendance at work or training. Likewise, federal and state child care subsidies are often dependent on the child's attendance at child care. If the child care center requires diapers but does not provide them, the child without sufficient diapers may be refused admittance to the child care center and lose the subsidy intended to increase access to child care for low-income families. Diaper need has been found in 1 industry-sponsored study to limit parental activities such as attendance at school and work and limit a child's attendance at child care centers.[33] Future studies should examine the link between diaper need and child care attendance.

Third, 8% of families reported stretching diapers, a practice associated with UTIs and diaper dermatitis. Diaper dermatitis and UTIs in young children are responsible for numerous pediatric office and emergency department visits per year.[16,34,35] Thus, diaper need has a direct link to child health and health care use because the number of office and emergency department visits for diaper dermatitis could potentially be reduced with an adequate supply of diapers.

Fourth, specific to maternal mental health, diaper need was more likely to occur among mothers who also endorsed some form of mental health need. This finding may be due to 3 mechanisms: (1) diaper need may be associated with other exposures related to a mother's psychological well-being (eg, low income, social isolation), (2) diaper need and maternal mental health may have common causes (eg, children's health/mental health status), and (3) diaper need may

TABLE 3 Predictors of Diaper Need in a Community Sample of Low-Income Pregnant and Parenting Women

Variable	OR (95% CI)	*P*
Race		
African American (reference)	1.00	—
Hispanic	1.96 (1.51–3.33)	.01
White	2.27 (0.92–5.58)	.07
Number of children <18 years living with mother		
1 (reference)	1.00	—
2–3	1.68 (0.96–2.95)	.07
≥4	1.44 (0.67–3.09)	NS
Age		
20–44 years (reference)	1.00	—
≥45 years	2.53 (1.21–5.28)	.01
Emotional health need		
Yes	1.89 (1.16–3.09)	.01
No (reference)	1.00	—

N = 292. NS, not significant; —, data not applicable.

independently predict maternal psychological and behavioral well-being.

Although more research on this topic could help to elucidate the exact mechanisms whereby diaper need affects maternal mental health, we know that maternal stress and depression are significant contributors to child development and mediate the relationship between poverty and child outcomes.[22,25–28] An adequate supply of diapers may prove to be a tangible way of reducing parenting stress and increasing parenting sense of competency, enabling parents to be more sensitive with their children, and thereby improving parenting quality and overall child outcomes.

Fifth, diaper need is a construct worth future scientific investigation. The definition of and method to assess diaper need presented herein are the result of decades of clinical and policy experience with low-income families. Thus, our method of assessing diaper need could easily be replicated by other researchers in future investigations to help increase understanding of diaper need on a national level and among different subpopulations (eg, grandparents raising grandchildren).

Limitations of our study include the fact that we could not assess diaper need in teen parents, a population likely to be at significant risk. The cross-sectional nature of our study means that the associations presented herein are not causal in nature. Additionally, mental health status was not assessed with a diagnostic instrument. However, the percentage of mothers endorsing mental health need is equivalent to that found in other similar low-income populations of women.[11] Our estimates of the relationship of diaper need and maternal mental health status are likely to be underestimates because more mothers may have had mental distress than reported needing help for their distress. Finally, our measure of diaper need has not been validated; however, it was developed with expert input and several (n = 46) pilot tests of its face validity and acceptability to our target population of low-income mothers.

CONCLUSIONS

The results from this study provide evidence of the substantial prevalence of diaper need in low-income families. This study calls attention to the fact that an insufficient supply of diapers is not only a risk factor for poor infant and child health but also for maternal mental health, potentially diminishing maternal sense of competence and increasing maternal stress, which ultimately leads to potential negative impacts on child health and development. For families who are financially struggling, health care professionals and researchers should recognize not only food and housing but also diapers as basic needs.

ACKNOWLEDGMENTS

We thank Dr Alice Forrester, Ms Janice Currier-Ezchiek, Dr Karen Dubois-Walton, Ms Maria Damiani, Rev Kenn Harris, Ms Natasha Rivera-LaButhie, Ms Cerella Craig, Ms Heather Howell, Ms Jessica Sager, Ms Janet Alfano, and Ms Kia Levey.

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Diaper Need and Its Impact on Child Health

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Pediatrics; originally published online July 29, 2013;
DOI: 10.1542/peds.2013-0597