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How Knowledge of Adverse Childhood Experiences Can Help Pediatricians Prevent Mental Health Problems

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Introduction: The purpose of this study was to gain a better understanding of the perspectives of low-income, minority primary caregivers to inform the design of pediatric interventions to prevent mental health problems. **Method:** The authors conducted a follow-up study of female primary caretakers of children ages 4–5 years old in an urban northeastern pediatric practice, including 5 mothers of children with low Child Adverse Childhood Experiences (C-ACE) scores and 13 mothers of children with high C-ACE scores. **Results:** Participation in early speech therapy, preschool programs, or mental health treatment was less likely for children with high C-ACE scores. Mothers of children with behavior problems expressed the most interest in developmental behavioral evaluations, parenting interventions, and mental health treatment. Information about nutrition and exercise options was of interest to mothers from low and high C-ACE groups. **Discussion:** Results suggest that screening for C-ACE along with developmental and behavioral screening may help pediatric health care providers to identify children who are both at greatest risk for mental health problems and in need of help in accessing services. Incorporation of nutrition and exercise components into mental health interventions may increase enrollment and retention, as may targeting mental health interventions and referrals to parents with child behavior concerns.

Keywords: mental disorder, behavior problem, adverse childhood experiences, determinants of health, pediatrics

The Adverse Childhood Experiences (ACE) study of over 17,000 HMO members identified increased risk for leading causes of morbidity and mortality in adulthood based upon childhood exposure to risk factors including substance use in the household, domestic violence, mental illness in a primary caretaker, child maltreatment, incarceration of a household member, and single parenting (Felitti et al., 1998).

Childhood exposure to four or more of these risk factors increased risk for a range of poor outcomes, but by far the greatest increase in risk was for mental health problems (Anda et al., 2006; Brown et al., 2009; Felitti et al., 1998). Risk for depression was four times higher in adults who were exposed to four or more ACEs, alcoholism was seven times higher, and attempted suicide was 12 times higher. The ACE study is consistent with and supported by a broader literature demonstrating the mental health consequences of early life stress (Barker, 1998; Nathanielsz, 1999; Repetti, Taylor, & Seeman, 2002; Wadsworth & Kuh, 1997; Werner & Smith, 2001).

Primary care pediatric providers interact regularly with families during the child's first few years of life and are therefore positioned to identify high risk family environments that may require intervention to improve children's short-term and long-term mental well-being. The challenge for successful prevention is not

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so much the identification of high risk families or the development of efficacious interventions. Rather, it is to successfully engage high risk families in effective programs. Research studies have demonstrated that home visiting programs, such as Nurse Family Partnership, can reduce child maltreatment (Karoly, Kilburn, & Cannon, 2005). However, when translating this research into practice, home visiting programs struggle with recruitment and retention (Eshel, Daelmans, de Mello, & Martines, 2006; Wagner, Spiker, Gerlach-Downie, & Hernandez, 2000). Similarly, parent-focused training can reduce child behavior problems (Guyer et al., 2009; Scott, Briskman, & O'Connor, 2014), but in practice suffer from poor attendance and high dropout, even when barriers to participation such as child care and transportation are removed (Baker, Arnold, & Meagher, 2011; Peters, Calam, & Harrington, 2005; Whittaker & Cowley, 2012). Importantly, parents who are the most difficult to engage may be those most at risk, because of low income, low education, or ethnic minority status (Barnes, MacPherson, & Senior, 2006; Gorman-Smith et al., 2002; Haggerty, MacKenzie, Skinner, Harachi, & Catalano, 2006). Community-based participatory research has been proposed as a method to identify how to improve acceptability and receipt of interventions (Wallerstein & Duran, 2006) and that is the approach we followed in the current study.

We report findings from a follow-up study of female primary caregivers of children in an urban pediatric practice. We oversampled families in which the child was exposed to high levels of ACEs and used qualitative methods to assess maternal perceptions of child health problems, as well as use of and interest in child behavior and mental health interventions. The purpose of our research was to explore the perspectives of low-income, minority primary caregivers to inform the design of pediatric interventions to prevent mental health problems in youth.

Method

The data summarized in this study was collected on primary caregivers of children age 4–5 years old who had previously participated in a cross-sectional study examining associations between Child-ACEs (C-ACEs) and child

outcomes. Methods used in the original cross-sectional study were previously reported (Marie-Mitchell & O'Connor, 2013). Briefly, subjects were recruited for the cross-sectional study from well-child visits at a federally qualified health center in a medium-sized northeastern city in the United States. This city was affected by common inner city problems including high school drop-out, unemployment, violence, and segregation. The pediatric practice included three pediatricians, two nurse practitioners, and one preventive medicine physician. The majority (90%) of pediatric patients at this health center were low-income recipients of Medicaid, and virtually all were of African American or Hispanic/Latino. During a research visit, two standard measures of child behavior and development with considerable validity and reliability were administered: (a) Pediatric Symptom Checklist (PSC; Gardner, Lucas, Kolko, & Campo, 2007; Jellinek et al., 1999) and (b) Vocabulary subscale of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI; Lichtenberger & Kaufman, 2004). Mothers also reported their child's health status (Flaherty et al., 2009), and child weight status was recorded from medical record data.

Recruitment

To recruit a subsample for follow-up, we divided the subjects from the cross-sectional study by C-ACE scores. Our C-ACE score included the following factors: suspected maltreatment, domestic violence, substance use, mental illness, criminal behavior, single parenting, and maternal education. Our goal was to interview a random selection of parents of children with low C-ACE scores (low risk for mental health problems) and parents of children with high C-ACE scores (high risk for mental health problems). We purposely recruited more parents of children with high C-ACE scores to better understand the experiences and interventions of interest to this population. Recruitment continued until saturation of responses. Subjects were offered a financial incentive to participate in the interviews, and all subjects who were contacted agreed to be interviewed.

Data Collection

We obtained written informed consent, after which we asked the mother to complete a sur-

vey of community resources utilized or of interest. Surveys were completed in either English or Spanish depending upon her language preference. The list of community resources was based upon previous interviews with 20 mothers using a WIC (Women, Infant and Children's) program colocated with the health center and identified strong interest in preschool programs, parenting support groups, child development/behavior evaluations, parent mental health/substance abuse treatment, and family sports programs (data unpublished). After subjects completed the community resource survey, we conducted 30–45 min interviews using a semistructured topic guide that inquired about maternal perception of child health problems and interest in interventions (see Table 1). A bilingual research assistant provided Spanish translation and English interpretation for participants who preferred to speak in Spanish.

This research was approved by the Research Subjects Review Board at the university and by the Research Committee at the health center.

Data Analysis

Each of the interviews was recorded and transcribed verbatim. The lead author (Ariane Marie-Mitchell) and a resident in Preventive Medicine (Karen R. Studer) independently reviewed the transcripts using inductive description of the data to identify themes and subthemes. Preliminary findings were discussed with all of the authors and used to develop a coding frame. Any discrepancies in applying the coding frame were discussed with the research team and resolved by consensus after which interviews were recoded if indicated. After coding was

completed, subjects were divided into low C-ACE and high C-ACE groups so that similarities and differences could be compared. Simple counts were used to compare groups on utilization reported in the community resource survey and on experiences described in the interviews. Interpretation of the results was triangulated with related literature.

Results

Participants

From the cross-sectional study, we identified 54 children age 4–5 years old who had low C-ACE scores (two or fewer risk factors) and 48 children age 4–5 years old who had high C-ACE scores (three or more risk factors). For follow-up interviews, we recruited five subjects with low C-ACE scores and 13 subjects with high C-ACE scores. The primary caregiver interviewed was most often the biological mother and so referred to as “mothers” in this manuscript, but a few were other female relatives with custody (e.g., aunt or grandmother). A description of participant characteristics is presented in Table 2, and examples of qualitative responses are shown in Table 3.

Maternal Perception of Child Health Problems

Language expression. A WPPSI-III vocabulary subscale score of <10 correlated with parent-reported speech problems in 12 of the 18 children. Mothers reported first being concerned about speech when their child was between the ages of 1–2 years old. Problems described in-

Table 1
Qualitative Interview Guide

Topic	Protocol question
1. Understand child health problems	When did they first realize child had (health problem)? Where did they go for help? Did they get help?
2. Identify interventions of interest to families:	Inquires based upon review of Community Resource Survey:
Parent-child interventions	<ul style="list-style-type: none"> • Parenting classes/support groups
Child-focused interventions	<ul style="list-style-type: none"> • Preschool programs, developmental and behavioral evaluations, exercise options, daycare program, mental health treatment
Parent-focused interventions	<ul style="list-style-type: none"> • Exercise options, mental health or substance treatment, additional education
	What community resources would help you and your child? What are barriers? Would co-location at a Pediatric practice be helpful?

Table 2
Sample Characteristics of Children Ages 4–5 Years Old and Maternal Parent

Characteristic	Low child ACE Score Mean 1.6 (range 1–2)	High child ACE Mean 3.5 (range 3–4)
Maternal ACE score: <i>M</i> (range)	1.2 (0–2)	3.5 (0–8)
Maternal age: <i>M</i> (range)	31.4 (20–47)	30.4 (21–61)
Child gender male: number (%)	2 (40%)	9 (69%)
Child ethnicity Black: number (%) ^a	2 (40%)	10 (77%)
Child health problems		
Child language (WPPSI-III vocabulary subscale): number < 10 (%)	2 (40%)	10 (77%)
Child behavior (PSC): number > 23 (%)	1 (20%)	8 (61%)
Child health rating: number < excellent (%)	2 (40%)	8 (61%)
Community services used		
Parenting class or support program: number (%)	2 (40%)	11 (85%)
Parent mental health or substance treatment: number (%)	1 (20%)	7 (54%)
Parent exercise program: number (%)	4 (80%)	6 (46%)
Child speech therapy: number (%)	2 (40%)	4 (31%)
Child mental or behavioral treatment: number (%)	1 (20%)	2 (15%)
Child preschool program: number (%)	5 (100%)	10 (77%)
Child exercise program: number (%)	1 (20%)	1 (8%)

Note. ACE = Adverse Childhood Experiences; PSC = Pediatric Symptom Checklist; WPPSI-III = Wechsler Preschool and Primary Scale of Intelligence version III.

^a Remaining children were Hispanic.

cluded lack of expressive language, limited vocabulary, and stuttering. Only three of the children with speech delays were referred to Early Intervention; of these two had low C-ACE scores. The majority of children with high C-ACE scores and low vocabulary scores did not receive speech therapy (six out of 10) or did not receive speech therapy until they were school age (three out of 10). This was attributed to lack of referrals or to a lack of follow-up with referrals.

Behavior problems. Half of the primary caregivers interviewed reported concerns about their child's behavior based upon a Pediatric Symptom Checklist score greater than 23. Mothers reported that they observed behavior problems by age 3 and as young as 6 months. More than one parent mentioned the difficulty of taking a child with behavior problems out of the house. Only one child, who was rated as low C-ACE, was receiving mental health treatment (Interviewee #10). One other child who had a high C-ACE score was receiving autism specific treatment. All of the remaining high C-ACE children with behavior problems were not receiving treatment or were waiting for referrals.

Health status. Half of the mothers who were concerned about their child's health status

attributed concern to weight status and eating habits (five out of 10), and the majority of these had high C-ACE scores (four out of five). Of note, none of the mothers interviewed had children who were underweight, but several (three out of 10) were concerned about their child being underweight. Of the children who were overweight or obese (six out of 10), only one mother was concerned about the child's health because of her weight and this child had a low C-ACE score.

Maternal Interest in Child Behavior and Mental Health Interventions

Parenting interventions. Analysis of the community resource survey showed that a high percentage of the sample had participated in some type of parenting class or support program (13 out of 18). Positive descriptions were given by two mothers who had participated in the Incredible Years program (e.g., "the class was good" and "it was awesome"). Other mothers described parenting classes as didactic and boring. Two mothers, who reported concerns about behavior problems in their children, expressed interest in parenting interventions (one had done a prior parenting class and the other had

Table 3
Example Qualitative Responses

Topic	Interviewee responses
Perception of child health problems	I noticed the difference between those three year olds and my three year old . . . I asked the doctor about it but they were just like oh, he'll grow out of it. So I mean they never really did anything about the speech. -Interviewee #5, mother of 3
Language expression	We were supposed to have a lady come to the house and stuff but it was impossible because I was working full time and he was at daycare. And there was no way that she could come to the house and stuff. -Interviewee #7, mother of 3
Behavior problems	We call him Booty Rock cause he rocks so much. But he rocks since he was like six months. . . . I used to be scared when he was a baby cause like one or two he would get a tantrum he'll bust his head on the wall, busting his head on the floor. And I used to have to take him to the emergency room a lot. And they said don't worry about it. -Interviewee #7, mother of 3 I said okay, when you go to the store what do you want? He said I want some chips. I said okay. You know kids these days don't know how to get one or two things. They get more than one. So he had like nothing but a lot of chips. I said X, you're not going to eat that many bags of chips you see. So he fell out. [Sighs] You know, he fell out in the store kicking. . . . I was so embarrassed. -Interviewee #17, mother of 4 (translated from Spanish) At age 2, I noticed he was very hyperactive. I took him to the doctor but was told to wait until he goes to school -Interviewee #8, mother of 3
Health status	Cause she don't like to eat . . . Well, I think she's just picky right now . . . I be scared because I was a diabetic when I had her so I'd be scared that she might be a diabetic -Interviewee #9, mother of 1 We try to teach her to stop eating junk food and candy cause her teeth got really bad. -Interviewee #18, mother of 4
Barriers to child behavior and mental health interventions	I'm taking child care classes but they are so boring to me. Like, I learned a lot of stuff but it's like, it's just like non-stop. I like to get hands on so we're just like sitting there listening to somebody talk. -Interviewee #2, mother of 2
Parenting interventions	I already tried parenting class. Cause I can't sit there and somebody trying to tell me how to do this and do that, uh uh, do you know what I'm saying? I got eight kids . . . and I raised other kids when I was young. So they can't . . . I went one time and I left. -Interviewee #11, mother of 8
Preschool	That's because of the hours. It was hard for me to go and pick him up at noon when I have two other children at home. And I didn't have any transportation and the school is kind of far from my house. -Interviewee #14, mother of 6 I've been trying but they didn't have no places. And then I didn't want to send her to the all-day Head Start cause I still be wanting to see her. -Interviewee #4, mother of 2
Mental health treatment	I wouldn't want my kids to know . . . if they understood I wouldn't want them to know that Mommy got to go see a mental health. -Interviewee #5, mother of 3

not). Some mothers also described a need for help with managing older boys (e.g., "He was just giving me a hard time when he was 14 and 15. When he turned 16 I had to get him out of my house cause he was kind of like violent").

The most common barrier to participating in a parenting class or support program cited was lack of time. Many of the mothers described competing demands for their time including taking care of multiple children, taking care of elderly relatives, and working, often in the context of being single parents (10 out of 18 in this sample were single). Additional barriers referenced included lack of personal transportation, lack of concern about par-

enting skills, lack of perceived benefit from a parenting class, maternal depression with associated lack of motivation, and discomfort participating in a group.

Preschool. All of the children participated in some form of preschool, except for three who were reported to have significant behavior problems and high C-ACE scores. Reasons for non-participation were limited transportation, child care for other children while transporting the preschool child, availability of preschool spots, preference for part-time or full day preschool programs, and maternal desire to spend time with her child.

Mental health treatment. Analysis of the community resource survey showed that the majority of the participants (12 out of 18) expressed an interest in developmental-behavioral evaluations of their children. Almost all of the mothers of children with behavior problems based upon the Pediatric Symptom Checklist were interested in developmental-behavioral evaluations, signaling their appreciation that the child was showing behaviors of concern. Mental health treatment—either for the parent or the child—was of interest only to parents of children with behavior problems. Colocation of mental health services with primary care was viewed as a convenience, especially by high C-ACE families.

In addition to lack of personal transportation, mothers mentioned some specific barriers to mental health treatment for themselves including mental health stigma, fear that admitting to her depression would result in her children being taken away, and concerns that taking depression medications would result in addiction (e.g., “I take it every now and then. But I don’t want to get hooked on it because that’s like a narcotic”). One mother also described her difficulties with obtaining her birth certificate and other necessary documents to be approved to live in a drug treatment facility. Regarding mental health treatment for the child, mothers described specific barriers including lack of awareness about treatment options, working full-time which made scheduling appointments challenging, difficulties managing child behavior in public, and scarcity of male therapists for male children.

Exercise. Analysis of the community resource survey showed that there was a high interest in parent exercise options (10 out of 18) and child exercise options (nine out of 18) across C-ACE scores. Family participation in exercise programs was limited by transportation issues and membership costs. In addition, poor organization and staffing at free community recreation centers was mentioned as a problem (e.g., “they don’t do the things they advertise” and “too many grown-ass kids there”). Additional barriers to parent exercise mentioned included lack of time between work and parenting, cultural acceptance of being overweight, chronic physical conditions, and distrust of child care providers. Additional barriers to child

exercise were limited after school programming and distrust of recreation staff.

Discussion

In our initial study, we demonstrated an association between higher C-ACE scores and child speech and behavior problems (Marie-Mitchell & O’Connor, 2013). Our findings underscored the feasibility of assessing child risk to identify families with children most likely to benefit from early child behavior and mental health interventions. The purpose of this follow-up study was to explore the perceptions and interests of mothers of young children stratified by C-ACE scores to inform the design of pediatric interventions to prevent mental health problems. Work of this kind is needed given the growing appreciation that a key barrier to improving child mental health outcomes is not the existence of effective programs, but rather the use of these programs by high-risk families.

Within our sample, children with high C-ACE scores were less likely to access Early Intervention and services to prevent speech delays and behavior problems, despite primary caregivers readily identifying problems with speech or behavior prior to age 3. All of our subjects were low-income and minority ethnicity, and hence expected to be difficult to engage (Barnes et al., 2006; Gorman-Smith et al., 2002; Haggerty et al., 2006). Our results extend this literature by suggesting that C-ACE screening identify the families in most need of case management and other support services. A comparison of child and maternal ACE scores (see Table 2), highlights the importance of targeting case management services to these families to help break the intergenerational spread of ACEs. In addition, our analysis of barriers suggests the importance of using a trauma-informed approach to providing services in order to gain the trust of high-risk families (Hopper, Bassuk, & Olivet, 2010).

Several mothers reported having developmental or behavioral concerns about their child, but not receiving assistance from their child’s health care provider. Although it is possible that these stories might be missing details about what the health care provider did do, they are consistent with literature reporting deficiencies in systematic developmental screening by pediatric health care providers, as well as deficiencies in pediatric provider comfort with managing mental health prob-

lems (Bethell, Reuland, Schor, Abrahms, & Halfon, 2011; Melnyk, Brown, Jones, Kreipe, & Novak, 2003). Our results reconfirm the need for educating pediatric providers about the value of using structured developmental and behavioral screening to identify children in need of referrals, and add to this the potential value of C-ACE screening to identify families in need of additional support to make use of these referrals.

Our study suggests some principles that might be useful to engage families in mental health interventions. First, weight status and eating habits were a concern to parents in our study. Also, the majority of participants in our study expressed an interest in family exercise options. Therefore, nutrition and exercise may be a useful way to engage parents in broader issues related to managing child behaviors and developing healthy relationships with their children. Mental health interventions that include nutrition and exercise components might have beneficial effects and be a nonthreatening way of engaging parents with additional mental health needs. We do not know of any other literature reporting a potential for lifestyle interventions to foster participation in mental health treatment. Future research on the incorporation of lifestyle components into mental health interventions is warranted.

Second, we found that mothers of children with behavior problems expressed the most interest in developmental-behavioral evaluations, parenting education, and mental health treatment. Thus, parental concern about child behavior might serve as a useful “red flag” to identify families most receptive to behavioral and mental health interventions.

A strength of this study is that the sample of children with high and low C-ACE scores was drawn from a larger cross-sectional quantitative study, and so detailed information was known on child outcomes. Although recruitment continued until saturation, a weakness of this study is the relatively small sample size and qualitative approach, which limits our ability to draw conclusions about rates or significant differences between the groups. In addition, our sample consisted of low-income, minority patients from a city in the northeastern United States. The perspective of this population is useful to understand and likely generalizable to patients in other regions from similar socioeconomic strata, but future research is needed to explore the interests of parents from other backgrounds.

This study is part of a growing literature illustrating the importance of considering social determinants in delivering patient-centered care. Screening for C-ACE prior to age 3 along with developmental and behavioral screening can help pediatric providers to identify children who are both at greatest risk for mental health problems and in need of help in accessing services. Incorporation of nutrition and exercise components into mental health interventions may increase enrollment and retention, as may targeting mental health interventions and referrals to parents with child behavior concerns.

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