

Parental Depression Screening in Pediatric Healthcare Settings: A Scoping Review

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Article summary: This scoping review outlines the current literature related to screening for parental depression outside of the 12-month postpartum period in pediatric healthcare settings.

What's known: Parental depression impacts child and parent wellbeing. Pediatric professionals are well situated to play a role in detecting parental depression throughout childhood. However, most of the literature to date on parental depression has focused solely on the immediate postpartum period.

What this study adds: Screening for parental depression outside the postpartum period has the potential to identify families in need of support. Further research is required to identify best practices for referral and follow-up of parents who screen positive for depressive symptoms.

Contributor's statement

Ava Marie Hunt: Dr. Hunt contributed to the conceptualization and design of the search strategy, screened articles during the literature review process, constructed the initial data extraction table, drafted the initial manuscript, and approved the manuscript as submitted.

Nila Uthirasamy: Ms. Uthirasamy screened articles during the literature review process, constructed the initial data extraction table, drafted the initial manuscript, and approved the manuscript as submitted.

Sallie Porter: Dr. Porter contributed to the conceptualization and design of the search strategy, screened articles during the literature review process, critically revised the data extraction table and manuscript, and approved the manuscript as submitted.

Manuel E. Jimenez: Dr. Jimenez contributed to the conceptualization and design of the search strategy, screened articles during the literature review process, critically revised the data extraction table and manuscript, and approved the manuscript as submitted.

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Abstract

Context: Parental depression affects as many as one in five US families. Pediatric professionals can play an important role in detecting parental depression, yet most studies on parental depression screening focus only on the postpartum period.

Objective: This scoping review aims to understand the existing literature on parental depression screening outside the postpartum period (child >12 months old) and to identify knowledge gaps.

Data Sources: PubMed, CINAHL, SCOPUS, Web of Science, and APA Psych Info.

Study Selection: We included English language papers concerning screening for maternal and/or paternal depression or mood disorders outside of the postpartum period by pediatric clinicians or in a pediatric healthcare setting.

Data Extraction: Extracted variables included publication year, title, author(s), country, geographic setting, clinical setting, child age range (in years), parental focus, sample size, study type, approach, screening instrument(s), and findings.

Results: Forty-one papers were included. The proportion of positive parental depression screens was consistently high across the included studies. Relatively few structured screening programs outside of the postpartum period were identified, especially for fathers. The included studies suggest that screening in pediatric settings is feasible, but appropriate referral and follow-up of positive screens poses a major challenge.

Limitations: This review was limited to English language papers concerning parental depression outside of the postpartum period.

Conclusions: These findings suggest that screening for parental depressive symptoms outside the postpartum period could identify families in need of support. Research is required to identify best practices for referral and follow-up of parents who screen positive.

1 **Introduction**

2 Parental depression affects as many as one in five families in the United States (US).¹
3 with negative effects on parental and child wellbeing.²⁻⁴ The economic burden due to lost work
4 productivity and increased healthcare utilization among adults with depression in the US is
5 estimated at \$210.5 billion per year⁵ with maternal mood disorders costing approximately
6 \$31,800 per mother-child dyad across the first six years of a child's life.⁶ The COVID-19
7 pandemic with its far-reaching impact on physical, psychosocial, and economic wellbeing has
8 further increased the prevalence of maternal depression, with one study finding an increase in the
9 rate of depression from 9% to 43% among mothers of children aged 18 months to 8 years during
10 the pandemic.⁷

11 Most of the literature related to parental depression to date has focused on maternal
12 depression. Mothers with depression, particularly those with chronic symptoms and those with
13 additional psychiatric comorbidities, are at elevated risk for insecure attachments with their
14 children⁸⁻¹¹ and harsh parenting behaviors.¹² Maternal depressive symptoms have negative
15 effects on mothers' caregiving behaviors¹³⁻¹⁵ and utilization of pediatric resources.¹⁶ Furthermore,
16 disturbances in maternal-child interactions in the context of maternal depression alter children's
17 responses to stress at a neurobiological level, with measurable effects on regions of the brain
18 involved in executive function skills.¹⁷⁻²² In the long term, maternal depression has been linked
19 to negative cognitive and psychosocial outcomes in children.²³⁻²⁷

20 The consequences of maternal depression are not limited to mother-child relationships.
21 Maternal depression is associated with increased paternal depressive symptoms as well as
22 increased couple morbidity and parenting stress.²⁸ Despite this connection, there are few studies
23 examining the impact of paternal depression on children. Existing studies demonstrate that

1 paternal depressive symptoms in the first year of life are associated with negative social,
2 behavioral, and emotional outcomes in children, similar to the outcomes observed among
3 children of depressed mothers.^{3,28,29}

4 Early recognition and treatment for parental depression can mitigate negative effects on
5 child health and development.^{30,31} However, multiple barriers exist to identifying and treating
6 parents with depressive symptoms. To begin, many women with unmet behavioral health needs
7 do not have a regular source of healthcare.³² While obstetricians and gynecologists (OB/GYNs)
8 commonly serve as the sole primary care clinicians for women of reproductive age, 59% of
9 OB/GYNs believe that identification and treatment of depression is not their responsibility and
10 66% are not confident in their ability to manage depression.³³ Given that most parents report that
11 their infants receive health supervision visits³⁴ and Bright Futures guidelines recommend at least
12 annual well visits outside of the postpartum period, pediatric practices may be an ideal setting to
13 identify parental depression and link families to support.^{35,36} Importantly, pediatric practices
14 could also be a unique resource for men of childbearing age who often lack a clear source of
15 healthcare, but attend pediatric visits with their children.³⁷ However, screening for parental
16 depression in the pediatric setting is limited both in current guidelines and in practice. Although
17 maternal depression beyond the immediate postpartum period has the potential to impact child
18 health and development, the current American Academy of Pediatrics (AAP) guidelines only
19 recommend that pediatric clinicians screen for maternal depression in the first year of life.^{38,39}
20 Further, while 85% of pediatric clinicians agree that recognizing maternal depression is their
21 responsibility, only half are confident in their ability to do so.⁴⁰ Among pediatric clinicians who
22 screen for parental depression, the vast majority rely solely on observational cues to detect
23 depressive symptoms.⁴¹ Only 9% report assessing for maternal depression using formal

1 diagnostic criteria and only 3% report using a validated screening tool.⁴⁰ While the rate of
2 maternal depression screening by pediatric clinicians has increased in recent years, those who do
3 remain in the minority.⁴² As per current guidelines, screening for paternal depression is even
4 more limited. The AAP recommends screening a mother's partner for depression only at the
5 child's six-month visit. Even if universally implemented, such limited screening of partners has
6 the potential to under-identify paternal depression and its impact on children and families.⁴³
7 Pediatric clinicians' limited comfort with screening for parental depressive symptoms
8 underscores the need for models that support clinicians and families. However, such models
9 remain poorly defined.

10 This scoping review outlines the current research related to parental depression screening
11 in the pediatric setting outside of the postpartum period (child >12 months old). Specifically, it
12 describes the proportion of positive parental depression screens outside of the postpartum period,
13 elucidates existing knowledge gaps in the field, and identifies potential barriers and opportunities
14 for broader screening efforts.

15

16 **Methods**

17 Scoping reviews synthesize research evidence by mapping “key concepts underpinning a
18 research area and the main sources and types of evidence available.”⁴⁴ They are well suited to
19 examine the extent of a body of literature and identify existing knowledge gaps.⁴⁴⁻⁴⁶ We use this
20 approach to obtain a broad understanding of the literature on parental depression screening in
21 pediatric healthcare settings outside of the postpartum period and to identify knowledge gaps.
22 We followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension
23 for Scoping Reviews (PRISMA-ScR) guidelines (Figure 1).

1 **Eligibility Criteria:** We included papers that met these inclusion criteria: 1. The study
2 concerned screening for maternal and/or paternal depression or mood disorder, 2. The screening
3 was conducted by a pediatric clinician or at a pediatric healthcare facility, 3. The screening was
4 performed after the postpartum period (child >12 months old), and 4. The study was published in
5 English. We excluded papers if they did not meet the above-specified inclusion criteria and
6 studies based on secondary analysis of parental depression data collected for non-screening
7 related research. There was no exclusion based on publication year. We aimed to capture studies
8 specific to screening for parental depression by pediatric healthcare clinicians outside of the
9 immediate postpartum period, which we anticipated might reveal a gap in the current literature as
10 of 01/12/2022.

11
12 **Information Sources:** A literature search was performed using PubMed, CINAHL, SCOPUS,
13 Web of Science, and APA Psych Info. The most recent search was executed on 01/12/2022.

14
15 **Search:** There was no registered review protocol for this study. We developed a search strategy
16 for PubMed with the guidance of a medical research librarian. The search terms were
17 subsequently adapted for the other databases specified above. The search terms used for the
18 PubMed search were as follows: ("depression" OR "mental health" OR "mood disorders" OR
19 "behavioral medicine" OR "behavioral health") AND ("parents" OR "mothers" OR "fathers" OR
20 "caregivers" OR "maternal" OR "paternal" OR "parental" OR "caregiver") AND ("screening"
21 OR "mass screening" OR "systematic screening") AND ("pediatrics" OR "pediatricians" OR
22 "pediatric setting" OR "pediatric clinic"). Search strategies for the other databases used are
23 specified in Supplemental Table 1. In total, 1566 studies were identified and compiled in an

1 EndNote library. Following removal of duplicates, first automatically using EndNote and then
2 manually, 1030 papers remained.

3
4 **Selection of Sources of Evidence:** During the first round of screening, two independent
5 reviewers assessed the titles and abstracts of each of the 1030 papers identified. Disagreements
6 between the reviewers were decided by a third independent reviewer. At the end of this first
7 round, 82 papers remained. Two independent reviewers then reviewed the full texts of these 82
8 papers to assess their eligibility. Papers were included if they met the inclusion criteria described
9 above. Following this second round of screening, 41 papers remained for inclusion.

10
11 **Data Charting Process:** Authors AH and NU charted the data obtained from the included papers
12 utilizing a table, which was reviewed for accuracy by authors MJ and SP. No additional data was
13 sought from the investigators of the included studies.

14
15 **Data Items:** Data was collected from the source papers on the following variables: publication
16 year, title, author(s), country, geographic setting (urban, suburban, rural, or other), clinical
17 setting (outpatient primary care, outpatient subspecialty, emergency department, general
18 outpatient, outpatient tertiary care center, general inpatient, inpatient intensive care, or other),
19 child age range (in years), parental focus, sample size, study type, approach using categories
20 described by Grimes and Schulz⁴⁷ (screening protocol as well as referral and/or follow-up
21 protocol when applicable), screening instrument(s) used, and findings (including but not limited
22 to proportion of positive screens, correlation of depressive symptoms with outcomes, and rate of
23 follow-through with recommended referrals).

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Synthesis of Results: We summarized data from the included papers in Table 1 and in narrative form below.

Results

Geographic and Clinical Setting

Forty-one studies were identified (Table 1), which included a total of over 32,744 parents and caregivers (two studies did not specify sample size). Twenty-nine of the 41 studies (71%) were conducted in the US, and the rest occurred elsewhere. Primary care was the most common clinical setting (21/41, 51%) with fewer studies conducted in outpatient subspecialty offices (12/41, 29%), both outpatient subspecialty and primary care settings (2/41, 5%), both outpatient subspecialty and inpatient settings (1/41, 2%), outpatient tertiary care centers (1/41, 2%), general outpatient settings (1/41, 2%), general inpatient settings (1/41, 2%), inpatient intensive care units (1/41, 2%), and emergency departments (1/41, 2%).

Participant Demographic Data

Mothers made up the majority of participating caregivers with 28/41 (68%) studies including mothers only. Eight of 41 studies (20%) enrolled both mothers and fathers and 1/41 (2%) enrolled fathers only. One study screened mothers and an unspecified caregiver and three papers did not specify which caregivers were enrolled. Additional demographic data for each of the articles are summarized in Supplemental Table 2.

Study Designs

1 Among the included papers, descriptive designs were the most common (26/41, 63%)
2 followed by cross-sectional studies (6/41, 15%), randomized control trials (4/41, 10%), case-
3 control studies (3/41, 7%), non-randomized control trials (1/41, 2%), and quality improvement
4 projects (1/41, 2%). A variety of measures were used to assess participant mood disorder
5 symptoms with several studies using multiple tools (Table 1). The most commonly used tool was
6 the Beck Depression Inventory (8/41, 20%).

7

8 *Study Results*

9 The included papers reported a mean of 25.5% of their study populations screening
10 positive for depressive symptoms. The highest reported proportion was 69.4% among mothers of
11 patients with cystic fibrosis in an outpatient pediatric pulmonology clinic in Turkey.⁴⁸ Single
12 motherhood and parental educational attainment of less than a high school level were associated
13 with increased risk of depressive symptoms. Parental depression was found to be associated with
14 both child behavioral and physical health outcomes, specifically child malnutrition, child anxiety
15 and depression, and HbA1c among children with Type 1 diabetes.^{4,49-54} Additionally, parental
16 depression was associated with increased concern for and negative attribution of child behavior
17 by parents as well as increased caregiver burden and worry among parents of children with
18 neurodevelopmental and/or physical health concerns.^{51,55-58} Four of the 41 (10%) studies
19 examined acceptability and all of these studies found that screening was acceptable to clinicians
20 and/or caregivers.

21

22 *Screening Models*

1 Among the included studies, 26/41 (63%) were conducted with the purpose of assessing
2 the prevalence of parental depressive symptoms in a particular population and/or correlating
3 those symptoms with child health outcomes. Two of the forty-one studies (5%) were designed to
4 determine the psychometric characteristics (sensitivity and specificity) of a screening tool in a
5 particular patient population. The remaining 13/41 (32%) described the development and
6 implementation of a structured screening program. Ten of the 13 (77%) studies describing
7 structured screening programs mentioned referring parents for services when they screened
8 positive, but only 4/13 (31%) included a follow-up mechanism (see Table 2). Overall, five of the
9 41 (12%) studies compared a standardized tool to clinician judgment, finding that screening
10 programs using a standardized screening tool were more sensitive.

11

12 **Discussion**

13 Parental depression is highly prevalent and significantly impacts the health and wellbeing
14 of both parents and children. In this review, we have identified multiple gaps in the existing
15 literature that have implications for pediatric practice and future research. First, although many
16 parents screened positive for depressive symptoms across all settings and sociodemographic
17 groups in the samples included in this review, structured screening programs outside of the
18 postpartum period in pediatric settings were rare, especially for fathers. Second, while screening
19 for parental depression was found to be both feasible and acceptable, appropriate referral and
20 follow-up of positive screens poses a major challenge warranting further investigation.

21 The majority of included papers found high proportions of positive parental depression
22 screens across all pediatric patient populations, including outpatient primary care, inpatient, and
23 subspecialty settings.^{4,48,50-54,56,57,59-73} Numerous papers advocated for expanding screening for

1 parental depression from the primary care setting, as currently practiced, to a wider range of
2 pediatric clinical settings.^{4,48,52,57,59,68} While certain demographic variables were associated with
3 an increased risk of parental depression (namely single motherhood and parental educational
4 attainment of less than a high school level), demographic factors in general were poor predictors
5 of risk. Therefore, screening programs based solely on perceived risk have the potential to miss
6 affected parents.^{60,65-68,70,74,75}

7 Despite the potential negative impacts of parental depression on children and the
8 emphasis placed by numerous papers on the need for increased screening programs, the studies
9 identified in this review make clear that more work is needed. First, most screening programs
10 occurred in primary care and involved children <5 years old. Fewer studies involved sub-
11 specialty, inpatient, or emergency department settings, which may provide important
12 opportunities for detection. Given that some families utilize the emergency department
13 frequently and some families, particularly those of children with complex medical needs, may be
14 seen by sub-specialists more frequently than by primary care professionals, expanding screening
15 beyond primary care has the potential to reach families who would not otherwise be screened.
16 Second, among the studies included in this review, the majority only screened mothers with a
17 much smaller number including mothers and fathers and only one paper focused on fathers.⁷³

18 Numerous studies included in this review have shown that screening for parental
19 depression in the pediatric healthcare setting is feasible.^{48,52,53,56,59-66,69-71,73,74,76-78} Bright Futures
20 recommends well visits at least annually beyond the child's first year of life and this regular
21 contact with parents offers a unique opportunity to build on established parent-clinician
22 relationships to address parental depression. Pediatric clinicians acknowledge the importance of
23 screening for parental depression.^{40,41} Yet, they often feel uncomfortable screening and only a

1 minority conduct screening.^{64,79-81} One concern has been the acceptability of depression
2 screening in the pediatric setting. However, the screening interventions were found to be
3 acceptable in the included studies that assessed acceptability.^{62,64,77,82} Although there was no
4 single agreed upon screening tool,^{63,74,77} studies consistently found that standardized tools were
5 more sensitive than solely clinical judgement.^{63,78,83} Healthcare organizations and clinicians are
6 increasingly expanding efforts to screen for social determinants of health, including focused
7 efforts on identifying adverse childhood experiences.⁸⁴ While such screening tools capture
8 information on parental behavioral health concerns, many commonly used tools do not use
9 validated depression screens. Future work should examine to what extent incorporating validated
10 parental depression screening tools into these efforts could identify additional families in need of
11 support.

12 A major limitation to screening programs, acknowledged by multiple included studies, is
13 the lack of follow up of positive depression screens. Even among programs with follow through
14 mechanisms in place, many parents who screened positive were lost to follow up.^{61,62,72,85} The
15 potential harms of screening related to potentially sensitive or stigmatizing topics such as social
16 determinants in the pediatric setting have been highlighted by Garg et al., who recommend that
17 screening programs adhere to several key tenets. Namely, screening programs should be
18 population wide, patient- and family-centered, and strengths-focused, and conducted within a
19 comprehensive system that provides linkage to community-based resources.⁸⁶ Given the
20 sensitivity of disclosure of mental health concerns, parental mental health screening programs
21 should ideally aspire to similar tenets, including robust follow up and linkage to services.
22 However, as indicated by many of the papers included in this study, that goal has been difficult
23 to achieve and follow up remains an important area of further research and innovation. In

1 obstetric and family practice settings, interventions that address patient, clinician, and practice-
2 level barriers through provision of patient resources, clinician education onsite assessments, and
3 access to mental health consultations for clinicians, have been the most successful in ensuring
4 women who screen positive for depressive symptoms in the perinatal period are connected to
5 behavioral healthcare.⁸⁷ Lessons derived from these specialties may serve as a helpful starting
6 place for developing follow up protocols for use in pediatric settings.

7 There are certain limitations to this study. This review was limited to English-language
8 papers only and therefore does not encompass findings that have been published in the non-
9 English literature. Since we focused on parental depression outside of the postpartum period, our
10 findings do not reflect the current state of the literature relating to postpartum depression.
11 Similarly, this paper does not address other forms of parental psychiatric morbidity. While we
12 used a comprehensive search strategy guided by a medical research librarian, we cannot exclude
13 the possibility that relevant articles may have been missed, this may be especially true when
14 parental depression screening is embedded in broader psychosocial screening efforts.

15

16 **Conclusion**

17 This scoping review demonstrates that the current literature clearly documents the high
18 number of parents who screen positive outside of the immediate postpartum period as well as its
19 impact on the wellbeing of parents and children. It identifies several knowledge gaps,
20 specifically that structured screening programs in pediatric settings outside the postpartum period
21 are rare, especially for fathers, and that appropriate referral and follow-up of positive screens is a
22 major challenge. These findings suggest that increased screening for parental depression across a
23 wider age range and in a broader array of clinical settings has the potential to identify families in

- 1 need of resources. They also suggest that further research is required to assess the best practices
- 2 for referral and follow-up of parents who screen positive for depressive symptoms to ensure they
- 3 receive the support they need.

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Table 1: Studies Screening for Parental Depression Outside of the 12-month Postpartum Period

Year (YYYY)	Title	Author (s)	Country	Geographic Setting	Clinical Setting	Child Age Range (in years)	Parental Focus	Sample Size (n approximated based on reported percentages)	Study Type	Approach	Screening Instrument (s)	Findings
1985	Behavioral deviance and maternal depressive symptoms in pediatric outpatients	Fitzgerald, M.	UK	Urban	Outpatient (sub-specialty)	3-4, 7-11	Maternal	103 mothers	Cross-sectional	<ul style="list-style-type: none"> Recruited mothers of 3-4 and 7-11 year-old medical and surgical outpatients Compared rates of depressive symptoms of mothers 3-4 year-old medical vs surgical outpatients and mothers of 7-11 year-old medical vs surgical outpatients 	Wakefield self-assessment depression inventory	<ul style="list-style-type: none"> 32% mothers of 7-11 year-old medical outpatients, 31% of 3-4 year-old medical outpatients, 17% of 7-11 year-old surgical outpatients, and 9% of 3-4 year-old surgical outpatients screened positive
1992	Screening for maternal depression in pediatric clinics	Kemper, K. J.; Babonis, T. R.	USA	Not specified	Outpatient (primary care)	0-6	Maternal	667 mothers	Descriptive	<ul style="list-style-type: none"> Recruited mothers of children attending routine health care visits at 5 pediatric practices (private, university, military) 2 versions of a screening instrument for depressive symptoms were administered by medical students 	3-item and 8-item versions of the RAND screening instrument for depressive disorders	<ul style="list-style-type: none"> 19% of mothers screened positive for depression Mothers who screened positive were younger and had less education and lower monthly incomes Positive screens were more common in teaching clinics (20%) and military clinics (24%) than in private practices (12%), among single vs married mothers (32% vs 15%), among mothers of color vs White mothers (29% vs 16%), and among those with positive screening test results for drugs compared with those with negative results (45% vs 17%) (P < .01 for all comparisons)
1992	Self-administered questionnaire for structured psychosocial screening in pediatrics	Kemper, K. J.	USA	Urban	Outpatient (primary care)	Not specified	Maternal	114 mothers	Cross-sectional	<ul style="list-style-type: none"> Parents completed questionnaires in waiting room containing screening instruments for substance abuse, depression, self-esteem, and social support, and questions about domestic violence, homelessness, and parental history of abuse Compared medical records of children whose mothers completed questionnaires to sample of children whose mothers did not 	8-item Screening Instrument for Depression	<ul style="list-style-type: none"> Maternal depression was identified in 16% of mothers who completed the questionnaire vs 4% identified by medical record. This difference between questionnaire and chart was statistically significant (P < .01)

1994	Family psychosocial screening: should we focus on high-risk settings?	Kemper, K. J.; Osborn, L. M.; Hansen, D. F.; Pascoe, J. M.	USA	Not specified	Outpatient (primary care)	0-6	Maternal	1404 mothers	Descriptive	<ul style="list-style-type: none"> Recruited mothers of children attending well child visits (758 in teaching clinic, 444 in private practice, and 202 at military clinic) Clinic sites deemed "low," "medium," or "high" risk Mothers at all sites completed a questionnaire that included information on mother's history of abuse/neglect, depressive symptoms, and history of drinking and drug use 	RAND Corporation's Screening Instrument for Depressive Disorders	<ul style="list-style-type: none"> Positive screens for maternal depression ranged from 12-35% Psychosocial problems were common even at "low risk" clinics
1994	Depressive symptoms and work role satisfaction in mothers of toddlers	Olson, A. L.; DiBrigida, L. A.	USA	Urban	Outpatient (primary care)	1-2	Maternal	233 mothers	Descriptive	<ul style="list-style-type: none"> Depression screening measures were completed by mothers attending health supervision visits at 2 community pediatric practices 	20-item depression screening instrument developed by Barrett, Oxman, and Gerber (modified Hopkins Symptom Checklist)	<ul style="list-style-type: none"> Depressive symptoms present in 42% of mothers (95% Confidence Interval (CI) interval 39% to 45%) Rates of symptoms were similar across employment groups (P = NS) but 67% of mothers who were dissatisfied with their current work role had depressive symptoms compared to 35% of those who were satisfied (P <.001) Mothers who were dissatisfied with employment status were 3.7x more likely to be depressed (95% CI interval 1.8 to 77, P = .0003) Mean PSI total score was 19, 39% scored ≥ 20, 18% scored ≥ 30 Anxiety and depression subscales were correlated with PSI total scores PSI scores did not vary by age, race, birthplace, education, employment, marital status, or family composition PSI scores were higher for mothers receiving public assistance (P <.05) and those with self-reported poor or fair financial status (P <.005) Scores were higher among mothers who reported poor health status (P <.005), mothers with activity limitations due to illness had higher scores than those without (P <.005)
1998	Depressive symptoms in inner-city mothers of young children: Who is at risk?	Heneghan, A. M.; Silver, E. J.; Bauman, L. J.; Westbrook, L. E.; Stein, R. E. K.	USA	Urban	Outpatient (primary care)	0.5-3	Maternal	279 mothers	Descriptive	<ul style="list-style-type: none"> English-speaking mothers of children presenting for well-child visits completed an interview and self-report checklist of mental health symptoms 	Psychiatric Symptom Index (PSI)	<ul style="list-style-type: none"> PSI scores were higher for mothers receiving public assistance (P <.05) and those with self-reported poor or fair financial status (P <.005) Scores were higher among mothers who reported poor health status (P <.005), mothers with activity limitations due to illness had higher scores than those without (P <.005)

1998	The scope of unmet maternal health needs in pediatric settings	Kahn, R. S.; Wise, P. H.; Finkelstein, J. A.; Bernstein, H. H.; Lowe, J. A.; Homer, C. J.	USA	Not specified	Outpatient (primary care)	0- 1.5	Maternal	559 mothers	Descriptive	<ul style="list-style-type: none"> Women were screened by a research assistant in waiting room before child's appointment 10-15 min survey was self-administered and completed in either waiting area or exam room 	3 questions from RAND screening instrument for depressive disorders	<ul style="list-style-type: none"> 39.6% of women reported depressive symptoms ($P < .001$) More than 90% of participants said they would welcome or not mind an offer to assist with appointment-making with an adult care provider if affected by one of the issues examined.
1999	Impact of screening for maternal depression in a pediatric clinic: an exploratory study	Needleman, R.; Walders, N.; Kelly, S.; Higgins, J.; Sofranko, K.; Drotar, D.	USA	Urban	Outpatient (primary care)	Not specified	Maternal	73 mothers	Descriptive	<ul style="list-style-type: none"> Mothers were referred to pediatric social workers who rated degree of depression clinically and administered a depression measure Mothers were referred for mental health and assessment and treatment based on the SW's clinical judgement and CES-D scores Follow-up calls were made 1-6 months later 	Center for epidemiological studies depression questionnaire (CES-D)	<ul style="list-style-type: none"> 67% of mothers had significant depressive symptoms (CES-D ≥ 16) but only 29% of total sample were identified by SWs based on clinical assessment 58% of high-scoring mothers showed at least minimal clinical depressive symptoms, 14% showed no symptoms 59% (26/44) of referred mothers agreed to seek mental health assessment and treatment but only 11% (3/26) had attended recommended visit at follow up
2000	Do pediatricians recognize mothers with depressive symptoms?	Heneghan, A. M.; Silver, E. J.; Bauman, L. J.; Stein, R. E.	USA	Urban	Outpatient (primary care)	0.5-3	Maternal	214 mothers	Descriptive	<ul style="list-style-type: none"> Mothers completed a depression screening tool and pediatric health care providers completed a questionnaire assessing mothers' symptoms, each unaware of other's responses. Sensitivity, specificity, PPV, and NPV of provider identification of maternal symptoms was evaluated against depression measure 	PSI	<ul style="list-style-type: none"> Out of 214 mothers 86 (40%) scored ≥ 20 (high symptom level) Of mothers who scored ≥ 20, 25 were identified by providers as being at risk (29%)
2004	Rates of maternal depression in pediatric emergency department and relationship to child service utilization	Flynn, H. A.; Davis, M.; Marcus, S. M.; Cunningham, R.; Blow, F. C.	USA	Not specified	Pediatric Emergency Department	0-7	Maternal	176 mothers	Cross-sectional	<ul style="list-style-type: none"> Approached women who brought a child to the pediatric ED for a visit that was not severe trauma or the highest level of acuity Administered survey that included screening tools for alcohol use and depression and questions on child health and maternal depression treatment 	CES-D, 3-item RAND screening instrument for depression	<ul style="list-style-type: none"> 31% of mothers screened positive for depression risk, of whom 78% were not being treated Elevated depression was correlated with missed pediatric outpatient visits (Odds Ratio (OR) = 2.9, $P < .05$) and greater use of emergency services (OR=3.2, $P < .05$) Mothers with depressive symptoms were younger, had fewer years of education, and were more likely to be Medicaid recipients or uninsured Mothers who screened positive were more likely to rate own health as worse and had higher risk for alcohol use

2004	Maternal distress, child behavior, and disclosure of psychosocial concerns to a pediatrician	Wildman, B. G.; Stancin, T.; Golden, C.; Yerkey, T.	USA	Urban	Outpatient (primary care)	4-12	Maternal	138 female caregivers (biological mothers, foster mothers and grandmothers)	Descriptive	<ul style="list-style-type: none"> Research assistants approached mothers in the waiting room of a primary care clinic and mothers completed measures while waiting After child's visit with the pediatrician, mothers completed exit questionnaire 	Beck Depression Inventory (BDI)	<ul style="list-style-type: none"> Among 36 mothers (24.1%) with elevated scores (BDI \geq 10), 58.3% were concerned about child's behavior compared to 25.7% of mothers without elevated BDI scores 10.6% of mothers without elevated BDI scores had children with elevated PSC scores vs. 27.8% of mothers with elevated BDI scores
2005	Two approaches to maternal depression screening during well child visits	Olson, A. L.; Dietrich, A. J.; Prazar, G.; Hurley, J.; Tuddenham, A.; Hedberg, V.; Naspinsky, D. A.	USA	Rural	Outpatient (primary care)	0-16	Maternal	473 mothers	Non-randomized controlled trial	<ul style="list-style-type: none"> Clinicians screened mothers of children of all ages who were scheduled for the first 3 well child visits of the morning and the afternoon on randomly selected days over a 1-month period In 1st condition, pediatricians screened mothers via a scripted interview, in 2nd condition, 223 mothers completed paper-based depression screening 	Patient Health Questionnaire-2 (PHQ-2)	<ul style="list-style-type: none"> Yield from paper-based screen was 22.9% vs 5.7% for interview 7.6% of women screened with paper tool were referred to mental health vs. 1.6% of those screened via interview. Several pediatricians commented that mothers indicated that they appreciated the attention to their family
2006	Brief maternal depression screening at well-child visits	Olson, A.; Dietrich, A.; Prazar, G.; Hurley, J.	USA	Rural	Outpatient (primary care)	Not specified	Maternal	1398 mothers	Descriptive	<ul style="list-style-type: none"> 3 pediatric practices implemented screening for parental depression at every well-child visit for a 1-month period After pilot phase, practices took part in a program to determine the feasibility of implementing screening and referral at all well-child visits for a longer 6-month period 	PHQ-2	<ul style="list-style-type: none"> 17% of mothers reported \geq1 depressive symptom and 6% scored as being at risk for depression Pediatric clinicians intervened with 62.4% of mothers who screened positive and 38.2% of mothers with lesser symptoms For most visits discussion time responding to screening was minimal
2006	Improving women's health during internatal periods: Developing an evidenced-based approach to addressing maternal depression in pediatric settings	Feinberg, E.; Smith, M. V.; Morales, M. J.; Claussen, A. H.; Smith, D. C.; Perou, R.	USA	Urban	Outpatient (primary care)	Not specified	Not specified	Not specified	Descriptive	<ul style="list-style-type: none"> Screening program was developed that included (1) screening of all mothers at well-child visits, (2) assessment of additional symptoms, level of impairment, suicidality risk, and preference for follow-up, (3) education on depressive symptoms, their impact on parenting, and management strategies, and (4) referrals for follow-up care Conducted 9 focus groups and 36 interviews of mothers, site-based healthcare providers, and community-based professionals to assess acceptability of program 	PHQ-2, PRIME-MD, PHQ-9	<ul style="list-style-type: none"> Providers found PHQ-2 non-burdensome Women with low levels of symptoms often declined further intervention beyond routine follow up in the pediatric setting For more symptomatic women, follow up with the woman's own primary care provider was often preferred Reluctance to access behavioral health services was related to stigma associated with a mental health condition Mothers and professionals both expressed a need for education about symptoms of depression, self-management strategies, and community-based services

2007	Screening for maternal depression in a low education population using a two-item questionnaire	Cutler, C. B.; Legano, L. A.; Dreyer, B. P.; Fierman, A. H.; Berkule, S. B.; Lusskin, S. I.; Tomopoulos, S.; Roth, M.; Mendelsohn, A. L.	USA	Urban	Outpatient (primary care)	0.011-4.5	Maternal	94 mothers	Descriptive	<ul style="list-style-type: none"> Recruited English and Spanish speaking mothers who brought children for a well-visit Mothers screening positive on either of 2 depression screens were referred to social worker for further assessment Followed up with mothers who screened positive at 3 months to see if further assessment had taken place 	PHQ-2, Edinburgh Postnatal Depression Scale (EPDS)	<ul style="list-style-type: none"> Sensitivity of PHQ-2 for identifying a positive EPDS score was 43.5%, specificity 97.2% 12.8% screened positive on PHQ-2 (95% CI 7.1%, 21.6%) compared to 24.5% on EPDS (95% CI 16.4%, 34.6%), 26.6% screened positive on ≥ 1 instrument (95% CI 18.3%, 36.9%) Sensitivity of PHQ-2 was higher for mothers with education beyond high school ($p = 0.02$) 22 of 25 women who screened positive accepted a referral for additional services. Among 22 who accepted a referral follow up was obtained for 15; four of whom reported that they had received services
2007	Screening for depression in an urban pediatric primary care clinic	Dubowitz, H.; Feigelman, S.; Lane, W.; Prescott, L.; Blackman, K.; Grube, L.; Meyer, W.; Tracy, J. K.	USA	Urban	Outpatient (primary care)	<6	Maternal, Paternal	216 caregivers (203 mothers, 9 fathers)	Descriptive	<ul style="list-style-type: none"> Mothers bringing in children for child health supervision at a primary care clinic completed a screening questionnaire Mothers then completed the computerized study protocol within 2 months including parent screening questionnaire and depression measure Different combinations of depression questions were evaluated against standard clinical cutoffs Parents of chronically ill children admitted to a tertiary level PICU completed a background questionnaire and depression measure Parents with elevated symptoms and/or who requested referral for counseling were referred to a psychiatry intake line or supplied with information on community mental health programs 	Parent screening questionnaire (adapted from existing screen), BDI-II	<ul style="list-style-type: none"> 12% of mothers met BDI-II cutoff value for clinically moderately depressed.
2011	Predictors of depressive symptoms in parents of chronically ill children admitted to the pediatric intensive care unit	Fauman, K. R.; Pituch, K. J.; Han, Y. Y.; Niedner, M. F.; Reske, J.; LeVine, A. M.	USA	Not specified	Inpatient (intensive care)	1.5 - 18	Maternal, Paternal	61 parents (37 mothers, 24 fathers)	Descriptive	<ul style="list-style-type: none"> Parents of chronically ill children admitted to a tertiary level PICU completed a background questionnaire and depression measure Parents with elevated symptoms and/or who requested referral for counseling were referred to a psychiatry intake line or supplied with information on community mental health programs 	BDI-II	<ul style="list-style-type: none"> 45.9% of mothers and 16.7% of fathers met cutoff for mild depressive symptoms
2012	Maternal psychiatric morbidity and childhood malnutrition	Ejaz, M. S.; Sarwat, A.; Aisha, T.	Pakistan	Urban	Inpatient (general)	0.25- 3	Maternal	100 mothers	Case-control	<ul style="list-style-type: none"> 50 mothers of children with moderate and severe malnutrition and 50 mothers of control children of normal weight were screened using HADS 	Hospital Anxiety and Depression Scale (HADS)	<ul style="list-style-type: none"> HADS scores were significantly elevated (>21) in 50% of mothers of malnourished children vs. 46% of controls (OR = 0.85 (95% CI - 0.38-1.86))

2012	A randomized controlled trial of screening for maternal depression with a clinical decision support system	Carroll, A. E.; Biondich, P.; An, V.; Dugan, T. M.; Downs, S.	USA	Urban	Outpatient (primary care)	0-1.25	Maternal	3520 mothers	Randomized controlled trial	<ul style="list-style-type: none"> Mothers were randomized to 3 groups: (1) pre-screen form (PSF) completed by mother in the waiting room with physician alert for positive screen, (2) PSF with physician alert screens plus "just in time" (JIT) printed materials to aid physicians, and (3) control group where physicians were reminded to screen on printed worksheet 	PHQ-2	<ul style="list-style-type: none"> More mothers were noted to have depressed mood in the PSF (OR 7.93, 95% CI 4.51 to 13.96) and JIT groups (OR 8.1, 95% CI 4.61 to 14.25) compared to control group More mothers had signs of anhedonia in the PSF (OR 12.58, 95% CI 5.03 to 31.46) and JIT groups (OR 13.03, 95% CI 5.21 to 32.54) compared to control group Physicians referred mothers for assistance significantly more often in the PSF (2.4%) and JIT groups (2.4%) compared to the control group (1.2%) (OR 2.06, 95% CI 1.08 to 3.93)
2013	Markers of maternal depressive symptoms in an urban pediatric clinic	Sia, J. H.; Leventhal, J. M.; Northrup, V. S.; Arunyanart, W.; Weitzman, C. C.	USA	Urban	Outpatient (primary care)	1-6	Maternal	917 mothers	Case-control	<ul style="list-style-type: none"> Case-control study of mothers screened for depressive symptoms at well child visits at an inner-city pediatric clinic Mothers with depressive symptoms were compared to controls with no symptoms Potential markers for maternal depressive symptoms were collected from child's medical record and grouped by child health and development, child health care utilization, and maternal psychosocial factors 	Quick Inventory of Depressive Symptomatology Self-Rated Questionnaire (QIDS-SR)	<ul style="list-style-type: none"> Among 917 screened, 23.3% scored in depressive range Maternal depressive symptoms were significantly associated with reports of concerns or negative attributions about child's behavior (Adjusted odds ratio (AOR): 2.35, p= .01) as well as concerns about speech (AOR: 2.4, p= .04) and sleep (AOR: 7.75, p<.001) Maternal depressive symptoms were associated with child emergency department visits Maternal depressive symptoms were associated with a history of maternal depression (AOR: 4.94, p =0.001), prior social work referral (AOR: 1.98, p = .01), and pediatric provider concerns for child abuse or neglect at previous visit
2013	Building healthy children: evidence-based home visitation integrated with pediatric medical homes	Paradis, H. A.; Sandler, M.; Manly, J. T.; Valentine, L.	USA	Not specified	Outpatient (primary care)	≤2	Maternal	497 mothers	Randomized controlled trial	<ul style="list-style-type: none"> Patients of 3 primary care practices were screened for eligibility Families were randomized to treatment vs control groups Treatment families received Parents as Teachers, child-parent psychotherapy, and interpersonal psychotherapy as needed Control families received referral to community services only All families were evaluated at baseline and at 12, 24, 36, and 48 months 	Not specified	<ul style="list-style-type: none"> At baseline, 22% had significant depressive symptoms

2014	Prevalence of depression and anxiety in patients with cystic fibrosis and parent caregivers: results of The International Depression Epidemiological Study across nine countries	Quittner, A. L.; Goldbeck, L.; Abbott, J.; Duff, A.; Lambrecht, P.; Solé, A.; Tibosch, M. M.; Bergsten Brucefors, A.; Yüksel, H.; Catastini, P.; Blackwell, L.; Barker, D.	Belgium, Germany, Italy, Spain, Sweden, Netherlands, Turkey, UK, USA	Not specified	Outpatient (sub-specialty)	0-18	Maternal, Paternal	4102 parents (3127 mothers, 975 fathers)	Descriptive	<ul style="list-style-type: none"> Patients with cystic fibrosis (CF) aged >12 and caregivers of children with CF aged 0-18 at 154 centers in 9 countries completed depression and anxiety screens Psychological symptoms were compared across countries 	HADS, CES-D	<ul style="list-style-type: none"> Symptoms of depression were found in 37% of mothers and 31% of fathers Elevated anxiety was found in 48% of mothers and 36% of fathers.
2015	Pediatric-based intervention to motivate mothers to seek follow-up for depression screens: The Motivating Our Mothers (MOM) trial	Fernandez y Garcia, E.; Joseph, J.; Wilson, M. D.; Hinton, L.; Simon, G.; Ludman, E.; Scott, F.; Kravitz, R. L.	USA	Urban, suburban, and rural	Outpatient (primary care)	0-12	Maternal	104 mothers	Randomized controlled trial	<ul style="list-style-type: none"> Mothers with positive depression screens presenting for well-child checks received interventions from research assistant Intervention included office-based written and verbal depression education, motivational messages encouraging further assessment, and a telephone booster 2 days later Measured proportion of mothers in each group who reported trying to contact any resources to discuss the positive screen by 2 weeks post-intervention 	2-item depression screen (see Dubowitz et al, 2007)	<ul style="list-style-type: none"> More mothers in intervention group tried to contact a resource (73.8% vs. 53.5%) (95% CI, 0.1% to 38.5%, P = 0.052)
2015	Depression and burden among caregivers of children with autistic spectrum disorder	Lerthattasilp, T.; Charernboon, T.; Chunsuwan, L.; Siriumpikul, P.	Thailand	Not specified	Outpatient (primary care)	0-15	Maternal, Paternal Relatives	51 caregivers (35 mother, 10 father, 5 relative)	Descriptive	<ul style="list-style-type: none"> Questionnaire administered to caregivers to assess caregiver depression and burden Assessment of patient's diagnosis obtained from psychiatrists and pediatricians 	CES-D, Thai version	<ul style="list-style-type: none"> The prevalence of depression among caregivers was 5.9%. 45.1% reported little or no caregiver burden, 45.1% reported mild to moderate burden, 7.8% moderate to severe burden, 2.0% severe burden. Significant positive correlation between caregiver depression and caregiver burden (p = 0.012)
2016	Quality of Life and Psychological Screening in Children with Type 1 Diabetes and their Mothers	Duru, N. S.; Civilibal, M.; Elevli, M.	Turkey	Not specified	Outpatient (sub-specialty)	8-17	Maternal	60 mothers	Cross-sectional	<ul style="list-style-type: none"> 30 children with type 1 diabetes and 30 controls completed measures of depressive symptoms 30 mothers of children with diabetes and 30 controls completed measures of depression, anxiety, and health-related quality of life 	STAI, BDI	<ul style="list-style-type: none"> Mean BDI score was higher among mothers of children with diabetes compared to controls (p = 0.004) Child depression scores of children with T1DM were positively correlated with the BDI scores of their mothers (p < 0.001)

2017	Maternal diabetes distress is linked to maternal depressive symptoms and adolescents' glycemic control	Rumburg, T. M.; Lord, J. H.; Savin, K. L.; Jaser, S. S.	USA	Not specified	Outpatient (sub-specialty)	10-16	Maternal	81 mothers	Descriptive	<ul style="list-style-type: none"> Mothers of youth diagnosed with type I diabetes were recruited from a diabetes clinic Research staff administered screening questionnaire before child's clinic visit 	Patient Health Questionnaire-9 (PHQ-9)	<ul style="list-style-type: none"> 49% were above clinical cutoff for mild depressive symptoms 25% were above cutoff for moderate depressive symptoms Diabetes distress strongly related to depressive symptoms (P< 0.001)
2017	Psychosocial functioning in pediatric heart transplant recipients and their families	Cousino, M. K.; Schumacher, K. R.; Rea, K. E.; Eder, S.; Zamberlan, M.; Jordan, J.; Fredericks, E. M.	USA	Not specified	Outpatient (sub-specialty)	0-22	Maternal, Paternal, Other	56 parents/guardians (41 mothers, 10 fathers, 1 other, 4 did not respond)	Descriptive	<ul style="list-style-type: none"> Medical assistants administered paper screening tool to parents/guardian of pediatric heart transplants at clinic visit Tool was given to pediatric transplant behavioral health clinician who used them to guide conversation with family The screening tool was scored to determine psychosocial risk and the associations between risk and demographic, and health-related variables 	Psychosocial assessment tool (PAT)	<ul style="list-style-type: none"> Few parents/guardians (2%) endorsed clinically significant family problems such as parental depression, anxiety, substance use, or relational problems, but 9% of respondents reported high levels of care-giver stress PAT score was not associated w/ demographic or health-related factors
2018	Prevalence of Depression Among Fathers at the Pediatric Well-Child Care Visit	Cheng, E.; Downs, S.; Carroll, A.	USA	Not specified	Outpatient (primary care)	<1.25	Paternal	806 fathers	Descriptive	<ul style="list-style-type: none"> A computer-based decision support system, was used to administer a patient-tailored, 20-item pre-screening form on a tablet to parents in clinic waiting room Data was merged with child's medical record data to create physician worksheet with 6 prompts designed to call pediatrician's attention to the child's specific health risks 	Modified 3-item version of the EPDS	<ul style="list-style-type: none"> Among fathers who answered the pre-screening form, 4.4% screened positive
2018	Health-related quality of life, anxiety, depression and distress of mothers and fathers of children on Home parenteral nutrition	van Oers, H.; Haverman, L.; Olieman, J. E.; Neelis, E.; Jonkers-Schuitema, C.; Grootenhuis, M.; Tabbers, M.	Netherlands	Not specified	Outpatient (sub-specialty)	0-18	Maternal, Paternal	62 parents (37 mothers, 25 fathers)	Descriptive	<ul style="list-style-type: none"> Parents with children receiving HPN for ≥3 months were invited by letter to register on website Parents and children completed surveys 1 week prior to outpatient consult with clinician Answers were discussed during the consultation 	HADS	<ul style="list-style-type: none"> 14.7 % of mothers and 16.7 % of fathers scored in the clinical range for depression

2020	Evaluation of the psychological status of mothers of children with cystic fibrosis and the relationship between children's clinical status	Unal Yuksekgonul, A.; Aslan, A. T.; Sismanlar Eyuboglu, T.; Soysal, S.; Budakoglu, II	Turkey	Not specified	Outpatient (sub-specialty)	5-23	Maternal	36 mothers	Descriptive	<ul style="list-style-type: none"> Patients with cystic fibrosis and primary care givers were recruited from pulmonary clinic to assess psychosocial status of care givers and its relationship with child clinical scores 	BDI	<ul style="list-style-type: none"> Depression was present in 69.4% of mothers, severity was correlated with poor child clinical status Increased depression was associated with negative attitudes towards child-rearing ($p < 0.05$)
2020	Long-term trajectories of depression symptoms in mothers of children with cancer	Howard Sharp, K. M., Fisher, R. S., Clark, O. E., Dunnells, Z. O., Murphy, L. K., Prussien, K. V., Vannatta, K., Compas, B. E. & Gerhardt, C. A	USA	Not specified	Outpatient (sub-specialty) & In-patient	5-17	Maternal	327 mothers	Descriptive	<ul style="list-style-type: none"> Families were approached at either outpatient oncology clinic or inpatient hospital units Mothers completed questionnaires in the hospital or at home after diagnosis/relapse and at 1 year, 3 years, and 5 years after enrollment 	BDI-II	<ul style="list-style-type: none"> Three trajectories were identified across 5-year study period: "low depression symptoms" (63.3%), "moderate depression symptoms" (31.5%), and "high depression symptoms" (5.2%)
2020	Health-Related Quality of Life and Emotional Distress Among Mothers of Sons With Muscular Dystrophy as Compared to Sex- and Age Group-Matched Controls	Jackson, Jamie L; Korth, Christina X; Leslie, Carine E; Cotto, Jennifer; Mah, May Ling; Hor, Kan; Cripe, Linda; Al-Zaidy, Samiah; Camino, Eric M; Church, Kathleen; Lehman, Kelly J; Shay, Victoria; Mendell, Jerry R	USA	Not specified	Outpatient (sub-specialty)	Not specified	Maternal	108 mothers	Cross-sectional	<ul style="list-style-type: none"> 82 mothers of sons with Duchenne or Becker muscular dystrophies and 26 sex- and age group-matched controls completed self-report measures 	HADS	<ul style="list-style-type: none"> Elevated symptoms of anxiety were reported by 39% of mothers who had sons with Duchenne or Becker muscular dystrophies compared to 19% among controls Elevated depressive symptoms were reported by 7% of mothers who had sons with Duchenne or Becker muscular dystrophies compared to none among controls
2020	Depression as a predictor of hypoglycemia worry in parents of youth with recent-onset type 1 diabetes	McConville, A.; Noser, A. E.; Nelson, E. L.; Clements, M. A.; Majidi, S.; Patton, S. R.	USA	Not specified	Outpatient (sub-specialty)	5-9	Maternal, others not specified	107 parents (94 mothers)	Descriptive	<ul style="list-style-type: none"> Families of children with recent onset type 1 diabetes were enrolled and completed assessments at baseline, 6 months, 12 months, and 18 months Multilevel modeling was used to examine 18-month trajectories of hypoglycemia worry and examine if parental depression modified trajectory 	CES-D	<ul style="list-style-type: none"> 25.6% parents met cutoff for depressive symptoms Parents with elevated depressive symptoms reported higher levels of worry compared to those without ($p < 0.05$)

2020	Psychosocial screening and mental health in pediatric cancer: A randomized controlled trial	Barrera, Maru; Alexander, Sarah; Atenafu, Eshetu G.; Chung, Joanna; Hancock, Kelly; Solomon, Aden; Desjardins, Leandra; Shama, Wendy; Mills, Denise	Canada	Urban and Rural	Outpatient (subspecialty)	8-16	Maternal, Paternal	122 caregivers (98 female, 24 male)	Randomized Controlled Trial	<ul style="list-style-type: none"> Caregivers completed the Psychosocial Assessment Tool (PAT) and Hospital Anxiety and Depression Scale (HADS) 2-4 weeks after child's cancer diagnosis and were randomized into either intervention (clinical care team received PAT results) or control group Caregivers completed HADS and PAT 6 months later 	HADS	<ul style="list-style-type: none"> No significant difference was found in caregiver depression symptoms between the intervention and control groups at 6 months overall At 6 months, caregivers in the intervention group showed improvement in depression scores compared to the control group when their psychosocial risk was high near diagnosis
2020	Rates of depression and anxiety in Italian patients with cystic fibrosis and parent caregivers: Implementation of the Mental Health Guidelines	Sonia Graziano; Barbara Spano; Fabio Majo; Dario Righelli; Lucidi Vincenzina; Alexandra Quittnerf; Paola Tabarini	Italy	Not specified	Outpatient (subspecialty)	0-17	Maternal, Paternal	186 caregivers (117 mothers, 69 fathers)	Descriptive	<ul style="list-style-type: none"> Caregivers of children diagnosed with CF were approached, consecutively, during routine clinic visits Participants completed the screening tools by paper and pencil via self-report Psychologist scored and interpreted the results Elevated scores were addressed systematically, and supportive interventions and referrals were provided, if necessary, according to the guidelines 	PHQ-9 GAD-7 questionnaire	<ul style="list-style-type: none"> Elevated symptoms of depression were found in 61% of mothers (N = 72), and 49% of fathers (N = 34) 7% of mothers and no fathers endorsed suicidal ideation
2021	From Planning to Implementation: Creating and Adapting Universal Screening Protocols to Address Caregiver Mental Health and Psychosocial Complexity	Buchholz, Melissa; Ashby, Bethany; Costello, Lisa; Ehmer, Amy; Serrano, Verenea; von Schulz, Jonna; Wolcott, Catherine; Talmi, Ayelet	USA	Not specified	Outpatient (primary care)	Not specified	Maternal	14660 mothers	Descriptive	<ul style="list-style-type: none"> A screening process was developed for 3 primary care clinics within one hospital system Screening workflows were developed and included processes for medical providers to review and discuss screening results with families, determine how and when to access the integrated behavioral health (IBH) team during a family's visit, and documentation of screening results and recommendations Four main intervention strategies were implemented across all three clinics to address caregiver needs identified through screening Early childhood behavioral health via Healthy Steps; behavioral health consultation in addition to connecting the family with community mental health resources, short term behavioral health therapy sessions, and care coordination 	Internally developed 14-question Screen	<ul style="list-style-type: none"> Child health clinic: 6.1% screened positive in the psychosocial adversity section of screener (includes caregiver mental health concerns) Young Mother's Clinic: 8.7% screened positive in the psychosocial adversity section Special Care Clinic: 13.1% endorsed items in the psychosocial adversity section Child Health and Special Care Clinics: elevated/positive caregiver screenings yielded increased IBH intervention when compared to screenings that were not elevated/positive Caregivers were referred to community mental health 245 times in the Child Health Clinic and 44 times in the Special Care Clinic)

2021	Developmental and Behavioral Problems of Preschool-Age Children with Chronic Rheumatic Diseases	Tuba Çelen Yoldas; Semanur Özdel; Jale Karakaya; Mehmet Bülbül	Turkey	Not specified	Outpatient (sub-specialty & primary care)	1.5-5.9	Maternal	91 mothers	Cross-sectional	<ul style="list-style-type: none"> • 46 children with a diagnosis of familial Mediterranean fever (FMF) or juvenile idiopathic arthritis (JIA) were included in the case group • Comparison group included 45 participants recruited from general pediatric outpatient clinics for well-child visits 	<p>State-Trait Anxiety Inventory (STAI)</p> <p>BDI</p>	<ul style="list-style-type: none"> • Maternal anxiety scores were associated with internalizing ($p = 0.002$) and total problems ($p = 0.003$) in children with FMF
2021	Communicative Environmental Factors Including Maternal Depression and Media Usage Patterns on Early Language Development	Celen Yoldas, Tuba Ozmert, Elif Nursel	Turkey	Not specified	Outpatient (sub-specialty & primary care)	1-3.5	Maternal	101 mothers	Case-control	<ul style="list-style-type: none"> • 51 children with a diagnosis of language delay were included in the case group • Comparison group included 59 children with typical development • Developmental pediatrician evaluated general and language development of all children • Maternal depressive symptoms, media usage, and other risk factors were assessed 	<p>BDI</p>	<ul style="list-style-type: none"> • Maternal depression scores, duration of TV viewing, background TV were higher in the children with language delay compared to control group ($p < 0.05$) • The total amount of screen viewing (mean 4.1 h) and duration of TV viewing (mean 2.9 h) were higher among children with mothers whose depressive symptoms were above the cut-off ($p = 0.015$ and $p = 0.018$, respectively) • Mothers with depressive symptoms under the cut-off also preferred screen for educational purposes and entertainment, mothers with depressive symptoms above the cut-off mostly aimed to keep their child occupied (57.1% vs 21.2%) ($p = 0.011$)
2021	Prevalence of depression and anxiety among mothers of children with neuro-developmental disorders at a tertiary care centre, Puducherry	Nousheen Fatima; Palanivel Chinnakali; Sathish Rajaa; Vikas Menon; Nivedita Mondal; Venkatesh Chandrasekaran	India	Not specified	Outpatient (tertiary-care center)	Range not specified, mean 6.9	Maternal	120 mothers	Descriptive	<ul style="list-style-type: none"> • Mothers of children with selected neuro-developmental disorder (epilepsy, cerebral palsy, intellectual disability, attention deficit hyperactivity disorder, and autism spectrum disorder) attending follow-up clinics for their children were evaluated for depression and anxiety through two questionnaires • Those with screens above the cut off were then evaluated with the MINI International Neuropsychiatric Inventory to confirm diagnosis of depression and anxiety 	<p>PHQ-9</p> <p>Generalized Anxiety Disorder-7 (GAD-7) questionnaire</p> <p>MINI International Neuropsychiatric Inventory</p>	<ul style="list-style-type: none"> • 52 mothers were screened positive for depression and 46 (37.5%, 95%CI 29.2–46.4) met diagnostic criteria on the MINI International Neuropsychiatric Inventory • 91 mothers were screened positive for anxiety and 52 (43.3%, 95% CI 34.7–52.3) met diagnostic criteria on the MINI International Neuropsychiatric Inventory

2021	Social needs screening during the COVID-19 pandemic	Rachel Mayo; Tamara Kliot; Rebecca Weinstein; Mutiat Onigbanjo; Rebecca Carter	USA	Not specified	Outpatient (general)	0-21	Not specified	328 caregivers	Descriptive	<ul style="list-style-type: none"> • Callers collected data from their telephone conversations with families while using the screening tool • Resident physician and medical student volunteers performing phone screening completed a 1-h training session • At the time of phone screening, applicable resources were provided to families over the phone 	Adapted from the Safe Environment for Every Kid (SEEK) Parent Questionnaire-R (PQ-R)	<ul style="list-style-type: none"> • 53% of the patients' guardians answered the screener's phone calls • Depression symptoms were identified in 18% of those screened • 81% of caregivers identified with depression symptoms, identified this as a new need during COVID
2021	Systematic depression and anxiety screening for patients and caregivers: implementation and process improvement in a cystic fibrosis clinic	Goetz, D. M., Frederick, C., Savant, A., Cogswell, A., Fries, L., Roach, C., Shea, N., Borowitz, D., & Smith, B.	USA	Not specified	Outpatient (sub-specialty)	Not specified	Not specified	Not specified	Quality Improvement	<ul style="list-style-type: none"> • Year 2 of project: All caregivers of children with CF < 18 were screened at the same time as patient screening • The review of the caregiver screening was completed and referral for further evaluation outside of CF clinic was recommended if PHQ-2 was positive, with a handout of resources given to all caregivers with elevated screens on the back of the screening form • Year 3: caregivers were randomized to receive either the PHQ-2 or PHQ-9 and were screened for anxiety • Year 4: All caregivers were screened with the PHQ-9 	PHQ-2 PHQ-9 GAD-7	<ul style="list-style-type: none"> • Year 2: 2% of caregivers screening positive for symptoms of depression • Year 3: The PHQ-9 was more frequently positive (18.6%) vs PHQ-2 (12%), suggesting the PHQ-9 was more sensitive • Annual caregiver screening rates were >95% • Screening caregivers for depression and anxiety was generally well accepted • 56% agreed and 6% disagreed that the CF center should be responsible for caregiver depression assessment and treatment

Table 2: Follow-Up Models

Year	Title	Author	Referral Process	Follow Up Mechanism	Follow Up Results
1999	Impact of screening for maternal depression in a pediatric clinic	Needleman, R.; Walders, N.; Kelly, S.; Higgins, J.; Sofranko, K.; Drotar, D.	<ul style="list-style-type: none"> • Pediatric social workers rated mother's degree of depression clinically then administered the CES-D • Social workers then decided whether or not to refer mothers for further mental health assessment and treatment 	<ul style="list-style-type: none"> • Follow-up calls were made 1-6 months following referral to assess completion of referrals 	<ul style="list-style-type: none"> • 26/44 mothers referred for mental health assessment and treatment accepted the referral (59%) • 3/26 of those who accepted referrals reported attending the recommended appointment on follow-up (12%)
2007	Screening for maternal depression in a low education population using a two item questionnaire	Cutler, C. B.; Legano, L. A.; Dreyer, B. P.; Fierman, A. H.; Berkule, S. B.; Lusskin, S. I.; Tomopoulos, S.; Roth, M.; Mendelsohn, A. L.	<ul style="list-style-type: none"> • Mothers who screened positive on either the PHQ-2 or EDPS were referred to a social worker for further assessment 	<ul style="list-style-type: none"> • Research staff contacted mothers by phone 3 months following referral to determine whether or not further assessment had taken place 	<ul style="list-style-type: none"> • Of the 26.6% of mothers who screened positive on at least one screening instrument, 88% accepted a referral for further mental health assessment • Researchers were able to reach 68.2% of referred mothers by phone at follow up of whom 26.7% reported that the recommended assessment had taken place
2013	Building healthy children: evidence-based home visitation integrated with pediatric medical homes	Paradis, H. A.; Sandler, M.; Manly, J. T.; Valentine, L.	<ul style="list-style-type: none"> • Families in the treatment (BHC) group received behavioral health services provided by pediatric social workers and outreach workers at a series of home visits • Mothers in the BHC group who screened positive for depressive symptoms were referred for interpersonal therapy (IPT) • Control families received referral to community services only 	<ul style="list-style-type: none"> • All enrolled families were evaluated at baseline and at 12, 24, 36, and 48-months w/ measures of socioemotional and familial functioning, child development, and parent-child interaction 	<ul style="list-style-type: none"> • 128 mothers in the BHC group who exhibited depressive symptoms were referred for IPT • At follow up, 60% of those referred for IPT were engaged in therapy, had achieved their treatment goals, and reported reduced depressive symptoms
2015	Pediatric-based intervention to motivate mothers to seek follow-up for depression screens: The Motivating Our Mothers (MOM) trial	Fernandez y Garcia, E.; Joseph, J.; Wilson, M. D.; Hinton, L.; Simon, G.; Ludman, E.; Scott, F.; Kravitz, R. L.	<ul style="list-style-type: none"> • Mothers in the intervention group received office-based written and verbal targeted depression education and motivational messages encouraging further assessment as well as a semi structured telephone "booster" 2 days later • Mothers in the control group received non-specific written and verbal messages with an attention control telephone survey 2 days later • Both groups received a list of depression care resources 	<ul style="list-style-type: none"> • Up to 6 attempts were made to contact mothers by telephone at 2 week and 8 weeks post-intervention in order to determine how many mothers had attempted to contact one of the provided resources 	<ul style="list-style-type: none"> • Despite 6 contact attempts, 10 intervention and 9 control mothers were lost to follow-up • 73.8% of mothers in the intervention group reported trying to contact one of the provided resources compared to 53.5% of control mothers

Figure 1: PRISMA Flow Diagram

