Screening and Referral for Low-Income Families' Social Determinants of Health by US Pediatricians

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Abstract

Objective: To measure the frequency US pediatricians report screening and referring for social needs and identify pediatrician and practice-level predictors for screening and referral.

Methods: Data were from the American Academy of Pediatrics Periodic Survey for October 2014 to March 2015 with a response rate of 46.6% (732/1570). Respondents reported on: 1) routine screening of low-income families for social needs, 2) attitudes toward screening, and 3) referral of low-income families for community resources. Results were analyzed by pediatrician and practice characteristics.

Results: Although most pediatricians (61.6%) thought that screening is important, fewer (39.9%) reported that screening is feasible or felt prepared addressing families' social needs (20.2%). The topics that pediatricians reported routinely asking low-income families about at visits (defined as ≥50% visits) were need for childcare (41.5%) and transportation barriers (28.4%). Pediatricians were less likely to report asking about housing (18.7%), food (18.6%), and utilities/heating (14.0%) insecurity. In multivariable analyses, pediatricians were more likely to report both that they screen and refer when they reported having more patients in financial hardship and having someone in the practice with the responsibility to connect low-income families to community services. Pediatricians who endorsed the importance of screening and who reported being prepared were also more likely to screen/refer.

Conclusions: A minority of pediatricians report routinely screening for social needs. Pediatricians were more likely to report that they screen and refer if they had positive attitudes toward the importance of screening, felt prepared, and had support staff to assist families in need.

Keywords: food insecurity; low-income; pediatrician; screening; social determinants of health

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What's New

This study found that most US pediatricians believe it is important to screen for social needs; however, fewer routinely screen. Positive attitudes towards the importance and preparedness for screening and having available staff were associated with higher rates of screening/referral.

Screening and referral for social determinants of health (SDoH) recently has garnered much attention in the medical community.[1] SDoH is defined by the World Health Organization as the conditions in which people are born, grow, work, live, and age.[2] The World Health Organization states that these circumstances are "shaped by the distribution of money, power and resources at global, national and local levels" and are a key driver for health inequities.[2] In 2016, the American Academy of Pediatrics (AAP) became the first medical organization to recommend screening for SDoH at routine visits in their policy statement, *Poverty and Child Health*.[3]

A recent commentary recommends making a clearer distinction between the terms *SDoH*, which encompasses more broader "upstream" social, economic, and political forces, and *social needs*, which are the "downstream" manifestations of SDoH on the individual level. The authors believe that screening and referral interventions delivered within medical care addresses patients' social needs but not the broader SDoH.[4] To be consistent with this evolving terminology in this nascent field, we hereafter use the term social needs (except when referencing the AAP SDoH screening recommendations).

Given children's vulnerability and frequent exposure to poverty,[5,6] it is fitting that the field of pediatrics has a long and distinguished history of encouraging pediatricians to address their patients' adverse social circumstances.[7-9] However, despite the fact that currently almost 2 in 5 children live in or near poverty conditions,[10] the frequency that

pediatricians screen (ie, for this study defined as a pediatrician inquiring about unmet social needs with patients' caregivers) and refer low-income families in need to resources remains unknown. The objectives of this study were to measure the rate at which US pediatricians reported screening for various social needs (eg, food, housing) and to identify which characteristics of pediatricians and their practices were associated with greater rates of reported screening and referral. Because these data were collected before the AAP's 2016 policy statement recommending screening for SDoH, this study constitutes a baseline assessment for pediatrician screening and referral practice for families' social needs.

METHODS

DATA

Since 1987, the AAP Periodic Survey has conducted more than 100 surveys of AAP-member pediatricians concerning their attitudes and experiences with a variety of pediatric topics.[11-13] In 2014 to 2015, the survey included items on screening and referral to community resources for various social needs. The survey also collected pediatrician personal and practice characteristics. The 8-page survey was sent to 1570 randomly selected non-retired US AAP members from October 2014 to March 2015. Up to 7 mailed contacts that included a cover letter, survey questionnaire, and business reply envelope were made to non-respondents. Non-respondents also were emailed twice with a link to complete the survey electronically. The initial mailing included a flyer describing the Periodic Survey and a $2 bill as a token of appreciation.

The social needs questions were based on a tool used in a previous study of pediatric residents[14] and were further refined in collaboration with the AAP Poverty and Child Health Leadership Workgroup. The questions were pilot tested with 37 pediatricians, and items were modified based on the feedback received. Four survey areas were analyzed in this paper: 1) characteristics of pediatricians, their practices, and the patients they serve, 2) pediatrician attitudes toward screening for social needs, 3) pediatrician reported practices for screening social needs, and 4) reported frequency of pediatricians' referrals for community resources.

MEASURES

PEDIATRICIANS' PERSONAL AND PRACTICE CHARACTERISTICS

Pediatrician characteristics included age, sex, and underrepresented minority status. Several dimensions of practice were measured. General pediatrics was self-defined as working 50% or more in general pediatrics. Practice location was assessed by asking if the primary practice locations were inner city, urban area (non−inner city), suburban, or rural. Practice type was categorized as group practice/health maintenance organization, solo/2-physician practice, or hospital/clinic/medical school. Practice region was defined using US Census regions (Northeast, Midwest, South, or West). Pediatricians were also asked "What proportion of children in your practice would you estimate to be in families who have financial hardship?" and patient economic hardship was dichotomized into those practices reporting that greater than or equal to 50% of the patients they served experienced economic hardship and those reporting that less than 50% of patients did so. Respondents also reported if there was someone in their practice with the responsibility to connect low-income families with services in the community for which they qualify, with response categories of yes, no, and unsure. The categories no and unsure were combined for analyses.

PEDIATRICIANS' PRACTICES FOR SOCIAL NEEDS SCREENING

Respondents were asked "How often do you routinely ask low-income parents about the following": need for childcare, transportation barriers, food insecurity, housing insecurity, and utilities/heating insecurity. Response options were almost always (≥75% of visits), usually (50%−74% of visits), sometimes (25%−49% of visits), and almost never (<25% of visits). For some analyses, responses were dichotomized to reflect routine screening (almost always and usually vs sometimes and almost never).[14] An overall screening scale also was created. One point was given for each of the 5 screening topics for which pediatricians almost always or usually screen. Thus, the possible scores ranged from 0 to 5 for the overall screening scale. We also reported the percentage of pediatricians who screened for any of the needs. Of note, data on screening by other practice staff (eg, nurses, medical assistants) were not collected in the survey.

PEDIATRICIANS' ATTITUDES TOWARD SOCIAL NEEDS SCREENING

Respondents were asked "How strongly do you agree or disagree with the following?": 1) It is feasible to screen for family financial and related social needs routinely at health care visits; 2) It is important to screen for family financial and related social needs routinely at health visits; and 3) I am well prepared to specifically address my patients' families' financial and related social needs. Response options were scored on a 5-point Likert scale: strongly agree, agree, neutral, disagree, and strongly disagree. Responses were dichotomized as strongly agree and agree versus neutral, disagree, and strongly disagree.

PEDIATRICIANS' PRACTICES FOR REFERRAL FOR COMMUNITY RESOURCES

Respondents were asked "Within the past 12 months, have you referred a low-income family to any of the following community resources?" Response options were yes and no. The list of community resources included childcare centers/providers, transportation assistance, local food pantries/private charities, public food assistance (eg, Special Supplemental Nutrition Program for Women, Infants, and Children, school lunch, food stamps [Supplemental Nutrition Assistance Program]), public health insurance enrollment assistance (eg, Medicaid, State Children's Health Insurance Program), housing services, and utility assistance programs. An overall referral scale also was created with a

point given for any referral to each of the 7 community resources over the past year. This resulted in scores ranging from 0 to 7 for the overall referral scale. We also reported the percentage of pediatricians who made a referral for any of the resources.

STATISTICAL ANALYSES

We conducted several different types of analyses. First, to assess the representativeness of the respondents in the sample, nonresponse bias analyses were conducted that compared sex, age, and geographic census region for respondents and the AAP membership using Chi-square tests and *t*-tests. Information for the AAP membership was available through the AAP administrative database. Second, frequency percentages for the various screening items were bivariately associated with each of the personal and practice characteristics and screening attitude variables using Chi-square tests. Third, a Pearson correlation was computed between the overall screening and overall referral measures. Next, 2 sets of multivariable linear regressions were estimated for the overall screening and referral scales. For each set of regressions, we first estimated a model that included pediatrician characteristics, practice characteristics, and patient characteristics. In a second fully specified model, we added attitudinal variables. All analyses were performed by using IBM-SPSS version 25.0 (IBM Corp, Armonk, NY). There were slight differences in the number of cases for each analysis base on item-level missing values. The study was reviewed and approved by the AAP institutional review board.

RESULTS

SURVEY RESPONDENTS AND NONRESPONSE ANALYSES

Survey response was 46.6% (732 respondents). Respondents who reported they were still in residency or fellowship training (n = 106) or who do not provide direct patient care (n = 23) were excluded from the analyses, leaving an analytic sample of 603 pediatricians. Table 1 presents descriptive information about the sample. A total of 61.5% of respondents were female, 54.3% were younger than 50 years old, 12.1% were underrepresented minorities, 42.7% practiced in a suburban area, 56.0% practiced in a group or health maintenance organization practice setting, and 69.1% spent the majority of their clinical time in general pediatrics. Almost one half (46.6%) of respondents reported there was someone in their practice with the responsibility for connecting low-income families with community services. In the nonresponse analyses, survey respondents were similar to the AAP membership for sex ($P = .543$), age ($P = .251$), and region ($P = .232$).

Table 1. US Pediatrician Personal and Practice Characteristics (N = 603)

	n	%
Personal characteristics		
Pediatrician sex		
Female	368	61.5
Male	230	38.5
Pediatrician age, y (mean = 48.4)		
<40	145	24.5
40–49	176	29.8
50–59	174	29.4
>59	96	16.2
% clinical time in general pediatrics (mean = 68.1)		
<50%	184	30.9
≥50%	412	69.1
Pediatrician underrepresented minority status*		
Underrepresented minority	71	12.1
Non-underrepresented minority	514	87.9
Practice characteristics		
Primary practice area		
Suburban	253	42.7
Urban, inner-city	140	23.6
Urban, not inner-city	138	23.3
Rural	61	10.3
Census region		
Northeast	114	18.9
Midwest	142	23.5
South	222	36.8
West	125	20.7
Practice setting		
Solo/2-person	70	12.4
Group/HMO	317	56.0
Medical school, hospital, or clinic	179	31.6
Someone in practice to connect low-income families to community services		
No/unsure	303	53.4
Yes	264	46.6
Patient characteristics		
% of patients with financial hardship (mean = 42.0)		
<50%	324	55.8
≥50%	257	44.2
Attitudinal variables		
It is important to screen		
Neutral/disagree	214	38.4
Agree	344	61.6
It is feasible to screen		
Neutral/disagree	334	60.1
Agree	222	39.9
I am prepared to address needs		
Neutral/disagree	447	79.8
Agree	113	20.2

HMO indicates health maintenance organization.

*Underrepresented minority pediatricians defined as respondents that identify with any of the following racial/ethnic groups: black, Hispanic, Hawaiian/Pacific Islander, or American Indian/Alaskan Native.

SOCIAL NEEDS SCREENING

Figure 1 shows that the topics that pediatricians reported asking low-income families about most often were need for childcare and transportation barriers. The topics that were asked about less frequently included housing insecurity, food insecurity, and utilities/heating insecurity. Table 2 indicates which of the pediatrician personal and practice characteristics were associated with the different screening topics. More than one half of pediatricians (52.6%) routinely screened for at least one need. Female pediatricians, pediatricians spending more time in general pediatrics, and underrepresented minority pediatricians were more likely to report routinely

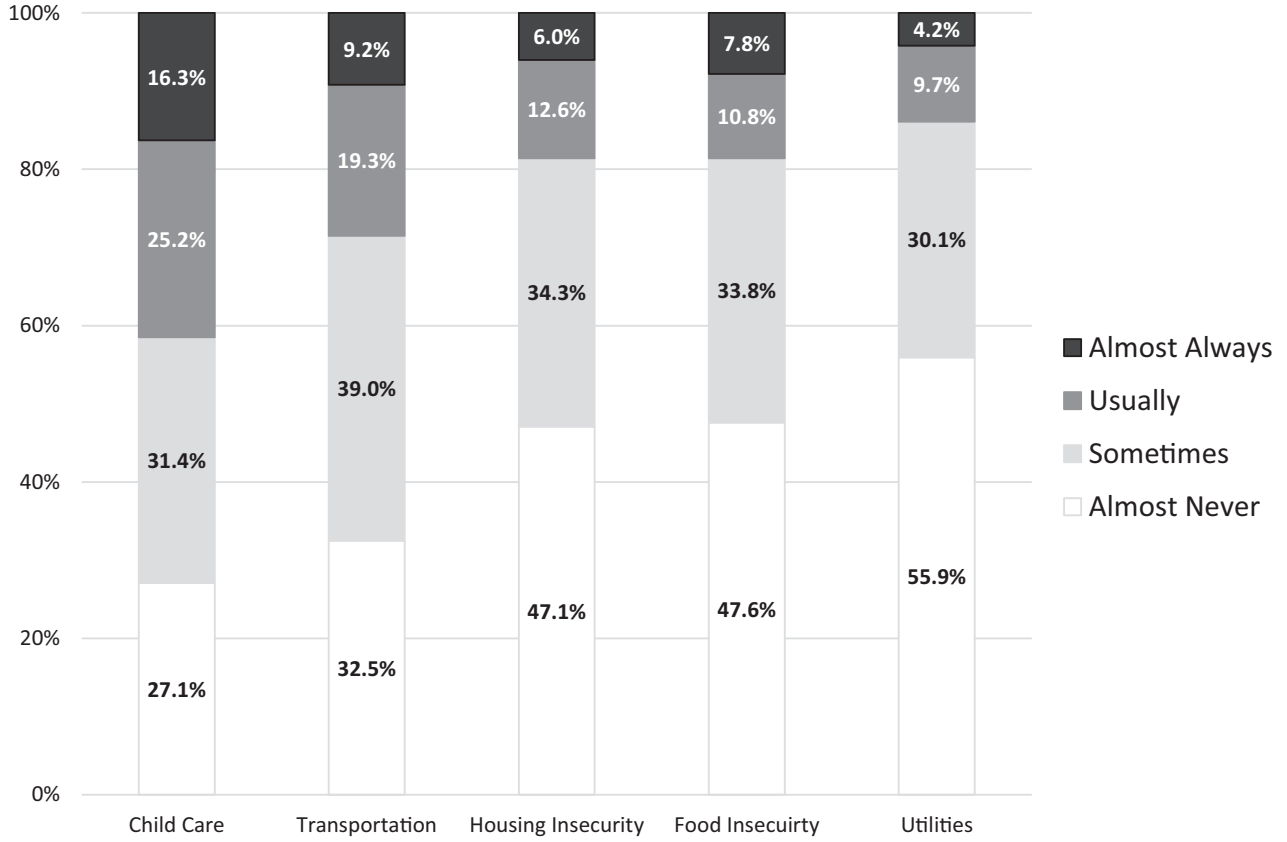

Figure 1. *Percentage of pediatricians who reported routinely screening low-income parents for various needs.*

screening for child care whereas rural pediatricians and those practicing in medical school, hospital, or clinic settings were less likely to do so. For most of the other items, pediatricians from rural locations were less likely to report screening. Conversely, pediatricians reporting that they cared for more families facing financial hardship and pediatricians whose practice had someone responsible for connecting low income families with community services reported that they were more likely to screen. For transportation and utilities, pediatricians from the West Census region were less likely to report screening for these issues. For all of the screening topics, pediatricians who endorsed the importance, feasibility, and preparation for screening were more likely than others to report that they screened for each queried need.

Attitudes Toward Social Needs Screening

Table 1 shows that the majority of respondents reports that it is important to screen for family financial and related social needs routinely at health visits (61.6%). Fewer reported that it is feasible to screen for family financial and related social needs routinely at health care visits (39.9%) or that they are well prepared to specifically address patients' families' financial and related social needs (20.2%).

Community Resource Referral

Pediatricians reported referring low-income families to a variety of community resources over the past year (Fig. 2). The most common resources were public health insurance enrollment assistance (68.4%) and public food assistance (66.0%), and 85.7% referred for any resource over the past year. Just less than one half reported referring any family to transportation assistance (49.9%) and childcare centers/providers (46.6%). Less than one third of pediatricians reported referring any family to local food pantries/private charities (30.9%), utility assistance programs (24.5%), or housing services (23.0%). There was a significant correlation between the number of items that pediatricians routinely screened and the number of items that pediatricians had made a referral for in the past year ($r = .44$, $P < .001$).

Multivariable Models

The mean number of items reported being routinely screened by pediatricians was 1.21 of a possible 5. The models specified for each set of linear regressions are summarized in Table 3 for screening outcomes and Table 4 for referral outcomes. In the complete multivariable model for screening (Table 3), male pediatricians screened for 0.35 fewer items on a mean of 1.21 than female pediatricians (B = −0.35, 95% confidence interval [CI], −0.63 to −0.07), whereas pediatricians with more patients with financial hardship (B = 0.42, 95% CI, 0.11−0.73), and pediatricians in a practice with staff responsible for connecting families to community services screened for more social needs (B = 0.43, 95% CI, 0.11−0.74). Pediatricians who reported that they are

Table 2. Bivariate Associations of Screening Low-Income Families for Various Social Needs (% Who Usually or Almost Always Screen)

	Child Care	Transportation	Food Insecurity	Housing Insecurity	Utilities	Screens for Any Need*
Overall % screening	41.5	28.4	18.6	18.7	14.0	52.6
Personal characteristics						
Pediatrician sex						
Female	48.1	30.9	19.6	20.6	15.5	56.7
Male	31.7†	24.8	17.4	16.1	11.9	46.3†
Pediatrician age, y						
<40	38.8	31.3	18.7	18.7	13.4	57.5
40–49	49.1	28.4	17.2	16.0	11.8	56.2
50–59	38.5	25.2	16.0	18.0	11.7	47.9
>59	36.4	29.2	24.7	23.9	21.3	47.2
% clinical time in general pediatrics						
<50%	27.8	38.2	19.5	23.8	18.3	47.6
≥50%	47.7†	24.2†	18.5	16.8	12.3	54.6
Pediatrician underrepresented minority status						
Underrepresented minority	57.4	37.7	27.5	20.6	18.8	66.7
Non-underrepresented minority	39.7†	27.1	17.1†	18.4	13.4	50.9†
Practice characteristics						
Primary practice area						
Suburban	49.4	21.0	14.6	14.2	10.3	53.4
Urban, inner-city	38.0	37.7	26.9	28.7	22.3	56.2
Urban, not inner-city	37.1	30.1	18.2	18.3	14.4	48.9
Rural	32.2†	28.8†	16.9†	15.3†	8.5†	49.2
Census region						
Northeast	46.2	28.8	22.1	20.4	16.3	54.3
Midwest	43.8	28.5	18.4	16.2	14.0	53.3
South	41.7	34.6	20.7	20.8	17.3	56.3
West	34.2	17.1*	12.0	16.2	6.0*	43.6
Practice setting						
Solo/2-person	45.5	28.8	16.7	15.2	16.7	51.5
Group/HMO	46.5	22.0	15.7	15.7	10.7	54.3
Medical school, hospital, or clinic	33.5†	39.4†	24.2	25.8†	18.2	51.2
Someone in practice to connect low-income families to community services						
No/unsure	41.3	19.2	13.9	11.0	7.9	48.0
Yes	41.6	38.9†	23.8†	27.3†	20.7†	57.8†
Patient characteristics						
% of patients with financial hardship						
<50%	41.1	17.5	12.8	11.4	8.1	46.0
≥50%	42.1	40.2†	25.1†	26.1†	20.8†	59.8†
Attitudinal variables						
It is important to screen						
Neutral/disagree	31.7	14.8	9.1	8.6	6.2	39.2
Agree	48.2†	37.0†	24.6†	24.8†	18.8†	61.4†
It is feasible to screen						
Neutral/disagree	36.4	22.0	11.9	12.8	9.5	45.9
Agree	50.7†	38.2†	28.6†	26.9†	20.9†	63.2†
I am prepared to address needs						
Neutral/disagree	38.0	24.1	15.0	14.4	10.2	48.8
Agree	56.8†	46.4†	33.9†	36.0†	29.5†	69.6†

HMO indicates health maintenance organization.

*Percent of respondents reporting "usually or almost always" screening for at least one of the following: child care, transportation, food insecurity, housing insecurity, or utilities.

†$P < .05$.

prepared to address needs (B = 0.63, 95% CI, 0.27–0.98) and that it is important to screen (B = 0.51, 95% CI, 0.20–0.81) also screened for more social needs domains.

The mean number of community resources that pediatricians referred low-income families to was 3.06 of a possible of 7. In the complete multivariable model for referral (Table 4), pediatricians 50–59 years old (B = 0.50, 95% CI, 0.04–0.97) and pediatricians >59 years old (B = 0.57, 95% CI, 0.01–1.13) referred for approximately 0.50 more social needs than pediatricians <40 years old on a mean of 3.06. In addition, pediatricians spending more time in general pediatrics referred for more social needs (B = 0.47, 95% CI, 0.03–0.91). Pediatricians practicing in inner-city areas (B = 0.55, 95% CI, 0.02–1.07) and rural areas (B = 0.63, 95% CI, 0.04–1.19) referred families for more social needs than pediatricians in suburban areas. Pediatricians with more patients with financial hardship also made referrals for more social need domains (B = 0.77, 95% CI, 0.37–1.16), along with pediatricians in a practice with someone responsible for connecting

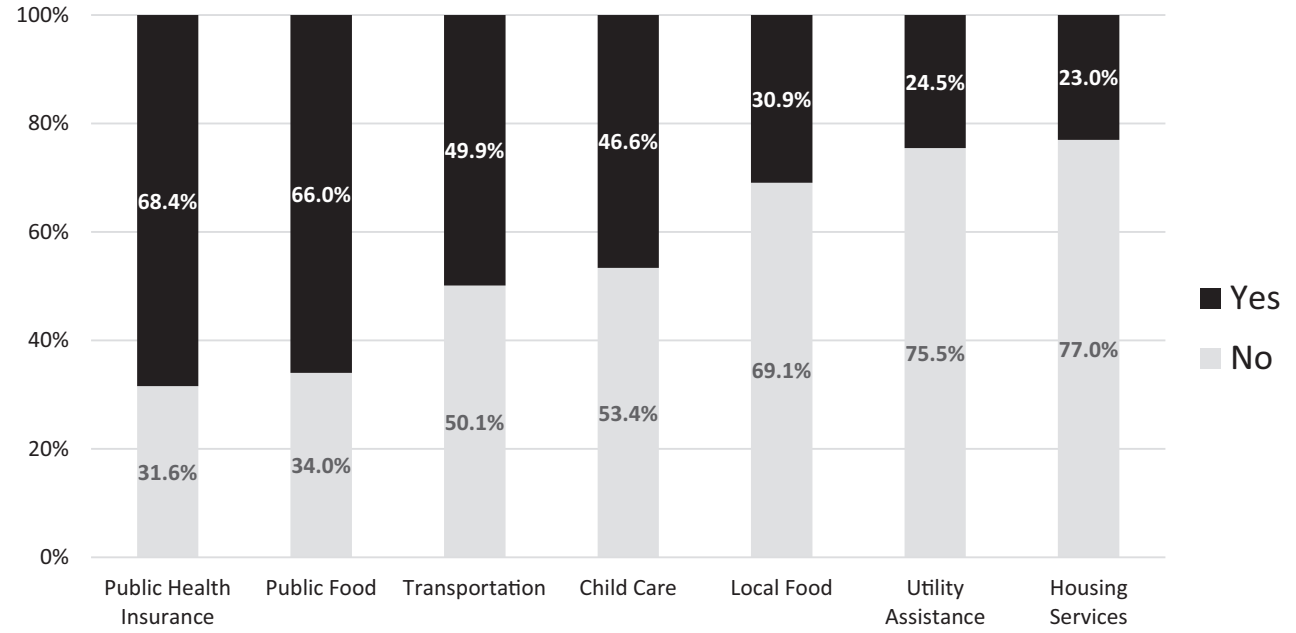

Figure 2. *Percentage of pediatricians who reported making at least one referral to various community resources in the past year.*

families to community services (B = 0.71, 95% CI, 0.31−1.11). Pediatricians who reported that they are prepared to address needs (B = 0.73, 95% CI, 0.28−1.18) and that it is important to screen (B = 0.57, 95% CI, 0.18−0.96) referred families for more social needs. Pediatrician attitudes about the feasibility to screen was not associated with screening or referral.

DISCUSSION

In this national sample of US pediatricians who are AAP members, we found that as of 2015, less than one half of practicing pediatricians reported routinely screening (defined as occurring at ≥50% visits) low-income families for social needs at visits. Majorities reported screening for unmet social needs at some visits and referring at least 1 parent in the previous year to public health insurance assistance, food assistance, adult mental health providers; just less than one half reported referring a parent for transportation assistance and child care providers. Since these responses predated the publication of the AAP Policy that recommended routine SDoH screening, they serve as baseline data with respect to these reported behaviors in pediatric practice. Thus, despite a history in the field of pediatrics that encourages clinicians to address patients' adverse social circumstances,[7-9] only a minority of pediatricians routinely screen for social needs.

In our multivariable models, we found variation in screening rates based on some pediatrician characteristics. For example, female pediatricians had greater screener rates than male pediatricians. These results are consistent with previous studies, which have shown greater rates for preventive counseling and cancer screening for female physicians.[15-17] In general, female physicians may have greater comfort levels discussing personal and sensitive issues than male physicians.[15-17] In addition, caregiver−-physician sex concordance has been demonstrated to foster improved trust and communication.[17,18] Pediatricians caring for large numbers of patients with financial hardship, not surprisingly, were more likely to screen and refer for unmet social needs. This is likely due to the greater prevalence of unmet social needs that their patients face and the need to tailor their practice to addressing these important risk factors. Of note, pediatricians 50 years of age or older, those working in general pediatrics, rural, or urban inner city areas were more likely to make referrals. This could reflect their greater comfort with making these referrals along with a more robust knowledge of local community agencies. Finally, pediatricians reported high screening rates but low referral rates for some needs, such as child care and transportation; it may be that pediatricians feel less comfortable making referrals for those needs or they may not find as many unmet needs for those screened domains compared with others (eg, food).

Our screening rates (range: 14%−41% by social need) are similar to screening rates for other pediatric issues/topics that are recommended by Bright Futures Health Supervision guidelines. For example, data from the 2013 AAP Periodic survey found that 44% of pediatricians screened for maternal depression.[19] Interestingly, screening for developmental problems in practice tripled from 2002 to 2016.[20] The uptake of social needs screening by pediatricians may follow a similar pattern to developmental screening over time due to the gradual adoption of the 2016 AAP recommendations. Further studies will need to be conducted to track future screening trends.

Pediatrician's attitudes toward the importance of screening and feeling prepared to address needs were significantly associated with screening and referral behaviors. While 60% of pediatricians felt that social needs screening was important, only 20% reported feeling prepared to address

Table 3. Multivariable Linear Regression Models Predicting Screening for Low-income Families

	Model 1		Model 2	
	B	95% CI	B	95% CI
Personal characteristics				
Sex (ref = female)				
Male	−0.35*	−0.65 to −0.06	−0.35*	−0.63 to −0.07
Age, y (ref = <40)				
40–49	0.22	−0.16 to 0.60	0.21	−0.15 to 0.57
50–59	0.20	−0.18 to 0.59	0.25	−0.22 to 0.52
>59	0.31	−0.15 to 0.78	0.34	−0.10 to 0.79
Clinical time in general pediatrics (ref = <50%)				
≥50%	0.23	−0.14 to 0.59	0.06	−0.29 to 0.41
Pediatrician underrepresented minority status (ref = non-underrepresented minority)				
Underrepresented minority	0.28	−0.13 to 0.69	0.24	−0.16 to 0.63
Practice characteristics				
Practice area (ref = suburban)				
Urban, inner city	0.02	−0.41 to 0.45	−0.07	−0.48 to 0.34
Urban, not inner city	−0.21	−0.59 to 0.17	−0.27	−0.64 to 0.09
Rural	−0.32	−0.79 to 0.16	−0.24	−0.69 to 0.22
Census region (ref = Northeast)				
Midwest	−0.03	−0.47 to 0.41	−0.04	−0.45 to 0.38
South	−0.05	−0.45 to 0.35	0.01	−0.38 to 0.38
West	−0.34	−0.78 to 0.10	−0.28	−0.70 to 0.14
Practice setting (ref = solo/2-physician practice)				
Group/HMO	−0.25	−0.68 to 0.17	−0.30	−0.71 to 0.11
Med School/hospital/clinic/CHC	−0.26	−0.78 to 0.27	−0.40	−0.91 to 0.10
Someone in practice to connect low-income families to community services (ref = no/unsure)				
Yes	0.60*	0.27 to 0.92	0.43*	0.11 to 0.74
Patient characteristics				
Patients with financial hardship (ref = <50%)				
≥50%	0.51*	0.19 to 0.84	0.42*	0.11 to 0.73
Attitudinal variables				
It is important to screen (ref = neutral/disagree)				
Agree	–	–	0.51*	0.20 to 0.81
It is feasible to screen (ref = neutral/disagree)				
Agree	–	–	0.30	−0.01 to 0.61
I am prepared to address needs (ref = neutral/disagree)				
Agree	–	–	0.63*	0.27 to 0.98
R^2	0.10		0.18	
F for change in R^2	3.25*		15.91*	

Overall, pediatricians reported screening for an average of 1.21 social determinants of health.
CI indicates confidence interval; HMO, health maintenance organization; and CHC, community health center.
*$P < .05$.

the needs uncovered by these inquires. We expect that pediatricians' positive attitudes toward screening will increase, given the recent AAP policy statement recommending SDoH screening at pediatric visits.[3] A recent study found that pediatricians felt that screening for food insecurity demonstrated caring, which reinforced their screening behavior.[21] Innovative, evidence-based and implementable screening and referral interventions need to be continued to be developed and tested in pediatric practices. One potential high-yield practice type is pediatric residency program continuity clinic sites, which are traditionally hospital-based urban clinics that serve low-income children. Trainees can be exposed to social needs screening and referral models while also developing their interviewing and clinical skills, which may increase their self-efficacy and communication skills. Ensuring social needs screening is universal, family-centered, includes shared decision making, and is conducted in a larger system that links results to referrals and to resources will be important to avoid unintended consequences such as distrust and failed expectations.[22] Our results also highlight an opportunity and need for further development of professional social needs screening training materials for pediatricians across the learning continuum. Pediatric training requirements from the Accreditation Council for Graduate Medical Education and training offered to practicing pediatricians via Continuing Medical Education from the AAP should be created to cultivate these critical skills in pediatricians.

Our results carry implications for the delivery of pediatric primary care for low-income children, given their exposure to social risk factors and the impact adverse childhood toxic stress can have on their health across their lifespan.[23] In our multivariable analyses, although we found differences with referrals, we did not find any significant variation in screening behaviors based on practice-level characteristics (eg, urban vs suburban practices). This suggests that there may be common impediments to screening that are widespread in pediatric practice. In addition, there are barriers at the pediatrician

Table 4. Multivariable Linear Regression Models Predicting Referral Behaviors for Low-Income Families

	Model 1		Model 2	
	B	95% CI	B	95% CI
Personal characteristics				
Sex (ref = female)				
Male	−0.09	−0.45 to 0.28	−0.09	−0.45 to 0.26
Age, y (ref = <40)				
40–49	0.40	−0.07 to 0.88	0.40	−0.06 to 0.86
50–59	0.56*	0.08 to 1.04	0.50*	0.04 to 0.97
>59	0.51	−0.07 to 1.09	0.57*	0.01 to 1.13
Clinical time in general pediatrics (ref = <50%)				
≥50%	0.66*	0.21 to 1.11	0.47*	0.03 to 0.91
Pediatrician underrepresented minority status (ref = non-underrepresented minority)				
Underrepresented minority	0.08	−0.44 to 0.59	0.04	−0.46 to 0.55
Practice characteristics				
Practice area (ref = suburban)				
Urban, inner city	0.64*	0.10 to 1.74	0.55*	0.02 to 1.07
Urban, not inner city	0.05	−0.42 to 0.52	−0.02	−0.48 to 0.43
Rural	0.53	−0.07 to 1.12	0.63*	0.04 to 1.19
Census region (ref = Northeast)				
Midwest	−0.28	−0.82 to 0.27	−0.29	−0.82 to 0.24
South	−0.05	−0.55 to 045	0.01	−0.48 to 0.49
West	−0.44	−0.99 to 0.11	−0.38	−0.91 to 0.5
Practice setting (ref = solo/2-physician practice)				
Group/HMO	−0.10	−0.63 to 0.43	−0.15	−0.67 to 0.36
Med school/hospital/clinic/CHC	0.34	−0.32 to 0.99	0.20	−0.45 to 0.84
Someone in practice to connect low-income families to community services (ref = no/unsure)				
Yes	0.89*	0.49 to 1.31	0.71*	0.31 to 1.11
Patient characteristics				
Patients with financial hardship (ref = <50%)				
≥50%	0.87*	0.46 to 1.28	0.77*	0.37 to 1.16
Attitudinal variables				
It is important to screen (ref = neutral/disagree)				
Agree	–	–	0.57*	0.18 to 0.96
It is feasible to screen (ref = neutral/disagree)				
Agree	–	–	0.22	−0.18 to 0.61
I am prepared to address needs (ref = neutral/disagree)				
Agree	–	–	0.73*	0.28 to 1.18
R^2	0.20		0.25	
F for change in R^2	7.13*		10.97*	

Overall, pediatricians reported referring to an average of 3.06 resources.
CI indicates confidence interval; HMO, health maintenance organization; and CHC, community health center.
*$P < .05$.

level; previous research documents that barriers include lack of time, professional training, and knowledge of community resources.[24,25] We found that having an individual whose role was to connect low-income families to community services was significantly associated with increased screening and referral behaviors. These results suggest that practice redesign that incorporates a team-based approach to addressing families' unmet social needs may be necessary to increase the uptake of social needs screening and referral in pediatric practices regardless of practice type or location.

Our findings are timely. Medicaid managed care organization programs in 30 states are requiring or encouraging screening for social needs and providing referrals,[26,27] and some Medicaid Accountable Care Organization programs are also incentivizing screening. These public policy initiatives will likely further accelerate the adoption of social needs screening and referral into practice. Previous research has demonstrated the positive impact of social needs screening and referral interventions on connecting families to community resources and parental report of child health.[28,29] Initiatives from the Center for Medicare and Medicaid Innovation including the Accountable Health Communities and Integrated Care for Kids will further our understanding of the impact of novel care models that address unmet social needs on population and child health.[30,31]

There are several potential limitations to our study. First, the results may not reflect the views of pediatricians who are not AAP members. However, it is estimated that roughly (60%) of board-certified pediatricians are AAP members.[11-13] It is possible that respondents' screening and referral behaviors are different than those of nonrespondents. Second, our survey questions referenced screening and referral of social needs for low-income families, which may limit the study's generalizability. Pediatricians' behaviors, along with providing care to low-income families, were measured via self-report, which may have introduced recall and social desirability biases. Nonetheless, we still found low screening

behaviors. These data are from 2015 and may not reflect current practice. Screening was defined as pediatricians' asking about social needs and it is unclear how respondents may have interpreted it (eg, personally inquiring vs using a screening tool). There were some additional social needs, such as financial stress, that were not included in the survey. Finally, our linear regression models are not able to predict the marginal effect of having a staff member provide assistance on screening/referral rates.

CONCLUSIONS

Our study found that before the 2016 AAP policy statement on *Poverty and Child Health*, which recommended SDoH screening, most pediatricians in the United States believed in the importance of screening for social needs; however, fewer pediatricians reported that they routinely screened for unmet social needs at low-income children's visits. Positive attitudes toward screening and preparedness along with having a practice member to assist families in need were associated with greater rates of screening and referral to community resources.

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