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Individual and Practice Characteristics Associated with Physician Provision of Recommended Care for Children with Special Health Care Needs

Dennis Z. Kuo, MD, MHS[†], **James M. Robbins, PhD**[†], **Katherine H. Burns, MD**[#], and **Patrick H. Casey, MD**[†]

[†]Center for Applied Research and Evaluation, Department of Pediatrics, University of Arkansas for Medical Sciences, Little Rock, AR

[#]Section on Developmental/Behavioral Pediatrics, Department of Pediatrics, University of Arkansas for Medical Sciences, Little Rock, AR

Abstract

Objective—To examine physician and practice characteristics associated with recommended care practices for children with special health care needs (CSHCN).

Methods—Survey of primary care physicians (PCPs) in Arkansas with a Medicaid caseload of ≥100 children. Predictor variables included physician specialty field, demographics, practice type, and % patients with public insurance. Multivariate regression analyses described predictors associated with recommended care practices informed by literature.

Results—Of 565 mailed surveys, 203 (36%) were returned. Solo/2 person practice was associated with recommended care practices, including written care plan (AOR 9.67, 95% CI 2.61, 35.8), providing extra time (AOR 3.52, 95% CI 1.47, 8.43), and providing community referrals (AOR 3.05, 95% CI 1.33, 7.02). Female gender was associated with extra time (AOR 2.26, 95% CI 1.07, 4.78) and providing community referrals (AOR 2.83, 95% CI 1.30, 6.18).

Conclusion—Future studies should examine characteristics of smaller practices that drive implementation of recommended care practices.

Keywords

medical home; primary care; children with special health care needs

Introduction

According to the Maternal and Child Health Bureau (MCHB), children with special health care needs (CSHCN) are those children who “have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally.”[1] Approximately 12–18% of children in the United States have special needs.[2] CSHCN are disproportionately poorer and socially disadvantaged, have additional barriers to health care access, and are at higher risk for adverse psychosocial outcomes.[3, 4] Families describe poor

Send correspondence to: Dennis Z. Kuo, MD, MHS, Arkansas Children’s Hospital, Pediatrics/CARE Slot 512-26, 1 Children’s Way, Little Rock, AR, 72202, tel (501) 364-3380, dzkuo@uams.edu.

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access to pediatric subspecialty and mental health providers, a confusing system of care, and multiple unmet service needs.[5–9]

Specific care practices such as a patient registry, a written care plan, and extra time for appointments have been recommended to improve care for CSHCN.[10] Many such recommendations are found in the medical home concept that defines comprehensive, coordinated, and family-centered care, ideally provided by a primary care physician.[11] Studies are supportive of medical homes improving care processes and reducing health care use for CSHCN.[12, 13] However, in the 2005–06 National Survey of Children with Special Health Care Needs (NS-CSHCN), only one-half of families reported receiving care consistent with all aspects of a medical home,[14] suggesting recommended care practices are not routinely being delivered. Noted barriers include a lack of time and inadequate compensation for primary care physicians.[15]

Primary care physicians vary by age, background, field of training, practice size, and location. A prior study found that subspecialty referral decisions are influenced by variations within patient, physician, and health care structural characteristics.[16] Such variation may similarly account for differences in delivery of recommended care practices for CSHCN. To our knowledge, no prior study has examined the relationship between physician and practice characteristics with provision of recommended care practices for CSHCN. Understanding the individual and structural characteristics associated with provision of recommended care could help physicians appropriately tailor such care and improve medical homes for CSHCN.

The objectives of this study were to examine characteristics of physicians and practices associated with recommended care practices for CSHCN. Our survey utilized a statewide sample of pediatricians and family physicians. Based on prior literature,[17, 18] we hypothesized that pediatricians, and physicians of any primary care specialty who worked in larger practices, would be more likely to provide recommended care practices for CSHCN.

Methods

The study is a mailed, paper cross-sectional survey of primary care physicians of children in the state of Arkansas.

Survey Instrument

The survey content was informed by prior literature describing recommended care practices for children with special health care needs.[11, 15] The survey introduction asked respondents to consider the MCHB definition of CSHCN when answering questions. Specific survey questions were informed by the Access to Care questions on the NS-CSHCN and the New England SERVE Provider Survey, which evaluates satisfaction of providers providing care for CSHCN in managed care settings.[15] All respondents were asked to provide physician characteristics, including gender, race/ethnicity, field of practice (pediatrics versus family practice), year graduated from medical school, and work status (full-time versus part-time); and practice characteristics, including practice setting (solo/2 person, group, multispecialty), number of children 0–21 years seen per week (grouped by ≤19, 20–50, and ≥51), and percentage of children in their practice insured by Medicaid. These variables were defined as covariates that may be associated with variation within delivery of recommended care practices.

Outcome variables were categorized into three groups: medical complexity of patients seen, recommended care practices for CSHCN, and willingness to increase the number of CSHCN seen. Respondents described the medical complexity of their patients seen by estimating the

number of patients they personally cared for with a tracheostomy; home oxygen; a feeding tube; requiring Synagis (palivizumab) in the last 12 months; or followed by ≥2 subspecialists. These characteristics have been previously described in children with complex medical needs, requiring particularly high levels of service and expertise.[19–21] The number of children within each subgroup of complexity was categorized by 0, 1–4, 5–9, or ≥10 patients. Specific recommended care practices included (1) providing a written care plan, (2) providing extra time for CSHCN, (3) providing referral to community resources, (4) satisfied with time provided for CSHCN care, (5) keeping a patient registry of CSHCN. The care practices questions, also adapted from New England SERVE, were both scored on a 5 point Likert scale and dichotomized as always/usually versus sometimes/rarely/never; the latter is presented for ease of reporting. Finally, survey respondents were asked how many CSHCN they personally provided primary care for (0, 1–50, 51–100, ≥101) and whether they would be willing to increase the number of CSHCN they saw. Survey respondents were asked to provide open comments on the barriers to providing good care for CSHCN that they perceived.

Prior to mailing, the survey was piloted through the Arkansas Children's Hospital Physician Services office with four community pediatricians for legibility, readability, and acceptance. Feedback resulted in revisions requesting conciseness, which reduced the survey instrument to four pages, 38 questions (two open response), and approximately 1,000 words, as shorter surveys are associated with higher response rates.[22]

Procedure

The study population included all primary care physicians in Arkansas, defined as those physicians who had a primary care caseload of ≥100 Medicaid beneficiaries. The rationale for this strategy was to identify all physicians who provided primary care for children, while excluding physicians, particularly pediatricians, who were primarily subspecialists. The methodology was adapted from an unpublished report on provision of mental health services for children in Arkansas that sampled a cutoff of ≥300 Medicaid beneficiaries, resulting in 430 eligible physicians. Using a lower cutoff of ≥100 Medicaid beneficiaries resulted in 565 eligible physicians.

The survey was mailed to eligible physicians with a cover letter signed by the primary investigator and the president of the Arkansas Chapter of the American Academy of Pediatrics. The survey was mailed to each recipient four times over a period of two months using a modified Dillman approach.[23] The window of survey return was closed a month after the last mailing. All surveys were completed anonymously and analyzed in the aggregate without identifiers. No additional surveys were received after the window was closed. A small monetary incentive of $1 has been shown to increase response rates in surveys of pediatricians, thus a $1 bill was included with the first mailing.[24] The study was approved by the IRB at the University of Arkansas for Medical Sciences.

Analysis

Survey demographics were reported as descriptive variables. For reporting, non-white race/ethnicity respondents were combined into a common category because of a low number of responses in each individual category. Sensitivity analyses found identical findings for African-American and Asian-American groups individually compared to reporting all non-white respondents combined. The two main predictor variables were field of practice (pediatrics/family practice) and size of group (solo, group, or multispecialty/other). Respondents who did not report pediatrics or family practice as field of practice were dropped from analyses due to low numbers (n=5, or 2.4% of sample). Bivariate outcomes were examined by chi-square. Multivariate logistic regression examined the association of

all previously noted physician and practice characteristics with medical complexity of patients seen, recommended care practices for CSHCN, and willingness to increase CSHCN care. All analyses were performed using Stata 10.1.

Results

Of 565 surveys mailed to eligible physicians, 220 surveys were returned, of which 203 were fully completed and able to be analyzed, for a complete response rate of 35%.

Physician and practice characteristics

The characteristics of the survey respondents are found in Table 1. Among physician characteristics, the overwhelming majority of respondents (82%) were white/non-hispanic; of the 35 non-white/non-hispanic respondents, 14 were African-American/non-hispanic, 13 were Asian/Pacific Islander, 3 were Hispanic, and 5 responded “other”. About half of respondents were family physicians and half were pediatricians. The average year of medical school graduation was 1989 (range 1947–2008). Most respondents (90%) practiced full time. Among practice characteristics, 37% of respondents reported practicing in a solo/2 person practice and 51.2% in a single-specialty group practice with ≥3 physicians. Half (55%) of respondents saw at least 51 children age 0–21 years per week. A mean of 49.6% (sd 24.3) of children were covered by Medicaid.

Recommended Care Practices

Almost all respondents reported they cared for at least one child with special needs, with 21.8% of respondents reporting that they personally cared for ≥ 51 CSHCN. The association of practice field (pediatrician and family practice) and practice setting with medical complexity of patients seen, recommended care practices, and willingness to see more CSHCN are presented in Table 2. Pediatricians were more likely to care for higher numbers of CSHCN than family practitioners (35.8% versus 5.9%, p<.001). Pediatricians were significantly more likely to report seeing children with medical complexity in all survey categories. No such differences were found by practice type. Of all respondents, 30.2% had at least one child with a tracheostomy, 57.0% had at least one child with home oxygen, 72.9% had at least one child with a G tube, and 68.7% had at least one child who received palivizumab in the last year. Most respondents reported they had at least ten children who saw at least 2 specialists in the past year, with pediatricians being significantly more likely to report having such children (94.9% versus 51.0%, p<.001).

Of recommended care practices for CSHCN, 15.4% of respondents reported they always/usually offered a written care plan; 45.3% reported routinely scheduling extra time for CSHCN; 32.6% reported being satisfied with available time for CSHCN care; and 57.7% reported referring to community resources. Eleven respondents out of 202 (5.5%) reported keeping a registry of CSHCN. Pediatricians were more likely to provide extra time, but family physicians were more likely to be satisfied with the time available. Physicians working in solo/2 person practices were more likely to provide a written care plan. Physicians in solo/2 person practices and multispecialty/other practices were also more likely to be satisfied with available time compared to physicians in single-specialty larger practices.

Multivariate analysis

The results of multivariate analysis of physician and practice characteristics associated with patient population complexity, recommended care practices, and willingness to see more CSHCN are presented in Table 3. Female gender was associated with providing extra time (AOR 2.26, 95% CI 1.07, 4.78) and providing community referrals (AOR 2.83, 95% CI

1.30, 6.18). White/non-Hispanic physician ethnicity was associated with greater likelihood of a written care plan, scheduling extra time, and referral to community resources. Younger physicians, specifically those who graduated from medical school between 1980–89 (AOR . 16, 95% CI .05, .50) and 1990–99 (AOR .16; 95% CI .05, .47), were less likely to be satisfied with time available for CSHCN, compared to respondents graduating before 1980. Practicing in a solo/2 person practice was associated with having a written care plan (AOR 9.67, 95% CI 2.61, 35.8), providing extra time (AOR 3.52, 95% CI 1.47, 8.43), and providing community referrals (AOR 3.05, 95% CI 1.33, 7.02). No association was seen for any predictor variable with a CSHCN registry (data not shown). The only characteristic associated with a willingness to see more CSHCN was having ≥51% of children with public insurance (AOR 2.81, 95% CI 1.24, 6.37).

Open responses

Providers described multiple challenges to caring for CSHCN, including time, reimbursement, and system complexity. One respondent wrote, “Burden of paperwork – forms, etc – are the biggest impediment to care for special needs children – not the medical issues themselves.” A second respondent reported “Time is the key. Reimbursement is low so if you spend the time you need you have to see fewer total patients.” One positive comment came from a respondent who wrote, “Our care improved greatly with our hiring a full time case manager - she expedites, coordinates, reports to agencies, knows weird services - don’t know how anyone does these kids without someone like her.”

Discussion

In contrast to our hypothesis, we found that physicians in smaller practices were more likely to report delivering recommended practices for CSHCN. Female physicians and white/non-Hispanic physicians were more likely to deliver certain recommended care practices, and younger physicians tended to be less satisfied with available time to care for CSHCN. Half of respondents reported routinely referring to community resources and just under half reported routinely scheduling extra time for CSHCN, but less than one-third was satisfied with available time to care for CSHCN. Few respondents routinely offer a written care plan, and about one in twenty keep a registry of their children with special needs, indicating significant room for improving care delivery and medical homes for CSHCN.

The association of recommended care practices with practice size was surprising, as we had hypothesized that financial and resource advantages of larger practices would enable physicians to provide the extra time and resources that CSHCN typically require. We are not aware of prior studies examining care practices for CSHCN by a general sampling of child health providers. Literature focusing primarily on adult health providers has been supportive of larger practice size. Forrest et al reported that practitioners in solo or small group practice were less likely to make a subspecialty referral.[16] Ketcham found that adult patients treated by solo practitioners were less likely to appropriately order angioplasty after an acute myocardial infarction,[17] and Friedberg et al found that larger practices were more likely to have the capacity to establish the quality measures in accordance with the Patient-Centered Medical Home.[18] Many of these quality measures, however, depend on resources such as electronic health records that may be more accessible to larger practices due to upfront costs.

Families of CSHCN report their biggest challenges are difficulty with health care system navigation, information needs, and linking with community resources.[25, 26] Addressing family needs entails a family-centered approach to care, which may also be associated with improved health outcomes for CSHCN.[27] Smaller practices may more readily offer the continuity, familiarity, and flexibility that encourage partnership and family-centered care. Given the trend of increasing practice size,[28] we suggest that larger practices should pay

close attention to addressing such family needs while patient volume and service demands increase, such as continuity of care and scheduling flexibility. We note one open response that reported the benefits of a full-time case manager that helped the practice with system navigation.

We found that family physicians, compared to pediatricians, were less likely to schedule extra time for CSHCN. Interestingly, more family physician respondents reported being satisfied with available time for CSHCN, although this was not significant in multivariate analysis. Nationally, one-fourth of childhood non-surgical health care visits are to family physicians,[29] While pediatricians were more likely to see CSHCN, significant proportions of family physician respondents saw children with medical complexity. Many rural communities rely heavily on family physicians for primary care, and interventions to improve care for CSHCN must address the needs and capacity of family physician practices that may see a lower number of children.

The association of female gender with extra time and community referrals is intriguing. Female physicians may be more likely to provide more preventive services and psychosocial counseling.[30] While gender is non-mutable, awareness of family needs and knowledge of typical provider practice patterns could influence resident training. The association of race/ethnicity with recommended care practices was surprising, but the study was not designed to examine physicians of specific race/ethnic groups, and the individual subgroups are small in number, preventing us from drawing meaningful conclusions. The proportion of non-white/non-Hispanic respondents is consistent with Arkansas demographics (24%, according to 2008 U.S. Census estimates). Future studies should examine this potential association more closely by oversampling physicians of non-white, non-Hispanic race/ethnicity.

Less than one-third of our respondents were satisfied with the available time for CSHCN, and only a third of our respondents reported a willingness to see more CSHCN. Providers with a patient panel of children predominantly on public insurance were more likely to report a willingness to see more CSHCN. This finding may reflect providers who work in settings with high-risk families, or in communities where the provider respondent is the only practice available. We did not examine the location of the physician respondent, as doing so would potentially break the anonymity of the survey given the relatively small sample size. However, our finding are cause for concern with trends indicating an increasing burden of chronic care management within child health. Further research should examine more closely the characteristics of physician practices that are favorable to the care of CSHCN; the resultant knowledge should inform policies that support all physicians to successfully care for CSHCN.

There are several strengths to this study. Notably, we included a broad sample of physicians across a single state, including both family practice physicians as well as pediatricians. The sampling strategy thus allowed includes a broad cross-section of physicians instead of sampling self-selected physicians, an issue encountered in some prior studies.[15, 31] Study limitations include a sampling strategy limited to one state, which may not be nationally generalizable. The response rate, accounting for completed surveys, was 35%. Physician survey response rates are typically low[32] and our response rate is consistent with reports of mailed surveys of similar length.[22] We do not know the field of practice distribution of eligible study participants; membership rosters of the state chapters of the American Academy of Pediatrics and Academy of Family Physicians show a predominance of family physicians in Arkansas. A selection bias towards inclusion of more pediatricians may weigh our findings towards those who see more CSHCN, potentially raising the number of respondents who do not want to take on a higher CSHCN caseload. However, the low proportion of recommended care practices remains striking. Our study results are by recall

and not externally validated. As with any cross-section study, no causality or mechanism is implied.

Conclusion

Smaller practices are more likely to provide recommended care practices for CSHCN. Providers with a patient population that is predominantly publicly insured are more likely to report a willingness to increase patient volume. Future studies should examine specific characteristics of smaller practices that drive implementation of recommended care practices for CSHCN, and how such characteristics can be adopted by larger practices.

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Table 1

Physician and practice characteristics of survey respondents.

	n=203	%
Physician Characteristics		
Gender		
Male	135	66.5
Female	68	33.5
Race/ethnicity		
White/non-hispanic	164	82.4
Other	35	17.6
Field		
Pediatrician	99	48.8
Family Practice	99	48.8
Other	5	2.4
Year graduated medical school		
≤1979	44	21.7
1980–89	51	25.1
1990–99	64	31.5
≥2000	44	21.7
Work status		
Full-time	183	90.2
Part-time, <40 hours/week	20	9.9
Practice Characteristics		
Practice setting		
Solo/2 person	75	37.0
Group	104	51.2
Multispecialty/other	24	11.8
# Children seen per week		
≥51	110	55.0
20–50	58	29.0
≤19	32	16.0
% Children who are on public insurance		
≥51%	112	55.2
≤50%	91	44.8

Table 2

Association of physician field and practice type with medical complexity of patients seen, recommended care practices for CSHCN, and willingness to increase the number of CSHCN seen.

	Peds, % (n=99)	FP, % (n=99)	Solo, % (n=75)	Group, % (n=104)	Multispecialty/Other, % (n=24)
Complexity of patient seen					
≥1 pt with trach	**48.5**	**12.2**	21.6	31.7	50.0
≥1 pt with G tube	**78.8**	**34.5**	50.0	60.6	62.5
≥1 patient with O2	**74.0**	**20.4**	40.9	53.5	45.8
≥10 pts see >2 specialist	**94.9**	**51.0**	67.1	76.5	75.0
≥1 pt with synagis	**96.9**	**38.5**	61.6	72.3	69.6
Recommended Care Practices					
Has written care plan	13.3	16.3	**29.2**	**6.0**	**13.0**
Provides extra time	**60.2**	**29.7**	52.0	39.6	50.0
Satisfied with time	**21.4**	**44.4**	**40.0**	**24.8**	**45.5**
Provides community referrals	63.3	51.7	66.2	52.5	54.6
Willing to increase					
See ≥51 CYSHCN	**35.8**	**5.9**	18.9	21.9	30.4
Willing to increase	34.5	29.7	47.7	22.6	31.8

Bold: p<.05 for pediatrics versus FP and group size by chi-square;

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Table 3

Multivariate analysis of provider and practice characteristics associated with recommended care practices and willingness to see more CSHCN (n=198).

	Written care plan	Extra time	Satisfied with time	Community referrals	≥51 CSHCN	Willing to increase
Physician Characteristics						
Gender						
Male	Ref	Ref	Ref	Ref	Ref	Ref
Female	1.76 (.57, 5.46)	**2.26 (1.07, 4.78)**	1.04 (.45, 2.39)	**2.83 (1.30, 6.18)**	2.74 (.95, 7.90)	1.49 (.66, 3.37)
Race/ethnicity						
White/non-hispanic	Ref	Ref	Ref	Ref	Ref	Ref
Other	**.03 (0, .39)**	**.26 (.09, .74)**	.60 (.20, 1.84)	**.16 (.06, .46)**	**.03 (0, .23)**	1.28 (.45, 3.62)
Field						
Pediatrician	Ref	Ref	Ref	Ref	Ref	Ref
Family Physician	.33 (.06, 1.94)	**.21 (.06, .72)**	2.00 (.61, 6.53)	.45 (.15, 1.36)	**.10 (.02, .56)**	1.10 (.33, 3.61)
Year graduated						
≤1979	Ref	Ref	Ref	Ref	Ref	Ref
1980–89	4.38 (.96, 20.0)	.59 (.22, 1.63)	**.16 (.05, .50)**	.72 (.27, 1.91)	2.02 (.50, 8.12)	**.22 (.07, .73)**
1990–99	.84 (.18, 3.92)	.84 (.32, 2.19)	**.16 (.05, .47)**	.92 (.35, 2.41)	.66 (.17, 2.55)	.69 (.26, 1.87)
≥2000	.79 (.14, 4.34)	.39 (.13, 1.15)	.48 (.16, 1.43)	.88 (.31, 2.53)	.68 (.16, 2.89)	.61 (.20, 1.84)
Work status						
Full-time	Ref	Ref	Ref	Ref	Ref	Ref
Part-time	3.72(.80, 17.3)	2.26 (.67, 7.67)	.45 (.10, 2.07)	.49 (.16, 1.55)	.33 (.08, 1.47)	.48 (.12, 1.97)
Practice Characteristics						
Practice setting						
Solo/2 person	**9.67 (2.61, 35.8)**	**3.52 (1.47, 8.43)**	1.94 (.81, 4.61)	**3.05 (1.33, 7.02)**	1.15 (.33, 3.94)	1.72 (.73, 4.09)
Group	Ref	Ref	Ref	Ref	Ref	Ref
Multispecialty/other	1.76 (.36, 8.59)	1.75 (.60, 5.12)	**5.02 (1.58, 15.9)**	1.21 (.42, 3.47)	.93 (.24, 3.60)	1.76 (.56, 5.60)
# Children seen per week						
≥51	Ref	Ref	Ref	Ref	Ref	Ref
20–50	1.83 (.31, 11.0)	1.27 (.38, 4.27)	1.40 (.44, 4.38)	.84 (.28, 2.57)	.36 (.06, 2.18)	.84 (.26, 2.65)
≤19	2.29 (.29. 18.3)	1.16 (.27, 5.06)	3.70 (.95, 14.5)	1.00 (.27, 3.71)	.35 (.03, 4.23)	.38 (.08, 1.77)
% Children on public insurance						

	Written care plan	Extra time	Satisfied with time	Community referrals	≥51 CSHCN	Willing to increase
≥51%	2.01 (.63, 6.42)	.81 (.36, 1.80)	.77 (.33, 1.80)	1.05 (.49, 2.24)	**4.17 (1.34, 13.0)**	**2.81 (1.24, 6.37)**
≤50%	Ref	Ref	Ref	Ref	Ref	Ref

All results presented as adjusted odds ratios (95% CI). Analyses adjusted for gender, race/ethnicity, practice field, year graduated medical school, work status, practice setting, number of children seen per week, and % children on public insurance.