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Screening Children for Social Determinants of Health: A Systematic Review

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Abstract

CONTEXT: Screening children for social determinants of health (SDOHs) has gained attention in recent years, but there is a deficit in understanding the present state of the science.

OBJECTIVE: To systematically review SDOH screening tools used with children, examine their psychometric properties, and evaluate how they detect early indicators of risk and inform care.

DATA SOURCES: Comprehensive electronic search of PubMed, Cumulative Index to Nursing and Allied Health Literature, Embase, Cochrane Central Register of Controlled Trials, and Web of Science Core Collection.

STUDY SELECTION: Studies in which a tool that screened children for multiple SDOHs (defined according to Healthy People 2020) was developed, tested, and/or employed.

DATA EXTRACTION: Extraction domains included study characteristics, screening tool characteristics, SDOHs screened, and follow-up procedures.

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Dr Sokol defined the review scope; participated in the title and abstract review, full-text screen, and data abstraction; drafted sections of the initial manuscript; and managed the review team; Dr Austin defined the review scope; participated in the title and abstract review, full-text screen, and data abstraction; and drafted sections of the initial manuscript; Ms Chandler, Ms Bousquette, Ms Lancaster, Ms Doss, and Ms Byrum participated in the title and abstract review, full-text screen, and data abstraction; Dr Dotson and Ms Urbaeva participated in full-text screen and data abstraction; Ms Singichetti and Dr Brevard participated in the title and abstract review and full-text screen; Ms Wright conducted the initial literature search and drafted sections of the initial manuscript; Drs Shanahan and Lanier supervised this work and participated in the title and abstract review; and all authors reviewed and revised the manuscript and approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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RESULTS: The search returned 6274 studies. We retained 17 studies encompassing 11 screeners. Study samples were diverse with respect to biological sex and race and/or ethnicity. Screening was primarily conducted in clinical settings with a parent or caregiver being the primary informant for all screeners. Psychometric properties were assessed for only 3 screeners. The most common SDOH domains screened included the family context and economic stability. Authors of the majority of studies described referrals and/or interventions that followed screening to address identified SDOHs.

LIMITATIONS: Following the Healthy People 2020 SDOH definition may have excluded articles that other definitions would have captured.

CONCLUSIONS: The extent to which SDOH screening accurately assessed a child's SDOHs was largely unevaluated. Authors of future research should also evaluate if referrals and interventions after the screening effectively address SDOHs and improve child well-being.

Social determinants of health (SDOHs), according to the World Health Organization, are “the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life.”¹ Healthy People 2020 organizes SDOH into 5 key domains: economic stability (eg, poverty and food insufficiency), education (eg, high school graduate and early childhood education), social and community context (eg, concerns about immigration status and social support), health and health care (eg, health insurance status and access to a health care provider), and neighborhood and built environment (eg, neighborhood crime and quality of housing).² Although SDOHs influence health and well-being among individuals of all ages, it is particularly important to consider SDOHs among children and youth given that the physical, social, and emotional capabilities that develop early in life provide the foundation for life course health and well-being.³ Thus, identifying and intervening on the basis of these factors early could serve as a primary prevention against future health conditions.

Much controversy surrounds screening children and youth for SDOHs, however. Some experts claim screening is unethical if done without ensuring that identified social needs are met, likewise generating unfulfilled expectations.^{4,5} Others argue that even in the absence of referrals, screening has benefits such as improving diagnostic algorithms, identifying children and youth who need more support, improving patient-provider relationships, and collecting data for an epidemiological purpose.⁶⁻⁸ Although many child service professionals feel ill-equipped to address patients' social needs within the current systems,^{9,10} several care teams cite that they identify unmet social needs and offer linkages to social services.^{11,12} This screening debate is largely centered on a deficit in understanding the present state of the science: what screening tools exist? How accurate are they? How do screening results inform care? In the present systematic review, we aim to answer these questions. Although authors of previous reports have outlined different SDOH screening tools used among children in clinical settings,^{13,14} there has been no systematic review of SDOH screeners used among children in various settings. In this review, we aim to systematically catalog the different SDOH screening tools used to assess social conditions among children and youth, examine their psychometric properties, and evaluate how they are used to detect early indicators of risk and inform care.

METHODS

Search Strategy

Authors of studies in this review developed and/or used a tool to screen children and youth for SDOHs. We systematically reviewed the literature using a protocol informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines to search research databases, screen published studies, apply inclusion and exclusion criteria, and select relevant literature for review.¹⁵ A trained clinical health sciences librarian (S.T.W.) performed our comprehensive electronic search of publications using the following databases: PubMed, Cumulative Index to Nursing and Allied Health Literature via EBSCO, Embase via Elsevier, Cochrane Central Register of Controlled Trials, and Web of Science Core Collection. Our search was restricted to English-only articles. All database results were collected from the inception of the database through November 2018. Search terms were used to retrieve articles addressing the 3 main concepts of the search strategy: (1) SDOHs, (2) pediatric population, and (3) screening administered by a child service provider (eg, a clinician, social worker, or teacher) or in a service provider setting (eg, self-administered at a pediatrician's office). The exact search strategy used in each of the electronic databases is reported in the Supplemental Information. Results were downloaded to EndNote, and duplicates were removed. All references were uploaded to Covidence systematic review software (<https://www.covidence.org>), a web-based tool designed to facilitate and track each step of the abstraction and review process.

Inclusion Criteria

We included studies in which a tool that screened children (or caregivers and/or informants on behalf of children) for multiple SDOHs was developed, described, tested, and/or employed, where SDOHs are defined according to Healthy People 2020.² Given Healthy People 2020 guided our understanding of SDOHs (an American framework), to be included in this review, studies had to be conducted within the United States, be peer-reviewed, and be published in English. Following these inclusion criteria, we excluded studies of screeners that only screened for 1 SDOH; did not conduct screening among children (age 0–25 years) or their caregivers and/or informants; were not published in English; were conducted outside of the United States; or were book chapters, reviews, letters, abstracts, or dissertations.

Study Selection and Data Extraction

We used Covidence, an online platform, to manage screening and selection of studies. For the title and abstract screening, each title was independently and blindly screened by 2 authors, and a third author resolved discrepancies. The authorship team followed this same independent, blind review for the full-text review. At the end of the title and abstract screen and full-text review phase, the lead investigators reviewed the included studies to confirm that all studies met the inclusion criteria. For any articles in question, the lead investigators convened to determine the articles' inclusion statuses. At the conclusion of the full-text review, study authors reviewed the reference lists of included studies to identify any additional studies for inclusion.

After reviewing the full texts of studies, the research team developed a data extraction tool in REDCap (a secure web platform for building and managing online databases and surveys) to extract the following information: study characteristics (ie, author and publication year, study type, study setting, age range of screened children, sample size of screened children, percent female sex of screened children, race and/or ethnicity of screened children, and study aims); screening tool characteristics (ie, average time to complete screener, screening setting, screening method, informant, training required for screening professionals, languages available, appropriate for low-literacy populations [ie, sixth grade reading level or lower], and validation); what SDOH domains the screener measured (per Healthy People 2020 guidelines; ie, economic stability, education, health and health care, neighborhood and build environment, and social and community context²); and screening follow-up procedures (ie, results were discussed with respondents, referrals were offered and/or scheduled, and/or intervention was delivered). Each primary reviewer extracted data from a set of studies that passed the research team's full-text review, and secondary reviewers confirmed the primary reviewers' extraction to ensure that the primary reviewer recorded accurate information. The team resolved any discrepancies through discussion and consensus.

RESULTS

Study Selection

The electronic search of databases returned 6274 references (of which 1223 were duplicates), resulting in 5051 studies. In the initial title and abstract screen, the research team deemed 4977 studies irrelevant, leaving 74 full texts to review. A total of 15 studies passed the full screen review, and we identified 2 additional studies from the reference lists of included studies. We retained and abstracted 17 studies. Figure 1 reveals the PRISMA flow diagram.

Study Characteristics

Table 1 reveals various study characteristics from the 17 studies that span 11 unique screeners. With the exception of 1 study,¹⁶ all studies took place in a medical setting. Among the 14 studies in which the ages of screened individuals were reported, the majority (ie, 8 studies) included screening for SDOHs exclusively in young childhood (ages 0 to 5 years).^{11,16–22} Study samples were primarily evenly divided with respect to biological sex. Among the 13 studies in which the races and/or ethnicities of screened individuals were reported, 10 study samples contained a majority nonwhite sample.^{11,12,17,18,20–25}

Screener Characteristics

Table 2 depicts SDOH screener characteristics from the 11 unique screeners included in this review. Screening was conducted in a doctor's or pediatrician's office for the majority of screeners (ie, 8 screeners), with a parent or caregiver being the primary informant for all screeners. Two screeners included additional information reported by a social worker¹⁶ or physician.²⁰ Screeners were completed via a variety of methods, including paper and pencil,^{11,17–20,23–26,30} computer or tablet,^{17–19,22,26,27} face-to-face interview,^{12,16,21,27–29} and phone interview.^{12,27} All screeners were available in English, with 7 screeners also available

in Spanish.^{11,12,17–20,22–27,30} Three screeners had validity and/or reliability assessed in 1 study.^{18,24,29}

With respect to the time frame that respondents were asked to reflect on when answering questions about SDOHs, the majority of screeners (ie, 6 screeners) did not have a clearly defined referent period (eg, past 30 days, past year, or lifetime); the referent periods for other screeners varied by question,^{18,22,28} and only 2 screeners had a single, clearly defined referent period for all included questions.^{16,24} Regarding how the SDOH screeners were developed, only 4 screeners reported being informed by practice^{18,21,24} and/or expert opinion.^{18,21,23,24} Remaining screeners were solely adaptations of previous tools or did not report how they were developed.

Table 3 reveals the specific SDOH domains assessed in each screener. Because many screeners were used to assess adverse childhood experiences (ACEs) (events that typically occur within the family context), for the purposes of this review, we added an additional domain labeled family context to the Healthy People 2020 domains included in Table 3. The family context domain was assessed in all screeners, and the economic stability domain was assessed in all but 1 screener.²⁰ Common areas examined under the family context domain included violence in the household,^{11,12,16–20,22,24–30} child abuse and neglect,^{16,20,23} and mental illness or substance abuse among parents or other household members.^{11,12,16–21,23–27,30} Although Healthy People 2020 identifies interpersonal violence as an SDOH within the neighborhood and built environment domain, we elected to include interpersonal violence in our newly created family context domain because this SDOH occurs within the family unit. Common areas examined under the economic stability domain included food insufficiency,^{11,12,16–19,21–30} housing instability^{11,12,16,22–25,27–30} and difficulty paying bills, making ends meet, or meeting basic needs.^{11,12,21–25,27,28,30} Seven screeners assessed the education domain, which included questions assessing parental education^{11,20,23–25,28,30} and access to child care.^{11,12,23–25,27,30} Six screeners assessed the health and health care domain, with parent and child health insurance status^{12,22,25,27,29} being the most common area examined. Seven screeners assessed the neighborhood and built environment,^{12,21–23,25,27–29} with concerns about the physical conditions of housing being the most common inquiry^{12,21,22,25,27–29} followed by violence and safety.^{12,21,23,27,28} Three screeners assessed social and community context,^{12,25,27,28} which included questions assessing concerns about immigration status,^{12,27,28} discrimination,²⁵ religious or organizational affiliation,²⁸ and social support.^{25,28} Of note, 4 screeners assessed protective factors under the social and community context and family context domains, including whether family members feel close,¹⁶ if the child has a relationship with a caring adult,²³ religious or organizational affiliation,²⁸ and if parents have social support.^{25,28}

Follow-up Procedures

Table 4 depicts various follow-up procedures from the 17 studies in this review. Authors of only 4 studies reported no follow-up procedures after SDOH screening.^{18,20,21,27} Authors of 6 studies reported that screening results were discussed with caregivers, and referrals to community resources and outside agencies (eg, referrals to legal or transportation services) were offered and/or scheduled for caregivers but no intervention was delivered.

11,17,19,23,24,28 Authors of 3 studies reported that referrals were offered and/or scheduled for caregivers without reporting that screening results were discussed with caregivers and without reporting that an intervention was delivered.^{22,29,30} Authors of only 3 studies reported that screening results were discussed with caregivers, referrals were offered and/or scheduled, and an intervention was delivered.^{12,25,26} Interventions came in the form of providers using motivational interviewing to engage caregivers²⁶ and navigators being assigned to caregivers to help caregivers access and understand resources.^{12,25}

DISCUSSION

In the present review, we identified 11 unique SDOH screeners. Although we systematically searched databases from their inception dates, all articles that detailed screeners were published in the last 12 years. This growth of SDOH screening within the research literature in the last several years is paralleled by increasing attention to SDOHs within the medical community. Since the early 2000s, the American Academy of Pediatrics and other organizations have encouraged pediatric providers to develop standardized screening tools to assess social and behavioral risk factors that are relevant to their patient populations in an effort to identify and address risks.^{31–33} More recently, in 2018, North Carolina announced it will soon require Medicaid beneficiaries to undergo SDOH screening as part of overall care management, and more states may soon follow.³⁴ Therefore, it is important to inventory the screening tools currently in use as well as assess their accuracy and impact on patient care. The majority of screeners identified in the present review were either validated, relevant to the priority population, or were accompanied by appropriate follow-up referrals or interventions, but a minority of screeners included all 3 qualities.

A central theme among screeners included in this review is the extent to which screening professionals (eg, primary care providers and social workers) can trust screening results. Only 3 out of the 11 screeners had been tested for reliability and/or validity; thus, we do not know the extent to which most tools accurately measured SDOHs.³⁵ Several screening tool features may impact an informant's ability to understand screening questions, thereby influencing the tools' ability to correctly evaluate a child's SDOHs. These features include the following questions: (1) Is the tool available in an informant's language of fluency? (2) Is the tool at or below an informant's reading level? and (3) Is the tool worded in such a way that the reference period for SDOHs is clear? The majority of reviewed screening tools were available in >1 language, and 3 of 7 tools that required informants to read were appropriate for low-literacy populations. However, a minority of screeners included a clear and single reference period for reporting SDOHs (ie, the reference period was not consistent across SDOHs assessed), and even fewer assessed SDOH chronicity or duration. Not only does information on the timing and duration of SDOH experiences guide interventions and referrals, but the reference period can influence the accuracy of informants' reports; authors of previous research have found that reporting accuracy diminishes as the time between the experience of interest and the report increases.^{36–38} Additional research is required to identify which SDOH referent periods are the most appropriate for informing interventions and referrals while also simultaneously producing valid responses.

Informants' ability to understand screening questions is necessary (but not sufficient) to obtain accurate screening results; informants must also answer truthfully. Parents and/or caregivers were the primary informants for all assessed tools; only 2 screeners triangulated information with a physician or social worker report. None included child self-report. Parents and caregivers often hold the most knowledge about their children's experiences and social context; however, these informants may also be influenced by social desirability bias and fear of intervention with child protective services when answering questions about their children's SDOHs.^{39,40} Furthermore, caregivers and children may simply disagree regarding the subjective assessment of the child's health.⁴¹ Triangulating parent and/or caregiver reports with external data sources, however, requires additional resources that may be beyond the scope of many screening settings.

To overcome the barrier of caregiver and/or parent fear or social desirability, many screeners included in this review were developed in conjunction with information provided by community members, experts, and/or practice experience. For example, creators of the Safe Environment for Every Kid (SEEK) Parent Screening Questionnaire (PSQ) not only reviewed the research literature to prioritize amenable risk factors, but they also involved community pediatricians and parents in the development of the SEEK PSQ. On the basis of this method of development, the PSQ began with a statement that conveyed an empathetic tone toward caregivers, highlighted the practice's concern about all children's safety, and stated the practice's willingness to help with any identified issues.¹⁸ Future research should conduct SDOH screening in tandem with a social desirability scale to empirically investigate if including empathetic language at the beginning of an SDOH screening tool allays concerns about social desirability bias.⁴²

Because evidence is currently lacking on which specific SDOH factors have the largest impact on child health, the American Professional Society on the Abuse of Children encourages pediatricians to tailor SDOH screening to their patients' needs and available community resources.⁴³ The majority of screeners included in this review followed this recommendation. For example, the Well Child Care, Evaluation, Community Resources, Advocacy, Referral, Education (WE CARE) screener only screened for SDOHs for which community resources were available.²⁴ A criticism of screening children for ACEs is a lack of appropriate follow-up interventions when screening tools identify ACEs.⁵ We did not find evidence supporting this critique within studies in which SDOH screening was reported; the vast majority of studies followed screening with immediate referrals and/or interventions to address the identified SDOHs. What typically happens after ACE screening in practice is unknown. However, future research is needed to evaluate the effectiveness of these referrals and interventions in meeting family needs and improving child health and well-being. Moreover, few screeners assessed protective factors; thus, most follow-up interventions were deficit-based rather than strength-based. Given the evidence in support of strength-based interventions,⁴⁴ future screening tools should incorporate the assessment of more protective factors.

Although we did not restrict our systematic search to clinical settings, all except 1 identified screener took place in either a pediatric clinic or hospital. Alternative settings, specifically educational settings, may be well-equipped to conduct universal SDOH screening. Trauma

screening tools for use in educational settings exist and may be applied to select portions of student bodies.⁴⁵ Universal SDOH screening, however, has not gained the same traction in educational settings that it has in medical settings, despite evidence that SDOHs can hinder optimal educational development and well-being.^{46,47}

The present review contains limitations. First, SDOH definitions vary. We elected to follow the Healthy People 2020 definition, and doing so may have resulted in excluding articles that other SDOH definitions would have encompassed. Second, because we focused the review on SDOH measures, we did not collect information on outcomes; it is still unknown which SDOH domains impact child health and well-being the most. We believe these limitations, however, are offset by numerous strengths. First, our comprehensive search strategy allowed us to identify the SDOH screening tools that have been the subject of both research and practice. To our knowledge, we are also the first review of tools to assess both the psychometric properties of SDOH screening tools and the follow-up procedures that accompany the tools.

Many of the SDOH screening tools identified in this review included questions about SDOHs that were important to the given population and subsequently addressed identified SDOHs in an informed and appropriate manner. We did find, however, that the extent to which SDOH screening results accurately assess a child's SDOHs as well as the extent to which the referrals and interventions offered after SDOH screening are effective are points for additional research. Although SDOH screening is increasing in popularity within medical settings, SDOH screening tool developers should consider creating tools for use in other childhood settings.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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ABBREVIATIONS

ACE	adverse childhood experience
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
PSQ	Parent Screening Questionnaire
SDOH	social determinant of health
SEEK	Safe Environment for Every Kid

WE CARE Well Child Care Evaluation Community Resources Advocacy
Referral Education

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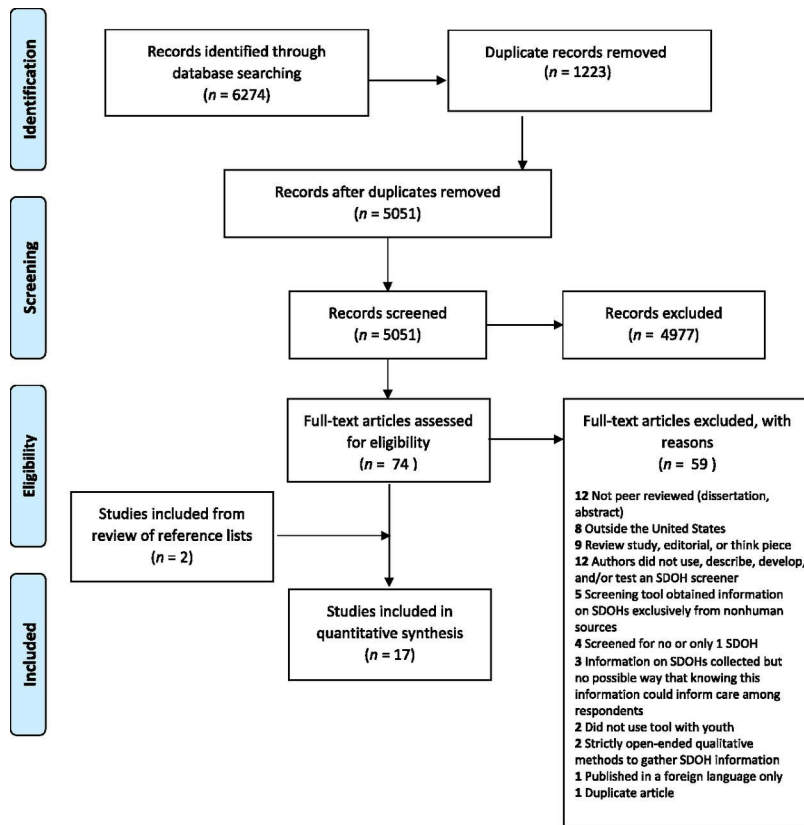


FIGURE 1.
PRISMA flow diagram.

TABLE 1

Study Characteristics

Screening Tool	Author and Year	Study Type	Setting	Age Range, y	Sample Size	Female Sex, %	Race and Ethnicity (%)	Study Aim
SEEK PSQ	Dubowitz et al ¹⁸ 2007	OC	Pediatric clinic serving an urban, low-income population	0–5	216	44	African American (92); white (3); multiracial (5)	Estimate the prevalence of parental depressive symptoms among parents at a pediatric primary care clinic and evaluate a parental depression screen
	Dubowitz et al ¹⁷ 2009	RCT	Pediatric clinic serving an urban, low-income population in Baltimore, Maryland	0–5	308	46	African American (93)	Evaluate the efficacy of the SEEK model of pediatric primary care in reducing the occurrence of child maltreatment
	Dubowitz et al ¹⁹ 2012	RCT	Pediatric practices serving suburban, middle-income populations	0–5	595	50	African American (4); white (86); Asian American (2); Hispanic (1); other (8)	Examine if the SEEK model is more effective in reducing maltreatment than standard pediatric practice when implemented in a middle-income suburban population
	Eismann et al ²⁶ 2018	Observational only	Pediatric practice, family medicine practice, and FQHC serving various populations	0–18	1057	NR	NR	Assess the generalizability of the SEEK model and identify barriers and facilitators to integrating the SEEK model into standard clinical practice
iScreen	Gottlieb et al ²⁷ 2014	RCT	Pediatric emergency department serving a low-income urban population in California	0–18	538	NR	NR	Compare psychosocial and socioeconomic adversity disclosure rates by caregivers of children in face-to-face interviews versus electronic formats
	Gottlieb et al ¹² 2016	RCT	Primary care or urgent care departments in safety-net hospitals serving low-income populations in California	0–18	1809	51	African American (26); white (4); Asian American (5); Hispanic (57)	Evaluate if addressing social issues during pediatric primary and urgent health care visits decreases families' social needs and improves children's health
HealthBegins Upstream Risks Screening Tool	Hensley et al ²⁸ 2017	Observational only	FQHC serving Southwestern Ohio and Northern Kentucky	NR	114	NR	NR	Explore the process of systematically screening pediatric patients and their families for SDOH risks
FMI	McKelvey et al ¹⁶ 2016	Observational only	Home visiting programs serving at-risk families in the Southern United States	0–5	1282	51	African American (22); white (60); Hispanic (16); other (2)	Develop an assessment of children's exposure to ACEs
ASK Tool	Selvaraj et al ²³ 2018	Observational only	Pediatric primary care clinic serving an urban, low-income population in Chicago, Illinois	0–18	2569	48	African American (55); white (7); Asian American (5); Hispanic (21); other (12)	Determine the prevalence of and demographic characteristics associated with toxic stress risk factors, the impact of screening on referral rates to community resources, and feasibility and acceptability in a medical home
IHELP	Colvin et al ²⁹ 2016	Observational only	Pediatric hospital in Kansas City, Missouri	NR	347	46	African American (22); white (55);	Determine if a brief intervention using multiple behavioral strategies to increase intervention intensity could improve

Screening Tool	Author and Year	Study Type	Setting	Age Range, y	Sample Size	Female Sex, %	Race and Ethnicity (%)	Study Aim
WE CARE survey instrument	Garg et al ^{2,4} 2007 Garg et al ¹¹ 2015	RCT RCT	Hospital-based pediatric clinic serving a low-income, urban population Community health centers serving an urban population in Boston, Massachusetts	0–10 0–5	100 168	NR NR	Asian American (1); other (22) African American (96); white (1); Hispanic (3) African American (44); white (24); Asian American (2); Hispanic (23); Pacific Islander and/or Native Hawaiian (1); Multiracial (4)	screening for social needs by pediatric residents Evaluate the feasibility and impact of an intervention on the management of family psychosocial topics at well-child care visits Evaluate the effect of a clinic-based screening and referral system on families' receipt of community-based resources for unmet basic needs
FAMNEEDS	Zielinski et al ³⁰ 2017 Uwemedimo and May ²⁵ 2018	Observational only Observational only	Primary care pediatric practice serving a low-income population in Rochester New York Hospital-based pediatric ambulatory practice in New York City New York	NR 0–18	602 299	NR NR	NR African American (30); white (8); Hispanic (34); other (26)	Evaluate the feasibility and acceptability of integrating the WE CARE screen into all well-child visits to increase the detection of family psychosocial needs and resultant social work referrals Determine if the integration of FAMNEEDS into routine pediatric care services at a hospital-based practice increases the referral to and receipt of social service resources among children in immigrant families
Child ACE Tool	Marie-Mitchell and O'Connor ²⁰ 2013	Observational only	FQHC serving an urban population	0–5	102	0.51	African American (57); Hispanic (43)	Pilot test a tool to screen for ACEs and explore the ability of this tool to distinguish early child outcomes between lower- and higher-risk children
Social History Template of the Standard Well Child Care Form embedded in E-health Record	Beck et al ²¹ 2012	Observational only	Hospital-based pediatric clinic serving an urban population in Cincinnati, Ohio	0–5	639	48	African American (71); white (20); other (9)	Determine social risk documentation rates among newborns using a new electronic template
Health-Related Social Problems screener	Fleegler et al ²² 2007	Observational only	Outpatient pediatric clinics serving an urban population in Boston, Massachusetts and Maryland	0–6	205	52	African American (28); Hispanic (57); other (15)	Characterize families' cumulative burdens of health-related social problems regarding access to health care, housing, food security, income security, and intimate partner violence; assess families' experiences regarding screening and referral for social problems; and evaluate parental acceptability of screening and referral

Age range, sample size, percent female sex, and race and/or ethnicity information reflects that of screened individuals only. ASK, Addressing Social Key Questions for Health; FAMNEEDS, Family Needs Screening Program; FMI, Family Map Inventories; FQHC, federally qualified health center; NR, not reported; OC, observational with comparison group; RCT, randomized controlled trial.

TABLE 2

Screening Tool Characteristics

Screening Tool	Screening Setting	Screening Method	Informant	Training for Screening Professionals	Average Time to Complete Screener, min	Available Languages	Appropriate for Low-Literacy Populations	Validity and/or Reliability Assessed
SEEK PSQ ^{17-19,26}	Doctor's or pediatrician's office	Paper and pencil; computer or tablet	Parent or caregiver	Yes	3-4	English; Spanish	NR	Yes ¹⁸
iScreen ^{12,27}	Hospital	Computer or tablet; face-to-face interview; or phone interview	Parent or caregiver	Yes	10	English; Spanish	Yes	No
HealthBegins Upstream Risks Screening Tool ²⁸	Doctor's or pediatrician's office	Face-to-face interview	Parent or caregiver	Yes	6	English	NR	No
FMI ¹⁶	Home	Face-to-face interview	Parent or caregiver; social worker	Yes	NR	English	NR	No
ASK Tool ²³	Doctor's or pediatrician's office	Paper and pencil	Parent or caregiver	Yes	NR	English; Spanish	NR	No
IHELP ²⁹	Hospital	Face-to-face interview	Parent or caregiver	Yes	NR	English	NR	Yes (validity only) ²⁹
WE CARE survey instrument ^{11,24,30}	Doctor's or pediatrician's office	Paper and pencil	Parent or caregiver	NR	4-5	English; Spanish	Yes	Yes ²⁴
FAMNEEDS ²⁵	Doctor's or pediatrician's office	Paper and pencil	Parent or caregiver	Yes	NR	English; Spanish; Haitian Creole; Urdu; Punjabi; Hindi; Arabic	NR	No
Child ACE Tool ²⁰	Doctor's or pediatrician's office	Paper and pencil	Parent or caregiver; physician	NR	5	English; Spanish	NR	No
Social History Template of the Standard Well Child Care Form embedded in E-health Record ²¹	Doctor's or pediatrician's office	Face-to-face interview	Parent or caregiver	NR	NR	English	NR	No
Health-Related Social Problems screener ²²	Doctor's or pediatrician's office	Computer or tablet	Parent or caregiver	NR	20	English; Spanish	Yes	No

ASK, Addressing Social Key Questions for Health; FAMNEEDS, Family Needs Screening Program; FMI, Family Map Inventories; NR, not reported.

TABLE 3

SDOH Domains

Screening Tool	Economic Stability	Education	Health and Health Care	Neighborhood and Built Environment	Social and Community Context	Family Context
SEEK PSQ ^{17-19,26}	Food insufficiency	—	Smoke alarm needed Contact information for Poison Control needed	—	—	Parental intimate partner violence Parental depression
iScreen ^{1,2,27}	Food insufficiency Housing instability Difficulty paying bills Trouble finding a job or other job-related problems Disability interfering with the ability to work Difficulty getting assistance from income support programs Concerns about pregnancy-related work benefits	Concerns the child is not getting needed services Lack of child care	No or inadequate health insurance Difficulty getting health care for the child Concerns about the child's behavioral or mental health Concerns about their own mental health or mental health care No regular health care provider Concerns about child exposure to tobacco smoke Concerns about the child's physical activity	Concerns about physical conditions of housing Transportation difficulties Threats to the child's safety at school or in the neighborhood Difficulty getting benefits or services Concerns about finding activities for the child after school or in summer	Concerns about immigration status	Parental stress Parental drug or alcohol problems Tobacco use in the home Gun in the home Help with the child is needed Violence toward the child in the household Drug or alcohol problems in the household Incarceration of a household member Problems with child support or custody
HealthBegins Upstream Risks Screening Tool ²⁸	Food insufficiency Housing instability	Parental education Concerns about the child's learning or behavior in school	Parental physical activity Parental fruit and vegetable consumption	Concerns about physical conditions of housing Transportation difficulties	Concerns about immigration status Religious or organizational affiliation	Parental intimate partner violence victimization Parental stress

Screening Tool	Economic Stability	Education	Health and Health Care	Neighborhood and Built Environment	Social and Community Context	Family Context
	Difficulty making ends meet or meeting basic needs Parental employment Food insufficiency Housing instability	—	—	Concerns about neighborhood safety	Parental social support	Parental marital status Child physical abuse Child sexual abuse Child emotional abuse Maternal intimate partner violence victimization Mental illness in the household Substance abuse in the household Parental separation or divorce Family members feel close
FMI ¹⁶						
	Food insufficiency Housing instability or difficulty paying bills Parental employment Need for legal aid	Parental education Lack of child care	—	Child witnessed violence Child experienced bullying	—	Child physical abuse Child sexual abuse Parental mental illness or substance abuse Child separation from caregiver Adult in child's life who can comfort the child when sad Violence in household
ASK Tool ²³						
	Food insufficiency Housing instability Food insufficiency Housing instability Difficulty paying bills Parental employment Food insufficiency Housing instability	Concerns about the child's educational needs Parental education Lack of child care	Concerns about the child's health insurance	Concerns about physical conditions of housing	—	Intimate partner violence in the household Parental depressive symptoms Alcohol abuse in the household Drug use in the household Parental experience of violence Parental experience of discrimination Parental social support
IHELP ²⁹						
	Food insufficiency Housing instability Food insufficiency Housing instability Difficulty paying bills Parental employment Food insufficiency	Parental education	—	Concerns about physical conditions of housing	—	Intimate partner violence in the household Parental depressive symptoms Alcohol abuse in the household Drug use in the household Parental experience of violence Parental experience of discrimination Parental social support
WE CARE survey instrument ^{1,24,30}						
	Food insufficiency Housing instability	Parental education Help needed getting child care or care for elderly adult	Help needed in getting health insurance Transportation problems that prevent health care visits	Concerns about physical conditions of housing	Parental experience of discrimination Parental social support	Parental depressive symptoms
FAMNEEDS ²⁵						

Screening Tool	Economic Stability	Education	Health and Health Care	Neighborhood and Built Environment	Social and Community Context	Family Context
	Difficulty paying bills Difficulty meeting basic needs Help needed in getting public benefits Help needed in finding a job Unfairly fired from job Need for legal aid	Parental education	Health literacy			Parental tobacco use Parental alcohol use Parental drug use
Child ACE Tool ²⁰	—	—	—	—	—	Child maltreatment is suspected Intimate partner violence in the household Mental illness in the household Substance abuse in the household Household member is incarcerated Parental marital status
Social History Template of the Standard Well Child Care Form embedded in E-health Record ²¹	Food insufficiency	—	—	Concerns about physical conditions of housing	—	Parental depressive symptoms
Health-Related Social Problems screener ²²	Difficulty making ends meet Difficulty getting assistance from income support programs Food insufficiency Housing instability Difficulty paying bills Use of income support programs Parental employment Household income	—	Parent and child health insurance status No regular health care provider Problems receiving health care	Parent and child safety Concerns about physical conditions of housing	—	Parental intimate partner violence victimization

ASK, Addressing Social Key Questions for Health; FAMNEEDS, Family Needs Screening Program; FMI, Family Map Inventories; —, not assessed.

TABLE 4

Follow-up Procedures

Screening Tool	Author and Year	Results Discussed	Referral Offered and/or Scheduled	Intervention Delivered	Description
SEEK PSQ	Dubowitz et al ¹⁸ 2007	—	—	—	No follow-up reported.
	Dubowitz et al ¹⁷ 2009	X	X	—	Trained residents worked with parents to address identified problems, including providing parents with user-friendly handouts that detailed local resources, involving a SEEK social worker, and making referrals to community agencies.
	Dubowitz et al ¹⁹ 2012	X	X	—	Health practitioners provided parents with handouts for identified problems (eg, substance abuse) customized with local agency listings. A licensed clinical social worker was available at each SEEK practice (either in person or by phone), and health practitioners and parents together decided whether to enlist the social worker's help. The social worker provided support, crisis intervention, and facilitated referrals.
	Eismann et al ²⁶ 2018	X	X	X	Providers performed a brief intervention (~5–10 min) with caregivers who had a positive PSQ result using the reflect-empathize-assess-plan approach, which uses principles of motivational interviewing to help engage caregivers. Providers offered resources and referrals to caregivers on the basis of caregiver needs and desire for additional help. A social worker was available by phone to all practices for assistance with referrals.
iScreen	Gottlieb et al ²⁷ 2014	—	—	—	No follow-up reported.
	Gottlieb et al ¹² 2016	X	X	X	After standardized screening, caregivers either received written information on relevant community services (active control) or received in-person help to access services with follow-up telephone calls for additional assistance if needed (navigation intervention). Navigators used algorithms to provide targeted information related to community, hospital, or government resources addressing needs caregivers had prioritized. Resources ranged from providing information about child-care providers, transportation services, utility bill assistance, or legal services to making shelter arrangements or medical or tax preparation appointments to helping caregivers complete benefits forms or other program applications. Follow-up meetings were offered every 2 wk for up to 3 mo until identified needs were met or when caregivers declined additional assistance.
HealthBegins Upstream Risks Screening Tool	Hensley et al ²⁸ 2017	X	X	—	After screening, at-risk results were cross-walked to a community resources guide built to identify local agencies and programs that addressed the social needs covered by the screening tool. Patients and families were offered assistance in making contact with the referred community resources as well as help in accessing other supportive services not listed in the community resources guide.
FMI	McKelvey et al ¹⁶ 2016	—	—	X	All participants were screened at the time of implementation of home visiting programs (ie, 2-generation programs designed to serve at-risk families with children <5 years of age). Families included in the analysis voluntarily enrolled in 1 of 3 evidence-based home visiting models: Healthy Families America, Parents as Teachers, or Home Instruction for Parents of Preschool Youngsters.
ASK Tool	Selvaraj et al ²³ 2018	X	X	—	After completing the ASK Tool, clinicians discussed the results with the caregiver. If ACEs and unmet social needs identified by the ASK Tool were substantiated and required intervention based on this discussion and clinician judgment, the physician referred caregivers to community resources using a developed resource lists. Consultation with the onsite social worker was available for families with multiple needs identified and/or significant social complexity.
IHELP	Colvin et al ²⁹ 2016	—	X	—	After use of the IHELP tool, some interns provided referrals for a social work consultation.

Screening Tool	Author and Year	Results Discussed	Referral Offered and/or Scheduled	Intervention Delivered	Description
WE CARE survey instrument	Garg et al ²⁴ 2007	X	X	—	Residents were instructed to review the WE CARE survey with the parent during the visit and make a referral if the parents indicated that they wanted assistance with any psychosocial problems. Referrals came in the form of handing parents pages from the Family Resource Book with more information about 2–4 available community resources on 1 of 10 potential topics of concern identified in the screening.
FAMNEEDS	Garg et al ¹¹ 2015	X	X	—	Clinicians reviewed the WE CARE survey with mothers and offered them a 1–page information sheet with 2–4 free community resources for any needs for which the mother indicated she wanted assistance. The information sheets contained the program name, a brief description, contact information, program hours, and eligibility criteria.
	Zielinski et al ³⁰ 2017 Uwemedimo and May ²⁵ 2018	— X	X X	— X	Positive results on the screen triggered a social work referral at the time of the visit. When a need was identified on the screening tool, patient families who desired assistance were informed they would receive a follow-up phone call within 48 h from a resource navigator. Navigators provided families with contact information of social service providers and made e-referrals. Navigators continued to follow-up via phone with families who received referral information every 2 wk for 8 wk to assess progress on the referral or provide new information. A final follow-up call to assess the status of the referral was conducted at 3 mo after initial contact with the navigator.
Child ACE Tool	Marie-Mitchell and O'Connor ²⁰ 2013	—	—	—	No follow-up reported.
Social History Template of the Standard Well Child Care Form embedded in E-health Record	Beck et al ²¹ 2012	—	—	—	No follow-up reported
Health-Related Social problems screener	Fleegler et al ²² 2007	—	X	—	All participants received a referral sheet listing local agencies that could help with problems in each of the assessed social domains.

ASK, Addressing Social key Questions for Health; FAMNEEDS, Family Needs Screening Program; FMI, Family Map Inventories; —, not assessed.