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Concerns about development, behavior & learning among parents seeking pediatric care

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Abstract

Objective—To describe responses to the questions “Do you have concerns about your child’s behavior? Development? Learning?” among parents seeking pediatric care, and to analyze their correspondence to formal screening questionnaires.

Methods—Of 465 parents of children ages 3–65 months recruited at pediatric primary care practices in greater Boston, 451 provided complete data for analysis. After completing a questionnaire that asked if they had any or all of these concerns parents filled out a developmental screener (Ages and Stages Questionnaire-3) and a behavioral screener (Ages and Stages Questionnaire-Social/Emotional).

Results—108 parents (24%) reported having at least one concern about their child. Greater child age, male gender, and lower family income were associated with more concerns about development, behavior, and learning. Moderate agreement was found between parents’ concerns and their responses on screening instruments. Compared to children who were not identified on either screener, parents of children identified only on the behavioral screener were more likely to have concerns about behavior and parents of children identified on both screeners were more likely to have noted concerns about both behavior and development. No type of concern was associated with identification on the developmental screener alone. Among parents who identified no concerns, 18% were identified as at risk on one or both screening tests.

Conclusion—Parents’ self-report of concerns showed moderate agreement with the results of developmental and behavioral screening instruments. Agreement was higher for behavioral concerns than for developmental concerns.

Keywords

screening; surveillance; developmental delay; behavioral problems; parent concerns

To improve identification of pediatric developmental and behavioral disorders, the American Academy of Pediatrics (AAP) recommends systematic surveillance and screening. To enhance surveillance, the AAP suggests that pediatricians ask parents, “Do you have any concerns about your child’s development? Behavior? Learning?”¹ We know of no studies that examine the effectiveness of asking these specific questions.

Historically, assessments of parent concerns have been validated using criterion instruments that assess only the same domain, i.e. whether concerns about development predict

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developmental disorders²⁻⁴ and whether concerns about behavior predict behavior disorders.⁵ Child behavior problems often co-occur with developmental disabilities,^{6, 7} yet the weight parents give to each type of problem may differ. For example, a child with a language delay may have trouble following rules at preschool and act out as a result. To the child's parents, reports of acting-out behaviors may make concerns about behavior more salient than the underlying developmental delay.

We know of no study that has assessed the value of eliciting parents' concerns in detecting both behavioral and developmental problems in an entire sample. To address this issue, we have investigated how concerns about behavior, development and learning correspond with outcomes on behavioral and/or developmental screening instruments.

The aims of this paper are to (1) describe parents' responses to the concern questions recommended by the AAP, and (2) determine the level of agreement between parent concerns and formal parent-report screening instruments.

METHOD

These analyses are based on data collected as part of a larger study designed to develop and validate a new comprehensive surveillance tool, the *Survey of Well-being of Young Children* (SWYC). The study was approved by the Tufts Medical Center Institutional Review Board.

We enrolled 465 parents of children ages 3 months to 5.5 years from 7 primary-care pediatric practices in the greater Boston area. Research assistants approached parents in waiting rooms, before their appointments, and asked them to join the study. Any parent with a young child was considered eligible. Enrolled parents received a packet of questionnaires to take home, complete, and mail back. The questionnaire asked: "Do you have any concerns about your child's development?" followed by, "Do you have any concerns about your child's behavior?" and "Do you have any concerns about your child's learning?" with three response options: "not at all," "somewhat," and "very much" for each question.

Concern questions were followed by two validated screening measures: the Ages and Stages Questionnaire (ASQ-3)⁸ and the Ages and Stages Questionnaire: Social-Emotional (ASQ-SE)⁹. The ASQ-3 asks parents if their child can accomplish certain age-specific developmental tasks such as climbing the stairs or manipulating buttons. As recommended in the ASQ-3 manual, parents were provided with materials, such as blocks and crayons, to support their observations. The ASQ-SE asks parents to report on their child's behavior, asking, for example, if their child plays well with others, can calm him/herself down and if s/he follows rules. Both instruments were scored according to the guidelines in their respective manuals.^{8,9} Finally, parents completed the Patient Health Questionnaire-2,¹⁰ a well-validated screen for depressive symptoms.

Analyses

All analyses were conducted using Stata version 11. The correspondence of demographic variables with each type of concern (development, behavior, and learning) was analyzed by recoding concern as a binary variable (any concern vs. no concern) and conducting logistic regression analyses. To analyze agreement with screening instruments, each child's status with respect to outcome measures was defined in a single variable in one of four categories: 1) identified by the developmental screener (ASQ-3), 2) identified by the behavioral screener (ASQ-SE), 3) identified by both, or 4) identified by neither. Bivariate associations between each variable and parents' concerns were analyzed via contingency tables and chi-square tests.

To control for relevant covariates, we conducted a multinomial logistic regression to determine whether each type of parent concern was associated with scores on the screening measures. Possible covariates considered included family income, parent education, maternal depressive symptoms, child age, and child gender. Following standard recommendations,¹¹ variables were retained if they predicted outcome with $p < .25$. For each type of concern, we included two design variables to distinguish between the predictive value of each response option (i.e., “somewhat” and “very much”). The first design variable was coded as 0 for “no concerns” and 1 if the parent was “somewhat” or “very much” concerned. The second design variable was also coded as 0 for “no concerns,” but was coded as 1 only if the parent was “very much” concerned. Binary variables were included to account for non-response to income and education questions.

RESULTS

Study sample

Sample characteristics are reported in Table 1. Parents were enrolled from four urban (n=169) and three suburban (n=282) primary care pediatric practices. Sixty-two percent of parents approached provided requested data; 97% of parents (n=451) provided complete data on all primary measures and were included in the analyses. This rate is comparable to the proportion of parents who complete screening instruments when asked to do so by their pediatrician.^{12–14}

The majority of respondents were mothers (86%). Most had completed college (55%), although many had not. Family incomes varied, with 30% making less than \$50,000 per year. The sample was diverse with respect to race and ethnicity, with 39% self-identifying as minority race or Hispanic ethnicity.

Outcomes Overall, 108 parents (24%) expressed “some” or “very much” concern in at least one area; 64 (14.2%) parents expressed concern about development, 72 (16.0%) expressed concern about behavior and 46 (10.2%) expressed concern about learning. Parents were more likely to express concern for older children, male children, and if they reported family income less than \$50,000 per year (Table 2). No associations with parent education or race/ethnicity were found.

One-hundred sixteen children (25.7%) were identified as at risk by parents’ reports on one or both of the screening measures: 67 (14.9%) were identified on the ASQ-3 only, 25 (5.5%) were identified on the ASQ-SE only and 24 (5.3%) were identified on both instruments.

Demographic variables did not moderate the relationship between concerns and screening results, with one exception: concerns about development were associated with positive screening results only for families with incomes >\$50,000 ($p < .05$). Because we found no clear pattern of interaction with demographic variables, we analyzed the association between parent concerns and screening results for the full sample.

Of the 108 parents who expressed concerns, 53 (49%) provided responses that identified their children as being at risk on at least one screening instrument; notably, 55 (51%) did not. Of the 343 parents who expressed no concerns, 63 (18%) of their children were nevertheless identified by parents’ responses on one or both screening instruments.

Table 3 displays further detail regarding how children scored on the screening measures for each level and type of parent concern. Chi-square tests compared children who scored positive on one or both screening tests to those who did not score positive on any. Row percentages indicate the proportion of parents with each level and type of concern whose

children scored positive on each screening test. For example, presence of any concerns—irrespective of whether they were in regard to behavior, development, or learning—are presented in Table 3, section D. The first row indicates that among children of parents who were “very much” concerned in at least one area, 87% (6%+56%+25%) were identified on one or both screening instruments. The second row indicates that for parents who were “somewhat” concerned, 42% (15% + 11% + 16%) were identified on one or both screening instruments.

In the multinomial logistic regression, all candidate variables except gender were significant at the $p < .25$ level and were retained as covariates. Concerns about learning were non-significant ($p > .25$) for all outcomes and were thus dropped from the final model. Likewise, coefficients for high levels of concern could not be estimated for those identified on the developmental screening test due to low response frequencies. Final models therefore included independent variables representing concerns about behavior and development as well as relevant covariates. Hosmer-Lemeshow goodness of fit tests were non-significant for all outcome categories, indicating adequate fit. Likewise, Pearson chi-square goodness of fit test was non-significant for all outcome categories except those identified by the developmental screener only, which is not surprising given that parent concerns did not predict this category.

Controlling for child age, gender and race/ethnicity as well as parent education and family income, any level of concern about behavior was associated with scores on the behavioral screener alone. Reports of being “somewhat” concerned about development and “very much” concerned about behavior were associated with simultaneous identification on both screening measures. No type or level of concern was associated with identification on the developmental screening measure alone.

DISCUSSION

The AAP recommends that pediatricians ask parents, “Do you have any concerns about your child’s development? Behavior? Learning?” Our results suggest that parents with lower incomes are more likely to report concerns, that parents are more likely to express concern about boys, and that concerns rise through age 5 years. Results also suggest that questions about parent concerns and standardized screening questionnaires only partially measure a common domain. Children of the small number of parents who were “very much” concerned in at least one area were very likely to be identified on at least one screening test. Concordance between parents’ reports of being “somewhat concerned” and screening tests are less robust. Almost one in five parents who indicated no concerns about their child’s behavior, development or learning provided responses on formal screening instruments indicating that their children were indeed at risk, especially for developmental delays. Agreement between parent concerns and behavioral screening results was generally stronger than agreement with developmental screening results.

After controlling for covariates, concerns about learning were not associated with the results of either the behavioral or developmental screening tests, though they may be predictive of other variables that were not evaluated in this study, such as IQ.

There are several possible explanations for why parents’ concerns about development did not predict scores on a developmental screening instrument. First, parents may not understand the breadth of what clinicians mean by the word “development.” They may not think of development as a set of specific domains as clinicians do¹⁵ and thus may not report concerns about areas of development that are not specifically elicited by this question, e.g. language. Other instruments, such as the PEDS, include more specific questions about the

child's language, cognition, and motor skills and may be more effective than queries about "development" in general.

Second, parents often do not know what skills are normative for children at a given age and thus may not recognize developmental delays as readily as behavioral problems.¹⁶ Third, while developmental problems may be present, behavioral problems may have greater salience to parents in their day to day lives if they are disruptive and lead to disturbances or concerns in multiple contexts (e.g., day care or preschool).

Our results suggest that asking parents about their concerns may be clinically helpful. In particular, parents who reported being "very much" concerned—although rare—were very likely to score positive on at least one screening instrument. Parents' concerns also identified many children who did not score positive on screening instruments. These children may benefit from further evaluation or intervention, although verification of this need was beyond the scope of this study. Finally, asking about parent concerns may serve to facilitate conversations between pediatricians and families.

Pediatricians should, however, use caution in relying solely on parents' stated concerns to determine subsequent evaluations. Parents of over half the children who scored positive on screening instruments had expressed no concerns. These children, too, may benefit from further evaluation or intervention. Moreover, parents were significantly less likely to express concerns about younger children, suggesting that solicitation of parent concerns may not be adequate for early detection among very young children.

There were a number of limitations to this study. First, we asked the 3 surveillance questions on a paper questionnaire; results might have been different if they had been asked in the course of a verbal interaction. Additionally, the ASQ-3 and ASQ-SE are screening tools and should not be considered diagnostic. Both the ASQ-SE and ASQ-3 are comprised of sets of forms that differ by age, thus the validity of each individual form may vary in ways that are as yet unknown. It is important that we continue searching for an effective combination of surveillance and screening questions to identify parents' concerns and children's difficulties as accurately and as early as possible.

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Abbreviations

AAP	American Academy of Pediatrics
PEDS	Parents' Evaluation of Developmental Status
SWYC	Survey of Wellbeing of Young Children
ASQ-3	Ages and Stages Questionnaire 3 rd Edition
ASQ-SE	Ages and Stages Questionnaire: Social – Emotional

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Table 1

Sample characteristics

	n=451	% of sample
Pediatric practices		
urban	169	37%
suburban	282	63%
Respondent characteristics		
mother	390	86%
father	64	14%
<u>Parent Education</u>		
< High School	19	4%
High School diploma	183	41%
College diploma	150	33%
Graduate education	94	21%
not reported	5	1%
<u>Family Income</u>		
< \$20,000	68	15%
\$20 – 40,999	69	15%
\$50 – 99,999	130	29%
\$100 – 149,999	98	22%
> \$150,000	70	16%
not reported	16	4%
Child Characteristics		
<u>Race/Ethnicity</u>		
White	276	61%
African-American	42	9%
Asian	37	8%
Other	9	2%
Hispanic	59	13%
<u>Male gender</u>	244	54%
<u>Age (months)</u>		
3–11	114	25%
12–23	122	27%
24–35	76	17%
36–47	74	16%
48+	65	14%

Table 2

Association between parent concerns and demographic variables

	development		behavior		learning	
	proportion with concerns	OR (95% CI)	proportion with concerns	OR (95% CI)	proportion with concerns	OR (95% CI)
child age						
3–11 months	9%	<i>baseline</i>	9%	<i>baseline</i>	7%	<i>baseline</i>
12–23 months	16%	2.8** (1.7–4.8)	13%	2.3* (1.2–4.3)	12%	4.3** (2.2–8.7)
24–35 months	12%	4.0** (2.4–6.8)	15%	3.6** (1.9–6.9)	5%	5.1** (2.2–10.2)
36–47 months	14%	6.2** (3.6–10.5)	22%	10.1** (5.5–8.75)	5%	10.8** (5.5–21.5)
≥ 48 months	25%	8.6** (5.0–14.0)	29%	17.9** (9.5–33.5)	25%	17.2** (8.7–34.0)
child gender						
female	11%	<i>Baseline</i>	11%	<i>baseline</i>	5%	<i>baseline</i>
male	17%	1.6** (1.2–2.1)	21%	2.2** (1.6–3.1)	15%	2.3** (1.6–3.2)
income						
<\$50,000	19%	<i>Baseline</i>	28%	<i>baseline</i>	17%	<i>baseline</i>
≥ \$50,000	12%	0.85** (.76–.96)	11%	.78** (.69–.89)	7%	.87* (.77–.99)

Note.

* p < .05;

** p < .01

Table 3
Screening results for children whose parents endorsed different levels and types of concerns. (n, % of row)

Concern question	Level of concern	score in the clinical range on			
		ASQ only	both ASQ & ASQSE	ASQSE only	neither
A. Do you have concerns about your child's development?		0	2	1	1
	very much	0%	50%	25%	25%
	somewhat	7	9	9	35
	none	12%	15%	15%	58%
B. Do you have concerns about your child's behavior?		60	13	15	299
	very much	16%	3%	4%	77%
	somewhat	n.s.	**	**	baseline
	none	0	4	4	2
C. Do you have concerns about your child's learning?		0%	40%	40%	20%
	very much	10	6	14	32
	somewhat	16%	10%	23%	52%
	none	57	14	7	301
D. Parent's highest level of concern on any question		15%	4%	2%	79%
	very much	n.s.	**	**	baseline
	somewhat	1	3	0	1
	none	20%	60%	0%	20%
E. Do you have concerns about your child's social skills?		5	6	5	25
	very much	12%	15%	12%	61%
	somewhat	61	15	20	309
	none	15%	4%	5%	76%
F. Do you have concerns about your child's academic skills?		n.s.	*	*	baseline
	very much	1	9	4	2
	somewhat	6%	56%	25%	13%
	none	14	10	15	53

Concern question	Level of concern	score in the clinical range on			
		ASQ only	both ASQ & ASQSE	ASQSE only	neither
		15%	11%	16%	58%
		52	5	6	280
	none	15%	1%	2%	82%

Note.
* p < .05;
** p < .01