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Facilitators and Barriers to Access to Pediatric Medical Services in a Community Hospital

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Abstract

Background: Missed medical appointments decrease continuity of medical care, waste resources, and may affect health outcomes. We examined the factors associated with missed children's supervision visits in Eastern Brooklyn, NY, USA. **Methods:** We surveyed guardians whose children received routine medical care at four pediatric clinics. Participants filled out a questionnaire that queried: demographics, food security, recent relocation, parental support of healthy behaviors, and length of knowing provider. Preexisting disease(s) and missed visits were retrieved from medical records. Regression analyses were used to determine factors that were associated with missing medical appointments. **Results:** Among 213 families, 33% faced food insecurity and 16.4% reported moving within the past 12 months. Forty percent of children missed at least 1 visit. Food insecurity (adjusted odds ratio [aOR] 2.3, 95% confidence interval [CI] 1.0% to 5.2%) and recent relocation (aOR 1.8, 95% CI 1.1-3.4) were associated with missed health supervision visits, whereas greater parental healthy behaviors (aOR 0.5, 95% CI 0.3-0.9) and longer length of knowing provider (aOR 0.8, 95% CI 0.7-1.0) were associated with fewer missed appointments. **Conclusion:** This study indicates that social inequity may contribute to poor adherence to medical appointments through multiple mechanisms, including food insecurity, lack of social stability, and parental health behaviors. Multidimensional proactive prevention, and reactive tolerance should be considered as opportunities to mitigate the impact of social inequity on health outcomes.

Keywords

missed medical appointment, food security, unstable housing, parental behavior

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Introduction

Missed medical appointments decrease continuity of medical care, adversely affect practice efficiency, and can harm quality of care.¹⁻³ In the pediatric population, adherence to health supervision appointments is particularly important as it is an opportunity for the physician to assess a child's developmental milestones, nutrition safety and immunization administration, and to provide health education. Therefore, the American Academy of Pediatrics (AAP) suggests children to visit their primary care providers periodically to ensure healthy development.⁴ Furthermore, missed health supervision visits is associated with a variety of subsequent poor health outcomes, including increased health care costs,⁵ emergency room visits,⁶ and hospitalizations.⁷

Physicians can find it challenging to manage pediatric health problems where social inequity may be contributing

factor, and this is further complicated by the variable role of parents and social support services as caretakers and protectors. Trying to manage children with health problems can be complicated by missed surveillance or follow-up visits. Attending surveillance visits is an indication of parental commitment to their child's health and provides health providers with an opportunity to effectively implement primary and secondary prevention. There are few studies assessing adherence to health supervision visits in the general

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pediatric population, especially in underserved areas.⁸ Potentially if we better understand the factors contributing to missing surveillance visits, we could introduce proactive measures to improve the process care. The purpose of this study is to identify facilitators and barriers associated with missed pediatric supervision visits.

Methods

Setting

Brookdale Hospital and Medical Center is a community hospital that serves Eastern Brooklyn, New York, an area with high rates of poverty, crime and substance use.⁹ The clinic consists of four ambulatory clinics. There are 275 000 of annual visits to outpatient clinics and 100 000 visits to the emergency room, 30% of these visits are for a patient who is 19 years or younger.¹⁰ In our community, half of the patients are covered by Medicaid as their primary insurance. The prevalence of asthma, obesity, and infant mortality are exceptionally high in some neighborhoods.¹⁰ A pilot study of our electronic medical record (EMR) review, indicated a high rate of missed medical appointments (up to 40%), 2 times higher than ambulatory clinics in other communities.¹⁰⁻¹²

Sample

This cross-sectional study surveyed parents/guardians of patients who received routine medical care at 4 Brookdale Hospital Medical Center's pediatric ambulatory clinics (from June 2017 to February 2018). Eligibility criteria were (1) child aged 18 years old or younger who was brought by parents/guardians to the clinics; (2) established patients are those who commit to choose physician at Brookdale Hospital Medical Center as primary physician; (3) parents/guardians who are English or Spanish speaking; and (4) parents/guardians who provided informed consent to participate in the study. Two authors (QS and FC) approached the eligible participants in clinic. This study was approved by Brookdale University Hospital and Medical Center's Institutional Review Board.

Procedures and Measures

Participants were asked to fill out a questionnaire if they consented to the study. Interpreter services was provided (by FC) for Spanish-speaking participants.

Sociodemographic Variables. Parents/guardians were asked to fill out a questionnaire, which included sociodemographic factors: child's age (years), gender (male vs female), caregiver's age (years), whether caregiver was born in the USA (yes vs no), and single parent (yes vs no). Socioeconomic factors: caregiver's education level (completed high

school vs did not complete high school), employment status (employed vs unemployed), household income (yearly before taxes and deductions), and health insurance coverage (yes vs no).

Food Security and Relocation. Food security status in the past 12 months was measured by 2 items from the US Household Food Security Scale Module¹³: "Are you and other household members worried that food would run out before you got money to buy more?" and "Are you and other household members not able to afford to eat balanced meals?" Food insecurity was determined by either question answered "often true" or "sometimes true."^{14,15} Recent relocation was determined by if the family moved within the past 12 months ("Did you move in the past 12 months?").

Reasons for Missed Medical Appointments. Parents/guardians were asked whether their child(ren) missed a medical appointment, without notifying the clinic, in the past 12 months. If they answered "yes," parents/guardians would be asked to answer the most important reason for missing the appointment (ie, forgot the appointment, unable to take time off, lack of transportation, unexpected weather, lack of insurance coverage, unexpected emergency, long waiting time, etc). Whether they missed a medical appointment or not, parents/guardians were asked to list measures that would help them attend their medical appointments (ie, reminder call, access to transportation, doctor's note for attending appointment, etc).

Parental Support for Healthy Behaviors. A 4-item questionnaire was developed according to AAP guidelines¹⁶⁻¹⁸ to evaluate caregiver's health behaviors. ("Do you think children should receive the flu vaccine?" "Do you think children should drink fewer sugary soft drinks?" "Do you think children should be involved with at least 60 minutes of moderate to vigorous physical activity a day?" "Do you think children should brush their teeth as early as when the first tooth comes out?") Parents/caregivers were determined to have support for healthy behaviors if they answered "yes" to all four health behavior questions.

Geographic Convenience. Since our 4 ambulatory clinics are located at the center of the borough, geographic convenience was defined as having matching zip codes for the patient's home address and assigned clinic.

Comorbidity. Chronic medical conditions were identified through EMR review, as defined by ICD-10 (International Classification of Diseases, 10th Revision) codes.

Nonadherence to Health Supervision Visits. Nonadherence to health supervision visits was defined as at least one missed preventive pediatric health care appointment in the past 12 months, as recommended by the AAP Bright Futures

Table 1. Demographic of Caregivers and Their Children (N = 268).

Variables	Total (N = 268)	Missed Appointment (n = 106), n (%)	Adherence to Appointment (n = 162), n (%)
Child age, y, mean (SD)	7.61 (5.20)	6.81 (5.01)	8.13 (5.28)*
Caregiver			
Age (<40 y)	189 (70.5)	74 (39.2)	115 (60.8)
Born outside America	103 (38.4)	37 (35.9)	66 (64.1)
Single parent	106 (39.6)	43 (40.6)	63 (59.4)
Unemployed	116 (43.4)	43 (37.1)	73 (62.9)
Household income (<\$20 000)	150 (56.0)	60 (40.0)	90 (60.0)
Education (high school or less)	179 (66.8)	68 (38.0)	111 (62.0)
Healthy behavior	115 (42.9)	32 (27.8)	83 (72.3)*
Moved in past 12 months	44 (16.4)	27 (61.4)	17 (38.6)*
Food insecurity	89 (33.2)	42 (47.2)	47 (52.8)*
Geographically convenience (same zip code)	159 (59.3)	67 (42.1)	92 (57.9)
Child with comorbidity	132 (49.3)	45 (34.1)	87 (65.9)
Length of knowing your doctor			
<1 y	61 (22.7)	36 (59.0)	25 (41.0)*
1-3 y	43 (16.0)	19 (44.2)	24 (55.8)
4-5 y	16 (6.0)	6 (37.6)	10 (62.5)
6-10 y	60 (22.3)	22 (36.7)	38 (63.3)
≥11 y	88 (32.8)	23 (26.1)	65 (73.9)*

* $P < .05$ intragroup.

Guidelines.¹⁹ The missed appointment information was retrieved through EMR review.

Statistical Analysis

Difference between children who missed one or more appointment versus those who adhered to all appointments within the past 12 months were compared through Student *t* test or chi-square on social determinants of health, food security, recent relocation, geographic convenience, length of knowing provider, and comorbidity. Variables that were associated ($P < .20$) with nonadherence to health supervision visits in bivariable logistic regression models were considered as covariates for multivariable analyses. A final multiple logistic regression analysis was done to identify the factors associated with nonadherence when controlling for confounders.

Results

In our sample of 213 families with 268 children, the average age was 7.6 ± 5.2 years. Two-thirds of these children were brought in by parents/guardians younger than 40 years. Forty percent of caregivers reported they were single parents, unemployed, and born outside the USA. Half of the children had at least 1 preexisting disease, the most common being asthma (25.3%), followed by obesity (14.9%). One-third (33.2%) faced food insecurity and 16.4% reported they had moved within the past 12 months. Forty percent of

children missed at least 1 health supervision visit. The most common reasons for missing their medical appointments were forgetting the appointment (40.3%), not being able to take time off from work (27.0%), transportation not available (8.5%), and loss of insurance coverage (8.1%). Three measures reported by participants, which can increase adherence to visits, were reminder calls (61.2%), available transportation (23%), and less waiting time (19%). Children whose parents supported healthy behaviors were less likely to miss their medical appointments (30.2% vs 51.2%, $P < .01$). Length of knowing their healthcare provider, particularly more than 10 years, also reduced the risk of missing appointment (26.1% vs 46.1%, $P < .01$; (Table 1). Results from the multiple logistic regression analysis suggested food insecurity (adjusted odds ratio [aOR] 2.3, 95% CI 1.0% to 5.3%) and recent relocation (aOR 1.9, 95% CI 1.1-3.4) were associated with missed health supervision visits, whereas parental support for healthy behaviors (aOR 0.5, 95% CI 0.3-0.9) and length of knowing provider (aOR 0.8, 95% CI 0.7-1.0) were protective from missing appointment (Table 2).

Discussion

We found that 40% of our participants missed at least 1 health supervision visit. Poverty-related stressors such as food insecurity and recent relocation were associated with missed medical appointments. On the other hand, an established physician-parent relationship and parental support for

Table 2. Univariate and Multivariate Modeling of Predictors to Missing Medical Appointment.

	Univariate, OR (95% CI)	P	Multivariate, aOR (95% CI)	P
Child age	0.95 (0.91-0.99)	.04*	0.98 (0.92-1.04)	.50
Caregiver				
Age (<40 y)	1.06 (0.61-1.81)	.84		
Born outside America	0.86 (0.52-1.42)	.55		
Single parent	1.07 (0.65-1.77)	.78		
Unemployed	0.83 (0.51-1.37)	.47		
Income less than \$20 000	1.04 (0.64-1.71)	.87		
Education (high school or less)	0.82 (0.49-1.38)	.46		
Healthy behavior	0.41 (0.27-0.69)	<.01*	0.50 (0.29-0.91)	.02*
Moved in past 12 months	2.92 (1.50-5.67)	.002*	1.88 (1.05-3.35)	.03*
Food insecurity	1.77 (1.04-3.02)	.04*	2.33 (1.04-5.25)	.04*
Geographical convenience	0.77 (0.46-1.26)	.30		
Child with comorbidity	0.64 (0.39-1.04)	.07	0.76 (0.42-1.38)	.36
Length of knowing doctor (≥ 11 y vs others)	0.73 (0.62-0.85)	<.01*	0.79 (0.65-0.97)	.02*

Abbreviations: OR, odds ratio; aOR, adjusted odds ratio.

* $P < .05$.

healthy behaviors was protective against missing medical appointments. Other factors such as caregiver's employment status, education level, birthplace, geographic convenience, and child's preexisting comorbidities were not associated with adherence to health supervision visits. Parents reported that forgetting the appointment were the most important factors that contributed to these missing visits and suggested that reminder call can be one of solutions that would have reduced their likelihood of missing appointments.

Since health supervision visits serve as an opportunity to evaluate a child's growth, provide parental guidance, and administer immunizations when the child is healthy, parents may not be aware of their importance if their physicians do not inform them of their purposes. In a study focusing on premature infants, 57% of participants missed at least 1 health supervision visit from ages 1 to 18 months,⁸ which is higher than our sample. For our study, we only sampled children who went to our ambulatory clinics and did not quantify the number of missed medical appointments within the past 12 months per child; therefore, the actual missing appointment rate may be underestimated.

Our study found that children from households that experienced food insecurity were twice as likely to miss their health supervision appointments. Similar findings were found in people living with HIV and diabetes who face food insecurity. These populations have been found to be less likely to adhere to medication regimens and medical appointments, and this has been associated with suboptimal health outcomes.^{20,21}

Parents are more likely to bring children to the clinic for acute infections or injuries rather than for immunizations because the benefits of preventive care may not be immediately visible.²² For families that struggle to meet the basic

necessities (eg, food, housing, clothes, and others), parents may be more reluctant to bring their children to health supervision visits if they have to take time off from work, lose wages, arrange transportation (which is difficult to access) and wait extra hours to see their doctor. These assumptions are supported by our findings. Interestingly, an apparently more direct measure of poverty, that is, household income, was not a significant predictor to nonadherence. This may be due to the fact that gross household income may not reflect financial stress as much as food insecurity since food insecurity is defined as limited availability of nutritionally adequate and safe foods.²³ Household income does not consider competing financial demands (high rent or other financial obligations) or alternative sources of income (preexisting financial resources, not employment sources of income). Therefore, the food insecurity question may more directly identify families where financial resources are insufficient to allow them to confidently provide healthy food for their families.

Frequent relocation can have detrimental effects on children. Children need a stable and supportive environment to access family, friends, school, and their neighborhood. Geographic familiarity and local social supports can be important neighborhood benefits. Relocations cut the ties to their community and services, causing extra time to find a health care provider and interrupting the continuity of care. This ongoing instability or lack of consistent care also puts children at risk for developing health problems, social-emotional problems, and behavior disorders.^{24,25} Our findings suggest that children who moved in the past 12 months are twice as likely to miss supervision visits when compared to children who live in a stable housing environment. Since our question would have included people who moved

within the same neighborhood or to a different neighborhood, it is possible that we underestimated the impact of moving outside of a familiar neighborhood.

Plausible explanations for missed appointments are gaps in children's health insurance,²⁶ inability of parents to take a leave in a new job, lack of social support for transportation, or the unavailability of a trustable caregiver. Moving homes or jobs can accentuate these barriers.

It is not surprising that forty percent of participants reported that forgetting their appointment was the major reason for not showing up, and 60% thought a reminder call would help them attend the appointment. Our findings are consistent with a UK study from Neal et al,²⁷ which showed that 40% of participants who missed their primary care appointments stated that it was because they forgot their appointment. It is also possible that patients say they forget an appointment when the underlying reason is competing demands, and life stressors that have caused them to be more forgetful. For example, a study in adults found that patients felt less obligated to keep appointments because they felt disrespected by the health care system, and did not understand the scheduling system.²⁸ Although our quantitative data could not explore the reasons why patients forget appointments, the improvements in health systems such as reminder calls, increased appointment availability and schedule flexibility could reduce missed appointments. However, the underlying reasons why some families forget appointments may need further exploration.

This was further illustrated by our finding that a stronger and more trusting physician-patient relationship was protective against missing health supervision visits. We found a linear association between years of knowing the health-care provider and fewer missing appointments, especially if they have known their provider for 11 years or more. A study by Samuels et al²² found that frequent changes of the child's primary care provider was associated with higher no-show rates. Therefore, the longer physician-parent relationship probably reflects the parents' trust in the physician for advice, which in turn fosters adherence.²⁹

Parents play an important role in promoting their child's well-being. We developed 4 health behavior questions recommended by the AAP to evaluate whether parents supported healthy behaviors. We found that parents who support healthy behaviors are twice as likely to adhere to preventive care visits compared with those who do not. These parents may already have positive health beliefs and are motivated to bring their children for nonemergency check-ups to achieve better health outcomes. On the other hand, healthcare providers need to explain the importance of health supervision visits and encourage parents to engage in conversation for adherence to occur.³⁰

Our findings should be interpreted by considering the following limitations. First, participants were recruited

when they presented in ambulatory clinics, which inherently excludes families who are not attending medical care at all. This leads to unavoidable selection bias as our participants may have better health behaviors and fewer rates of missed medical appointments to begin with. Second, our analyses were based on self-reported surveys, which are more likely to overestimate adherence to health care.³¹ Third, we are not able to establish a temporal association between adherence to supervision visits due to the cross-sectional design of the study. Fourth, we used zip code as a measure of geographic convenience, which is inherently imprecise, and results in error and estimation of actual geographic distance or functional geographic accessibility since the ease of access and the clinic may depend on distance and proximity to public transportation. Last, but not least, community and neighborhood-level factors such as accessibility of transportation, average waiting time for visits were not considered into model.

Despite the limitations discussed above, our results show that the prevalence of missed supervision visits is high in underserved populations, and that socially disadvantaged children and families are more affected. This is alarming as previous research has linked non-adherence with various adverse health outcomes such as increased emergency room utilization and hospitalizations.^{6,7} Investments to identify and engage appropriate stakeholders to improve show rates, adherence, and patient experience will reduce future public health care expenditures.

Conclusion

Food security and recent relocation are risk factors for non-adherence to health supervision appointments whereas parental support for healthy behaviors and length of knowing provider are protective against nonadherence. Promptly identifying families that face food and housing challenges, educating children/parents on the importance of a healthy lifestyle, and establishing an ongoing trusted physician-patient relationship may reduce the rate of nonadherence to surveillance visits, with the goal of improving health outcomes.

Author Contributions

Dr Shi conceived of research idea and designed the study. Dr Shi acquired the data, and conducted the analysis. Dr Castillo was involved in acquisition of the data. Dr Shi drafted the first version of manuscript. Drs MacDermid, Viswanathan, and Kupferman revised the manuscript critically for important intellectual content. All authors approved the final version of the manuscript.

Declaration of Conflicting Interests

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