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ADVANCES IN FAMILY PRACTICE NURSING

Closing the Gap

Addressing Adversity and Promoting Early Childhood Development

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Keywords

• Early childhood • Poverty • Brain development • Early childhood education • Toxic stress • Adversity

Key points

- Early childhood is a critical period of brain development, and access to literacy-rich environments, caring adults, and quality early childhood education play important roles.
- Family nurse practitioners play an important role in guiding families through early childhood.
- Family nurse practitioners, through clinical practice and connections to community resources, can help buffer the negative effects of poverty and toxic stress.
- Family nurse practitioners can promote a family-centered approach in order to develop interventions to promote early childhood development that are strengths-based and culturally sensitive.

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INTRODUCTION

The term "early childhood" has traditionally been defined by governmental organizations such as Healthy People, the World Health Organization, and the United Nations Children's Fund as a time period from birth to 8 years. The state of the science has found that time period to be too broad, and pediatric health care organizations are currently defining "early childhood" as a time between birth to 3 years. This is an important distinction because neuroplasticity occurs rapidly and expansively during the first 3 years. Neurons form new connections at a rate of more than one million per second and comprise about 80% of all brain development during the early childhood period, which in turn means this time period is important for foundational brain structures and setting the stage for brain connectivity [1,2]. This article aims to offer guidance and support for the role of FNP in caring for those in the early childhood period and emerging science of early childhood adversity.

Early childhood is a time when early life experience quite literally gets "under the skin" and affects physical and mental health [3]. The concepts of individual differences (each individual can have a unique response to the same experience) and vulnerability genes (genetic code passed on to the child that specifically affects physiologic development) are important to keep in mind because they significantly contribute to how experiences shape one's environment and development. If conditions are chronically aversive or stress becomes prolonged or excessive during early childhood, it affects short- and long-term learning, behavior, and health outcomes [4,5].

This sensitive period of early childhood is when care and interventions are the most effective and can determine the lifelong health and wellness of the individual. Family nurse practitioners (FNPs) who care for children from birth to 3 years of age have the ability to make a significant impact because these children typically are seen by their primary care provider more during the early childhood period than they are seen in the remainder of their lifetimes. The FNP curriculum has a population life span focus, and given the clinical hours required, there often are limited clinical pediatric training opportunities. Further, it is recognized that FNPs who care for children from 0 to 3 years old often work in high need, low resourced areas, and have this patient population as part of the wider age range patient pool.

The importance of FNPs caring for young children should not be overlooked. There is limited literature that addresses FNPs caring for pediatric patients, and scant articles specifically addressing care of children from birth to 3 years of age. In 2010, a survey of a random national sample of 1000 FNPs with a response rate of 75.9% showed 66% of FNPs provide care to children and 54% of them reported that children represented less than 25% of their patient population [6]. There is evidence for FNPs supporting breastfeeding [7], pediatric clinical guidelines [8–10], and pediatric culturally competent care [11]. None of the articles that were found specifically addressed this critical period in early development and the role the FNP brings in offering astute assessment of these patients as well as anticipatory guidance to families.

Resources not specific to the FNP but critical to those delivering primary care to children from birth to 3 years of age are the Bright Futures Pocket Guide, the Healthy Steps program, HealthyChildren.org, National Resource Center for Patient/Family Centered Medical Home, and Education in Quality Improvement for Pediatric Practice. These guides focus on the 2 most important parts of an early childhood primary care visit: evaluating developmental milestones and planning for anticipatory guidance [12]. Nevertheless, these might not elucidate the importance of recognizing adversity and promoting trauma-informed care and early home environments. A caring adult who is consistently present can positively ameliorate certain types of stress. Achieving developmental milestones and breakthrough outcomes for young children facing adversity requires supporting the adults who care for them [13].

This paper strives to highlight aspects of the early childhood primary care visit that are critical for the FNP to promote optimal early brain and child development. Healthy brain development requires enrichment from early language and caregiver engagement; protection from adverse childhood experiences (ACEs), especially in impoverished settings that can lead to toxic stress; and safe, stable, and nurturing relationships.

POVERTY AS A SOCIAL DETERMINANT OF HEALTH

Social determinants of health (SDH or SDOH) are defined by the Centers for Disease Control and Prevention as "conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks" [14,15]. An in-depth analysis of each SDOH is beyond the scope of this article, but given the high rates of childhood poverty, the authors focus on the effect of economic stability on early childhood health and development.

Poverty is defined by the US government based on income and family size, and the threshold is adjusted annually based on inflation. Poverty exists in every community–urban, suburban, and rural–and children are the poorest members of our society. In 2016, approximately 13% of the US population lived in poverty, including 18% of US children (more than 13 million children) [16]. Although poverty rates declined between 2014 and 2016 across all demographics, disparities remain. Black, Hispanic, and American Indian/Alaska Native children are 3 times more likely to live in poverty than are white and Asian children. Among immigrants, naturalized citizens have the lowest poverty rates, followed by US-born citizens; noncitizens are at highest risk of living in poverty [16].

Children born into poverty, and who persistently live in poor conditions, are at risk for several health and developmental challenges throughout their lives. Poverty has negative effects on birthweight, infant mortality, immunization rates, nutrition, language, and social development. Children living in poverty are also more likely to be exposed to violence and suffer from injury and chronic illnesses [17]. Moreover, the effects of persistent poverty can lead to toxic stress and can alter the way a young child's brain develops, which can

lead to lower educational attainment and higher rates of crime, teen pregnancy, and substance abuse.

Federal antipoverty programs aim not only to provide economic stability to individuals and families but also to mitigate these long-term effects of poverty. Several programs specifically are designed to support early childhood development, including those that provide access to health care through Medicaid and the Child Health Insurance Program (CHIP), early education (such as Head Start and Early Head Start), quality child care, as well as affordable housing and home visiting. Perhaps the most widely used programs are those providing critical nutrition assistance, such as the Women, Infants, and Children Program (WIC); Supplemental Nutrition Assistance Program (SNAP, formerly the "food stamps" program); school meals; and summer feeding programs. Without these resources, it is estimated that nearly 1 in 3 children would live in poverty instead of 1 in 5 [17].

ADVERSE CHILDHOOD EXPERIENCES

The groundbreaking 1998 study on ACEs has greatly expanded scientific and public health understanding of the relationship between early adversity and later adult health. In this study of more than 17,000 adults, two-thirds reported having at least one ACE, defined as having experienced one of the following before 18 years of age:

Abuse: psychological, physical, or sexual.

Neglect: emotional or physical.

Household dysfunction: exposure in the home to substance abuse, mental illness or suicide attempt, parental separation or divorce, incarceration, or violence to the mother.

ACEs clustered, with nearly 90% of those who reported one ACE reporting at least one additional ACE. One in eight participants reported 4 or more ACEs [18]. Strikingly, the researchers noted a dose-response relationship between early adversity and adult behaviors and illness, with a greater number of ACEs leading to poorer health in adulthood. Individuals who reported 4 or more ACEs had a 4- to 12-fold increased risk for alcohol and drug abuse, depression, and suicide attempts and at least a 2-fold increased risk of smoking and risky sexual behavior. These individuals were also much more likely to develop cancer, heart disease, chronic lung disease, liver disease, and other physical illnesses, even if they did not have risk behaviors such as smoking and substance abuse. Notably, the study population was largely educated, white, and all had health insurance through Kaiser Permanente. In short, the accumulation of adversities in childhood has deleterious effects on long-term behaviors and health, regardless of one's socioeconomic status.

FNPs should be aware of how ACEs currently manifest. Since the publication of the original ACEs study, the list of ACEs has been expanded to include neighborhood violence, racial/ethnic discrimination, economic hardship, and other factors [19]. Economic hardship and parental divorce or separation are the most common ACEs reported nationally and in all states. Nearly half of

all children in the United States have experienced at least one ACE, and 1 in 10 children has experienced 3 or more ACEs, placing them at high risk for chronic illness in adulthood. Young children exposed to 5 or more significant adverse experiences in the first 3 years of childhood face a 76% likelihood of having one or more delays in their language, emotional, or brain development [20]. Disparities in race occur, with 61% of black non-Hispanic children and 51% of Hispanic children having experienced at least one ACE, compared with 40% of white non-Hispanic children and 23% of Asian non-Hispanic children [21].

Exactly how ACEs affect long-term health is still not fully clear, but research suggests that early adversity causes an overdose of stress hormones. In the absence of a supporting and stable environment, this can lead to a toxic stress response involving chemical and structural changes to a child's brain, blood vessels, lymph nodes, and adrenal glands and can change how one's DNA is expressed. This can decrease the body's ability to physiologically protect itself from damage and thereby increase the risk of adult illnesses, particularly those caused by chronic inflammation [22]. In the pediatric setting, the adult illnesses may not yet be evident, but children experiencing toxic stress may present with problems with bladder and bowel control, sleeping, eating, learning and concentrating, as well as symptoms of depression, anxiety, and posttraumatic stress.

ADDRESSING ADVERSE CHILDHOOD EXPERIENCES AND POVERTY

Although ACEs and poverty may not be wholly preventable, clinicians who care for children are in a unique position to help families mitigate the negative effects of these experiences, thereby changing the trajectory of a child's life. The first step in recognizing these issues in the clinical setting is to screen families, which can take various forms. There is a growing body of literature in support of screening for ACEs, but as of this writing, there are no validated screening tools for ACEs and no universal guidelines for screening. FNPs should become familiar with various screeners that assess for stress and trauma broadly and for ACEs specifically; a summary of tools is available on the American Academy of Pediatrics (AAP) Website [23]. Universal screening questions have also been suggested as an alternative to more formal screening tools, such as asking a parent, "Since the last time I saw your child, has anything really scary or upsetting happened to your child or anyone in your family?" [24]. The FNP's response to a positive screen may range from reassurance, to referral to a mental health provider, to connecting to resilience-building parenting programs.

The 2016 AAP policy statement on poverty and child health recommends pediatricians screen families for basic needs such as food, housing, and heat and connect them with community-based resources and programs (such as WIC, SNAP, and others that were previously mentioned) that address those needs. As with ACEs screening, there are several available tools to screen for the effects of poverty [17,25,26]. The AAP recommends screening for

food insecurity using a validated "Hunger Vital Sign" 2-question screener (Table 1) [27,28]. The question, "Do you have difficulty making ends meet at the end of the month?" has 98% specificity for identifying families who may need to be connected to resources [25]. The decision to screen for ACEs and poverty, including which questions or tools to use, depends on a practice's workflows and staffing, availability of resources within the practice and in the community, and incentives such as insurance reimbursement.

Animal and human studies show that positive care giving and nurturing in the early years can help buffer responses to stress, boost immunity, and reduce the risk of adverse adult behaviors and illness [29–31]. The role of the FNP is to take a family-centered approach that can build resilience in the child, family, and community [22,32]. This can include providing routine anticipatory guidance to build parents' understanding of normal child development and to identify support systems for the family; incorporating evidence-based programs such as Reach Out and Read that promote child development and child-parent bonding [33,34]; and connecting families to community resources that build stress-buffering capacity, such as nurse home visiting programs, and positive parenting programs such as Triple P [22,35].

EARLY CHILDHOOD EDUCATION: A CRITICAL INGREDIENT FOR DEVELOPMENT

Brain development can be influenced by positive factors, such as high-quality early childhood educational experiences [36]. Early Childhood Education (ECE) improves academic outcomes; children who attend ECE have lower rates of grade retention and placement in special education, as well as improved math and reading scores and school readiness [37,38]. Enrollment in ECE improves economic outcomes for children.

Families choose a child care option based on multiple factors, including schedule, convenience, curriculum, and affordability, so the decision needs to be tailored to the needs of each individual family. This section focuses on the benefits of early childhood education, the impact of ECE on life course outcomes, and the health issues commonly encountered in ECE settings. Young children are cared for in a variety of settings as they grow, and parents

Table 1
US department of agriculture screening tool for risk of food insecurity

	Often true	Sometimes true	Never true
1. "Within the past 12 mo we worried whether our food would run out before we got money to buy more."			
2. "Within the past 12 mo the food we bought just didn't last and we didn't have money to get more."			

Data from Hager ER, Quigg AM, Black MM, et al. Development and validity of a 2-item screen to identify families at risk for food insecurity. Pediatrics 2010;126(1):26.

often consult child health providers about the optimal setting for their child [39,40]. Many parents use informal "day-care" arrangements that are not subject to licensing and regulation, where child care is provided by a parent, relative, or nonrelative such as a nanny, neighbor, or friend, takes place in the child's home or the provider's home, and may not have an educational curriculum [41]. Early childhood education centers, which include Early Head Start programs, Head Start programs, community drop-in centers, and nursery and pre-kindergarten programs in school settings, are licensed and regulated, with requirements that depend on the state in which they are located. The AAP offers guidance on how child health providers can help families identify and select high-quality early child care options [42]. Quality ECE has a significant return on investment. Examples include the High/Scope Perry Preschool Program and Carolina Abecedarian Project, which have demonstrated higher earnings, lower rates of incarceration, improved adult health outcomes, and a reduction in academic achievement gaps among adults enrolled in ECE programs as young children [43–45].

FNPs should recognize the common health issues that arise in ECE settings, including ear infections, upper respiratory infections, gastrointestinal illnesses, and behavioral issues, as well as be familiar with policies that allow children to return to ECE after an illness [46]. Providers can communicate and coordinate with ECE personnel or school nurses, when available, to optimize the care of children across settings. In the transition to preschool years, providers can serve as an important link to behavioral health services for students and families and help mitigate the risk of suspension and expulsions in ECE settings. Preschool children are 3 times more likely to be expelled than children in grades K–12 [47].

Further, it is important for FNPs to know that there are racial disparities in the application of school discipline, linked to implicit bias on the part of ECE staff, with black children representing a disproportionate number of children who are suspended in preschool [48,49]. Given the strong correlation between health and educational attainment [43–45], health care providers play a key role in addressing these racial disparities, which includes taking evidence-based assessments to evaluate one's own implicit biases such as the online Race Implicit Association Test [50] and contacting a child's teacher or school administrators to discuss health and educational support needed to ensure the child's academic success.

HIGH-QUALITY LANGUAGE INTERACTIONS AND HEALTH

Within the medical home that the FNP is providing, the foundational element surrounding anticipatory guidance for parent–/caregiver–child interaction often begins with language. Language is an incredibly powerful precursor to literacy and anticipatory guidance, discussion, and emphasis should be woven into well-child visits with families to optimize early learning and literacy. Rich early language exposure delivered by caregivers in the context of engaged adult–infant interaction provides the foundation for children's future educational

achievement and health. Thus, talking to children in both their native and secondary languages in higher volumes must start early with their first and best teachers, their parents and caregivers. Language and cognitive development depends on early language exposure provided by parents or caregivers. Evidence suggests that the number of words spoken to a child in the first 3 years of life strongly predicts both concurrent and future language skills and cognitive functioning [51–58]. In addition to the quantity of words, research suggests that the quality of language input is essential for advancing language learning. The rich, back-and-forth interaction between parent and child that supports the child's brain and language development has been termed "language nutrition" [59].

The trajectory of a child's life can be dramatically changed if parents are educated to understand the importance of language, are coached to provide language nutrition to their baby, and build the habit of talking to their infant. This is key anticipatory guidance for FNPs to provide to families of young children. Research has identified the early language and preliteracy skills are necessary to support infants, toddlers, and young children in learning to read. FNPs can help guide families to translate this knowledge into improved education and health outcomes (Fig. 1). There are a host of programs, not limited to: Reach Out and Read, Talking is Teaching, Vroom, Thirty Million Words, Hablame Bebe (Fig. 2), and others (Table 2). According to the 2017 Nation's Report Card by the National Assessment of Educational Progress, just 37% of the nation's fourth graders scored at the proficient level or above in reading [60]. Data from the landmark Hart and Risley "word-gap" study affirm that building strong language is foundational for learning in every

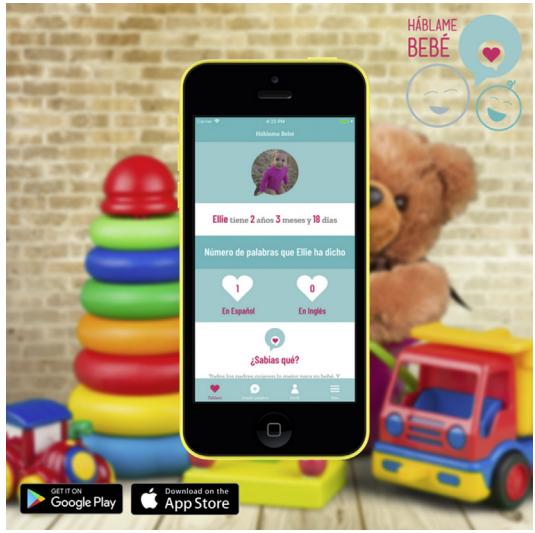

Fig. 1. "Háblame Bebé" is an app to help Hispanic families reduce the Word Gap and promote bilingualism. (*Courtesy of* Melissa Baralt, PhD, Miami, Florida.)

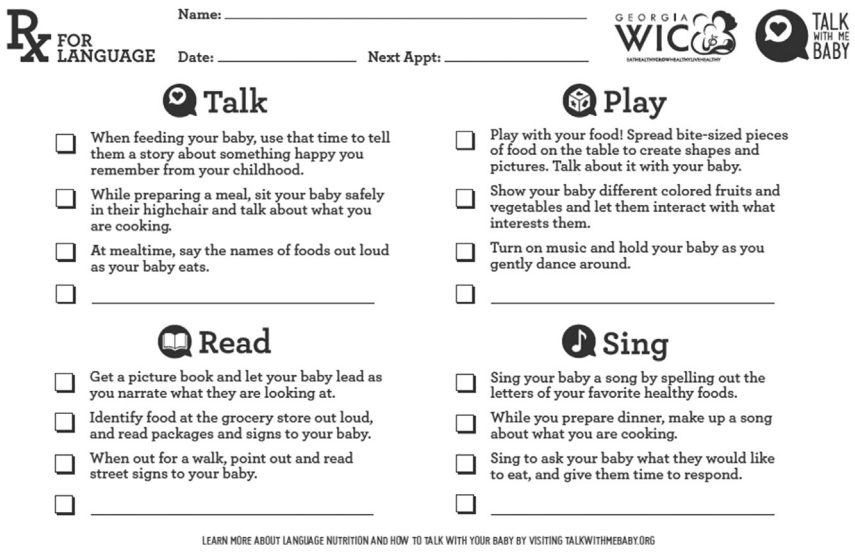

Fig. 2. Talk with Me Baby prescription pads offered by Georgia WIC. (*From* Technological Solutions for Provider and Caregiver Language Nutrition Training, Talk with Me Baby. Available at: http://www.talkwithmebaby.org/training_resources.)

home. Counting the number of words per hour addressed to children in the homes of professional families, working-class families, and families on public assistance, they extrapolated that by the time children were 4 years old, advantaged children had roughly 30 million more words addressed to them than the least advantaged–a finding replicated and often referred to as the "30 million word gap" [59,61,62]. A recent study by Amy Pace and her colleagues found that a child's language competency in kindergarten predicts later language, math, reading, and social abilities up to fifth grade and is the best early indicator of success [63]. Because language is so important as a foundation for learning, teaching families how to talk early and often to their children is the type of guidance that FNPs and all child health providers need to be offering to parents at their well-child visits.

Home language

Culture shapes all our experiences, and there can be profound differences across cultures in the way parents raise their children. The cultural lens influences how people think, interact, and view others. One of the areas in which cultural variation is most evident is the way in which parents talk with their children. As child health providers, it is important to acknowledge those differences and encourage families to adopt a more "conversational" style with their babies, to foster reciprocity in the communication. More and more children in the US come from homes where a language other than English is spoken [64]. The term "dual language learner" is used to refer to children who are

Table 2
Online resources for providers

Organization	Website
CDC: Learn the Signs. Act Early Free research-based, parent-friendly resources to assist health care providers with developmental surveillance from age 2 mo to 5 y.	https://www.cdc.gov/ncbddd/actearly/milestones/index.html
Parents as Teachers Parents are children's first teachers, and this site offers parenting tips and information.	https://parentsasteachers.org/
Zero to Three Parent and professional resource for child development from birth to 3 y.	http://www.zerotothree.org
Bright Futures Guidelines for Health Supervision of Infants, Children, and Adolescents Detailed information on well-child care for health care practitioners. This includes recommendations on providing anticipatory guidance and screening for delays in social-emotional development.	https://brightfutures.aap.org/materials-and-tools/guidelines-and-pocket-guide/Pages/default.aspx
The Resilience Project This project is designed to provide resources for pediatricians and medical home teams to more effectively identify and care for children and adolescents who have been exposed to violence.	https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/resilience/Pages/Resilience-Project.aspx
Reach out and Read The AAP officially endorsed the Reach Out and Read model of early literacy promotion.	http://www.reachoutandread.org/
Read Conmigo (''Read With Me'') Bilingual literacy program that provides free children's books in English and Spanish	http://www.readconmigo.org/
Too Small to Fail & Talking is Teaching Public awareness and action campaign to promote the importance of early brain and language development and boost children's early brain and vocabulary development through simple, everyday actions	http://toosmall.org/ http://talkingisteaching.org

developing in their home language and in English and highlights their linguistic capacity in more than one language. Dual language learning is an opportunity for even greater language enrichment in children; therefore, the home language should be encouraged because it can foster greater acquisition in both languages as the child gets older [65]. Many families receive misinformed advice to switch to nonnative English with their children [66]. Contrary to the advice

many immigrant families receive from trusted sources (including nurses, doctors, and teachers), linguistic research shows that nonnative language input is less useful for babies' language acquisition than high-quality native input. Scientific evidence consistently shows that teaching and encouraging bilingualism have positive outcomes for young children [67–72]. Of note, infants have the innate capacity to acquire 2 languages and can easily separate the sounds of each language [67]. There is no scientific evidence indicating that learning 2 languages during the early childhood years overwhelms, confuses, or significantly delays a child's acquisition of English [68]. Young bilingual children achieve critical milestones, such as babbling and onset of first words, within the same timeframe as typically developing monolingual children [69]. The reason for this is that home language provides a foundation for learning English—many skills developed in the first language transfer to the second. An extensive body of research highlights the many benefits that speaking more than one language has in many areas of development, including cognitive function [70–72]. It is imperative that FNPs understand how the science of home language can and should be applied to early childhood experiences to provide guidance and answer many of the questions that families will present with during their well-child visits.

Implications for practice

FNPs function in a broad variety of roles in the health care system: as clinicians, teachers, researchers, and advocates for patients across the lifespan. FNPs may see children during early childhood for routine well-child visits, during periods of acute illness or injury, or for chronic disease management. In any of these roles and settings where FNPs care for patients during early childhood, FNPs are ideally suited to provide a family-oriented approach and partner with parents and other important caregivers to design interventions and treatment plans to mitigate ACEs and to promote health, education, and literacy.

Caring for children during early childhood is a rewarding part of an FNP's scope of practice. FNPs who care for children during early childhood play a critical role in identifying that the child's health and development are a part of the family's development and functioning. In the face of many competing priorities during any outpatient visit, FNPs should remain grounded in a family-centered approach in order to develop interventions that are strengths-based and culturally sensitive, knowing that strong family support can help buffer the impact of psychosocial stressors.

This paper establishes the rationale for delivering health care to children and their families that transcends the conventional biomedical, anticipatory guidance model and embraces the assessment of the child in his or her community. Although there is good evidence from the AAP Bright Futures on using development screening tools such as the Modified Checklist for Autism in Toddlers and Ages and Stages Questionnaire, it is important to consider routinely posing questions about food insecurity, ACEs, stress, and trauma to inform the larger context of the child's growth and development (Table 3).

Table 3
Early childhood developmental/behavioral/social screening tools

	Sample available screening tools	AAP-recommended age
General Developmental Screening	• Ages and Stages Questionnaire (ASQ) • Parents' Evaluation of Developmental Status (PEDS) • Survey of Wellbeing of Young Children	9, 18, and 30 mo
Autism Spectrum Disorder Screening	• Modified Checklist for Autism in Toddlers • Survey of Wellbeing of Young Children (at specific ages)	18 and 24 mo
Social-Emotional Development	• Ages and Stages Questionnaire: Social-Emotional (ASQ-SE) • Pediatric Symptom Checklist (PSC) • Survey of Wellbeing of Young Children	"Regular intervals" depending on screening tool
Maternal Postpartum Depression	Edinburgh Postpartum Depression Scale (EPDS)	By 1 mo; then 2, 4, and 6 mo
Food Insecurity [27]	Hunger Vital Sign	At well-child visits
Social Determinants of Health	• A Safe Environment for Every Kid (SEEK) Questionnaire • Income, Transportation, Housing, Education, Legal Status, Literacy, and Personal Safety (IHELLP) • Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences (PRAPARE) • Well-Child Care, Evaluation, Community Resources, Advocacy, Referral, Education Survey Instrument (WE CARE) • Survey of Wellbeing of Young Children	Increasing focus in Bright Futures, but broad screening not yet specifically recommended
Adverse Childhood Experiences (ACEs)	• Center for Youth Wellness ACE Questionnaire (CYW ACE-Q) • Survey of Wellbeing of Young Children	Not yet specifically recommended

Data from Refs. [73–75]

Furthermore, by recognizing the synergistic relationship between health and education outcomes, FNPs can promote cognitive development and educational achievement by guiding families toward high-quality childcare options and encouraging language development and early literacy in the home. Given the documented benefits of ECE, FNPs can advocate for ECE environments that match the demand in the jurisdictions where they work. If developmental or behavioral concerns are identified by childcare providers, FNPs may contribute to the development of care plans for children in the childcare setting through consultation about treatment plans within the childcare setting and through initiating and maintaining contact with schools as appropriate. FNPs should encourage families to expose children to rich vocabulary in the home, even when the family's first language is not English.

FNPs who see patients during early childhood should cultivate child-friendly clinical environments where children and family members feel welcomed, respected, and valued. Siblings and important caregivers (eg, grandparents) may be invited to participate in visits as a way to recognize their role and contribution in the child's growth and development. Lastly, an important function of FNPs is to recognize when concerns that are identified warrant a referral to an appropriate specialist or community resource, including social services. FNPs should familiarize themselves with the network of resources in the areas where they practice and be prepared to collaborate with other professionals to support and empower families.

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