

Modifiable Resilience Factors to Childhood Adversity for Clinical Pediatric Practice

Flora Traub, PA-C, MPP,^a Renée Boynton-Jarrett, MD, ScD^{a,b}

Childhood adversity is highly prevalent and associated with risk for poor health outcomes in childhood and throughout the life course. Empirical literature on resilience over the past 40 years has identified protective factors for traumatized children that improve health outcomes. Despite these empirical investigations of resilience, there is limited integration of these findings into proactive strategies to mitigate the impact of adverse childhood experiences. We review the state of resilience research, with a focus on recent work, as it pertains to protecting children from the health impacts of early adversity. We identify and document evidence for 5 modifiable resilience factors to improve children's long- and short-term health outcomes, including fostering positive appraisal styles in children and bolstering executive function, improving parenting, supporting maternal mental health, teaching parents the importance of good self-care skills and consistent household routines, and offering anticipatory guidance about the impact of trauma on children. We conclude with 10 recommendations for pediatric practitioners to leverage the identified modifiable resilience factors to help children withstand, adapt to, and recover from adversity. Taken together, these recommendations constitute a blueprint for a trauma-informed medical home. Building resilience in pediatric patients offers an opportunity to improve the health and well-being of the next generation, enhance national productivity, and reduce spending on health care for chronic diseases.

Early childhood adversity is common, with a study of nearly 54 000 Americans finding that 60% had experienced at least 1 adverse childhood experience (ACE)¹ and data from the National Survey of Child Health finding that 48% of American children have suffered at least 1 ACE.² Findings of the literature on ACEs have been remarkably consistent: early life trauma, in a graded, dose-response fashion, impacts the developmental trajectory of children and numerous health outcomes over the life course.^{1,3-12}

In 2012, the American Academy of Pediatrics (AAP) released a policy statement encouraging pediatricians

to develop leadership roles in addressing the enduring effects of early life adversity and toxic stress on child health and development.¹³ Although there is agreement that there is an urgent need to identify ways for pediatric clinical providers to foster resilience in children given what we know of the detrimental health consequences of untreated ACEs and their high prevalence, clinicians and policy makers are unsure of how best to move forward.^{12,14}

The literature on resilience has clearly identified protective factors for traumatized children that improve health outcomes.¹⁵⁻²⁵

abstract

^aDepartment of General Pediatrics, Boston University School of Medicine, Boston, Massachusetts; and ^bDivision of General Pediatrics, Boston Medical Center, Boston, Massachusetts

Ms Traub conceptualized the manuscript, conducted the initial literature review and drafted and revised the manuscript; Dr Boynton-Jarrett participated in the conceptualization, assisted with the literature review, and critically edited the manuscript; and both authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

DOI: 10.1542/peds.2016-2569

Accepted for publication Nov 15, 2016

Address correspondence to Flora Traub, PA-C, MPP, Brigham and Women's Hospital, Department of Medicine, 75 Francis St, Boston MA 02115, flora.traub@gmail.com

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2017 by the American Academy of Pediatrics

FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: No external funding.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

To cite: Traub F and Boynton-Jarrett R. Modifiable Resilience Factors to Childhood Adversity for Clinical Pediatric Practice. *Pediatrics*. 2017;139(5): e20162569

Just under half (48%) of high-risk preschoolers were found to be resilient in a 2016 study; significantly correlated with resilience were no experiences of maltreatment and a nondepressed primary caregiver.²⁶ Yet despite empirical investigations of resilience over the past 40 years, there is limited integration of these findings into proactive strategies to mitigate the impact of ACEs on the life course health trajectory.¹⁴

What specifically can be done in pediatric clinical practice to build resilience to ACEs? To answer this focused question, we comprehensively reviewed the research about resilience to childhood trauma across many different fields: child development, child maltreatment, preventive health, clinical pediatrics, psychiatry, traumatology, neurobiology, and sociology. Using PubMed, we concentrated on those peer-review studies published in the last 5 years that explored possible levers for change, those that investigated modifiable characteristics of a child's psychosocial and family environment associated with increasing resilience to ACEs. We primarily included 2 types of resilience studies: (1) longitudinal investigations of traumatized children that elucidate factors associated with resilience; and (2) randomized controlled trials (RCTs) or quasi-experimental studies of interventions that had resilience as a primary outcome. We considered modifiable resilience factors at the community level to be beyond the scope of this review because we were looking specifically at malleable, health-enhancing resilience factors in the context of pediatric clinical practice. We enhanced our search results with a review of bibliographies of included research. This review aims to empower pediatricians with specific recommendations to bolster the resilience of traumatized children,

while highlighting the need for more research.

The Adverse Childhood Experiences study was a landmark investigation of the relationship between childhood trauma and long-term health outcomes. Subsequent work expanded the original set of ACEs to include several types of adversities common in diverse, nonwhite, lower socioeconomic-level communities.²⁷ Research supports the hypothesis that adult health outcomes are influenced by the cumulative incidence of ACEs, although differences in risk are appreciated by chronicity, severity, contextual factors, and type of childhood traumas.^{1,3-5,7-11,16,28} There is a graded, dose-response association between ACEs and the risk for poor health outcomes, including asthma, ischemic heart disease, stroke, obesity, diabetes, chronic obstructive pulmonary disease, autoimmune disease, substance use disorder, and sexually transmitted diseases.^{1,3-5,7-10,16-20,29-38} Mental health consequences of adversity include emotional and behavioral problems, school failure, major depressive disorder (MDD), anxiety, posttraumatic stress disorder (PTSD), and dissociative disorders, which similarly increase in a dose-response relationship with adversity.^{2,7,11,16-20,30-35,39,40} Not only are those with ACEs sicker, but they have lower overall satisfaction with their lives, have less access to health care, use more expensive health care, and die nearly 20 years earlier on average.⁴¹

We first present the definition and components of resilience to childhood adversity, focusing on 5 modifiable resilience factors identified in the comprehensive search of the literature. We then offer recommendations for preventive pediatric care aimed at promoting resilience in pediatric patients through individual practice

modifications and broader systems-level change.

RESILIENCE

Resilience is defined in this review as good mental and physical health despite the assaults of early adversity (the ability to withstand, adapt to, and recover from adversities).⁴² Far from being inherent to the child, resilience results from a complex interplay between the child's genetics, natural temperament, knowledge and skills, past experiences, social supports, and cultural and societal resources.^{8,32,34,43-48} Zolkoski and Bullock⁴² published a recent review of the resilience literature that identified 3 consecutive waves of resilience research since its inception around 1970: the first wave concerned itself with understanding and preventing psychopathology; the second wave focused on how resilience factors lead to good outcomes for children despite risks; the third wave, into which our work falls, investigates how to promote resilience through prevention, intervention, and policy changes.

The early resilience research focused on the traits of children with ACEs who fared better than their peers, with an implication that some children were immune to ACEs as a result of inherent characteristics.^{46,49} Multiple authors identify similar resilient traits: high self-esteem, internal locus of control, external attributions of blame, optimism, determination in the face of obstacles, cognitive flexibility and reappraisal ability, social competence, and the ability to face fears.^{8,32,34,44,45,50} Rutter⁴⁶ elaborated the concept of resilience instead as a mediating factor that buffers a child from adversity by reducing the impact of trauma, reducing negative chain reactions stemming from trauma, and enabling opportunities for recovery from

TABLE 1 Modifiable Resilience Factors Relevant to Pediatric Clinical Practice

Level	Resilience Factor	Description
Individual	Cognitive traits: positive appraisal style and executive function skills	Positive appraisal styles, defined by optimism and confidence about one's ability to manage adversity, are associated with resilience to adversity. Improved executive function, especially cognitive flexibility and inhibitory control, is also associated with resilience to ACEs.
Family	Parenting	Responsive parenting and good parental relationships foster resilience. The HPA axis normalizes in traumatized children when parenting improves.
	Maternal mental health	Maternal mental health problems are associated with risk for trauma as well as less sensitive parenting (a resilience factor); identifying and treating maternal psychopathology could foster resilience in children and prevent ACEs.
	Self-care skills and household routines	ACEs are associated with poor sleep, nutrition, and exercise habits. Teaching children self-care skills and using consistent routines at home are associated with healthy resilient development.
Individual/family	Trauma understanding	Educating children and families about trauma in pediatric settings and through trauma-focused interventions builds resilience.

trauma. More recently, researchers are elucidating the relationships between genetic, specifically genes modulating neurotransmitters, and environmental factors with resilience.^{47,51-53}

If resilience is conceptualized as the shield protecting children from toxic stress, the shield gets battered and worn down from use.^{26,31,54,55} Wingo et al³⁴ found that resilient individuals had both fewer and less severe lifetime experiences of childhood physical, sexual, and emotional abuse. On the other hand, the child's resilience can flourish in an ecosystem that proactively develops resilient coping.^{32,42,43,52,56} Recent research has shed light on a paradoxical phenomenon related to resilience of particular relevance to medicine: the "John Henryism" hypothesis, which states that high-effort coping styles defined by hard work and determination ("grit") by low-income youth may lead to improved socioeconomic outcomes, but are associated with hypertension.⁵⁷⁻⁵⁹

Many interventions have shown promise in enhancing resilience in traumatized children.^{16-19,21-23,60-63} Toxic stress is purported to permanently alter brain architecture and make the child vulnerable to stress-related disease processes.^{7,31,64} However, there is evidence that children's stress hormone regulation is responsive to psychosocial interventions.^{18,20-22,25,65}

We posit that resilience has 3 temporal aspects relevant to pediatrics: resilience to withstand, adapt to, and recover from adversity.⁶⁶ The literature has ample evidence for 5 such modifiable resilience factors, by no means the only modifiable resilience factors: a positive appraisal style and good executive function, nurturing parenting, maternal mental health, good self-care skills and consistent household routines, and an understanding of trauma (Table 1). We will highlight some of the many interactions between these resilience factors.

Positive Appraisal Style and Executive Function Skills

Several researchers have identified a positive appraisal style as predictive of resilience.^{32,49,50,67,68} Although there is a biological, and likely genetic, element to appraisal style, resilience theorists maintain that appraisal style is modifiable via experience and explicit cognitive behavioral therapy.⁶⁷ In a prospective study of children, positive expectations about the future were found to be significantly associated with future lower rates of depression.⁶⁸

Similarly, researchers identify strong executive function as predictive of resilience.³² Early adversity and poverty in childhood are both associated with lower levels of executive function.⁶⁹⁻⁷¹ Blair et al⁷⁰

found that higher executive function in 3-year-old children was associated with more positive parenting ratings in infancy, potentially mediated by lower stress hormone activation. Davidovich et al⁷² studied executive function in children exposed to the adverse event of parental MDD and found fewer depressive symptoms among those children with improved executive function, specifically better cognitive flexibility and inhibitory control. Executive function in children improves with several educational approaches from the narrow, computer training programs on executive function to the general, aerobic exercise and mindfulness training.⁷³

Parenting

Parent-child interactions and relationships have a profound effect on resilience. Two notable longitudinal studies identify parental competence and relationship quality as key to resilience. Collishaw's team⁴⁵ used data from the 40-year Isle of Wight study. Forty-four percent (44%) of those who had been physically or sexually abused showed resilience, with lower rates of self-rated health problems, better interpersonal relationships, and less criminality than the control group. Participants who rated at least 1 of their parents as "very caring" were significantly more likely to be resilient in midlife (61.5% vs 20% who rated neither parent as such). Savage-McGlynn et al⁷⁴

reanalyzed the Avon Longitudinal Study of Parents and Children data, focusing on infants experiencing maternal postpartum depression at 8 months of age. The study found that the best correlate of resilience at age 11 was a composite indicator of mothers' positive feelings about their ability to parent at 8 and 21 months' postpartum. In other words, a woman's belief that she is doing a good job parenting her child was associated with resilience in the child.⁷⁴

Measures of parenting have also been linked to neuroendocrine activation. In families with high levels of psychosocial stressors, parents are at risk for developing less sensitive and warm early caregiving patterns, with a concomitant increase in cortisol levels in their children.⁶⁹ Blair et al⁷⁰ studied salivary cortisol levels in a diverse group of low-income infants and correlated these findings to observations of parenting interactions. "Positive parenting," evaluated on the axes of sensitivity, positive/negative regard, intrusiveness, detachment, and animation, was inversely correlated with cortisol levels at baseline and after a standardized stressful event.⁷⁰ Gunnar et al²⁰ found that mothers rated low in sensitivity during infant medical exams had toddlers with higher cortisol responses to vaccinations. This finding is consistent with earlier research showing the effect of nurturant foster and adoptive parenting secondary to early abuse and neglect. Children removed from orphanages have consistently been shown to have perturbations of the hypothalamic-pituitary-adrenal (HPA) axis that normalize with adoption by a stable caregiver by 3 years later.^{19,20} The Attachment and Bio-Behavioral Catch-up intervention, a manualized parenting intervention designed to foster sensitive caregiving, was found to normalize participant toddler and preschooler cortisol levels at

significantly greater rates than control group participants in multiple RCTs.^{17-20,22,24,65}

Treating Maternal Mental Health Problems

Yet another way to enhance children's resilience is to screen for, identify, and treat maternal psychopathology, which has been found to be harder to treat when the mother herself has a history of trauma.⁷⁵⁻⁷⁷ Depressed mothers are less responsive to and more punitive of their infants, less able to develop and implement consistent household routines, more likely to employ punitive disciplinary measures, and less available to supervise adolescents, resulting in cognitive, social, and emotional deficits for their children.^{74,78,79} Furthermore, when mothers have a history of ACEs themselves, they are less able to modulate their own stress responses and teach coping.⁸⁰ Chemtob et al,⁷⁵ in a study of preschoolers in a pediatric clinic, found that maternal PTSD was associated with an average of 5 potentially traumatic events per preschooler, maternal comorbidity with PTSD and depression with 3.2, and maternal depression alone with 1.2 potentially traumatic events. The more severe the maternal depression, the higher was the risk of child physical abuse and neglect.⁷⁵ A 2009 joint consensus report of the Institute of Medicine and the National Research Council highlighted the scale of the challenge: 15.6 million children live with a parent suffering from MDD. The report identified pediatric health visits as an opportunity for addressing parental depression, noting that parenting is often what depressed parents care most about.^{54,56,78}

Self-Care Skills and Routines

Self-care and consistent routines are key ingredients in understanding resilience. Adults who have experienced ACEs are less likely to have healthy sleep, nutrition, and

physical activity habits.^{81,82} Nurius et al⁸¹ found that study participants with high ACE scores who demonstrated healthy sleep and exercise habits were no more likely to miss work for mental health problems than were those with lower ACE scores.

Consistent routines in the household are essential for establishing feelings of safety in young children, and form the basis for learning to care for themselves, self-regulation, and school readiness, while also mitigating toxic stress.^{17,23,56,79,83,84} Household chaos is associated with poor health in adolescents.⁵⁶ When parents adhere to predictable structure around mealtimes, bedtimes, and media consumption, there are reductions in rates of obesity, substance use, and improved nutrition for their children.⁵⁶ Children with asthma who have a regular bedtime routine experience fewer asthma symptoms and are more likely to sleep through the night.^{54,56} In a 2015 longitudinal study, Staples et al⁸⁵ found that having a consistent bedtime routine (usually story, bath, and pajamas) was associated with greater nightly sleep time for 3-year-old children, an effect that was enhanced when parents used consistent parenting practices throughout the day. A recent longitudinal study of children's sleep and consistent routines found that inadequate sleep at age 6 years was associated with a lack of household routines both at ages 4 and 6 years.⁸⁶

Fiese et al⁵⁶ note that maintaining routines requires planning, time, and clear communication, all of which are scarcer in families dealing with adversity, poverty, and housing instability.^{84,87} In addition, parental depression has been found to be independently associated with fewer household routines (odds ratio [OR] = 0.68 for consistent routines).⁷⁹ Using data from a national database of over 2000 mothers, Winders

Davis et al⁷⁹ found that mothers evincing depressive symptoms were less likely to employ bedtime, naptime, and mealtime routines in their parenting. Illustrating another interrelationship between modifiable resilience factors, mothers heading chaotic households had lower executive function capacity and were more likely to use harsh parenting techniques.⁸⁸

The Early Intervention Foster Care program (EIFC) teaches caregivers how to create an environment with consistent caregiving and predictable routines. The EIFC pilot showed improvements in child behavior, reductions in parental stress, and improved parenting along with concordant changes in the neuroendocrine activation of the children, as evidenced by changes in salivary cortisol that had the EIFC group coming to resemble the untraumatized community control, whereas the regular foster care cohort maintained blunted cortisol and high cortisol variability.^{17,18} A 5-year RCT evidenced significant increases in permanent placements for the treatment group over the control group (90% vs 64%).²¹

Enhancing Trauma Understanding

The final lever that will be examined in this article to enhance resilience to pediatric trauma is education about the nature of toxic stress and children's response to toxic stress. Streeck-Fischer and Van der Kolk³¹ note that children who have experienced chronic stress and trauma rarely spontaneously speak of their experiences and tend to have little insight about the relationship between their experiences and how they feel and act. Several psychotherapy approaches, including child-parent psychotherapy and trauma-focused cognitive behavioral therapy, show the positive impact of trauma education on children's mental health outcomes.^{16,23,60,62,63} In a clear interaction between

resilience factors, parents who are able to jointly make meaning out of traumatic experiences with children are able to improve their children's resilience.⁵⁴ Traumatized children and families treated with these approaches have dramatically reduced incidences of PTSD, depression, and behavioral problems.^{16,62,63} Cohen et al²³ describe how age-appropriate breathing and muscle relaxation techniques that can be taught in the pediatric office reduce the physiologic hyperarousal seen in pediatric PTSD.

RECOMMENDATIONS FOR PEDIATRIC PRACTICES TO ENHANCE RESILIENCE TO ACES

Pediatric primary care, with its focus on preventive health care, is the right place to deliver interventions to enhance resilience to childhood adversity. Results of a subgroup analysis of an AAP 2013 survey including 302 pediatricians show that only 4% screen for all 7 ACEs routinely and almost a third (32%) screen for none.⁸⁹ Only 11% were familiar with the original ACE study, whereas more than three-quarters (76%) were not at all familiar.^{80,89} Pediatricians agree on the need to offer evidence-based interventions proven to successfully address the needs of traumatized children.^{17,20,23,90,91} Despite recognizing the importance of parenting to resilience, most did not screen for parental ACEs.⁸⁰ Barriers to the identification and treatment of trauma in pediatrics include a perceived lack of time, lack of training, lack of reimbursement, and a reluctance to experience the discomfort of discussing trauma and parenting, especially when children are in the room.^{11,91-94}

The following are 10 recommendations for leveraging these modifiable resilience factors in a pediatric clinical setting. Table 2 summarizes additional

studies that pertain to the specific recommended practices. Taken together, these recommendations constitute a blueprint for a pediatric trauma-informed medical home. Table 3 offers a comparison of this theoretical trauma-informed medical home to usual care.

1. Train all pediatric clinical staff in the principles of trauma-informed care. Trauma-informed pediatric care aims to ensure a safe experience for children, families, and staff.^{41,95,102} A study of Massachusetts pediatricians found that <20% reported having adequate knowledge of pediatric trauma, frequently learning of trauma through direct inquiry, and regularly assessing for and treating PTSD; there was also a significant association between training in PTSD and learning of traumatic experiences through direct inquiry.⁹⁴
2. Screen pediatric patients for ACEs, resilience, maternal psychopathology and ACEs, family functional capacity, and family violence. Childhood adversity is common, causes significant morbidity, and is eminently treatable once identified; yet the vast majority of children with emotional and behavioral problems, many of which may be due to trauma, go unidentified and untreated.^{23,93,103} There are validated screening tools for trauma and resilience that enable clinicians to target the age group and type of screening (for trauma symptoms, resilience, or specific types of ACEs) (Table 4).¹⁰⁴⁻¹⁰⁷ Ahern et al¹⁰⁴ and Wevodau et al¹⁰⁵ have published recent reviews of resilience and trauma screening tools. The most basic screening is to ask patients and caregivers the question: "Has anything scary or upsetting happened to you [your child]"

TABLE 2 Recommendations and Associated Key Studies

Reference	n (Age)	Method	Main Findings
Recommendation 1: Train All Pediatric Clinical Staff in the Principles of Trauma-Informed Care Oral et al (2016) ⁴¹	—	Literature review summarizing components of trauma-informed care, its relevance to pediatrics and childhood adversity, and early evidence of its effectiveness.	Review finds that implementation of trauma-informed care would require surveillance of trauma, resilience, functional capacity, and health consequences of ACEs. There is a significant public health need to identify childhood trauma when it occurs.
Banh et al (2008) ⁶⁵	587 (average, 46; SD, 10.3)	Survey of all known PCP pediatricians in Massachusetts (60% response rate), evaluating pediatricians' self-reported practices in identifying, assessing, and treating trauma and PTSD. Survey data were analyzed with descriptive statistics and multivariate analyses.	18% of survey respondents reported adequate knowledge of childhood PTSD. 15% of respondents reported that they frequently learned of traumatic experiences in their patients through direct inquiry. 10% of respondents reported frequent assessment and treatment of PTSD. There were significant associations between having received PTSD training and believing that PTSD treatment is within the purview of pediatricians and learning of trauma through direct inquiry.
Recommendation 2: Screen Pediatric Patients for ACEs, Resilience, Maternal Psychopathology, Parental ACEs, and Family Violence Horwitz et al (2007) ⁹³	687 (average, 45.4 y; SD, 10.4 y)	Questionnaire to a random sample of the cross-sectional survey of the AAP membership (52% response rate). Factor analysis performed on the questionnaire data.	Majority of physicians provide mental health care to children (61%); few screen regularly for maternal depression (4.5%) and treat maternal depression (4.3%). Lack of time to treat mental health problems (77%) and long waits to see mental health providers (74%) were the most common barriers cited to treating psychosocial issues in children. Lack of training (74.5%) and lack of time (64.3%) were the most frequent barriers cited to the treatment of maternal depression.
Dubowitz et al (2011) ⁷⁷	102 (average, 45 y)	Cluster RCT at 18 pediatric practices of the SEEK model of screening for risk factors for child maltreatment, with random assignment to intervention and standard care groups. Data collected at 6, 18, and 36 mo into intervention.	SEEK model showed significantly ($P < .05$) greater improvement from baseline over controls on provider questionnaire of their ability and confidence to address depression (6 mo); substance abuse (18 mo); intimate partner violence (6 and 18 mo); and stress (6, 18, and 36 mo). SEEK providers screened significantly ($P < .001$) more often for targeted problems than control group providers.
Recommendation 3: Employ Nonphysicians To Conduct Psychosocial Screening and Offer Education to Families Coker et al (2018) ⁹⁶	251 (parents of infants <12 mo)	RCT comparing an intervention (PARENT) to usual well-child care for parents of infants <12 mo. Primary outcome measures included receipt of preventive care services, parent experiences of care, and health care use.	PARENT model showed significantly greater preventive care delivered (anticipatory guidance, psychosocial screening, health education, and parental concerns addressed) in the intervention group and 52% fewer intervention children with >2 emergency department visits over 1 year. No difference was found between intervention and control groups for well-child care or sick visits.
Recommendation 4: Create a Medical Home for Children With ACEs, Emphasizing Strong Relationships With Families, Regular Care Providers, and Individualized Care Raphael et al (2015) ⁹⁷	240 (0–18 y; average, 8.9 y; SD, 4.8 y)	Survey of families of low-income children with chronic health conditions and their pediatric practices to assess the degree to which they were cared for in a patient-centered medical home.	There were associations between parents' reports of having a usual health care provider and pediatric practice reports of higher organizational capacity and lower rates of emergency department use. Parent reports of a patient-centered medical home was associated with higher scores on the medical home index of the pediatric practice.
Winders Davis et al (2015) ⁷⁹	2068 (parents of children 0–3 y old)	Secondary analysis of telephone interview data of parents of children under 3 y, stratified by parental depression, examining parenting practices and access to family-centered care.	Depression was associated with a significant increase in punitive discipline (OR = 1.51, $P = .007$ that the parent performed more than the median number of punitive discipline behaviors) and decrease in household routines (OR = 0.68, $P = .018$ that the parent performed more than the median number of routines). Family-centered care was independently associated with performing more household routines (OR = 1.12, $P = .011$ that the parent performed more than the median number of routines).
Bethell et al (2014) ²	95677 (range, 0–17 y)	Secondary analysis of data collected in the 2011–2012 National Survey of Child Health. Multivariate and multilevel regression analysis of data.	Prevalence of ACEs was found to be 48% for 1 of ACE and 23% for ≥2 ACEs. Those with ACEs had significantly lower rates school engagement and higher rates of chronic disease. Resilience among those with ACEs was positively correlated with school engagement and receipt of care in a family-centered medical home.
Recommendation 5: Integrate Behavioral and Physical Health Care in the Pediatric Office			

TABLE 2 Continued

Reference	n (Age)	Method	Main Findings
Asanow et al (2015) ⁹⁶	13 129 (0–21 y)	Systematic meta-analysis of 31 eligible RCTs of combined pediatric medical-behavioral health care versus usual care after PubMed search yielded 6792 studies. Meta-analysis with random effects model used to calculate overall effect across trials.	Significant ($P < .001$) behavioral health outcome advantages were found for integrated practices over usual care. The most beneficial were “treatment” models where a particular subgroup of patients were targeted and “collaborative care” models where team-based interdisciplinary care was provided to jointly evaluate, treat, and monitor patients. Probability was 66% (73% in collaborative care practice) that a randomly selected youth would have a better outcome after receiving integrated medical-behavioral treatment over usual care.
Recommendation 6: Offer Group-based Parenting Education Martin et al (2011) ⁹⁹	1851 (0–3 y)	17 Early Head Start sites, randomized to receive parenting services or control. Data collected 6, 15, and 26 mo into intervention as well as at age 3 y. Multivariate regression models used to analyze service receipt and outcomes.	At age 3 y, 76% of mothers reported regular bedtime for child and 81% reported a bedtime routine. Participation in parent–child group or parenting education at child’s age of 0–10 mo or receipt of case management services at child’s age of 11–19 mo significantly increased the odds of having a bedtime at age 3 y. Only parent–child group participation between 11 and 19 mo of age significantly increased the odds of having a bedtime routine at age 3 y of all the parenting services offered.
Bethell et al (2016) ¹⁰⁰	—	Literature review of emotional and behavioral problems in children with ACEs and approaches to building resilience through parental support.	Mindfulness-based and mind–body training for parents can build resilience in children with emotional and behavioral problems as a result of adversity.
Recommendation 7: Offer Peer-based Group Education to Pediatric Patients With Multiple ACEs About Trauma and Self-Care Nurius et al (2015) ⁸¹	13 593 (>18 y; average, 57.1 y; SD, 16 y)	Secondary analysis of a sample of 2010 Behavioral Risk Factor Surveillance System for Washington State. Analysis included bivariate correlations and theory-guided hierarchical regression.	ACE scores were significantly associated with all mental health outcomes in the expected direction. ACEs were associated with diminished resilience resources (sense of community and ameliorating health behaviors). Sense of community and ameliorating health habits (sleep and physical activity) were, to a lesser extent, associated with improved mental health, despite ACEs.
Recommendation 8: Customize Pediatric Health Care to the Needs of the Family Flynn et al (2015) ¹⁴	3422 (0 y to adult)	Systematic meta-analysis of 10 eligible studies (6 RCTs) of interventions to address toxic stress in pediatric primary care.	Authors of 9 of the 10 included studies concluded that interventions in screening, recognition and discussion of trauma, and provider education about community resources for trauma had positive effects on intended outcomes: provider behavior, provider knowledge/skills, child maltreatment, family violence exposure, and child behavioral problems.
Recommendation 9: Familiarize Pediatric Staff With Mental Health and Social Service Resources in the Community Hornor (2015) ³²	—	Literature review of appropriate responses to ACEs by pediatric clinicians on the topics of toxic stress physiology, resilience to ACEs, ACE screening, intervention, and referral to the community.	Toxic stress and trauma change children’s physiology and predispose them to health problems. Early identification and intervention by pediatric clinicians can avert lifelong health consequences of early adversity. Enhancing resilience by supporting families in parenting and referring to community-based resilience-building services is key to protecting children from ACEs.
Recommendation 10: Be Cognizant of the Barriers to Engagement Dorsey et al (2014) ¹⁰¹	47 (6–15 y and foster parent)	Facing Families of Children With ACEs RCT of an engagement intervention (McKay’s) in a group of foster children referred to TF-CBT.	Families in the intervention, which included discussions of concrete and perceptual barriers to treatment and caregivers’ greatest concerns for their child, were significantly more likely to attend at least 4 sessions of TF-CBT (96% vs 75%) and to complete treatment (80% vs 41%).

PARENT, parent focused redesign for encounters, newborns to toddlers; PCP, primary care provider; SEEK, safe environment for every kid; TF-CBT, trauma-focused cognitive behavioral therapy; —, literature reviews which do not quantify the number of participants in study.

TABLE 3 Trauma-Informed Medical Home Versus Usual Care

Care Component	Trauma-Informed Medical Home	Usual Care
Medical health care	History and physical Provider trained in trauma-informed care	History and physical
Behavioral health care	Integrated Trauma-informed, team-based, engagement-focused	Separate Usually not trauma-informed
Trauma/resilience screening	Comprehensive screening Referral and integrated case management with screening results	Trauma/resilience screening rare
Anticipatory guidance provided	Anticipatory guidance re: trauma impacts and recovery; self-care skills, mental health treatment; age-appropriate risk reduction, and parenting	Anticipatory guidance re: age-appropriate risk reduction and parenting
Case management	Integrated team-based case management with regular follow-up	Usually none provided at the pediatric office
Referrals to community-based services	Relationships and communication with community-based service providers ongoing Staff with knowledge of community resources helps families trouble-shoot and overcome obstacles	Referrals are made, but there is no ongoing communication with service providers or attempt to surmount obstacles to accessing services
Parenting support	Trauma-informed Integrated into care	Not usually offered except for brief conversations during well-child visits
Peer support	Trauma-informed Integrated into care	Not usually offered
Educational advocacy	Educational advocacy, educational testing	Not usually offered

or your family since the last time I saw you?”²³ Dubowitz et al⁷⁷ conducted an RCT of a screening tool and found that those pediatricians trained with the tool were both doing significantly more screening and feeling significantly more competent to effectively address these issues as far as 3 years postintervention.

3. Employ nonphysicians to conduct psychosocial screening and offer education to families about healthy development, trauma impacts, and recovery; self-care skills and mental health treatment; age-appropriate risk reduction; and parenting. An RCT of a parent-coach model found significant increases in pediatric psychosocial screening and reductions in emergency department visits.⁹⁶
4. Create a medical home for children with ACEs, emphasizing strong relationships with families, regular care providers, and individualized care. The literature demonstrates the health benefits to children of medical homes, particularly

those that target vulnerable patient subgroups.⁹⁷ Bethell et al² found that children who had >2 ACEs were significantly less likely than children with no ACEs (43.5% vs 61.4%) to receive care in a family-centered medical home. Furthermore, those children with ACEs who did not have a medical home were significantly less likely to evince resilient characteristics (OR = 0.69).² Winders Davis et al⁷⁹ found a significant positive relationship between the provision of family-centered care and consistent household routines (OR = 1.12), itself a correlate of resilience.

5. Integrate behavioral health care into the pediatric office. Asarnow et al,⁹⁸ in a 2015 meta-analysis of 35 RCTs comparing integrated medical and behavioral health care for pediatric patients to standard care, found a 73% likelihood that a randomly selected child treated in a “collaborative care” model would have a better outcome than a child in the standard care comparison group.

6. Offer group-based parenting education and support. Emphasize responsive parenting, the importance of the parental role in enabling trauma recovery and resilience, and the establishment of consistent routines at home.^{99,100} Pediatricians are well situated to inquire about and offer anticipatory guidance about the importance of consistent routines for all children, and especially those who have experienced ACEs. This guidance should include an understanding of the particulars of the child’s living arrangements as well as determining current routines, elucidating barriers to consistent routine implementation, and offering individualized, scaffolded support to implement more consistent and appropriate routines.⁵⁶
7. Offer peer-based group education and anticipatory guidance to children and families with multiple ACEs about trauma and self-care to foster resilience and increase social support for these children. Nurius et al⁸¹ report that a strong sense of

TABLE 4 Pediatric Screening Tools for Trauma and Resilience

Characteristics of Screening Tool	PEDS-ES ¹⁰⁸	TESI-C ¹⁰⁹	CTQ ¹¹⁰	TSC-C/ TSC-YC ¹¹¹	WBTH ¹¹²	UCLA ¹¹³	STEP ¹¹⁴	SDQ ¹¹⁵	CD-RISC ¹¹⁶	RS/RS-14/ RS-10 ¹¹⁷	READ ¹¹⁸
Domains of trauma											
Any trauma	✓				✓						
Physical abuse	✓		✓								
Emotional abuse	✓		✓								
Sexual abuse	✓		✓								
Physical neglect	✓		✓								
Emotional neglect	✓		✓								
Witness to violence	✓										
Resilience											
Individual traits								✓		✓	✓
Ecological aspects											✓
Symptoms of trauma exposure											
Emotional	✓			✓	✓		✓	✓			
Behavioral	✓			✓	✓		✓	✓			
PTSD				✓	✓						
Administration considerations											
Ages 0–5 y	> 2 y	> 4 y		> 3 y	> 7 y	> 7 y	> 8 y	> 4 y	> 10 y	> 8 y	
Ages 5–12 y	✓	✓		✓, > 8 y	✓	✓	✓	✓	✓	✓	✓
Ages 12–18 y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Parent version/component	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Time to complete	7 min	10–30 min	5–10 min	15–20 min	10–20 min	15–30 min	10 min	10 min	5 min	5 min	10–20 min
Published psychometric properties	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

CD-RISC, Connor Davidson Resilience Scale; CTQ, Childhood Trauma Questionnaire; PEDS-ES, Pediatric Emotional Distress Scale-Early Screener; READ, Resilience Scale for Adolescents; RS/RS-14/RS-10, Resilience Scale/14-Item/10-Item; SDQ, Strengths and Difficulties Questionnaire; STEP, Screening Tool for Early Predictors of PTSD; TESI-C, Traumatic Events Screening Inventory for Children; TSC-C/TSC-YC, Trauma Symptom Checklist for Children/Young Children; UCLA, UCLA 9-item PTSD Reaction Index; WBTH, When Bad Things Happen Scale.

- community among adults with previous ACEs is the most closely associated with health in adulthood of all the examined resilience factors. Children’s increased understanding of trauma’s toll has the potential to augment resilience by modifying children’s self-esteem, internal locus of control, and attribution of blame, all cognitive traits associated with resilience. At the same time, as families learn about PTSD and symptoms of emotional distress in their children, they will be more likely to seek help for them.²³
8. Customize pediatric health care to the needs of the family, considering the broad-reaching effects of trauma on physical and mental health as well as social and academic outcomes. Flynn et al¹⁴ conducted a systematic review of primary care interventions to address toxic stress in children and their families, finding that 9 out of the 10 included studies had positive outcomes for children and families. Children with ACEs are more at risk for academic failure than those without, which contributes to poor health outcomes.^{2,11,29,30,40}
 9. Familiarize pediatric staff with resources in the community and make individualized referrals for children and their families. Bolstering children’s resilience requires treating the whole family, which is often not possible without adjunct services.^{17,32}
 10. Be cognizant of barriers to engagement facing families of children with ACEs. These families often have negative perceptions of mental health services; family stress; lack of social support for receiving behavioral health services; and difficulty with logistics of participating in services.^{63,103}

Using evidence-based engagement strategies can increase engagement of these families in treatment.¹⁰¹ Having a history of trauma, belonging to a cultural or ethnic minority group, and having nonbiological caregivers are all independent predictors of premature treatment disengagement.^{63,119}

LIMITATIONS OF EXISTING RESEARCH

The existing literature has few longitudinal studies of resilience in children who experience adversity. We need more rigorous trials of resilience-building interventions, especially those that include a nontraumatized comparison group, those housed in pediatric practices, and those that identify mechanisms of risk and resilience, including measures of allostatic load, health risk behaviors, and ecological elements of resilience. The existing resilience research is heavily weighted toward the mental health outcomes of childhood adversity and retrospective studies of adults who experienced adversity as children. As our understanding of the impact of ACEs on life course and health trajectory deepens, the investigation of resilience pathways will enable informed clinical care and policy improvements.

CONCLUSIONS

Pediatricians are ideally situated to address both primary and secondary prevention of trauma as well as to identify treatable trauma sequelae and build resilience. In order for pediatricians to be successful in this undertaking, significant change at the individual pediatric practice level, as well as in the broader health care policy environment, is required. Addressing the malleable social and environmental resilience factors identified through this review offers a reasonable set of enhancements

to clinical practice that would help children withstand, adapt to, and recover from adversity. We need innovative models to ensure that those payers who invest in treating early adversity share in the cost savings that will surely result. To intervene in the lives of children experiencing adversity offers an opportunity to improve the health and well-being of the current and future generations. Not only is this the right thing to do, but it will also enhance national productivity and reduce spending on health care for chronic diseases.

ABBREVIATIONS

AAP: American Academy of Pediatrics
 ACE: adverse childhood experience
 EIFC: early intervention foster care program
 HPA: hypothalamic–pituitary–adrenal
 MDD: major depressive disorder
 OR: odds ratio
 PTSD: posttraumatic stress disorder
 RCT: randomized controlled trial

REFERENCES

1. Gilbert LK, Breiding MJ, Merrick MT, et al. Childhood adversity and adult chronic disease: an update from ten states and the District of Columbia, 2010. *Am J Prev Med.* 2015;48(3):345–349
2. Bethell CD, Newacheck P, Hawes E, Halfon N. Adverse childhood experiences: assessing the impact on health and school engagement and the mitigating role of resilience. *Health Aff (Millwood).* 2014;33(12):2106–2115
3. Anda RF, Brown DW, Dube SR, Bremner JD, Felitti VJ, Giles WH. Adverse childhood experiences and chronic obstructive pulmonary disease in adults. *Am J Prev Med.* 2008;34(5):396–403

4. Brown DW, Anda RF, Tiemeier H, et al. Adverse childhood experiences and the risk of premature mortality. *Am J Prev Med.* 2009;37(5):389–396
5. Dong M, Giles WH, Felitti VJ, et al. Insights into causal pathways for ischemic heart disease: adverse childhood experiences study. *Circulation.* 2004;110(13):1761–1766
6. Child Trends. Adverse childhood experiences: national and state-level prevalence. *Research Brief.* July 2014; publication #2014-28. Available at: <http://impact.sp2.upenn.edu/ostrc/doclibrary/documents/AdverseChildhoodExperiences.pdf>. Accessed December 6, 2015
7. Shonkoff JP, Boyce WT, McEwen BS. Neuroscience, molecular biology, and the childhood roots of health disparities: building a new framework for health promotion and disease prevention. *JAMA.* 2009;301(21):2252–2259
8. Ungar M. Practitioner review: diagnosing childhood resilience—a systemic approach to the diagnosis of adaptation in adverse social and physical ecologies. *J Child Psychol Psychiatry.* 2015;56(1):4–17
9. Repetti RL, Taylor SE, Seeman TE. Risky families: family social environments and the mental and physical health of offspring. *Psychol Bull.* 2002;128(2):330–366
10. Dube SR, Felitti VJ, Dong M, Giles WH, Anda RF. The impact of adverse childhood experiences on health problems: evidence from four birth cohorts dating back to 1900. *Prev Med.* 2003;37(3):268–277
11. Augustyn M, Groves BM. Training clinicians to identify the hidden victims: children and adolescents who witness violence. *Am J Prev Med.* 2005;29(5 suppl 2):272–278
12. Shonkoff JP, Garner AS; Committee on Psychosocial Aspects of Child and Family Health; Committee on Early Childhood, Adoption, and Dependent Care; Section on Developmental and Behavioral Pediatrics. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics.* 2012;129(1). Available at: www.pediatrics.org/cgi/content/full/129/1/e232

13. Garner AS, Shonkoff JP; Committee on Psychosocial Aspects of Child and Family Health; Committee on Early Childhood, Adoption, and Dependent Care; Section on Developmental and Behavioral Pediatrics. Early childhood adversity, toxic stress, and the role of the pediatrician: translating developmental science into lifelong health. *Pediatrics*. 2012;129(1). Available at: www.pediatrics.org/cgi/content/full/129/1/e224
14. Flynn AB, Fothergill KE, Wilcox HC, et al. Primary care interventions to prevent or treat traumatic stress in childhood: a systematic review. *Acad Pediatr*. 2015;15(5):480–492
15. Cicchetti D. Annual Research Review: Resilient functioning in maltreated children—past, present, and future perspectives. *J Child Psychol Psychiatry*. 2013;54(4):402–422
16. Ghosh Ippen C, Harris WW, Van Horn P, Lieberman AF. Traumatic and stressful events in early childhood: can treatment help those at highest risk? *Child Abuse Negl*. 2011;35(7):504–513
17. Dozier M, Albus K, Fisher PA, Sepulveda S. Interventions for foster parents: implications for developmental theory. *Dev Psychopathol*. 2002;14(4):843–860
18. Fisher PA, Gunnar MR, Chamberlain P, Reid JB. Preventive intervention for maltreated preschool children: impact on children's behavior, neuroendocrine activity, and foster parent functioning. *J Am Acad Child Adolesc Psychiatry*. 2000;39(11):1356–1364
19. Bernard K, Hostinar CE, Dozier M. Intervention effects on diurnal cortisol rhythms of Child Protective Services-referred infants in early childhood: preschool follow-up results of a randomized clinical trial. *JAMA Pediatr*. 2015;169(2):112–119
20. Gunnar MR, Fisher PA; Early Experience, Stress, and Prevention Network. Bringing basic research on early experience and stress neurobiology to bear on preventive interventions for neglected and maltreated children. *Dev Psychopathol*. 2006;18(3):651–677
21. Fisher PA, Burraston B, Pears K. The early intervention foster care program: permanent placement outcomes from a randomized trial. *Child Maltreat*. 2005;10(1):61–71
22. Dozier M, Peloso E, Lewis E, Laurenceau J-P, Levine S. Effects of an attachment-based intervention on the cortisol production of infants and toddlers in foster care. *Dev Psychopathol*. 2008;20(3):845–859
23. Cohen JA, Kelleher KJ, Mannarino AP. Identifying, treating, and referring traumatized children: the role of pediatric providers. *Arch Pediatr Adolesc Med*. 2008;162(5):447–452
24. Bernard K, Meade EB, Dozier M. Parental synchrony and nurturance as targets in an attachment based intervention: building upon Mary Ainsworth's insights about mother-infant interaction. *Attach Hum Dev*. 2013;15(5–6):507–523
25. Slopen N, McLaughlin KA, Shonkoff JP. Interventions to improve cortisol regulation in children: a systematic review. *Pediatrics*. 2014;133(2):312–326
26. Dubowitz H, Thompson R, Proctor L, et al. Adversity, maltreatment, and resilience in young children. *Acad Pediatr*. 2016;16(3):233–239
27. Cronholm PF, Forke CM, Wade R, et al. Adverse childhood experiences: expanding the concept of adversity. *Am J Prev Med*. 2015;49(3):354–361
28. Margolin G, Gordis EB. The effects of family and community violence on children. *Annu Rev Psychol*. 2000;51:445–479
29. Jimenez ME, Wade R Jr, Lin Y, Morrow LM, Reichman NE. Adverse experiences in early childhood and kindergarten outcomes. *Pediatrics*. 2016;137(2):e20151839
30. Burke NJ, Hellman JL, Scott BG, Weems CF, Carrion VG. The impact of adverse childhood experiences on an urban pediatric population. *Child Abuse Negl*. 2011;35(6):408–413
31. Streeck-Fischer A, van der Kolk BA. Down will come baby, cradle and all: diagnostic and therapeutic implications of chronic trauma on child development. *Aust N Z J Psychiatry*. 2000;34(6):903–918
32. Hornor G. Childhood trauma exposure and toxic stress: what the PNP needs to know. *J Pediatr Health Care*. 2015;29(2):191–198
33. Purtle J, Harris E, Compton R, et al. The psychological sequelae of violent injury in a pediatric intervention. *J Pediatr Surg*. 2014;49(11):1668–1672
34. Wingo AP, Fani N, Bradley B, Ressler KJ. Psychological resilience and neurocognitive performance in a traumatized community sample. *Depress Anxiety*. 2010;27(8):768–774
35. Slopen N, Koenen KC, Kubzansky LD. Cumulative adversity in childhood and emergent risk factors for long-term health. *J Pediatr*. 2014;164(3):631–638.e2
36. Danese A, Tan M. Childhood maltreatment and obesity: systematic review and meta-analysis. *Mol Psychiatry*. 2014;19(5):544–554
37. Mason SM, Bryn Austin S, Bakalar JL, et al. Child maltreatment's heavy toll: the need for trauma-informed obesity prevention. *Am J Prev Med*. 2016;50(5):646–649
38. Winning A, Glymour MM, McCormick MC, Gilsanz P, Kubzansky LD. Psychological distress across the life course and cardiometabolic risk: findings from the 1958 British birth cohort study. *J Am Coll Cardiol*. 2015;66(14):1577–1586
39. Sugaya L, Hasin DS, Olfsen M, Lin K-H, Grant BF, Blanco C. Child physical abuse and adult mental health: a national study. *J Trauma Stress*. 2012;25(4):384–392
40. Michenbaum D. Bolstering resilience: benefitting from lessons learned. Brom D, Pat-Horenczyk R, Ford JD, eds. In: *Treating Traumatized Children: Risk, Resilience and Recovery*. New York, NY: Routledge; 2008
41. Oral R, Ramirez M, Coohy C, et al. Adverse childhood experiences and trauma informed care: the future of health care. *Pediatr Res*. 2016;79(1–2):227–233
42. Zolkoski SM, Bullock LM. Resilience in children and youth: a review. *Child Youth Serv Rev*. 2012;34(12):2295–2303
43. Lynch M, Cicchetti D. An ecological-transactional analysis of children and contexts: the longitudinal interplay among child maltreatment, community violence, and children's

- symptomatology. *Dev Psychopathol.* 1998;10(2):235–257
44. Wrenn GL, Wingo AP, Moore R, et al. The effect of resilience on posttraumatic stress disorder in trauma-exposed inner-city primary care patients. *J Natl Med Assoc.* 2011;103(7):560–566
 45. Collishaw S, Pickles A, Messer J, Rutter M, Shearer C, Maughan B. Resilience to adult psychopathology following childhood maltreatment: evidence from a community sample. *Child Abuse Negl.* 2007;31(3):211–229
 46. Rutter M. Psychosocial resilience and protective mechanisms. *Am J Orthopsychiatry.* 1987;57(3):316–331
 47. Rutter M. Resilience as a dynamic concept. *Dev Psychopathol.* 2012;24(2):335–344
 48. DuMont KA, Widom CS, Czaja SJ. Predictors of resilience in abused and neglected children grown-up: the role of individual and neighborhood characteristics. *Child Abuse Negl.* 2007;31(3):255–274
 49. Garmezy N, Masten AS, Tellegen A. The study of stress and competence in children: a building block for developmental psychopathology. *Child Dev.* 1984;55(1):97–111
 50. Cicchetti D, Rogosch FA. Adaptive coping under conditions of extreme stress: Multilevel influences on the determinants of resilience in maltreated children. *New Dir Child Adolesc Dev.* 2009;2009(124):47–59
 51. Bowes L, Jaffee SR. Biology, genes, and resilience: toward a multidisciplinary approach. *Trauma Violence Abuse.* 2013;14(3):195–208
 52. Bradley B, Davis TA, Wingo AP, Mercer KB, Ressler KJ. Family environment and adult resilience: contributions of positive parenting and the oxytocin receptor gene. *Eur J Psychotraumatol.* 2013;4:21659
 53. Luthar SS, Sawyer JA, Brown PJ. Conceptual issues in studies of resilience: past, present, and future research. *Ann N Y Acad Sci.* 2006;1094(1):105–115
 54. Olson S, ed; Institute of Medicine; National Research Council; Committee on the Science of Research on Families. *Toward an Integrated Science of Research on Families: Workshop Report.* Washington, DC: National Academies Press; 2011. Available at: www.ncbi.nlm.nih.gov/books/NBK56249/. Accessed October 3, 2016
 55. O'Malley DM, Randell KA, Dowd MD. Family adversity and resilience measures in pediatric acute care settings. *Public Health Nurs.* 2016;33(1):3–10
 56. Fiese BH, Rhodes HG, Beardslee WR. Rapid changes in American family life: consequences for child health and pediatric practice. *Pediatrics.* 2013;132(3):552–559
 57. LeBrón AMW, Schulz AJ, Mentz G, White Perkins D. John Henryism, socioeconomic position, and blood pressure in a multi-ethnic urban community. *Ethn Dis.* 2015;25(1):24–30
 58. Brody GH, Yu T, Chen E, Miller GE, Kogan SM, Beach SRH. Is resilience only skin deep?: rural African Americans' socioeconomic status-related risk and competence in preadolescence and psychological adjustment and allostatic load at age 19. *Psychol Sci.* 2013;24(7):1285–1293
 59. Chen E, Miller GE, Brody GH, Lei M. Neighborhood poverty, college attendance, and diverging profiles of substance use and allostatic load in rural African American youth. *Clin Psychol Sci.* 2015;3(5):675–685
 60. Dorsey S, Briggs EC, Woods BA. Cognitive-behavioral treatment for posttraumatic stress disorder in children and adolescents. *Child Adolesc Psychiatr Clin N Am.* 2011;20(2):255–269
 61. Bick J, Dozier M. The effectiveness of an attachment-based intervention in promoting foster mothers' sensitivity toward foster infants. *Infant Ment Health J.* 2013;34(2):95–103
 62. Cohen JA, Deblinger E, Mannarino AP, Steer RA. A multisite, randomized controlled trial for children with sexual abuse-related PTSD symptoms. *J Am Acad Child Adolesc Psychiatry.* 2004;43(4):393–402
 63. Dorsey S, Conover KL, Revillion Cox J. Improving foster parent engagement: using qualitative methods to guide tailoring of evidence-based engagement strategies. *J Clin Child Adolesc Psychol.* 2014;43(6):877–889
 64. Bloom SL, Frarragher B. *Restoring Sanctuary.* New York, NY: Oxford University Press; 2013
 65. Gunnar MR, Quevedo KM. Early care experiences and HPA axis regulation in children: a mechanism for later trauma vulnerability. *Prog Brain Res.* 2008;167:137–149
 66. Langeland K, Manheim D, McLeod G, Nacouzi G. How civil institutions build resilience: organizational practices derived from academic literature and case studies. RAND corporation. Available at: www.rand.org/pubs/research_reports/RR1246.html. Accessed November 9, 2016
 67. Kalisch R, Müller MB, Tüscher O. A conceptual framework for the neurobiological study of resilience. *Behav Brain Sci.* 2015;38:e92
 68. Kleiman EM, Chiara AM, Liu RT, Jager-Hyman SG, Choi JY, Alloy LB. Optimism and well-being: a prospective multi-method and multi-dimensional examination of optimism as a resilience factor following the occurrence of stressful life events. *Cogn Emot.* 2017;31(2):269–283
 69. Blair C, Raver CC. Poverty, stress, and brain development: new directions for prevention and intervention. *Acad Pediatr.* 2016;16(3 suppl):S30–S36
 70. Blair C, Granger DA, Willoughby M, et al; FLP Investigators. Salivary cortisol mediates effects of poverty and parenting on executive functions in early childhood. *Child Dev.* 2011;82(6):1970–1984
 71. Hanson JL, Hair N, Shen DG, et al. Family poverty affects the rate of human infant brain growth. *PLoS One.* 2013;8(12):e80954
 72. Davidovich S, Collishaw S, Thapar AK, Harold G, Thapar A, Rice F. Do better executive functions buffer the effect of current parental depression on adolescent depressive symptoms? *J Affect Disord.* 2016;199:54–64
 73. Diamond A, Lee K. Interventions shown to aid executive function development in children 4 to 12 years old. *Science.* 2011;333(6045):959–964

74. Savage-McGlynn E, Redshaw M, Heron J, et al. Mechanisms of resilience in children of mothers who self-report with depressive symptoms in the first postnatal year. *PLoS One*. 2015;10(11):e0142898
75. Chemtob CM, Gudiño OG, Laraque D. Maternal posttraumatic stress disorder and depression in pediatric primary care: association with child maltreatment and frequency of child exposure to traumatic events. *JAMA Pediatr*. 2013;167(11):1011–1018
76. Silverstein M, Feinberg E, Cabral H, et al. Potential impact of trauma on the ability to prevent depression among low-income mothers. *Depress Anxiety*. 2011;28(6):478–484
77. Dubowitz H, Lane WG, Semiatin JN, Magder LS, Venepally M, Jans M. The safe environment for every kid model: impact on pediatric primary care professionals. *Pediatrics*. 2011;127(4). Available at: www.pediatrics.org/cgi/content/full/127/4/e962
78. England MJ, Sim LJ, eds; National Research Council; Institute of Medicine; Committee on Depression, Parenting Practices, and the Healthy Development of Children. *Depression in Parents, Parenting, and Children: Opportunities to Improve Identification, Treatment, and Prevention*. Washington, DC: National Academies Press; 2009. Available at: www.ncbi.nlm.nih.gov/books/NBK215117/. Accessed September 30, 2016
79. Winders Davis D, Myers J, Logsdon MC, Bauer NS. The relationship among caregiver depressive symptoms, parenting behavior, and family-centered care. *J Pediatr Health Care*. 2016;30(2):121–132
80. Szilágyi M, Kerker BD, Storfer-Isser A, et al. Factors associated with whether pediatricians inquire about parents' adverse childhood experiences. *Acad Pediatr*. 2016;16(7):668–675
81. Nurius PS, Green S, Logan-Greene P, Borja S. Life course pathways of adverse childhood experiences toward adult psychological well-being: A stress process analysis. *Child Abuse Negl*. 2015;45:143–153
82. Chapman DP, Liu Y, Presley-Cantrell LR, et al. Adverse childhood experiences and frequent insufficient sleep in 5 U.S. States, 2009: a retrospective cohort study. *BMC Public Health*. 2013;13(1):3
83. Groves BM. Mental health services for children who witness domestic violence. *Future Child*. 1999;9(3):122–132
84. Evans GW, Gonnella C, Marcynyszyn LA, Gentile L, Salpekar N. The role of chaos in poverty and children's socioemotional adjustment. *Psychol Sci*. 2005;16(7):560–565
85. Staples AD, Bates JE, Petersen IT. Bedtime routines in early childhood: prevalence, consistency, and associations with nighttime sleep. *Monogr Soc Res Child Dev*. 2015;80(1):141–159
86. Koulouglioti C, Cole R, Moskow M, McQuillan B, Carno M-A, Grape A. The longitudinal association of young children's everyday routines to sleep duration. *J Pediatr Health Care*. 2014;28(1):80–87
87. Mayberry LS, Shinn M, Benton JG, Wise J. Families experiencing housing instability: the effects of housing programs on family routines and rituals. *Am J Orthopsychiatry*. 2014;84(1):95–109
88. Deater-Deckard K, Chen N, Wang Z, Bell MA. Socioeconomic risk moderates the link between household chaos and maternal executive function. *J Fam Psychol*. 2012;26(3):391–399
89. Kerker BD, Storfer-Isser A, Szilágyi M, et al. Do pediatricians ask about adverse childhood experiences in pediatric primary care? *Acad Pediatr*. 2016;16(2):154–160
90. Barth RP, Crea TM, John K, Thoburn J, Quinton D. Beyond attachment theory and therapy: Towards sensitive and evidence-based interventions with foster and adoptive families in distress. *Child Fam Soc Work*. 2005;10(4):257–268
91. Bright MA, Thompson L, Esernio-Jenssen D, Alford S, Shenkman E. Primary care pediatricians' perceived prevalence and surveillance of adverse childhood experiences in low-income children. *J Health Care Poor Underserved*. 2015;26(3):686–700
92. Feliitti VJ. Adverse childhood experiences and adult health. *Acad Pediatr*. 2009;9(3):131–132
93. Horwitz SM, Kelleher KJ, Stein REK, et al. Barriers to the identification and management of psychosocial issues in children and maternal depression. *Pediatrics*. 2007;119(1). Available at: www.pediatrics.org/cgi/content/full/119/1/e208
94. Banh MK, Saxe G, Mangione T, Horton NJ. Physician-reported practice of managing childhood posttraumatic stress in pediatric primary care. *Gen Hosp Psychiatry*. 2008;30(6):536–545
95. Reeves E. A synthesis of the literature on trauma-informed care. *Issues Ment Health Nurs*. 2015;36(9):698–709
96. Coker TR, Chacon S, Elliott MN, et al. A parent coach model for well-child care among low-income children: a randomized controlled trial. *Pediatrics*. 2016;137(3):e20153013
97. Raphael JL, Cooley WC, Vega A, et al. Outcomes for children with chronic conditions associated with parent- and provider-reported measures of the medical home. *J Health Care Poor Underserved*. 2015;26(2):358–376
98. Asarnow JR, Rozenman M, Wiblin J, Zeltzer L. Integrated medical-behavioral care compared with usual primary care for child and adolescent behavioral health: a meta-analysis. *JAMA Pediatr*. 2015;169(10):929–937
99. Martin A, Barajas RG, Brooks-Gunn J, Hale L. Parenting services may be an opportunity for improving bedtime routines among at-risk preschoolers. *Behav Sleep Med*. 2011;9(4):237–242
100. Bethell C, Gombojav N, Solloway M, Wissow L. Adverse childhood experiences, resilience and mindfulness-based approaches: common denominator issues for children with emotional, mental, or behavioral problems. *Child Adolesc Psychiatr Clin N Am*. 2016;25(2):139–156
101. Dorsey S, Pullmann MD, Berliner L, Koschmann E, McKay M, Deblinger E. Engaging foster parents in treatment: a randomized trial of supplementing trauma-focused cognitive behavioral therapy with evidence-based engagement strategies. *Child Abuse Negl*. 2014;38(9):1508–1520
102. Kassam-Adams N, Rzucidlo S, Campbell M, et al. Nurses' views and

- current practice of trauma-informed pediatric nursing care. *J Pediatr Nurs*. 2015;30(3):478–484
103. Harrison ME, McKay MM, Bannon WM Jr. Inner-city child mental health service use: the real question is why youth and families do not use services. *Community Ment Health J*. 2004;40(2):119–131
 104. Ahern NR, Kiehl EM, Sole ML, Byers J. A review of instruments measuring resilience. *Issues Compr Pediatr Nurs*. 2006;29(2):103–125
 105. Wevodau A. Review of trauma screening tools for children and adolescents. National Youth Screening and Assessment Partners. Available at: www.nysap.us/Products.html. Accessed July 28, 2016
 106. Strand VC, Sarmiento TL, Pasquale LE. Assessment and screening tools for trauma in children and adolescents: a review. *Trauma Violence Abuse*. 2005;6(1):55–78
 107. Windle G, Bennett KM, Noyes J. A methodological review of resilience measurement scales. *Health Qual Life Outcomes*. 2011;9:8
 108. Kramer DN, Hertli MB, Landolt MA. Evaluation of an early risk screener for PTSD in preschool children after accidental injury. *Pediatrics*. 2013;132(4). Available at: www.pediatrics.org/cgi/content/full/132/4/e945
 109. Ghosh Ippen C, Ford J, Racusin R, et al. Traumatic events screening inventory - parent report revised. The Child Trauma Research Project of the Early Trauma Network and the National Center for PTSD. Dartmouth Child Trauma Research Group; 2002. Available at: <https://www.ptsd.va.gov/professional/assessment/child/tesi.asp>. Accessed October 10, 2016
 110. Bernstein DP, Fink L. *Childhood Trauma Questionnaire: A Retrospective Self-Report Manual*. San Antonio, TX: The Psychological Corporation; 1998
 111. Briere J. *Trauma Symptom Checklist for Children (TSCC) Professional Manual*. Odessa, FL: Psychological Assessment Resources; 1996
 112. Fletcher K. Psychometric review of the When Bad Things Happen Scale (WBTH). In: Hudnall Stamm B, ed. *Measurement of Stress Trauma and Adaptation*. Lutherville, MD: Sidran Press; 1996:435–437
 113. Steinberg AM, Brymer MJ, Kim S, et al. Psychometric properties of the UCLA PTSD reaction index: part I. *J Trauma Stress*. 2013;26(1):1–9
 114. Winston FK, Kassam-Adams N, Garcia-España F, Ittenbach R, Cnaan A. Screening for risk of persistent posttraumatic stress in injured children and their parents. *JAMA*. 2003;290(5):643–649
 115. Goodman R. The Strengths and Difficulties Questionnaire: a research note. *J Child Psychol Psychiatry*. 1997;38(5):581–586
 116. Campbell-Sills L, Stein MB. Psychometric analysis and refinement of the Connor-davidson Resilience Scale (CD-RISC): validation of a 10-item measure of resilience. *J Trauma Stress*. 2007;20(6):1019–1028
 117. Wagnild GM, Young HM. Development and psychometric evaluation of the Resilience Scale. *J Nurs Meas*. 1993;1(2):165–178
 118. Hjemdal O, Friborg O, Stiles TC, Martinussen M, Rosenvinge JH. A new scale for adolescent resilience: grasping the central protective resources behind healthy development. *Meas Eval Couns Dev*. 2006;39(2):84–96
 119. Wilcox HC, Rains M, Belcher H, et al. Behavioral problems and service utilization in children with chronic illnesses referred for trauma-related mental health services. *J Dev Behav Pediatr*. 2016;37(1):62–70

Modifiable Resilience Factors to Childhood Adversity for Clinical Pediatric Practice

Flora Traub and Renée Boynton-Jarrett

Pediatrics 2017;139;

DOI: 10.1542/peds.2016-2569 originally published online April 19, 2017;

Updated Information & Services

including high resolution figures, can be found at:
<http://pediatrics.aappublications.org/content/139/5/e20162569>

References

This article cites 108 articles, 12 of which you can access for free at:
<http://pediatrics.aappublications.org/content/139/5/e20162569#BIBL>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):
Community Pediatrics
http://www.aappublications.org/cgi/collection/community_pediatrics_sub
Preventive Medicine
http://www.aappublications.org/cgi/collection/preventative_medicine_sub

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
<http://www.aappublications.org/site/misc/Permissions.xhtml>

Reprints

Information about ordering reprints can be found online:
<http://www.aappublications.org/site/misc/reprints.xhtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Modifiable Resilience Factors to Childhood Adversity for Clinical Pediatric Practice

Flora Traub and Renée Boynton-Jarrett

Pediatrics 2017;139;

DOI: 10.1542/peds.2016-2569 originally published online April 19, 2017;

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/139/5/e20162569>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2017 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

