

# BMJ Open Utility of screening for adverse childhood experiences (ACE) in children and young people attending clinical and healthcare settings: a systematic review

Sara Cibralic <sup>1</sup>, Mafruha Alam,<sup>1</sup> Antonio Mendoza Diaz,<sup>2</sup> Susan Woolfenden,<sup>3,4</sup> Ilan Katz,<sup>5</sup> Dimitra Tzioumi,<sup>6,7</sup> Elisabeth Murphy,<sup>7</sup> April Deering,<sup>7</sup> Lorna McNamara,<sup>7</sup> Shanti Raman,<sup>8</sup> Valsamma Eapen <sup>2,9</sup>

**To cite:** Cibralic S, Alam M, Mendoza Diaz A, *et al.* Utility of screening for adverse childhood experiences (ACE) in children and young people attending clinical and healthcare settings: a systematic review. *BMJ Open* 2022;**12**:e060395. doi:10.1136/bmjopen-2021-060395

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2021-060395>).

Received 21 December 2021  
Accepted 05 August 2022



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

## Correspondence to

Sara Cibralic;  
s.cibralic@unsw.edu.au

## ABSTRACT

**Objective** To examine and synthesise the literature on adverse childhood experience (ACE) screening in clinical and healthcare settings servicing children (0–11) and young people (12–25).

**Design** A systematic review of literature was undertaken.

**Data source** PsycInfo, Web of Science, Embase, PubMed and CINAHL were searched through June 2021. Additional searches were also undertaken.

**Eligibility criteria** English language studies were included if they reported results of an ACE tool being used in a clinical or healthcare setting, participants were aged between 0 and 25 years and the ACE tool was completed by children/young people or by parents/caregivers/clinicians on behalf of the child/young person. Studies assessing clinicians' views on ACE screening in children/young people attending health settings were also included.

**Data extraction and synthesis** Two independent reviewers extracted data and assessed for risk of bias using the Mixed Methods Appraisal Tool. Results were synthesised qualitatively.

**Results** Initial searches identified 5231 articles, of which 36 were included in the final review. Findings showed that the most commonly used tool for assessing ACE was the ACE questionnaire; administering ACE tools was found to be feasible and acceptable; there were limited studies looking at the utility, feasibility and acceptability of assessing for ACE in First Nations people; and while four studies provided information on actions taken following ACE screening, no follow-up data were collected to determine whether participants accessed services and/or the impact of accessing services.

**Conclusion** As the evidence stands, widespread ACE screening is not recommended for routine clinical use. More research is needed on how and what specific ACE to screen for and the impact of screening on well-being.

**PROSPERO registration number** University of York Centre for Reviews and Dissemination (CRD42021260420).

## INTRODUCTION

Adverse childhood experiences (ACE) are stressful experiences that occur during childhood and either have a direct impact on the child (ie, physical, emotional and sexual

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Broad inclusion criteria and five different search strategies increased the likelihood of identifying all relevant literature.
- ⇒ All included studies and risk of bias assessments were reviewed independently by two reviewers.
- ⇒ The findings and the generalisability *need to be interpreted with caution* due to the inclusion of only English language studies.

abuse; physical and emotional neglect) or impact the environment (eg, domestic violence, divorce) in which they live.<sup>1</sup> Approximately 61% of adults report having experienced ACE,<sup>2</sup> with higher prevalence rates reported in priority populations.<sup>3</sup> In particular, First Nations people have been shown to experience higher rates of ACE<sup>4 5</sup> which has been attributed to collective, historic and intergenerational trauma and continued experiences of racism.<sup>5 6</sup>

## Increasing awareness of the impact of ACE

Immediate and long-term outcomes of exposure to ACE have been documented, with research showing that ACE can result in child learning, mental health and physical health problems<sup>7 8</sup> as well as adult health issues such as cancer and problematic drug use.<sup>9</sup> Furthermore, ACE have been shown to have an intergenerational effect<sup>10 11</sup>; often co-occur, necessitating attention to cumulative exposures<sup>12 13</sup>; and are costly, with the economic cost of ACE in the United States of America (USA) estimated at \$428 billion across a person's lifetime.<sup>14</sup>

Given the negative effects associated with ACE, a call for routine ACE screening in health settings was made as early as 2004 with Felitti<sup>15</sup> arguing that comprehensive biopsychosocial

screening (ie, medical assessments together with ACE screening) of all patients could reduce health service utilisation. Felitti<sup>15</sup> reported that biopsychosocial screening in an adult population led to a 35% decrease in doctor office visits the following year, compared with 11% reduction in visits when only a biomedical approach was used. Over the last decade, others have also supported the uptake of routine ACE screening in health settings (eg, ref 16 17), with national governments and professional organisations introducing policies focused on increasing ACE identification and intervention.<sup>18–20</sup> In the USA, for example, the American Academy of Pediatrics policy statement on trauma-informed care recognises the benefits of ACE screening.<sup>21</sup> However, the report also acknowledges the potential risk associated with ACE screening (eg, lack of standardised screening tools, available tools to identify factors that have been derived from epidemiological studies rather than outcomes at the individual level). Further, it recommends that if ACE screening is undertaken then resilience screening occurs concurrently to buffer identified stressors and provide a holistic understanding of the child's health.<sup>21</sup> In Philadelphia (USA), an ACE task force was developed which applied a community-based approach (eg, increased screening, intervention and community engagement) as a means of addressing ACE in the community.<sup>18</sup> In Australia, the Royal Australasian College of Physicians position statement on inequalities in child health<sup>22</sup> recommended that paediatricians are trained and provided materials to address child health inequities, including comprehensive biopsychosocial assessments. Most recently, the Australian Capital Territory State Government introduced universal ACE screening (using an adoption of the Center for Youth Wellness ACE Questionnaire) as part of their Kindergarten Health Check Program—a screening programme for all children entering kindergarten.<sup>19 23</sup>

### Assessing for ACE in health settings

In addition to the growing support for the identification of ACE there has also been growing opposition to ACE screening,<sup>24</sup> and Dube<sup>25</sup> has suggested that the uptake of ACE screening in health settings with child and young people is not widespread. Research examining paediatricians' views on ACE screening has identified several barriers to ACE screening including limited knowledge and training on the subject and practitioner discomfort.<sup>26–31</sup> Some authors, such as Finkelhor,<sup>24</sup> have cautioned against universal screening by arguing that the evidence base for the benefits of ACE screening (eg, early identification and intervention) has not yet been fully established, warning about prospective costs of assessing for ACE such as potentially retraumatising, overdiagnosing and overtreating children and young people. Indeed, a recent scoping review undertaken by Ford *et al*,<sup>32</sup> exploring the evidence base for routine ACE screening in health settings among adult populations, found that there was limited research looking at the effectiveness of retrospective ACE enquiry among adults.

Despite the lack of evidence, the authors concluded that the available literature suggested that service users and practitioners were positive about routine ACE enquiry, with some practitioners indicating that assessing for ACE improved service user and provider relationships.<sup>32</sup> Less is known, however, about routine clinical enquiry of ACE with children and young people, especially those from priority populations such as First Nations children, young people and their families.

### Aims

A narrative systematic review approach was used to examine and synthesise the literature on ACE screening in routine clinical practice with children (0–11 years), young people (12–25 years) and their families. This review focused specifically on ACE and not social determinants of health (SDH). SDH, which can also have negative impacts on an individual's health, refer to the conditions in which people are born, grow, live, work and age, such as poverty,<sup>33</sup> while ACE are traumatic events that occur during childhood in the microenvironment of the child. If studies focused on ACE but also screened for some SDH they were included in this review; however, when possible, only the data on ACE were interpreted.

The systematic review aimed to address the following questions in routine clinical practice with children (0–11), young people (12–25) and their families:

- ▶ What is the extent to which an ACE tool has been included?
- ▶ What is the feasibility, acceptability and validity of routine ACE screening?
- ▶ What are the benefits and risks of using ACE scores in the provision of healthcare?
- ▶ Has an ACE tool been administered to screen First Nations populations?
- ▶ What responses are implemented following ACE screening?

### METHOD

#### Search strategy

#### Research evidence

Five search strategies were implemented to identify relevant research studies available up to June 2021 (no limits were placed in terms of earliest possible starting date). First, interdisciplinary research databases (PsycInfo, Web of Science, Embase, PubMed and CINAHL) were searched concurrently for entries containing any combination of the following terms: 'Adverse childhood experience questionnaire' OR 'Adverse childhood experience tool' OR 'Adverse childhood experience measure' OR 'Adverse childhood event\*' OR 'ACE score\*' OR 'childhood adversit\*' OR 'childhood trauma' AND 'clinical setting' OR 'hospital setting' OR 'hospital' OR 'health service\*' OR 'health care' OR 'mental Health care' OR 'p?diatric care' OR 'P?diiatrics'. The searches were then limited by age (0–25 years) and to articles published in English. Second, a connected papers<sup>34</sup> search was conducted for articles selected for the review. Third, the

'cited by' option available on some databases (eg, Google Scholar) was used to manually search articles that had referenced the articles selected for this review. Fourth, internet searches for grey literature were conducted using the above-mentioned search terms alongside focused searches on key websites including the Australian Institute of Family Studies, New South Wales Government Agency for Clinical Innovation, Australian Institute of Health and Welfare and the National Institute for Health and Care Excellence. Fifth, the reference lists of articles selected for this review as well as the reference lists of relevant previous reviews conducted on this topic<sup>9 32 35</sup> and relevant grey literature were searched manually. As per the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines,<sup>36</sup> online supplemental table 1 provides an example of the search strategy approach.

### Inclusion and exclusion criteria

Articles were included for the full-text review if: (1) an ACE screening tool (ie, a questionnaire asking about history of abuse and neglect, parental substance use or mental illness, parental incarceration, domestic violence or parental divorce) was used in a clinical (eg, paediatrician or general practitioner clinics) or healthcare setting (eg, hospital settings such as acute care units); (2) the study sample included participants aged between 0 and 25 years, or, for articles that included some participants over the age of 25 years, the mean age was 25 years or less; (3) the ACE tool was completed by children/young people or by parents/caregivers/clinicians on behalf of the child/young person; and (4) the article was published in English. Studies were also included if they were assessing clinicians' views on screening for ACE in children/young people attending health settings. Studies which focused primarily on ACE screening but also included SDH (ie, economic and social factors) were included if they met all the inclusion criteria. Studies which focused primarily on SDH (eg, poverty, food insecurity, housing, transport) were excluded as the main focus of the review was on ACE and although both constructs are interconnected, they have slightly different focuses and require different screening. Furthermore, studies which evaluated ACE screening when they were completed as part of a trauma-informed care approach, for example, were also included if they met all the inclusion criteria. In these cases, care was taken to only interpret results relating to ACE screening. Articles were excluded if: (1) they were not available in English; (2) they were not data based (eg, books, theoretical papers, reviews); (3) they were unpublished dissertations/theses; (4) they only examine the impact of one ACE (eg, divorce); (5) their focus was on adults (>25 years) reporting on their own ACE history; or (6) they were population-level surveillance studies.

### Quality assessment and data analysis

The Mixed Methods Appraisal Tool (MMAT)<sup>37</sup> was used to assess the quality of studies included in the review. The MMAT was chosen as it allows for the assessment of

methodological quality of qualitative research, randomised controlled trials, non-randomised studies, quantitative descriptive studies and mixed-methods studies. The quality of studies is determined based on five sources for each study category. For quantitative randomised controlled trials, for example, quality is determined based on (1) randomisation; (2) group comparability; (3) complete outcome data; (4) blinding of assessors; and (5) participant intervention adherence. Each outcome is assessed and responded to by the reviewer with a 'yes', 'no' or 'can't tell'. The 'can't tell' option is used when the paper does not provide sufficient information for the reviewer to assign a 'yes' or 'no'. Two reviewers reviewed all included studies. As MMAT discourages the calculation of an overall quality score, an overall quality score was not calculated. Consensus on the quality of studies was reached through discussion (see [table 1](#) for quality assessments of the included studies).

### Patient and public involvement

Patients and the public were not involved in the design and conduct of this review.

## RESULTS

[Figure 1](#) presents an overview of our search strategy and number of articles identified at each stage. The initial database search resulted in a total of 5231 articles (1546 from PsycInfo, 67 from Web of Science, 2707 from Embase, 865 from PubMed and 46 from CINAHL). After duplicates were excluded a total of 4913 articles remained. A further 4685 articles were excluded based on title and abstract screening, resulting in 259. Twenty-five articles could not be located, leaving in 234 articles to be read in depth. A further 19 relevant articles were identified through additional searches, resulting in a total of 253 that underwent full-text review. An additional 217 articles were excluded as they did not meet inclusion criteria. The remaining 36 articles met inclusion criteria and were included in the current review (see online supplemental table 2 for an overview of studies included in the review). Two reviewers (SC and MA) screened all article titles and abstracts and completed full-text reviews and quality assessments. Disagreements regarding study selection and quality assessment were discussed and resolved. A third reviewer (AMD) was available in case disagreements could not be resolved by the primary reviewers. Inter-rater reliability (calculated by dividing the total number of agreements by the total number of ratings) for title/abstract and full-text screening were 95% and 80%, respectively.

### Overview of included studies

Online supplemental table 2 presents an overview of studies included in the review. Studies that fit the inclusion criteria included those conducted to assess for vulnerable children who would benefit from early intervention and prevalence studies identifying vulnerable populations in medical settings (ie, cross-sectional

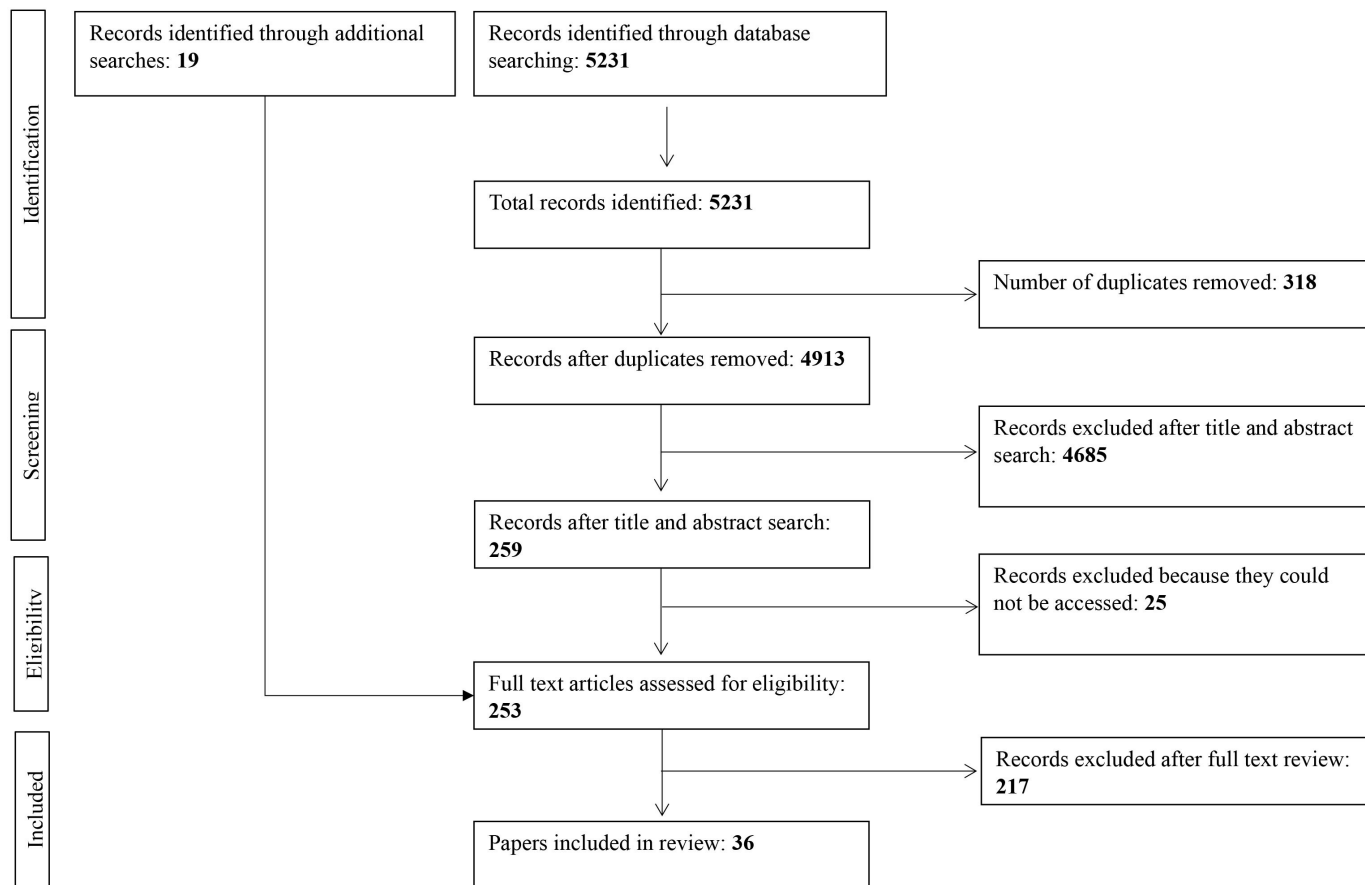
**Table 1** Quality assessment using the Mixed Methods Appraisal Tool (2018)

Citation	Screening questions		Qualitative studies					Is there coherence between qualitative data sources, collection, analysis and interpretation?
	Are there clear research questions?	Do the collected data allow to address the research questions?	Is the qualitative approach appropriate to answer the research question?	Are the qualitative data collection methods adequate to address the research question?	Are the findings adequately derived from the data?	Is the interpretation of results sufficiently substantiated by data?		
Conn <i>et al</i> <sup>42</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Chokshi and Skjoldager <sup>58</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
<b>Quantitative descriptive</b>								
	Is the sampling strategy relevant to address the research question?	Is the sample representative of the target population?	Are the measurements appropriate?	Is the risk of non-response bias low?	Is the statistical analysis appropriate to answer the research question?			
Baiden <i>et al</i> <sup>56</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Basu and Isaacs <sup>5</sup>	Yes	Yes	No	No	No	No	Yes	
Benarous <i>et al</i> <sup>39</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Bora <i>et al</i> <sup>31</sup>	Yes	Yes	No	No	No	No	Yes	
Bottino <i>et al</i> <sup>59</sup>	Yes	Yes	No	No	No	No	Yes	
Burke <i>et al</i> <sup>7</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Choi <i>et al</i> <sup>40</sup>	Yes	Yes	No	No	No	No	Yes	
Chung <i>et al</i> <sup>41</sup>	Yes	Yes	No	Can't tell	Yes	Yes	Yes	
DiGangi and Negriff <sup>43</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Duddu <i>et al</i> (2016) <sup>78</sup>	Yes	Yes	No	Yes	Yes	Yes	Yes	
Isohookana <i>et al</i> <sup>44</sup>	Yes	Yes	No	Yes	Yes	Yes	Yes	
Isohookana <i>et al</i> <sup>45</sup>	Yes	Yes	No	Yes	Yes	Yes	Yes	
Jones <i>et al</i> <sup>30</sup>	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	
Kaess <i>et al</i> <sup>46</sup>	Yes	Yes	No	Yes	Yes	Yes	Yes	
Kerker <i>et al</i> <sup>27</sup>	Yes	Yes	No	Yes	Yes	Yes	Yes	
Koball <i>et al</i> <sup>48</sup>	Yes	Yes	No	No	No	No	Yes	
Marshall <i>et al</i> <sup>67</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Mehari <i>et al</i> <sup>51</sup>	Yes	Yes	No	Yes	Yes	Yes	Yes	
Park <i>et al</i> <sup>61</sup>	Yes	Yes	No	Can't tell	Yes	Can't tell	Yes	
Pope <i>et al</i> <sup>62</sup>	Yes	Yes	No	No	Yes	No	Yes	

Continued

Table 1 Continued

		Quantitative descriptive				
		Is the sampling strategy relevant to address the research question?	Is the sample representative of the target population?	Are the measurements appropriate?	Is the risk of non-response bias low?	Is the statistical analysis appropriate to answer the research question?
Rahman <i>et al</i> <sup>63</sup>	Yes	Yes	Yes	Yes	Yes	Yes
Wickramasinghe <i>et al</i> <sup>4 55</sup>	Yes	Yes	Can't tell	Yes	Yes	Yes
Popp <i>et al</i> <sup>29</sup>	Yes	Yes	No	Yes	No	Yes
Mahindroo <i>et al</i> <sup>60</sup>	Yes	Yes	No	Yes	No	Yes
Marchand <i>et al</i> (2005) <sup>79</sup>	Yes	Yes	No	Yes	Yes	Yes
Scott <i>et al</i> <sup>54</sup>	Yes	Yes	Can't tell	Yes	Can't tell	Yes
Stork <i>et al</i> <sup>28</sup>	Yes	Yes	No	Yes	No	Yes
Liu <i>et al</i> <sup>49</sup>	Yes	Yes	No	Yes	Yes	Yes
Grasso <i>et al</i> <sup>8</sup>	Yes	Yes	Can't tell	Yes	No	Yes
Mixed methods						
		Is there an adequate rationale for using a mixed-methods design to address the research question?	Are the different components of the study effectively integrated to answer the research question?	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?
Barnett <i>et al</i> <sup>38</sup>	Yes	Yes	Yes	Yes	Yes	Yes
Bright <i>et al</i> <sup>26</sup>	Yes	Yes	Yes	Yes	Yes	No
Wickramasinghe <i>et al</i> <sup>4 55</sup>	Yes	Yes	Yes	Yes	No	No
Kia-Keating <i>et al</i> <sup>47</sup>	Yes	Yes	Yes	Yes	Yes	No
Marie-Mitchell <i>et al</i> <sup>50</sup>	Yes	Yes	Yes	Yes	Yes	No
The 'Can't tell' response category means that the authors do not report appropriate information to answer 'Yes' or 'No'.						



**Figure 1** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram of included studies.

and file review studies). Of these studies, 18 were cross-sectional, 6 were mixed methods, 6 were prospective file reviews, 4 were retrospective file reviews and 2 were qualitative. Twenty-three studies were undertaken in the USA, 4 in Australia, 3 in Canada, 2 in Finland, 1 in Germany, 1 in New Zealand, 1 in France and 1 in the UK. Twenty-four studies used a tool to assess for ACE; 2 studies examined the feasibility while 14 looked at the acceptability of routine ACE screening in health settings; 6 studies specified that they had participant samples that identified as First Nations; 4 studies provided information on actions taken following ACE screening; and no studies assessed the benefits or risks of using ACE scores in the provision of healthcare services.

### Screening for ACE in health settings

Twenty-four studies included in the review used a tool to assess for ACE as part of clinical enquiry.<sup>4 5 7 8 38–57</sup> Of these, 3 studies also assessed for SDH.<sup>8 40 52</sup> Fourteen studies were undertaken in the USA, 3 in Canada, 3 in Australia, 2 in Finland, 1 in Germany and 1 in France. Eight studies were conducted in primary care medical centres, 5 in paediatric clinics, 4 in inpatient units, 4 in child and adolescent mental health service settings, 1 in a hospital, 1 in a collaborative practice model health setting and 1 in a residency (ie, postgraduate training) practice. Samples varied from 15 to 9329 participants, with mean ages ranging from 5 months (parents identified infants'

ACE exposure) to 24 years. The mean number of ACE assessed for was 7, with most studies using similar core domains (ie, physical abuse, sexual abuse, emotional abuse, emotional neglect, physical neglect, single parent, domestic violence, substance abuse, mental illness, incarceration).

The most commonly used tool for screening ACE was the 'ACE questionnaire', originally developed as part of the seminal ACE study for use with adults,<sup>1</sup> with 8 studies using a 10-item version,<sup>5 38 39 42 43 47 48 53</sup> 3 using a 9-item version,<sup>7 51 54</sup> 2 using a 14-item version<sup>4 55</sup> and 1 using a 7-item version.<sup>41</sup> For most studies using the ACE questionnaire, a score of  $\geq 4$  ACE was used to indicate high ACE exposure. Of the studies that did not use a version of the ACE questionnaire, 2 used the Post-Traumatic Stress Disorder section of the Schedule for Affective Disorder and Schizophrenia for School-Age Children Present and Lifetime (to assess for domestic violence and exposure to sexual and/or physical abuse) and the European Addiction Severity Index (to assess parental employment status)<sup>44 45</sup>; 2 used the interRAI Child and Youth Mental Health Assessment; 1 used an adapted version of the Traumatic Event's Screening Inventory<sup>40</sup>; 1 used the Center for Youth Wellness ACE Questionnaire (17-item child and 19-item teen)<sup>49</sup>; 1 used the Traumatic History Profile<sup>8</sup>; 1 developed and used the Whole Child Assessment which included ACE questions<sup>50</sup>; and 1 employed

seven measures including the Childhood Trauma Questionnaire-Short Form, Trauma Experiences Checklist, Parental Nurturance Scale, Parental Harsh Discipline Scale, Violence Exposure Scale, Friends' Delinquent Behavior Scale and School Connectedness Scale.<sup>52</sup>

### Feasibility, acceptability and validity of routine ACE enquiry

#### Feasibility

Two studies examined the feasibility of ACE questionnaire administration in a health setting.<sup>47 49</sup> Both studies were conducted in the USA. One study used the ACE 10-item questionnaire (completed by parents of infants; n=151, infant *M* age=5.77 months, SD=1.98, 49.7% male) while the other used the ACE 17-item (completed by parents of children; n=114, child *M* age=8.4 years, SD=2.5, 57% male) and 19-item questionnaires (completed by adolescents; n=49, *M* age=14.7 years, SD=1.3, 40.8% male). Both studies found administering the ACE questionnaire to be highly feasible with 92%<sup>47</sup> and 97%<sup>49</sup> of potential participants completing the questionnaire. Given the small number of studies looking at the administration of ACE in health settings and that both studies were undertaken in the USA, further research is indicated for generalisability.

#### Acceptability

##### *Patient acceptability of ACE screening*

Two studies<sup>42 50</sup> were identified that examined caregivers' acceptability of ACE screening and<sup>58</sup> 1 study had looked at adolescents' acceptability of ACE screening. All 3 studies were conducted in the USA. The 2 studies examining caregiver (combined n=45 caregivers) acceptability<sup>42 50</sup> showed that caregivers were willing to participate in ACE screening when the screening pertained to their child/children. Both studies also indicated that some caregivers were less comfortable about discussing their own ACE, noting that they questioned how their history was relevant to their child's health, that recalling past events may be emotionally difficult and/or retraumatising,<sup>42</sup> and raised concerns about feeling uncomfortable if their doctor knew about their socioeconomic factors and/or stressors.<sup>50</sup> Conn *et al*<sup>42</sup> noted that a way to reduce parental discomfort may be to adopt a patient-centred, trauma-informed approach that promotes support and trust in the patient-provider relationship when screening for parental ACE. Parents in their study also suggested alternate methods including private conversations with guidance on the importance of prenatal ACE for their child's care and emphasising the choice regarding completing screening.

Chokshi and Skjoldager<sup>58</sup> were the only team to explore adolescents' (n=16) perspectives on ACE screening. Results showed that adolescents believed that a primary care setting was suitable for discussing ACE, indicating that such information would increase a service provider's understanding of their patients and help them through discussions regarding adversities.

Despite limitations including small sample sizes, convenience sampling and that all the studies were conducted

in the USA, available evidence provides preliminary support for patient acceptability of ACE screening in health settings.

##### *Health practitioner knowledge and acceptability of ACE screening*

Eleven studies were identified that explored health practitioner knowledge and acceptability of ACE screening.<sup>26-31 47 49 50 55 59</sup> Ten studies were undertaken in the USA while one was conducted in Australia. Most studies used surveys to capture practitioners' views. Sample sizes ranged from 5 to 605 participants (qualitative studies had smaller sample sizes).

Overall, the results of these studies indicated that practitioner awareness and acceptability of, and screening for, ACE had increased over the past decade. Kerker *et al*,<sup>27</sup> for example, reported that only 4% of their sample of 302 paediatricians routinely asked about ACE in 2013, whereas by 2020 studies indicated ACE screening rates ranged from 33% to 89%.<sup>29-31</sup> Results also showed that practitioners recognised the value of ACE screening and indicated several perceived benefits, including increasing therapeutic alliance, clarifying the connection between mental and physical health, highlighting the importance of holistic care, identifying especially vulnerable children, assisting with case conceptualisation, improving treatment planning and improving patients' understanding of certain relationships (eg, parent-child and provider-patient relationship). Most studies also explored practitioners' perceptions of barriers to screening. Commonly identified barriers included limited training on the topic, access to screening tools, access to community resources postscreening and inadequate time. Other less common barriers identified included not seeing patients on a regular basis and discomfort asking ACE questions.

In sum, these studies provide support for practitioner acceptability of ACE screening in healthcare settings. Strengths of this body of research include that several studies have been conducted on the topic and that a variety of health providers were included in study samples (eg, paediatricians, social workers, wellness navigators). Limitations include that nearly all studies were undertaken in the USA and that nearly half of the studies had samples that were not representative of their target populations (see [table 1](#) and online supplemental table 2), reducing the generalisability of the findings. Furthermore, though practitioners identified several benefits to screening, no study included a follow-up to examine the impacts of routine inquiry.

#### Validity

None of the identified studies examined the validity of the ACE screening tools.

#### Risks and benefits of ACE screening

As discussed in the previous section, several studies have gathered information on the *perceived* benefits and risks of screening for ACE.<sup>26-31 42 47 49 50 55 58 59</sup> No studies have, however, examined what risks and benefits were

experienced by children and young people who have undergone ACE screening (eg, how did screening impact uptake of services and any consequences).

### Screening for ACE in health settings with First Nations children, young people and their families

Six studies<sup>4 5 54 55 60 61</sup> specified that their participant samples included First Nations children (Māori children, Native American children and Aboriginal and Torres Strait Islander children). One study was conducted in the USA, 1 in New Zealand and 4 in Australia. Four studies<sup>5 54 60 61</sup> were retrospective file reviews reporting on the prevalence of ACE in their sample populations and two used clinician-completed ACE questionnaires, completed after child clinic visits using routinely collected data (eg, referral information, previous medical reports).<sup>4 55</sup> Of these, only 3 Australian studies segregated data based on ethnicity.<sup>4 5 55</sup> None of the studies administered the ACE tool directly to First Nations populations thus there is no evidence regarding the utility, feasibility or acceptability of administering ACE questionnaires to First Nations populations.

### Action taken following ACE screening

Only 4 studies provided information on action taken following routine ACE enquiry.<sup>4 38 47 60</sup> Two studies were conducted in the USA and 2 in Australia. Two were conducted in paediatric clinics, 1 in a community medical centre and 1 in a hospital. The percentage of children identified as in need of services ranged from 10%<sup>4</sup> to 53%.<sup>38</sup> Only 2 studies outlined the eligibility criteria for receiving services.<sup>47 55</sup> Wickramasinghe *et al*<sup>4</sup> reported that action was taken for participants with  $\geq 4$  ACE while those in Kia-Keating *et al*'s<sup>47</sup> study received access to services if an infant had 1+ ACE and/or parent had 2+ ACE. Neither study reported on the types of services accessed by participants. The 2 studies that did not report eligibility criteria for referrals did provide details on the services that participants were referred to.<sup>38 60</sup> In Barnett *et al*'s<sup>38</sup> study, participants were most frequently referred to insurance enrolment services, childcare and housing services. In Mahindroo *et al*'s<sup>60</sup> study, participants were referred to mental health services, Child FIRST or Child Protection, social workers, and alternative services or existing supports. None of the studies completed follow-ups thus the impact of accessing services or the percentage of participants who accessed services after referral is unknown.

## DISCUSSION

To our knowledge, this study is the first to have systematically reviewed literature on ACE screening in routine clinical practice with children, young people and their families. The review examined 36 studies in total to ascertain the process of ACE screening, feasibility, patient acceptability, health provider knowledge and acceptability, screening undertaken with First Nations populations and

evidence of the outcomes of ACE screening implementation. Our review found that there is insufficient evidence to advocate for routine use of ACE screening in clinical care involving children and young people.

The measure used most to screen for ACE in clinical and healthcare settings was the ACE questionnaire, with most studies using the 10-item version. As the ACE questionnaire was originally developed for research purposes,<sup>1</sup> it is problematic that different studies used different cut-offs to indicate low, medium or higher ACE exposure. For example, as mentioned above, Kia-Keating *et al*<sup>47</sup> used a score of 1+ while Wickramasinghe *et al*<sup>4</sup> used a score of  $\geq 4$  to signify high risk and need for enhanced support. The idea of a universal cut-off score for ACE is controversial with some suggesting that universal cut-offs indicate that all ACEs are created equally when research has shown that this is not the case.<sup>62 63</sup> Another concern is that additional factors such as the severity, timing and duration of ACE along with other SDH (eg, poverty) that can have a positive/negative impact on the way ACE are experienced are not taken into consideration (eg, age at which parents separated, whether it was amicable).<sup>64</sup> While the focus of this review was not on SDH, it is important to note that ACE and SDH are interconnected, and both can lead to adverse outcomes.<sup>65</sup> They do, however, have slightly different focuses and therefore need to be screened separately.<sup>66</sup> Though there are measures that combine the two variables, such as the Safe Environment for Every Kid (SEEK), often these measures have a stronger focus on one variable over the other (eg, SEEK has a stronger focus on SDH over ACE).<sup>67</sup> As versions of the ACE questionnaire developed for use in Felitti *et al*'s<sup>1</sup> original study appear to be the most popular questionnaire choice in child and youth settings, more research examining its utility in its current form in health settings is required.

While the available evidence supports the feasibility and acceptability of ACE screening in health settings, research is limited by the small number of studies conducted with patients (five studies) as well as lack of evidence about its feasibility and acceptability in specific patient groups such as the First Nations populations. The appropriateness of the items in the available questionnaires for use with First Nations populations will therefore need further examination.<sup>68–70</sup> In addition, research on the feasibility, acceptability and utility of ACE questionnaires in specific population groups is necessary before widespread use of these questionnaires as part of routine clinical screening.

No studies included in this review provided information on the outcomes of ACE screening. Though a handful of studies offered information on actions taken following screening for ACE (eg, referrals provided to services),<sup>4 38 47 60</sup> no study conducted a follow-up to determine the outcomes of these referrals. Thus, the benefits and risks of ACE screening to the patients are unknown. Reviews of grey and non-empirical literature, however, have suggested potential benefits and risks of screening.<sup>24 64 71–75</sup> A key benefit being early detection that could result in early intervention, which, given the



plasticity of the brain during childhood and adolescents, may have the greatest impact on well-being outcomes.<sup>71 74</sup> Another benefit was that screening increased practitioner knowledge of patient ACE, thereby improving their understanding and empathy and facilitating holistic care.<sup>72 73</sup> In contrast, commonly cited potential risks of screening for ACE included: (1) screening for adversity without also screening for protective factors may result in a one-sided view of a child's profile; (2) potential for harm, especially if administered by an untrained individual, including creating stigma, triggering unwarranted child protection investigations and creating opportunity costs by reducing time available for more beneficial assessments and/or activities; and (3) the possibility of creating expectations regarding help that cannot be fulfilled due to resourcing and overtreatment or undertreatment given that the ACE tools have not been validated.<sup>24 71 76</sup> Other factors to consider are the frequency at which to implement routine ACE screening and, given that guidelines and standards for screening for ACE have not yet been developed, whether screening practices comply with the WHO standards for screening implementation.<sup>71</sup>

In light of the findings that no study has examined the benefits of ACE screening and the potential dangers associated with screening, ACE screening may be considered ineffective and unethical.<sup>64</sup> This is especially the case if completed in isolation, as it runs the risk of reinforcing stigmatising and demoralising sections of the population already struggling.<sup>64</sup>

### Clinical and policy implications

The studies examined in this review have provided preliminary support for the feasibility and acceptability of ACE screening in health settings. Given that no studies have assessed the benefits or risks of screening for ACE in paediatric patients and their families, the implementation of widespread screening is not recommended. If ACE screening is to be undertaken, it should only be conducted at this time as an experimental procedure, until evidence of benefits and absence of harm have been established. This recommendation, however, should not be interpreted to mean that specific ACE should not be screened for in high-risk populations (eg, chronic pain sufferers<sup>77</sup>) or that ACE screening should not occur during comprehensive paediatric assessments.

### Strengths and limitations

This review had several strengths. First, using a systematic review strategy with broad inclusion criteria as well as five different search strategies increased the likelihood of identifying all relevant literature. Second, two reviewers reviewed all included studies and completed the risk of bias assessments, increasing the likelihood that all relevant factors were considered. Third, to our knowledge, it is the first review to have examined the utility of screening for ACE in children and young people attending clinical and healthcare settings. The review was also limited by several factors. First, searches were restricted to studies

written in the English language, reducing the generalisability of findings. Second, also negatively impacting the generalisability of findings, was that all included studies were conducted in high-income countries. Had studies written in a language other than English been included in the review, more studies from lower income countries may have been identified and this may have resulted in different outcomes. Third, the identified studies were limited by the lack of methodological diversity (ie, primarily file reviews and cross-sectional studies). Fourth, the quality assessment indicated that several studies had non-representative samples suggesting an increased risk of bias. Fifth, only studies looking at multiple ACEs were included in the review, and if studies examining only one type of ACE (eg, domestic violence) were to be included, the review results may have differed. Sixth, despite the broad search strategy, studies that fit the inclusion criteria but were not focused on an ACE framework may have been missed (eg, studies using a child maltreatment framework). This may have impacted the study outcomes.

### CONCLUSION

To conclude, this review found that research on the use of universal ACE screening with children and young people in health settings is still in its infancy. While there are promising attempts at incorporating screening and assessment of ACE into routine clinical assessments, there is insufficient evidence to recommend routine screening of ACE. More research with diverse populations, using more rigorous methodologies, and assessing the risk and benefits of assessment needs to be undertaken alongside opportunities for identifying strengths, trauma-informed intervention and supports, before widespread ACE screening is recommended. If ACE screening is undertaken, it should be done so only as an experimental procedure, until evidence of benefits and absence of harm have been established.

### Author affiliations

<sup>1</sup>Ingham Institute, Liverpool, New South Wales, Australia

<sup>2</sup>Department of Psychiatry, University of South Wales, Sydney, New South Wales, Australia

<sup>3</sup>Sydney Local Health District, Camperdown, New South Wales, Australia

<sup>4</sup>Department of Paediatrics, University of New South Wales, Sydney, New South Wales, Australia

<sup>5</sup>Department of Social Policy Research Centre, University of New South Wales, Sydney, New South Wales, Australia

<sup>6</sup>University of New South Wales, Sydney, New South Wales, Australia

<sup>7</sup>New South Wales Ministry of Health, St Leonards, New South Wales, Australia

<sup>8</sup>South Western Sydney Local Health District, Liverpool, New South Wales, Australia

<sup>9</sup>ICAMHS, South Western Sydney Local Health District, Liverpool, New South Wales, Australia

**Contributors** All authors (SC, MA, AMD, SW, IK, DT, EM, AD, LM, SR and VE) were involved in the conception and design of the study. SC and MA conducted the analyses and interpreted the data. SC wrote the first draft of the manuscript. MA, AMD, SW, IK, DT, EM, AD, LM, SR and VE contributed to the final draft. SC accepts full responsibility for the work and/or the conduct of the study and had access to the data. All authors (SC, MA, AMD, SW, IK, DT, EM, AD, LM, SR and VE) controlled the decision to publish.

**Funding** This research was funded by the New South Wales Ministry of Health (funding number: UNSW GRP0292402).

**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Ethics approval** This is a systematic review and thus ethical approval is not required.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available upon reasonable request.

**Supplemental material** This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

#### ORCID iDs

Sara Cibralic <http://orcid.org/0000-0003-1888-2956>

Valsamma Eapen <http://orcid.org/0000-0001-6296-8306>

#### REFERENCES

- Felitti VJ, Anda RF, Nordenberg D, *et al.* Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The adverse childhood experiences (ACE) study. *Am J Prev Med* 1998;14:245–58.
- Centers for Disease Control and Prevention. Preventing adverse childhood experiences, 2021. Available: [https://www.cdc.gov/violenceprevention/aces/fastfact.html?CDC\\_AA\\_refVal=https%3A%2F%2Fwww.cdc.gov%2Fviolenceprevention%2Ffastfact.html](https://www.cdc.gov/violenceprevention/aces/fastfact.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fviolenceprevention%2Ffastfact.html)
- Zubrick SR, Silburn SR, Lawrence DM. *The Western Australian Aboriginal child health survey: the social and emotional wellbeing of Aboriginal children and young people*. Perth, Western Australia: Curtin University of Technology and the Telethon Institute for Child Health Research, 2005.
- Wickramasinghe Y, Raman S, Garg P, *et al.* The adverse childhood experiences checklist: can it serve as a clinical and quality indicator? *J Paediatr Child Health* 2019;55:1113–8.
- Basu S, Isaacs AN. Profile of transcultural patients in a regional child and adolescent mental health service in Gippsland, Australia: the need for a multidimensional understanding of the complexities. *Int J Soc Psychiatry* 2019;65:217–24.
- Menzies K. Understanding the Australian Aboriginal experience of collective, historical and intergenerational trauma. *Int Soc Work* 2019;62:1522–34.
- Burke NJ, Hellman JL, Scott BG, *et al.* The impact of adverse childhood experiences on an urban pediatric population. *Child Abuse Negl* 2011;35:408–13.
- Grasso DJ, Dierkhising CB, Branson CE, *et al.* Developmental patterns of adverse childhood experiences and current symptoms and impairment in youth referred for trauma-specific services. *J Abnorm Child Psychol* 2016;44:871–86.
- Hughes K, Bellis MA, Hardcastle KA, *et al.* The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *Lancet Public Health* 2017;2:e356–66.
- McDonnell CG, Valentino K. Intergenerational effects of childhood trauma: evaluating pathways among maternal aces, perinatal depressive symptoms, and infant outcomes. *Child Maltreat* 2016;21:317–26.
- Grummitt LR, Kreski NT, Kim SG, *et al.* Association of childhood adversity with morbidity and mortality in US adults: a systematic review. *JAMA Pediatr* 2021;175:1269–78.
- Chartier MJ, Walker JR, Naimark B. Separate and cumulative effects of adverse childhood experiences in predicting adult health and health care utilization. *Child Abuse Negl* 2010;34:454–64.
- Edwards VJ, Holden GW, Felitti VJ, *et al.* Relationship between multiple forms of childhood maltreatment and adult mental health in community respondents: results from the adverse childhood experiences study. *Am J Psychiatry* 2003;160:1453–60.
- Peterson C, Florence C, Klevens J. The economic burden of child maltreatment in the United States, 2015. *Child Abuse Negl* 2018;86:178–83.
- Felitti VJ. Kaiser Permanente Institutes of preventive medicine. *Perm J* 2004;8:3–5.
- Flanagan T, Alabaster A, McCaw B, *et al.* Feasibility and acceptability of screening for adverse childhood experiences in prenatal care. *J Womens Health* 2018;27:903–11.
- Goldstein E, Athale N, Sciolla AF, *et al.* Patient preferences for discussing childhood trauma in primary care. *Perm J* 2017;21:16–55.
- Pachter LM, Lieberman L, Bloom SL, *et al.* Developing a community-wide initiative to address childhood adversity and toxic stress: a case study of the Philadelphia ACE Task force. *Acad Pediatr* 2017;17:S130–5.
- Emerging Minds. Adverse childhood experience (ACEs) questions in the kindergarten health check, 2021. Available: <https://emergingminds.com.au/resources/adverse-childhood-experiences-aces-questions-in-the-kindergarten-health-check-emerging-minds/>
- American Academy of Pediatrics. Early childhood adversity, toxic stress, and the role of the pediatrician: translating developmental science into lifelong health, 2021. Available: <https://pediatrics.aappublications.org/content/pediatrics/129/1/e224.full.pdf>
- Forkey H, Szilagyi M, Kelly ET, *et al.* Trauma-Informed care. *Pediatrics* 2021;148:e2021052580.
- Woolfenden S, Asher I, Bauert P. The Royal Australasian College of Physicians Paediatric & Child Health Division 145 Macquarie Street, Sydney, NSW, 2000 Summary of position statement on inequities in child health Published by RACP, 2018. Available: <https://www.racp.edu.au/advocacy/policy-and-advocacy-priorities/inequities-in-child-health>
- Canberra Health Services. *Kindergarten health check consent and questionnaire*, 2020.
- Finkelhor D. Screening for adverse childhood experiences (ACEs): cautions and suggestions. *Child Abuse Negl* 2018;85:174–9.
- Dube SR. Continuing conversations about adverse childhood experiences (ACEs) screening: a public health perspective. *Child Abuse Negl* 2018;85:180–4.
- Bright MA, Thompson L, Esernio-Jenssen D, *et al.* Primary care pediatricians' perceived prevalence and surveillance of adverse childhood experiences in low-income children. *J Health Care Poor Underserved* 2015;26:686–700.
- Kerker BD, Storer-Isser A, Szilagyi M, *et al.* Do pediatricians ask about adverse childhood experiences in pediatric primary care? *Acad Pediatr* 2016;16:154–60.
- Stork BR, Akselberg NJ, Qin Y, *et al.* Adverse childhood experiences (aces) and community physicians: what we've learned. *Perm J* 2020;24:19.099.
- Popp TK, Geisthardt C, Bumpus EA. Pediatric practitioners' screening for adverse childhood experiences: current practices and future directions. *Soc Work Public Health* 2020;35:1–10.
- Jones LM, Nolte K, O'Brien AJ, *et al.* Factors related to providers screening children for behavioral health risks in primary care settings. *J Pediatr Nurs* 2021;59:37–44.
- Bora N, Jones TR, Salada K. Inter-clinician variability in primary care providers' adverse childhood experience knowledge, training, screening practices, and perceived intervention barriers: an exploratory cross-sectional study. *J Child Adolescent Trauma* 2021:1–12.
- Ford K, Hughes K, Hardcastle K, *et al.* The evidence base for routine enquiry into adverse childhood experiences: a scoping review. *Child Abuse Negl* 2019;91:131–46.
- Sokol R, Austin A, Chandler C, *et al.* Screening children for social determinants of health: a systematic review. *Pediatrics* 2019;144:e20191622.
- Eitan AT, Smolyansky E, Knaan-Harpaz I. Connected papers, 2021. Available: <https://www.connectedpapers.com/>
- Lorenc T, Lester S, Sutcliffe K, *et al.* Interventions to support people exposed to adverse childhood experiences: systematic review of systematic reviews. *BMC Public Health* 2020;20:1–10.
- Page MJ, McKenzie JE, Bossuyt PM, *et al.* The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71.
- Hong QN, Pluye P, Bregues SF. Mixed methods appraisal tool (MMAT), version 2018 2018:1148552.

- 38 Barnett ML, Kia-Keating M, Ruth A, *et al.* Promoting equity and resilience: wellness Navigators' role in addressing adverse childhood experiences. *Clin Pract Pediatr Psychol* 2020;8:176–88.
- 39 Benarous X, Raffin M, Bodeau N, *et al.* Adverse childhood experiences among inpatient youths with severe and early-onset psychiatric disorders: prevalence and clinical correlates. *Child Psychiatry Hum Dev* 2017;48:248–59.
- 40 Choi KR, Stewart T, Fein E, *et al.* The impact of attachment-disrupting adverse childhood experiences on child behavioral health. *J Pediatr* 2020;221:224–9.
- 41 Chung EK, Nurmohamed L, Mathew L, *et al.* Risky health behaviors among mothers-to-be: the impact of adverse childhood experiences. *Acad Pediatr* 2010;10:245–51.
- 42 Conn A-M, Szilagyi MA, Jee SH, *et al.* Parental perspectives of screening for adverse childhood experiences in pediatric primary care. *Fam Syst Health* 2018;36:62–72.
- 43 DiGangi MJ, Negriff S. The implementation of screening for adverse childhood experiences in pediatric primary care. *J Pediatr* 2020;222:174–9.
- 44 Isohookana R, Marttunen M, Hakko H, *et al.* The impact of adverse childhood experiences on obesity and unhealthy weight control behaviors among adolescents. *Compr Psychiatry* 2016;71:17–24.
- 45 Isohookana R, Riala K, Hakko H, *et al.* Adverse childhood experiences and suicidal behavior of adolescent psychiatric inpatients. *Eur Child Adolesc Psychiatry* 2013;22:13–22.
- 46 Kaess M, Parzer P, Mattern M, *et al.* Adverse childhood experiences and their impact on frequency, severity, and the individual function of nonsuicidal self-injury in youth. *Psychiatry Res* 2013;206:265–72.
- 47 Kia-Keating M, Barnett ML, Liu SR, *et al.* Trauma-responsive care in a pediatric setting: feasibility and acceptability of screening for adverse childhood experiences. *Am J Community Psychol* 2019;64:286–97.
- 48 Koball AM, Domoff SE, Klevan J, *et al.* The impact of adverse childhood experiences on healthcare utilization in children. *Child Abuse Negl* 2021;111:104797.
- 49 Liu SR, Grimes KE, Creedon TB, *et al.* Pediatric ACES assessment within a collaborative practice model: implications for health equity. *Am J Orthopsychiatry* 2021;91:386–97.
- 50 Marie-Mitchell A, Lee J, Siplon C, *et al.* Implementation of the whole child assessment to screen for adverse childhood experiences. *Glob Pediatr Health* 2019;6:19862093
- 51 Mehari K, Iyengar S, Schneider M, *et al.* Adverse childhood experiences among children with neurodevelopmental delays: relations to diagnoses, behavioral health, and clinical severity. *J Clin Psychol Med Settings* 2021;28:808–14.
- 52 Pope LG, Ashekun O, Zern A, *et al.* Associations between childhood and adolescence adversity and risk for arrest among patients with first-episode psychosis. *Psychiatr Serv* 2021;72:202000238:826–9.
- 53 Rahman A, Perri A, Deegan A, *et al.* On becoming trauma-informed: role of the adverse childhood experiences survey in tertiary child and adolescent mental health services and the association with standard measures of impairment and severity. *Perm J* 2018;22:17–54.
- 54 Scott BG, Burke NJ, Weems CF, *et al.* The interrelation of adverse childhood experiences within an at-risk pediatric sample. *J Child Adolesc Trauma* 2013;6:217–29.
- 55 Wickramasinghe YM, Raman S, Garg P, *et al.* Burden of adverse childhood experiences in children attending paediatric clinics in South western Sydney, Australia: a retrospective audit. *BMJ Paediatr Open* 2019;3:e000330.
- 56 Baiden P, Stewart SL, Fallon B. The role of adverse childhood experiences as determinants of non-suicidal self-injury among children and adolescents referred to community and inpatient mental health settings. *Child Abuse Negl* 2017;69:163–76.
- 57 Marshall C, Semovski V, Stewart SL. Exposure to childhood interpersonal trauma and mental health service urgency. *Child Abuse Negl* 2020;106:104464.
- 58 Chokshi B, Skjoldager K. Adolescent patient perspectives on addressing childhood adversity in the primary care setting. *Clin Pediatr* 2020;59:1014–8.
- 59 Bottino CJ, Daniels A, Chung M, *et al.* Child life specialists' experiences addressing social determinants of health: a web-based survey. *Clin Pediatr* 2019;58:851–6.
- 60 Mahindroo S, Smith AS, Roberts G. Audit of paediatrician recognition of children's vulnerability to harm at the Royal children's Hospital, Melbourne. *J Paediatr Child Health* 2021;57:80–6.
- 61 Park C, McDermott B, Loy J, *et al.* Adolescent admissions to adult psychiatric units: patterns and implications for service provision. *Australas Psychiatry* 2011;19:345–9.
- 62 Schilling EA, Asetline RH, Gore S. The impact of cumulative childhood adversity on young adult mental health: measures, models, and interpretations. *Soc Sci Med* 2008;66:1140–51.
- 63 Negriff S. ACEs are not equal: examining the relative impact of household dysfunction versus childhood maltreatment on mental health in adolescence. *Soc Sci Med* 2020;245:112696.
- 64 White S, Edwards R, Gillies V, *et al.* All the ACEs: a chaotic concept for family policy and decision-making? *Social Policy and Society* 2019;18:457–66.
- 65 Brown SM, Bender K, Orsi R, *et al.* Adverse childhood experiences and their relationship to complex health profiles among child welfare-involved children: a classification and regression tree analysis. *Health Serv Res* 2019;54:902–11.
- 66 Chung EK, Siegel BS, Garg A, *et al.* Screening for social determinants of health among children and families living in poverty: a guide for clinicians. *Curr Probl Pediatr Adolesc Health Care* 2016;46:135–53.
- 67 Dubowitz H, Lane WG, Semiatin JN, *et al.* The safe environment for every kid model: impact on pediatric primary care professionals. *Pediatrics* 2011;127:e962–70.
- 68 Black EB, Ranmuthugala G, Kondalsamy-Chennakesavan S, *et al.* A systematic review: identifying the prevalence rates of psychiatric disorder in Australia's Indigenous populations. *Aust N Z J Psychiatry* 2015;49:412–29.
- 69 Cave L, Cooper MN, Zubrick SR, *et al.* Caregiver-perceived racial discrimination is associated with diverse mental health outcomes in Aboriginal and Torres Strait Islander children aged 7–12 years. *Int J Equity Health* 2019;18:142.
- 70 McKendrick JH. Aboriginal reconciliation: a role for psychiatrists? *Aust N Z J Psychiatry* 1997;31:617–21.
- 71 Asmussen K, Fischer F, Drayton E. *Adverse childhood experiences. What we know, what we don't know, and what should happen next.* London, 2020.
- 72 Hardcastle K, Bellis M. Asking about adverse childhood experiences (ACEs) in general practice. Evaluation findings from a pilot study in Anglesey, North Wales 2019.
- 73 Hardcastle K, Bellis M. Asking about adverse childhood experiences (ACEs) in health visiting. Findings from a pilot study 2019.
- 74 Allen M, Donkin A. The impact of adverse experiences in the home on the health of children and young people, and inequalities in prevalence and effects 2015.
- 75 Kelly-Irving M, Delpierre C. A critique of the adverse childhood experiences framework in epidemiology and public health: uses and misuses. *Social Policy and Society* 2019;18:445–56.
- 76 Campbell TL. Screening for adverse childhood experiences (ACEs) in primary care: a cautionary note. *JAMA* 2020;323:2379–80.
- 77 Nelson S, Simons LE, Logan D. The incidence of adverse childhood experiences (ACEs) and their association with pain-related and psychosocial impairment in youth with chronic pain. *Clin J Pain* 2018;34:402–8.
- 78 Duddu V, Rhouma A, Qureshi M, *et al.* An acute in-patient psychiatric service for 16- to 17-year-old adolescents in the UK: a descriptive evaluation. *BJPsych Bull* 2016;40:261–5.
- 79 Marchand WR, Wirth L, Simon C. Adverse life events and pediatric bipolar disorder in a community mental health setting. *Community Ment Health J* 2005;41:67–75.