



Developmental Services in Primary Care for Low-Income Children: Clinicians' Perceptions of the Healthy Steps for Young Children Program

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ABSTRACT *Difficulties with providing quality primary health care for low-income Americans have been well documented. Few studies have addressed the challenges faced by pediatric clinicians serving low-income families or whether practice-based interventions improve clinicians' ability to provide quality preventive health services. We investigated if, over time, the Healthy Steps for Young Children program affected the practices and perceptions of clinicians in pediatric primary care practices serving low-income families compared to practices serving more affluent families. Self-administered questionnaires were completed at baseline (N=104) and at 30 months (N=91) by clinicians at 20 pediatric practices participating in the Healthy Steps program. Practices were divided into three groups: those serving families with low, middle, and high incomes. Barriers to providing care, provision of preventive developmental services, and perceptions of care were assessed at baseline and at 30 months after introducing the program. Across all income groups and over time, clinicians were more likely to report the provision of preventive developmental health services. Clinicians in low-income practices reported increased problems with both reimbursement and time barriers; clinicians in high-income practices reported increased problems with reimbursement. At 30 months, clinicians serving low-income families reported the greatest positive changes in their perceptions about the quality of care provided by their practices. They also were more likely to strongly agree that they gave support to families and to be very satisfied with the ability of their clinical staff to meet the developmental needs of children. We found that Healthy Steps was successful in universally increasing developmental services despite the reported practice barriers for both low- and high-income practices. The Healthy Steps program enabled low-income practices to achieve similar levels of clinician satisfaction as middle- and high-income practices despite having reported lower levels at the beginning months of the program.*

KEYWORDS *Child development, Low-income population, Preventive health services, Pediatrics, Staff attitudes.*

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INTRODUCTION

The provision of quality primary health care to low-income and underserved populations is a national concern.¹ Clinicians report three main areas of difficulty that contribute to poorer quality care in practices that serve low-income populations. For one, clinicians encounter barriers such as inadequate reimbursement, limited staff and referral resources, and stressful work environments.²⁻⁶ Second, clinicians report that a comprehensive approach to health care best addresses the complex psychosocial issues that affect the health of low-income patients. Yet, in practice settings that serve large numbers of low-income children and families, it is especially challenging to provide recommended comprehensive services.^{5,7-10} Third, studies of physician satisfaction suggest that clinicians have higher levels of satisfaction if they believe they are meeting families' needs.^{11,12} Thus, the barriers to care and the difficulty of dealing with the multifaceted problems confronting low-income families may reduce clinicians' satisfaction with their jobs and in turn the quality of care that they provide.^{7,11}

Few studies have addressed the particular challenges faced by pediatric clinicians in practice settings serving low-income families with children. Moreover, there is limited research documenting the ways practice-based interventions can affect clinicians' perceptions about the care they provide in settings serving low-income families. The Healthy Steps for Young Children Program (HS) evaluation in primary care settings serving families with varied income levels provides a unique opportunity to assess clinicians' perceptions about the care they provide low-income children and families in comparison to perceptions of clinicians who serve higher income populations.

HS is an example of a new approach to pediatric care that utilizes a physician and early child development specialist partnership to better meet parents' and children's needs. It addresses deficiencies in the quality of preventive health care and developmental services provided to families with young children, as recommended in professional guidelines such as *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*.¹³⁻¹⁵ The program was designed by the Boston University School of Medicine and the Commonwealth Fund, and its evaluation was conducted by the Johns Hopkins Bloomberg School of Public Health at primary care practices dispersed across the continental United States.

The HS approach includes the following services: enhanced well child care through well child office visits with physicians and developmental specialists (HS Specialists); a sequence of home visits by the developmental specialists; a child development telephone information line; child development and family health checkups with developmental screenings; written informational materials for parents that emphasize prevention and health promotion; parent groups that offer social support as well as interactive learning opportunities; and linkages to community resources.^{14,16,17}

The HS Specialists (early childhood educators, nurses, nurse practitioners, social workers, and other professionals with expertise in early childhood development) and physicians received training in HS by the Boston University team.¹⁸ Participating sites implemented written protocols describing key program elements, received program materials and training manuals¹⁹ to guide them in the practical aspects of program implementation, participated in three annual training sessions, and received ongoing monitoring, site visits, and operational support from the national HS program office.

In this study, we examined whether over time the HS program changed HS clinicians' perceptions about the preventive primary care they provided in practice settings serving low-income families with young children compared to HS clinicians who served more affluent children and their families. We measured the impact of HS in three areas: clinician perceptions of both practice environment and the provision of developmental services and clinicians' satisfaction with care provided. We posited that the implementation of HS would provide support to clinicians that would (1) improve the delivery of preventive developmental services and (2) improve clinicians' satisfaction with the quality of care they provided. Furthermore, we hypothesized that, by enabling clinicians to better address the needs of children and families facing challenging psychosocial issues, HS would have a greater impact on the perceptions of clinicians serving low-income populations than clinicians serving more affluent children and families.

METHODS

This study was based on analyses of clinician surveys collected as part of the ongoing evaluation of HS located in 13 states across the country. Participating sites were chosen by local program funders in consultation with the Commonwealth Fund, Boston University, and the National Program Office. The HS evaluation included both a national evaluation, using an experimental design, and an evaluation of affiliate sites not included in the national evaluation. Affiliate sites fully implemented the same program and were monitored by the National Program Office similarly to sites in the national evaluation. Affiliate sites differed from national evaluation sites in that a comparison group could not be identified for them, and most served primarily low-income families. The national evaluation and affiliate sites included the same clinician survey measures at baseline and 30 months. (Although not the focus of this study, there were differences between national and affiliate sites in the family components of the evaluation. Unlike the national evaluation, families in the affiliate evaluation did not participate in telephone interviews at 2–3 months and 30–33 months, but rather at 18 months; the interviews were also shorter than in the national evaluation. In addition, for the medical chart review, data were abstracted through the child's first year of life for affiliate families; national evaluation families data were abstracted through 32 months.)

The data on clinicians reported here were limited to HS intervention practices at both national and affiliate sites to assess clinician responses to the implementation of the program by client characteristics. Overall, the sites served an economically and ethnically diverse population¹⁸ and represented a range of organizational practice settings that included group practices, hospital-based clinics, and pediatric practices in health maintenance organizations.

Sample

The study sample consisted of physicians and nurse practitioners (referred to as clinicians throughout the article) at 20 HS practice sites that implemented the HS program between 1996 and 2001; there were 14 sites participating in a national evaluation and 6 affiliate sites. One site was excluded because of incomplete data. Resident physicians were excluded because their disproportionate representations at only 3 sites would skew the results. Of the 20 sites, 13 (65%) were located in urban areas, 5 (25%) in small cities, and 2 (10%) in rural areas.

All HS intervention clinicians were asked to complete a self-administered questionnaire at the initiation of the program and again approximately 30 months later. Questionnaires were distributed and collected by site staff, usually the site administrator. The survey was anonymous, and all responses were confidential. Of the sample of 148 eligible clinicians surveyed at baseline, 104 (70.3%) returned the questionnaire; of the 120 surveyed at 30 months, 91 (75.8%) responded. In all, 56 clinicians (53.8% of the baseline sample, 61.5% of the 30-month sample) completed questionnaires at both baseline and 30 months. The response rates did not differ by the income level of families served at the practice. Given that response rates did not differ significantly over time, the difference between the number of clinicians responding at baseline and at 30 months is mostly likely because of changes in the number of clinicians at the sites.

The sample was divided into groups of clinicians based on the median income of the patient population at the site in which they practiced. (For the national evaluation sites, the median income of the sites was calculated from the median income of the combined intervention and control populations at the site.) Three groups were identified based on the median incomes at the practice sites: <\$20,000, \$20,000–\$35,000, and >\$45,000, with 7 sites in the <\$20,000 group, 7 in the \$20,000–\$35,000 group, and 6 in the >\$45,000 group. Of the 13 sites in urban areas, 6 (46%) served disproportionately low-income families. Community health centers were disproportionately represented in practices serving low-income families, and conversely, private practices were disproportionate in the high-income sites.

Data Sources

The survey asked clinicians about their opinions regarding pediatric primary care in general and the HS program in particular. Survey content was informed by HS protocols and program materials and literature reviews focused on barriers to the delivery of preventive services and recommended content of health supervision visits. The baseline and 30-month questionnaires contained questions related to the clinicians' backgrounds, including their education and their number of years in pediatric care and working at the site. These questionnaires also included questions in three broad categories: barriers to providing well child care, developmental services provided, and perceptions about the care provided to families.

Study Variables

Comparisons were made for clinicians at the three groups of HS practices between baseline and 30 months on two sets of scalar variables measuring the broader concepts of the practice environment and clinicians' perceptions of care. A detailed description of the scalar variables and items included in each scale is displayed in Table 1. Dichotomous variables measured problems with the practice environment that may have affected the clinicians' ability to deliver the best quality care in three areas: reimbursement, time, and staff. As Table 1 reports, time problems indicated two of three items were reported; for staff problems, both items for these problems were reported; and one of two problems with reimbursement were reported. A dichotomous variable defining that the clinician often worked as a team with others was included as a measure of teamwork.

Six scales were developed to measure clinicians' perceptions of care provided in their practice and were based on the responses of clinicians to questions about the type of activities they and the HS Specialists provided (see Table 1). For the response to each of the five scales asking agreement with a given statement, each

TABLE 1. Clinician survey scales and items for analysis

Variable	Items
Practice environment	
Reimbursement problems (two items); α : T ₁ (.63), T ₂ (.79)*	Low Medicaid reimbursement rates; problems with reimbursement by managed-care organizations
Time problems (two of three items); α : T ₁ (.74), T ₂ (.83)	Not enough time to answer parents' questions; not enough time to teach parents; not enough time to follow-up with families
Staff problems (two items); α : T ₁ (.30), T ₂ (.66)	Shortage of support staff; limited staff to address parent's/child's needs
Clinician perceptions	
Strongly agree that clinicians give support to parents (five items); α : T ₁ (.58), T ₂ (.58)	Suggest things that parents can do for their child that fit into their family's daily life; give parents advice on how to solve problems at home with their child; help parents get services for their child from other agencies and programs; help parents get information they need about their child's growth and development; point out what parents do well
Strongly agree that clinicians listen to parents (eight items); α : T ₁ (.64), T ₂ (.81)	Always have time to answer parents' questions; do not seem to have other things on their minds when they talk to parents; do not act like parents' cannot understand growth and development information; are not always in a rush; encourage parents to ask questions; seem to think carefully about parents and about their child's development; make parents feel they are doing a good job; understand that parents know their child better than anyone else does
Very satisfied with ability of clinical support staff to meet children's developmental and behavioral needs (two items); α : T ₁ (.96), T ₂ (.96)	Very satisfied with ability of staff (nurses, social workers, nutritionists, HSSpecialists, medical assistants) within practice to meet the needs of parents concerning (1) child behavior and (2) child development
Strongly agreed HS Specialist talked to parents about child's behavior and development (five items); α : T ₁ (.96), T ₂ (.92)	Encouraged parents to talk about problems they or their young child were experiencing; listened carefully to what parents said about their child; gave parents advice about solving problems that they were having at home with their child; gave parents help understanding their child's growth and development; checked the progress of the child
Strongly agreed HS Specialist showed parents activities and gave information about what to do with child (four items); α : T ₁ (.95), T ₂ (.85)	Showed parents activities that they could do with their child to promote him or her to grow and learn; told parents about the kinds of behaviors they could expect to see in their child in the next 6 months; helped parents organize the daily routines for their child; let parents consider options for themselves and their child that were best for both of them
Strongly agreed HS Specialist provided parents with support, helped with stress, and referred for emotional problems (two items); α : T ₁ (.83), T ₂ (.68)	Provided emotional support or helped with stress; referred parents for help with their emotional problems

*Refers to Cronbach α at baseline (T₁) and 30 months (T₂).

item was rated on a 5-point Likert scale, with the value 1 strongly disagree and 5 strongly agree; a 4-point Likert scale was used for the one satisfaction variable. The total score for each of the five agreement scales and one satisfaction scale were summed for each respondent and divided by the number of items in the scale so that the mean scores could be interpreted in relation to the response categories for the items. Dichotomous variables were created, indicating strongly agree (score of 4.5 or more) for the five agreement scales and very satisfied (score of 3.5 or more) for the satisfaction scale.

The internal consistency of the scales was assessed using Cronbach α (see Table 1). The scale scores ranged from .58 to .96. Scales with an α value of at least .60, the generally accepted lower limit below which the scale is assumed not to be internally consistent, were used in the analyses. The exceptions to this were staff problems at baseline, with a score of .30, and clinicians give support to parents, with a score of .58 at both baseline and 30 months. Dichotomous items were used to measure the provision of each of the five developmental services: office visit focusing on development; preparatory letter for the visit; phone line for questions about development; home visits; and a booklet to track the child's health and development.

Analyses

Data analyses were conducted using the Stata software package. Saturated logistic regression models with time, income group, and time-by-income-group interactions were fit to evaluate the income strata-specific changes in outcomes between baseline and 30 months.²⁰ Robust standard errors were computed to account for the correlation between the baseline and 30-month outcomes for respondents because more than half of the clinicians responded to the surveys at both baseline and 30 months. The analyses were adjusted for site only because of the small numbers. This adjustment accounts for the fact that subjects within sites tend to be more similar to one another than they are to clinicians and staff at other sites. Sites contributed to the pooled data based on the number of respondents at the site, so that sites with larger numbers of clinicians contributed more data points.

Missing data varied from 0% to 23% at baseline, with considerable missing data at baseline for five program component variables and three HS Specialist variables, and from 1% to 12% at 30 months (see footnotes in Tables 2–4). The large amount of missing data at baseline is probably because clinicians were not aware of program components and the HS Specialist and thus reported “don't know” to questions about the components.

Within income strata, odds ratios greater (less) than 1 indicate an increase (decrease) in the odds of reporting of an outcome at 30 months relative to baseline. When comparing these odds ratios across income strata, we computed the ratio of odds ratios. For example, when evaluating whether the change in an outcome between baseline and 30 months was different for middle-income versus low-income practice settings, a ratio of odds ratios greater (less) than 1 indicates that the change was greater (lower) in the middle-income practice settings compared to the low-income practice settings (see Tables 2–4).

RESULTS

The demographic characteristics of the clinicians were similar across the three income groups. Across all sites, over 80% of the respondents at baseline and 30 months were physicians. Although there were no statistically significant differences

TABLE 2. Changes in pediatric clinicians' perceptions of practice environment barriers at low-, middle-, and high-income practices: percentages and adjusted odds ratios (95% confidence intervals)

	Median family income at practice site											
	<\$20,000			\$20,000–\$35,000			≥\$45,000					
	Baseline (N = 37) % (N)	30 months (N = 25) % (N)	OR (95% CI)	Baseline (N = 32) % (N)	30 months (N = 40) % (N)	OR (95% CI)	Baseline (N = 35) % (N)	30 months (N = 26) % (N)	OR (95% CI)	Baseline (N = 35) % (N)	30 months (N = 26) % (N)	OR (95% CI)
Practice environment*	24.3 (9)	68.2 (15)	6.93‡ (2.02–23.75)	40.6 (13)	40.0 (16)	0.94 (0.45–1.94)	42.9 (15)	70.8 (17)	2.78‡ (1.03–7.48)	42.9 (15)	70.8 (17)	2.78‡ (1.03–7.48)
Reimbursement problems†	27.0 (10)	65.2 (15)	4.68‡ (1.68–13.03)	59.4 (19)	67.5 (27)	1.42 (0.56–3.61)	48.6 (17)	73.1 (19)	2.65 (0.92–7.62)	48.6 (17)	73.1 (19)	2.65 (0.92–7.62)
Time problems	43.2 (16)	52.2 (12)	1.34 (0.53–3.40)	43.8 (14)	31.6 (12)	0.61 (0.23–1.58)	34.3 (12)	50.0 (13)	1.77 (0.69–4.53)	34.3 (12)	50.0 (13)	1.77 (0.69–4.53)
Staff problems												

*Denominators differ for each variable because of missing data. Missing data 0% at baseline and 5.5% or less at 30 months.

†Significant difference in reimbursement problems between middle-income and low-income practice settings, OR 0.14 (0.03–0.57).

‡Significant difference ($P < .05$) between baseline and 30 months.

TABLE 3. Changes in pediatric clinicians' perceptions of provision of developmental services at low-, middle-, and high-income practices: percentages and adjusted odds ratios (95% confidence intervals)

Developmental services*	Median family income at practice site								
	<\$20,000		\$20,000–\$35,000		≥ \$45,000				
	Baseline (N = 37) % (N)	30 months (N = 25) % (N)	OR (95% CI)	Baseline (N = 32) % (N)	30 months (N = 40) % (N)	OR (95% CI)			
Practice included office visit with someone who teaches parents about child's development	39.3 (11)	87.5 (21)	12.89†(2.85–58.40)	41.4 (12)	74.4 (29)	4.47†(1.77–11.29)	38.7 (12)	80.8 (21)	6.98†(2.30–21.24)
Practice included letter before well child visits to prepare parents	6.9 (2)	55.0 (11)	18.44†(3.46–98.39)	14.3 (4)	45.7 (16)	5.68†(1.72–18.72)	12.1 (4)	68.0 (17)	16.65†(4.56–60.75)
Practice included telephone information line‡	36.7 (11)	87.0 (20)	11.19†(3.10–40.42)	66.7 (20)	74.4 (29)	1.51 (0.52–4.37)	42.4 (14)	92.0 (23)	14.98†(3.55–64.15)
Practice included home visits§	30.0 (9)	91.7 (22)	26.72†(4.42–161.70)	37.9 (11)	70.0 (28)	3.82†(1.32–10.99)	15.2 (5)	88.5 (23)	41.63†(9.37–184.88)
Practice included booklet to help track child's health and development	57.7 (15)	88.3 (20)	3.67(0.89–15.13)	34.6 (9)	71.4 (25)	4.72 (1.84–12.11)	48.3 (14)	66.7 (16)	2.14 (0.72–6.39)

*Denominators differ for each variable because of missing data. Missing data ranged from 10.6% to 15.4% at baseline for all variables except for “practice included booklet to help track child's health and development” (22.1% missing data) and 1.1% to 12.1% at 30 months for all variables.

†Significant difference ($P < .05$) between baseline and 30 months.

‡Significant differences in effects between middle- and low-income groups, OR 0.13 (95% CI 0.03–0.71), and high- and middle-income groups, OR 9.95 (95% CI 1.66–59.62), in reports of inclusion of telephone information line.

§Significant differences in effects between high- and middle-income groups in reports of inclusion of home visits, OR 10.91 (1.75–67.89).

||Significant difference ($P < .001$) between baseline and 30 months.

TABLE 4. Changes in pediatric clinicians' perceptions of care at low-, middle-, and high-income practices: percentages and adjusted odds ratios (95% confidence intervals)

	Median family income at practice site					
	<\$20,000		\$20,000–\$35,000		≥\$45,000	
	Baseline 30 months (N = 37) % (N)	OR (95% CI)	Baseline 30 months (N = 32) % (N)	OR (95% CI)	Baseline 30 months (N = 35) % (N)	OR (95% CI)
Clinician perceptions*						
Strongly agreed that clinicians give support to parents*, †	40.0 (14)	4.32‡ (1.25–14.99)	53.3 (16)	1.13 (0.45–2.82)	46.9 (15)	0.68 (0.32–1.40)
Strongly agreed that clinicians listen to parents*	37.1 (13)	0.6 (0.20–1.88)	43.3 (13)	0.59 (0.24–1.43)	30.3 (10)	0.50 (0.17–1.52)
Very satisfied with ability of clinical support staff to meet children's developmental and behavioral needs*	20.6 (7)	5.99‡ (2.08–17.24)	37.5 (9)	2.94 (0.93–9.34)	39.4 (13)	2.28 (0.85–6.15)
Strongly agreed HS Specialist talked to parents about child's behavior and development\$,	33.3 (8)	19.23‡ (14.05–91.35)	44.8 (13)	4.23‡ (1.76–10.16)	69.0 (20)	1.82 (0.61–5.46)

TABLE 4. Continued

	Median family income at practice site						
	<\$20,000		\$20,000–\$35,000		≥\$45,000		
Clinician perceptions*	Baseline 30 months (N = 37) % (N)	OR (95% CI)	Baseline 30 months (N = 32) % (N)	Baseline 30 months (N = 40) % (N)	Baseline 30 months (N = 35) % (N)	Baseline 30 months (N = 26) % (N)	
Strongly agreed HS Specialist showed parents activities and gave information about what to do with child§	25.0 (6)	6.65‡ (1.91–23.14)	39.3 (11)	63.2 (24)	2.68‡ (1.11–6.48)	68.0 (17)	1.54 (0.47–5.09)
Strongly agreed HS Specialist provided parents with support, helped with stress and referred for emotional problems§¶	37.5 (9)	4.95‡ (1.46–16.78)	41.4 (12)	60.5 (23)	2.17 (0.90–5.28)	51.7 (15)	1.05 (0.48–2.31)
Worked as a team*	29.4 (10)	7.57‡ (2.54–22.61)	32.3 (10)	57.5 (23)	2.80‡ (1.14–6.88)	24.2 (8)	3.21‡ (1.17–8.84)

*Denominators differ for each variable because of missing data. Missing data ranged from 5.8% to 12.5% at baseline and from 1.1% to 11.0% at 30 months for these variables.

‡Significant differences in effects between high- and low-income groups to strongly agree that clinicians give support to parents, OR 0.16 (95% CI 0.04–0.68).

§Significant difference ($P < .05$) between baseline and 30 months.

¶Denominators differ for each variable because of missing data. Missing data ranged from 21.2% to 23.1% at baseline and from 5.5% to 6.6% at 30 months for these variables.

||Significant differences in effects between high- and low-income groups to strongly agree that HS Specialist talked to parents about child's behavior and development, OR: 0.09 (95% CI 0.01–0.64).

¶¶Significant differences in effects between high- and low-income groups to strongly agree that HS Specialist provided parents with support, helped with stress, and referred for emotional problems between high-income and low-income practice settings, OR: 0.21 (95% CI 0.05–0.91).

by age or time in practice, clinicians in low-income practices tended to be a few years younger on average (40 years vs. 43–45 years) and had spent less time working in their current practice (5 years vs. 9–10 years). In addition, more pediatric clinicians serving low-income families were females than their counterparts in practices serving middle- and high-income families.

Practice Environment

Table 2 shows that at baseline between 24.3% and 42.9% of clinicians reported problems with reimbursement, and the corresponding figures for 30 months were between 40.0% and 70.8%. The respective percentages at baseline and 30 months for time problems were 27.0% to 59.4% and 65.2% to 73.1%. The logistic regression results showed that clinicians serving low-income families had over four times greater odds of reporting time problems at 30 months than they did at baseline and nearly seven times greater odds of reporting problems with reimbursement over time (Table 2). Clinicians serving high-income families had nearly three times the odds of reporting reimbursement problems at 30 months than at baseline, but no differences were observed for time problems. For practices serving primarily middle-income families, no significant changes from baseline to 30 months were found in clinicians' perceptions of reimbursement or time problems. There were no differences over time in the percentage reporting staffing problems, which ranged from 34.3% to 43.8% at baseline and 31.6% to 52.2% at 30 months.

Comparisons were made across the three income groups regarding the change over time in reporting of problems. There was a significant difference over time between the middle- and low-income groups reporting reimbursement problems (odds ratio [OR]=0.14; confidence interval [CI] 0.03–0.57), with the low-income group showing a greater increase in the reporting of reimbursement problems. There were no other differences over time between groups for time or staff problems.

Provision of Child Development Services

Analyses reported in Table 3 reveal that, across income groups, clinicians reported that they were significantly more likely to provide multiple child development services to families at 30 months than at the beginning of HS. These services were an office visit with someone who talks with parents about the child's development; a child development telephone information line; a letter before the well child visit; and home visits. The frequency of reporting these services ranged from 6.9% to 66.7% at baseline and from 45.7% to 92.0% at 30 months.

There were income group differences in the increase in reporting of developmental services between baseline and 30 months for two of the five services. In low-income practices, the odds of reporting a child development telephone information line was 11 times greater at 30 months than at baseline, and in high-income practices, it was 15 times greater; the odds were close to 1 for practices serving middle-income families. A comparison of these odds ratios indicated that the odds of middle-income practices reporting a telephone information line was 87% less (see footnote in Table 3) compared to low-income practices; when middle-income practices were compared to high-income practices, the latter practices had 10 times the odds of reporting a developmentally focused telephone line (see footnote in Table 3).

A significant difference was also found in the inclusion of home visits between the high- and middle-income practice groups: Clinicians at the practices serving high-income families had 11 times the odds of reporting that they offered home visits compared to middle-income practices (see footnote in Table 3).

Perceptions of Care

Over time, clinicians in pediatric primary care practices serving low-income families indicated more positive change in their perceptions about the care they provided than clinicians serving high-income populations (see Table 4). At 30 months after starting HS, clinicians in practices serving low-income families had four times the odds of reporting that they strongly agreed they were giving support to parents than they did at baseline and nearly six times the odds of reporting being very satisfied with the ability of the clinical support staff to meet children's developmental and behavioral needs. The latter odds ratio did not differ significantly from the ones estimated for practices serving middle- or high-income families. The odds of reporting that they were giving support to parents, however, was significantly greater for clinicians at low-income than at high-income practices.

For the clinicians in practices serving both the middle- and high-income families, the odds ratios revealed no significant changes over time in clinicians' perceptions of the support they provided parents or in their satisfaction with the ability of the clinical staff to meet children's developmental and behavioral needs. These findings by income group are caused, in part, by the fact that clinicians in low-income practices reported the lowest percentages of satisfaction with the care they were providing at baseline compared to the middle- and high-income practices.

There also were differences over time in clinicians' perceptions of the role of the HS Specialist in meeting parents' child-rearing needs. Clinicians in low-income pediatric practices had over 19 times the odds at 30 months than at baseline of reporting that they strongly agreed that the specialist talked to parents about the child's behavior and development. They had over 6 times the odds of reporting that they strongly agreed that the specialist showed parents activities and gave information about what to do with the child and nearly 5 times the odds of strongly agreeing that the specialist provided parents with support and helped with stress and referrals for problems.

In the practices serving middle-income families, the clinicians had four times the odds of strongly agreeing that the specialist showed parents child-rearing activities and information at baseline versus 30 months and had over two times the odds of strongly agreeing that the specialist showed parents activities and gave information about what to do with their child. The logistic regression analyses for the clinicians in practices serving high-income families revealed no significant changes from baseline to 30 months in their perceptions of the care provided by the specialist. As a result, the odds ratios for clinicians in the low-income practices were significantly greater than for those clinicians in high-income practices for two of the three specialist scales, showing activities and providing support to parents (see footnote in Table 4).

Table 4 shows across all income groups that clinicians were significantly more likely to report functioning as a team at 30 months (ranging from 46.2% to 75.0%) than they were at the beginning of HS (24% to 32.3%). Compared to baseline, the odds that clinicians reported working as a team at 30 months was seven times greater for low-income practices, over two times greater for middle-income practices, and three times greater for high-income practices; these estimates did not vary across income groups.

DISCUSSION

HS is a practice-based health care intervention that has a goal to promote the clinical capacity and effectiveness of pediatric primary care to meet the developmental

needs of families with young children. This study is the first opportunity to assess the differential effects of implementation of this universal model on clinicians' perceptions of the care and developmental services provided in practice settings that serve primarily low-income families compared with those serving higher income families.

A strong finding from this study is that clinicians in low-income practices showed the greatest increases in satisfaction with the care they provided children and families for 3 areas: that they gave support to parents; that the support staff met children's developmental and behavioral needs; and that the HS Specialists did in fact fulfill their roles, i.e. talked to parents about their child's behavior and development, provided parents with support, helped with stress, and referred for emotional problems. At 30 months, the clinicians in low-income practices reported satisfaction with the care their clinical staff was providing at the same percentages that clinicians serving middle- and high-income families reported, but they reported less satisfaction at baseline. It appears that the HS implementation enabled the low-income practices to achieve the same level of clinician satisfaction as higher income practices, given their comparatively lower satisfaction ratings at baseline.

From the ongoing HS National Program Evaluation, interviews with parents at 30–33 months confirmed the positive perceptions of clinicians reported here about delivery of services and the value of the HS Specialist.²¹ Parents reported receiving these services and being very satisfied with the care they received. For example, almost all parents (97%) stated that they had received developmental services; over 75% reported receiving four or more. More than 65% of parents reported that someone in the practice went out of the way to help them. There were 93% of parents who found the HS Specialist very helpful: They reported that they were satisfied or very satisfied (99.3%) with the care they received from the specialist in providing support, talking about their children's progress, and showing them activities or providing information.

HS was implemented during a period in which our health care system was undergoing dramatic changes; clinicians struggled with increasing reimbursement and time problems and the incorporation of managed care into both Medicaid and commercial health care systems. Amid these challenges that can contribute to clinician dissatisfaction, it is especially noteworthy that the clinicians caring for HS families reported that they were more satisfied with the care that they were providing after 30 months of providing HS services. Although it is possible that the program itself might have contributed to the practice environment barriers, provider data from the HS National Evaluation suggest this is not the case. When control groups were available for quasi-experimental sites, the percentages of clinicians reporting these barriers were similar between intervention and control groups.²²

The results suggest that HS was successful in universally increasing developmentally oriented services across all income levels, as reported by clinicians, in a variety of settings. That the practices serving low-income families were comparatively as successful in providing child development services as practices serving higher income families is noteworthy, especially given clinicians' reports of greater reimbursement and time problems at 30 months. The incorporation of developmental services and the HS Specialist into routine pediatric primary care appears to assist clinicians and clinical staff in their efforts to provide more comprehensive health care to low-income children and their families.

There are several limitations of our study that warrant comment. The small sample size, once clinicians were divided into tertiles based on the income level of

families at their practice, limited the analyses we could undertake in this study. The sample was also too small to explore differences between urban and nonurban sites. However, 65% of the practices were located in urban areas, with 46% of the urban practices serving primarily low-income families. As such, the findings from this study have particular relevance for low-income families and clinicians in urban areas. In urban areas, parents of young children may feel isolated and do not have or know how to find community-based and parent education services. The HS approach could offer a practical model within urban primary health care systems to provide family support and developmental services.

A second limitation is that some variables related to the effects of serving low-income families were not included in our questionnaires. For instance, we were not able to address directly the impact of HS on clinician burnout and retention rates, which have been associated with low levels of clinician satisfaction and deficiencies in provisions of health services for low-income populations.^{7,23} Although this study's findings on the increased satisfaction of clinicians might suggest that HS could have the potential to alleviate the staffing problems for practices that serve low-income families, additional work would need to address this question empirically.

Three other limitations should be noted. First, the HS practices were selected to participate in the evaluation partly because they demonstrated delivery of high-quality pediatric primary care services. In pediatric practices providing lower quality care, the implementation of HS might create greater positive changes in the provision of services and clinician satisfaction ratings. Also, it is possible that practice settings providing lower quality care would contain greater divergence in the perceptions of clinicians and staff, with less practice cohesion and less agreement on the importance of behavior and development. Second, with a 70% response rate, the participating clinicians in our study may not be representative of all clinicians at each site, but we do not have data to assess whether this is the case. Finally, it has been shown that physicians tend to overrate the quality of care they provide to consumers.^{24,25} Although this may be generally true for clinicians in our sample, it is unlikely that inflated ratings account for the changes observed in ratings over time.

In conclusion, the findings of this study, although modest, suggest that the provision of developmental services and the addition of a developmental specialist could have a greater impact on clinicians' perceptions and professional satisfaction in practices that serve low-income children and families. These are meaningful findings for program evaluations of real world interventions. Such a model could be associated with the delivery of more comprehensive, family-oriented primary care for a potentially more vulnerable population of young children and families.

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