The Efficacy of Targeted Mindfulness-Based Interventions for Improving Mental Health and Cognition Among Youth and Adults with ACE Histories: A Systematic Mixed Studies Review

Ellie Moyes1 · George Nutman1 · Jessica Hafetz Mirman1

Accepted: 4 April 2022 / Published online: 5 May 2022 © The Author(s) 2022

Abstract
Mindfulness-based interventions (MBIs) are associated with increased psychological wellbeing. The literature suggests that individuals exposed to adverse childhood experiences (ACEs) may benefit greatly from MBIs. However, research has tended to focus on universal MBIs for this population with less attention on the effectiveness of targeted approaches. Moreover, there is growing concern regarding the methodological rigor of MBI research. This systematic mixed studies review (SMRS) reports the effectiveness of MBIs for improving mental health and cognition among individuals with ACE histories. Additionally, the review reports the quality and rigor of the included research. Systematic searches of PsycInfo, EMBASE, MEDLINE, ProQuest Dissertations and Theses, ProQuest Social Science database and the Child Development and Adolescent Studies database were conducted. Results were screened and data were extracted then synthesized using a data-based convergent synthesis design. Thirteen studies were included in the final review. Six prominent themes emerged. Themes indicated that MBIs were effective for improving mental health and cognition for individuals with ACEs. For example, improvements in mood and anxieties, as well as a better ability to manage emotions. Shortcomings in the quality of MBI research included lack of reporting of methodological details (e.g., randomization procedures) and not systematically reporting adverse event evaluations. Recommendations are made for future research to strengthen the evidence base for MBIs for individuals with ACEs.

Keywords Targeted intervention · Mindfulness-based intervention · Mindfulness-based intervention · Adverse childhood experience · ACE · Adversity

Mindfulness is the state of being fully aware in the present moment and being non-judgmental towards oneself (Kabat-Zinn, 1990), with higher levels of mindfulness being associated with greater psychological well-being (Bränström et al., 2011; Schutte & Malouff, 2011) and less psychological stress (Hicks et al., 2020). It has been conceptualized as both a trait, i.e. an innate characteristic, and a state, i.e. a skill that can be practiced (Rau & Williams, 2016; Tang, 2017). Research suggests that practicing mindfulness improves state mindfulness and overtime can increase trait mindfulness (Kiken et al., 2015). Therefore, it is no surprise that recent years have seen the emergence of mindfulness-based interventions (MBIs) that aim to harness the therapeutic benefits of mindfulness practices (Klingbeil et al., 2017).

MBIs
Several standardized MBIs exist (Chiesa & Malinowski, 2011) such as: mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990), mindfulness-based cognitive therapy (MBCT; Segal et al., 2002), acceptance and commitment therapy (ACT; Hayes et al., 1999), dialectical behaviour therapy (DBT; Linehan, 1993), and Mindful Self-Compassion (Germer & Neff, 2019). Mindfulness techniques are also incorporated into several unstandardized interventions, e.g., yoga, art therapies and other mind–body interventions (Breedvelt et al., 2019; Ortiz & Sibinga, 2017; Varambally & Gangadhar, 2016). All MBIs
aim to teach individuals to recognize and accept unpleasant thoughts and feelings; to reflect on their reaction to these; and to apply appropriate coping skills (Gu et al., 2015; Shapero et al., 2018).

Efficacy of MBIs

There is a well-established evidence base supporting the use of standardized MBIs in treating mood and anxiety disorders (Lynch et al., 2003; Maiello et al., 2020; Segal & Teasdale, 2018), and borderline personality disorders (O’connell & Dowling, 2014). So much so that the National Institute for Care Excellence endorses MBCT as an effective treatment for preventing relapse in clinical depression (Crane & Kuyken, 2013). Reviews also report the benefits of yoga and other mind–body interventions in improving depression and increasing mental health generally (Bridges & Sharma, 2017; Cramer et al., 2013; Domingues, 2018), particularly when delivered in adjunct with other treatments (Taylor et al., 2020). Preliminary research also supports the use of MBIs for bi-polar disorders and eating disorders (Dunne, 2018; Key et al., 2017; Salcedo et al., 2016). Moreover, MBIs are reported to be more effective than placebo or treatment as usual for most psychiatric disorders, more clinically effective than psychoeducation and support groups, and comparable to traditional cognitive behaviour therapy (A-Tajk et al., 2015; Goldberg et al., 2018; Ruiz, 2012). The dissemination of MBIs, particularly non-standardized approaches, in non-clinical settings (Baer et al., 2019) has highlighted the positive effects of MBIs on non-pathological indicators of wellbeing, including cognition (Felver et al., 2016). Therefore, MBIs may be of greater benefit to vulnerable populations and individuals (Baer et al., 2019), such as those who endure adverse childhood experiences (ACEs) (Ortiz & Sibinga, 2017; Felitti et al., 1998).

ACEs and Developmental Outcomes

There are ten common ACEs – neglect; physical, sexual or emotional abuse; exposure to violence, mental illness, incarceration, or substance abuse in the family; and parental absence due to divorce or separation (Felitti et al., 1998) – with low socioeconomic status, community violence and being removed from the family home now also being recognized (The Scottish Government, 2012). Exposure to ACEs is attributable to the onset of approximately one-third of all mental disorders (Green et al., 2010; McLaughlin et al., 2012). For example, exposure to violence in childhood contributes to attentional biases toward threat cues (Lambert et al., 2017), that confer a risk factor for anxiety and PTSD (Shackman et al., 2007). Early life adversity is also associated with deficits in executive functioning (Nusslock & Miller, 2016). Specifically, childhood exposure to poverty (Javanbakht et al., 2015) and neglect (Maheu et al., 2010) are common risk factors for heightened emotional reactivity and an increased use of maladaptive emotion regulation strategies (Heleniak et al., 2016, 2018), which confer risk of depression, anxiety and PTSD (Chapman et al., 2004; Gratz et al., 2008; McElroy & Hevey, 2014).

MBIs for Individuals with ACE Histories

For individuals with ACE histories, MBIs may work to improve use of coping strategies and overall mental health by recognizing and managing the negative thoughts and emotions that are common outcomes of ACE exposure (Baer et al., 2019; Sheffler et al., 2020). The majority of MBI research has used universal strategies to reach the target population at mass through institutions where the population is commonly found (Dodge, 2020; Sanders & Morawska, 2011). Although results do indicate improvements in mental health and cognition for ACE individuals of all ages through universal MBI approaches (McKeering & Hwang, 2019; Simpson et al., 2018), a potential issue is that there is no real certainty regarding the extent to which the target population will be reached (Greenberg & Abenavoli, 2017). For this reason, targeted strategies that specifically aim to target sub-groups/individuals within the target population (Horowitz & Garber, 2006) are perhaps preferable (Dodge, 2020). Research has found targeted MBIs to be useful in teaching adult survivors of ACEs how to accept and explore their thoughts and feelings related to prior adversity (Follette et al., 2006; Gallegos et al., 2015; Kalmanowitz & Ho, 2016; Kimbrough et al., 2010). Importantly, results are found to maintain over time (Earley et al., 2014). Research using adult cohorts is much more prevalent than children and adolescents (Kirlic et al., 2020). It could be argued that there should in fact be greater focus on the latter population; as there is reason to believe that childhood and/or adolescence may be the optimal time to implement MBIs (Dunning et al., 2019). This is mainly because brain plasticity is greatest during this period and so children/adolescents may find learning and retaining mindfulness skills easier than adults (Belsky, 1997; Blakemore & Choudhury, 2006).

Concerns in MBI Research

Despite increases in research and dissemination, critics often note methodological shortcomings in MBI research (Gu et al., 2015): failure to utilise rigorous randomization processes (Goyal et al., 2014); variability in intervention style (Shonin et al., 2013); and concern regarding the potential for participants to experience adverse effects when undertaking MBIs, such as re-experiencing traumatic memories (Brewin, 2015; Lomas et al., 2015; Van Dam et al., 2018). Thus, the purpose of this review is to address the gap in the literature concerning
the effectiveness of MBIs among individuals with ACE histories, specifically taking into account methodological rigor. Uniquely, we included studies with young people and adults thus enabling us to ascertain if there is support for the use of MBIs as both an early intervention, to foster positive changes for youth who experience adversity, and as a late intervention, for adults living with the persistent impact of ACE histories.

**Research Questions:**

1. Are targeted MBIs effective for improving mental health and cognition among individuals with ACE histories?
2. What is the methodological quality and rigor of research pertaining to targeted MBIs for individuals with ACE histories?

**Methods**

A systematic mixed studies review (SMSR; Pluye & Hong, 2014) was conducted. Conducting an SMSR is a highly interpretative protocol (Petticrew et al., 2013) that is best-suited for reviews that aim to synthesize data from studies that vary in methodology (e.g., quantitative, qualitative), that consider more than one type of outcome or research question, and that are interested in illuminating issues related to intervention reception (see Harden, 2010). This approach can facilitate knowledge synthesis by providing processes for considering methodologically distinct studies to contribute data to the same evidence (literature) analysis. In addition to standard systematic review procedures, SMSRs go a step further to coherently synthesize the findings across methods. Two independent researchers were utilized throughout the searching, screening, data extraction and quality analysis procedures to reduce risk of bias. Discrepancies at any stage were discussed and reconciled by the research team. The research protocol was informed by PRISMA guidelines (Moher et al., 2009). The authors have no conflicts of interest to declare in relation to this manuscript.

**Search Strategy**

The literature was searched from 1st January 2010 to 10 August 2021 using PsycInfo, EMBASE, MEDLINE, ProQuest Dissertations and Theses, ProQuest Social Science database and the Child Development and Adolescent Studies database. The search terms ‘mindful* OR MBCT OR MBSR’; ‘child* OR adolescen* OR youth* OR young OR adult*’; ‘advers* OR ACE* OR ‘adverse childhood experience*’ OR trauma*’ were combined with the ‘AND’ Boolean operator. The truncation (*) was included to increase the sensitivity of search terms.

**Eligibility Criteria**

Eligibility criteria was informed by the PICOS (population, intervention, comparison, outcome, study design) method (Methley et al., 2014). Studies were included if they met all of the following criteria: (1) Participants had ACE histories; (2) The MBI was implemented in a targeted manner or mindfulness was the theoretical basis for the targeted intervention; (3) Comparison was either within or between subjects; (4) Outcomes measured mental health and/or cognition; (5) Studies were primary sources of literature; (6) Were published in English; and (7) Were published from 1st January 2010 onwards. No age restrictions were used.

**Screening Procedure**

The screening process (Fig. 1) was informed by PRISMA guidelines (Moher et al., 2009). Interrater reliability was calculated to be, $\kappa = 0.62$ (Cohen, 1960). The search yielded 1502 (de-duplicated) results, 55 were screened against inclusion criteria and review aims; of these, 13 were included in the final review.

**Data Extraction and Synthesis**

A data-based convergent synthesis design was used (Hong et al., 2017). Firstly, both quantitative and qualitative data were extracted. Quantitative data were then transformed into qualitative categories by grouping outcome data in terms of domain being measured. This resulted in eight categories (mood, anxiety and stress, emotion, coping, social functioning, behaviour and cognitive functioning, psychological irritability and self-acceptance). A thematic analysis of all qualitative data was then conducted. Data extraction was conducted independently by two researchers prior to quality analysis. This approach reduces bias by blinding researchers to study quality (Boland et al., 2017).

**Quality Analysis**

Methodological quality of the included studies was assessed using the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018a). It provides five criteria points for appraising different types of methodology. Ratings of ‘yes’ (clearly described by author), ‘no’ (not mentioned by author or not met) or ‘can’t tell’ (unclear description given by author) can be given (Hong et al., 2018a).
Study characteristics, demographics, and outcome assessments are shown in Table 1. Eleven studies quantitatively measured outcomes. Across these, improvements in mental health and cognition were reported for individuals with ACEs. Improvements were found across most measures, although variability in statistical significance was noted; trauma symptoms did not improve. Quantitative data were grouped into eight broad domains of mental health and cognition. These were mood (1; 2; 6; 11; 13), anxiety (1; 6; 8; 10; 13), emotion (4; 5; 11), coping (1; 4; 5; 6; 7), social functioning (4; 8; 10; 13), behavior and cognitive functioning (4; 5; 7), psychological inflexibility (3; 8; 10; 13) and self-awareness (3; 13). Improvements were evident across these domains, regardless of MBI type or sample age.

The quantitative results and the qualitative results from 6 studies were thematically analyzed resulting in six main themes (T):

(T1) Improvements in mood. This was mainly devised of improvements in depression symptoms although improvements in negative emotion also contributed (1; 2; 6; 7; 8; 10; 11; 13).

(T2) Improvements in anxiety and/or stress. Improvements in anxiety and increased calmness and/or relaxation and less rumination all account for this theme (1; 2; 3; 5; 6; 7; 8; 10; 13).

(T3) Increased psychological flexibility. This is the ability to adapt in daily life. This theme was established through increased acceptance of one’s thought and feelings, a better understanding of one’s self, increased body awareness and valued living (3; 4; 7; 11; 13).

(T4) Increased understanding and management of emotions. Across studies a better understanding of feelings and emotions, and how to manage these, was found (5; 4; 11).

(T5) Increase in social skills. A novel finding was that participating in MBIs increased participants social functioning. Specifically, by eliciting feelings of acceptance and being more comfortable to seek support (4; 8; 10; 13).

(T6) Increased use of effective coping strategies. Findings consistently suggested that participation in MBIs improved the use of effective coping strategies to cope with the effects of trauma, namely, mindfulness (1; 5; 6; 4; 7; 13).
Table 1: Full descriptions of study, sample and interventions characteristics

| Study ID | Author | Sample (N, age range, mean, standard deviation, gender) | Study design | Intervention | Main Findings |
|----------|--------|--------------------------------------------------------|--------------|--------------|---------------|
| 1        | Kimbrough et al. (2010) | N = 27  
23-68y (M = 45, SD = 10.8)  
F, M | Exploratory mixed-methods | Modified MBSR | A reduction in depression, anxiety & PTSD scores that remained at follow up; An improvement in mindfulness scores that remained, marginally, at follow up. |
| 2        | DePrince and Shirk (2013) | N = 2  
15y F | Quantitative case study (within-subjects) | Adolescent Mood Project (adapted) | A reduction in depression symptomology throughout and immediately post-treatment; This maintained for 1 participant. |
| 3        | Burrows (2013) | N = 1  
18y F | Quantitative case study (within-subjects) | ACT | Moderate reduction in experiential avoidance and increase in psychological flexibility. |
| 4        | Sitzer and Stockwell (2015) | N = 43  
9-12y  
24F, 19M | Qualitative descriptive (within-subjects) | The Wellness Programme | Pre-post intervention differences in overall functioning were significant (0.77, P < 0.001). |
| 5        | Caldwell and Shaver (2015) | N = 39  
21-80y (M = 47, SD = 13.5)  
F | Quantitative quasi-experimental (between-groups) | REAC-H | Treatment group showed significant improvement in most of the study’s outcome variables, compared to control group. |
| 6        | Jee et al. (2015) | N = 42  
14-21y (M = 16.8, SD = 1.8)  
23F, 19M | Mixed-methods RCT | MBSR | No significant difference between pre-post intervention for general mental health, mindfulness and state/trait anxiety. |

Jee et al. (2015). Sub-group analysis found a trend towards improvement on these measures for 14-17 year olds.
| Study ID | Author (Year) | Sample (N, age range, mean, standard deviation, gender) | Study design | ACE | Intervention | Main Findings |
|----------|--------------|----------------------------------------------------------|--------------|-----|--------------|---------------|
| 7        | Houser (2015) | N = 34 F [Site 1] (M = 13.68) [Site 2] (M = 15.89)   | Embedded mixed methods (within- subjects) | Complex childhood trauma (emotional/ physical/ sexual abuse; neglect; or exposure to domestic violence) | Hatha yoga | Decrease in overall mental health scores; this was significant for site 1, but not site 2. Strong negative correlation between affirmation and mental health functioning, $r(24) = -0.697, p < 0.001$, and CPSS scores, $r(11) = -0.661, p = 0.014$. Intervention length had a significant effect on overall mental health symptom severity, $F(1,9) = 4.66, p = 0.059, \eta^2 = 0.34$. A moderate effect size was found. |
| 8        | Spidel et al. (2018) | n = 50 19-64y (M = 40.4) 26F, 24 M | RCT | Childhood trauma | ACT | Intervention group showed greater improvements on areas such as psychiatric symptom severity, anxiety symptoms and the acceptance domain of emotional regulation; and showed increased help-seeking in the service engagement domain at 3 months follow up compared to baseline, relative to control (TAU) group. |
| 9        | Norman (2018) | n = 8 12-18y M | Embedded mixed methods (within- subjects) | Maternal death, physical/ sexual abuse, removed from family home & “unspecifie psychological abuse” | The Mindfulness Curriculum for Adolescents | Clients who practiced mindfulness techniques regularly reported increasingly feeling calm and in control, an increased sense of relaxation and reduced aggression. |
| Study ID | Author | Sample (N, age range, mean, standard deviation, gender) | Study design | ACE | Intervention | Main Findings |
|----------|--------|-------------------------------------------------------------|--------------|-----|--------------|---------------|
| 10       | Spidel et al. (2019) | n = 50  
19-64y  
(M = 40.4)  
26F, 24 M | RCT | Childhood maltreatment | ACT | No significant 3-way Time x Group x CTQ (childhood trauma questionnaire) score interaction across emotion, psychiatric symptoms, anxiety and help-seeking scores  
A k-means cluster analyses found three outcome clusters for the intervention group; a chi-squared analyses and Cramer’s V effect sizes indicated that none of the CTQ subscales were different across the clusters  
Increased attendance in ACT sessions, and an avoidant attachment style, were associated with cluster membership such that being in the two clusters that showed most improvements in clinical symptoms, increased help-seeking and acceptance |
| 11       | Van der Gucht et al. (2019) | n = 13  
13-18y  
(M = 15, SD = 1.15)  
5F, 8 M | Exploratory mixed methods (within-subjects) | Removed from parents, community violence/conflict, deprivation & financial difficulties | MBSR/MBCT: elements of each adjusted to suit population | Changes across mental health domains pre/post interventions of varying significance  
Depression symptoms positively correlated with negative affect  
Girls indicated higher correlation between depression symptoms, than boys  
Age was uncorrelated with outcomes |
| 12       | Fields (2019) | n = 5  
21-31y  
F | Embodied qualitative (within-subjects) | Childhood sexual abuse | TTY | After 18 week intervention there were notable reductions in psychological/physiological symptoms, increased self-acceptance/self-awareness (mindfulness), body reconnection and improved relationship/affect regulation |
| 13       | Classen et al. (2020) | n = 32  
24-64y  
F | RCT | Complex childhood trauma | TBG | Intervention significantly improved anxiety, body awareness and soothing receptivity – maintained at 6 month follow up  
Intervention had no significant impact on depression or PSTD |
Study Quality

Only 3 studies met all five criteria points outlined by the MMAT (Hong et al., 2018a, b), seven studies met four criteria points and two studies met three criteria points. One study (6) was a mixed-methods RCT and was appraised using both quantitative RCT and mixed-methods study design criteria. The most commonly unmet criterion was that differences and inconsistencies between quantitative and qualitative results were not adequately addressed; this occurred in four mixed-methods study designs (1; 6; 7; 9). Randomization was not appropriately performed in two RCTs (8; 13), i.e. there was a lack of description of the randomization process (Hong et al., 2018a). It was unclear if participants were representative of the target population for two RCTs (13), as there was a lack of description of the randomization process. It was unclear if participants were representative of the target population for two non-randomised trials (2; 3). This was because these were both case studies using n = 1 (3) and n = 2 (1) participants. Finally, in one non-randomized quantitative study (3) the intervention was not administered as intended; this was because the MBI ended abruptly due to the participant gaining employment and being unable to gradually end the intervention as planned for a full description of study alignment against quality criteria).

Five studies (1; 5; 6; 11; 13;) reported dropouts between originally recruited and final reported samples. However, baseline characteristics of dropped out participants were not significantly different from other participants. Thus, authors did not deem analysis to be influenced by attrition. Follow-up data was available in five studies (1; 2; 3; 8; 13). Follow-ups ranged from four weeks to six months. Across studies follow-up data showed changes in mental health and cognition to maintain. Burrows et al. (3) noted maintained improvements in Client A, but not Client M; however, author notes this may have been due to personal adversities Client M faced since intervention ended. Effect sizes were reported for six of 13 studies (1; 7; 8; 10; 11; 13). One study explicitly mentioned study related adverse effects (1).

Discussion

In this systematic review we evaluated the state of the evidence to determine if targeted MBIs are effective for improving mental health and cognition among individuals with ACE histories. Our results have implications for practice, theory, and future research and we consider these each in turn.

Implications for Theory

By utilizing a data-based convergent synthesis approach (Hong et al., 2017) this review provides a unique preliminary understanding of the processes that may underpin these improvements. These can perhaps best be understood in relation to the aims of MBIs – acceptance of, reflection on and ability to coping with thoughts and feelings (Gu et al., 2015; Shapero et al., 2018; Hayes et al., 2011; Seligman et al., 2014). For example, improvements in psychological flexibility were indicated (T3). Specifically, improvements in self-understanding, increased self-acceptance and an increased value of living. Overall, these factors denote an increased ability to accept one’s thoughts and feelings. For individuals with ACEs this may include the acceptance of suppressed thoughts related to the adversities experienced (Follette et al., 2006). The paradoxical effect whereby individuals who suppress negative thoughts actually ruminate over these more, results in greater distress (Wang et al., 2020). Therefore, the current findings suggest that by participating in targeted MBIs individuals with ACE histories may come to accept such negative thoughts and, in turn, improve overall psychological wellbeing (Ford et al., 2018).

Moreover, two themes indicated a better understanding and management of anxiety and/or stress (T2) and emotions (T4). This suggests that targeted MBIs improved participants’ ability to reflect on the aforementioned thoughts and feelings. Such acceptance and reflection of one’s thought and emotions equips individuals with a better ability to rationalize and utilise effective coping strategies (T6) (Aldao & Plate, 2018). Increased coping is also associated with improvements in mood (Arlt Mutch et al., 2020). Moreover, this SMSR has highlighted the effectiveness of using targeted MBIs to improve these domains among individuals with ACEs histories (Baer et al., 2019; Ortiz & Sibinga, 2017; Sheffler et al., 2020). MBIs deployed in practice in the context of care should ideally be accompanied by a detailed implementation strategy, service utilization plan, quality assurance monitoring and an impact evaluation once the program is established. Finding resources for evaluation and quality monitoring on top of those needed for implementation can be challenging. University-community partnerships are one way to help to alleviate some of the resource constraints related to evaluation support where an exchange of expertise, knowledge, training opportunities (e.g., clinical intervention delivery, data analysis) between partners can potentially be leveraged to support evaluation and quality improvement activities.

Implications for Practitioners

From a programmatic and intervention standpoint, the main findings of our review indicate that MBIs are effective for improving mental health and cognition (Domingues, 2018; Dunning et al., 2019; Maiello et al., 2020). Moreover, this SMSR has highlighted the effectiveness of using targeted MBIs to improve these domains among individuals with ACEs histories (Baer et al., 2019; Ortiz & Sibinga, 2017; Sheffler et al., 2020). MBIs deployed in practice in the context of care should ideally be accompanied by a detailed implementation strategy, service utilization plan, quality assurance monitoring and an impact evaluation once the program is established. Finding resources for evaluation and quality monitoring on top of those needed for implementation can be challenging. University-community partnerships are one way to help to alleviate some of the resource constraints related to evaluation support where an exchange of expertise, knowledge, training opportunities (e.g., clinical intervention delivery, data analysis) between partners can potentially be leveraged to support evaluation and quality improvement activities.

Implications for Theory

By utilizing a data-based convergent synthesis approach (Hong et al., 2017) this review provides a unique preliminary understanding of the processes that may underpin these improvements. These can perhaps best be understood in relation to the aims of MBIs – acceptance of, reflection on and ability to coping with thoughts and feelings (Gu et al., 2015; Shapero et al., 2018; Hayes et al., 2011; Seligman et al., 2014). For example, improvements in psychological flexibility were indicated (T3). Specifically, improvements in self-understanding, increased self-acceptance and an increased value of living. Overall, these factors denote an increased ability to accept one’s thoughts and feelings. For individuals with ACEs this may include the acceptance of suppressed thoughts related to the adversities experienced (Follette et al., 2006). The paradoxical effect whereby individuals who suppress negative thoughts actually ruminate over these more, results in greater distress (Wang et al., 2020). Therefore, the current findings suggest that by participating in targeted MBIs individuals with ACE histories may come to accept such negative thoughts and, in turn, improve overall psychological wellbeing (Ford et al., 2018).

Moreover, two themes indicated a better understanding and management of anxiety and/or stress (T2) and emotions (T4). This suggests that targeted MBIs improved participants’ ability to reflect on the aforementioned thoughts and feelings. Such acceptance and reflection of one’s thought and emotions equips individuals with a better ability to rationalize and utilise effective coping strategies (T6) (Aldao & Plate, 2018). Increased coping is also associated with improvements in mood (Arlt Mutch et al., 2020). Moreover, this SMSR has highlighted the effectiveness of using targeted MBIs to improve these domains among individuals with ACEs histories (Baer et al., 2019; Ortiz & Sibinga, 2017; Sheffler et al., 2020). MBIs deployed in practice in the context of care should ideally be accompanied by a detailed implementation strategy, service utilization plan, quality assurance monitoring and an impact evaluation once the program is established. Finding resources for evaluation and quality monitoring on top of those needed for implementation can be challenging. University-community partnerships are one way to help to alleviate some of the resource constraints related to evaluation support where an exchange of expertise, knowledge, training opportunities (e.g., clinical intervention delivery, data analysis) between partners can potentially be leveraged to support evaluation and quality improvement activities.

Implications for Practitioners

From a programmatic and intervention standpoint, the main findings of our review indicate that MBIs are effective for improving mental health and cognition (Domingues, 2018; Dunning et al., 2019; Maiello et al., 2020). Moreover, this SMSR has highlighted the effectiveness of using targeted MBIs to improve these domains among individuals with ACEs histories (Baer et al., 2019; Ortiz & Sibinga, 2017; Sheffler et al., 2020). MBIs deployed in practice in the context of care should ideally be accompanied by a detailed implementation strategy, service utilization plan, quality assurance monitoring and an impact evaluation once the program is established. Finding resources for evaluation and quality monitoring on top of those needed for implementation can be challenging. University-community partnerships are one way to help to alleviate some of the resource constraints related to evaluation support where an exchange of expertise, knowledge, training opportunities (e.g., clinical intervention delivery, data analysis) between partners can potentially be leveraged to support evaluation and quality improvement activities.
concurrently. Although these aims are not solely designed for individuals with ACEs, the findings nonetheless begin to substantiate the use of targeted MBIs with this population.

Interestingly, the analyses in this review noted the emergence of a theme that associated targeted MBIs with increased social skills (T5). Syntheses suggested that these feeling often derived from participants enjoying being part of a group of people with similar experiences. This rich qualitative data imposes an argument that group variations of targeted MBIs may be more efficacious than other forms of targeted MBI for individuals with ACE histories. Specifically, in helping to grow their sense of self and increase feeling of belonging. Moreover, such feelings of inclusion were evident alongside an increased sense of help-seeking. Again, demonstrating how the effects of MBIs for ACE experienced populations are interlinking and, more importantly, empowering to the individuals involved.

The current findings are particularly relevant due to ACE informed practice increasingly being at the forefront of policy making, e.g. Getting It Right For Every Child (GIRFEC) (The Scottish Government, 2012). Moreover, appropriate intervention is one of the key outcomes for The Mental Health Strategy 2017–2027 (The Scottish Government, 2017). By including samples from youth and adult age ranges this review provides preliminary support for the use of MBIs as both an early intervention, to foster positive changes for youth who experience adversity, and as a late intervention, for adults who have been surviving with the lasting impact of ACEs (Selous et al., 2019). Although further research into the magnitude of the effect of MBIs is needed to support this claim as well as systematic evaluation of potential harms, which we discuss further in the next section.

Implications for Research

While the current findings have identified six themes to suggest that targeted MBIs may result in positive changes for ACE survivors, it was noted that little consideration is given to the potential negative outcomes that participants may experience. Indeed, only one study (Kimbrough et al., 2010) mentioned this, stating that no study-related effects were noted through their research process. This is unhelpful as it indicates that there may have been low level adverse effects but does not elaborate further. Worryingly, this study was the earliest published study included in the final review (Kimbrough et al., 2010), suggesting that a regression in the acknowledgement of adverse effects in the literature may have occurred. It should not be assumed from the omission of such information that adverse effects were not experienced, rather the likelihood is that they were not systematically evaluated. This is a common feature in psychological research generally with reviews finding consistently weak reporting of adverse effects (Duggan et al., 2014; Jonsson et al., 2014). One estimate suggests that only 28% of clinical research provides such data (Jonsson et al., 2014). Moreover, the current findings posit that underreporting in MBI research may be even lower, with only 8% of the included literature acknowledging adverse effects. This is particularly concerning because populations with ACE histories may be more susceptible to adverse effects of mindfulness than the general population, e.g. re-traumatization or deterioration in pre-existing clinical outcomes (Lindahl et al., 2017). The latter being very relevant due to the high levels of co-morbidity associated with ACEs (Felitti et al., 1998). It has been suggested that the reason for such underreporting of adverse effects is an effort to establish MBIs as evidence-based psychological interventions (Rozental et al., 2016). Regardless of rationale for doing so, a lack of reporting of adverse effects results in an inaccurate research record.

Quality and Rigor of Reviewed Research

Methodological shortcomings were common, specifically, lack of random assignment, lack of follow-up, non-reporting of effect sizes, and lack of reporting of adverse events. Overall, the main methodological issues that arose during this review are not dissimilar to those apparent across intervention and efficacy research (Kazdin, 2015). By considering these shortcomings collectively, there appears to be more concern regarding the dissemination and application of MBIs being based on a lack of research, opposed to the quality of research in itself. This supports previous literature, which argues that the dissemination of MBIs may be ahead of its evidence base (Greenberg & Harris, 2012). Future research could use this SMSR as a foundation upon which meta-analytical evaluation can be conducted. Finally, we recommend the adoption of open science and rigor and reproducibility methods including but not limited to pre-registration of study protocols (e.g., registered reports), the conduct of replication studies, secure and ethical data sharing, and carefully delineating both negative and positive effects of MBIs among people with ACEs when designing and reporting study data. A more rigorous, balanced, and open approach will lead to the strongest, most ethical and equitable scientific foundation from which interventions can be developed, deployed and evaluated.

Strengths, Limitations, and Implications

The SMSR method is still relatively new compared to established review methods (Hong & Pluye, 2019; Saini & Shlonsky, 2012). However, it is methodologically inclusive, which allowed for the entire scope of the research pertaining to the research questions to be captured (Sandelowski...
et al., 2006, 2012). Moreover, the emotive impact of the improvements associated with the MBIs was apparent when extracting the data. This approach is relatively uncommon with most reviews that include mixed-methods data opting for a quantitative synthesis (Morse, 2012). Future research could replicate this SMR method, adopting a quantitative approach and conduct meta-analyses to further examine the magnitude of effect of MBIs on improving mental health and cognition among individuals with ACE histories.

**Supplementary Information** The online version contains supplementary material available at https://doi.org/10.1007/s40653-022-00454-5.

**Declarations**

**Conflict of Interest** We have no known conflict of interest to disclose.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article’s Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article’s Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/.

**References**

A-Tjak, J. G., Davis, M. L., Morina, N., Powers, M., Smits, J. A., & Emmelkamp, P. M. (2015). A meta-analysis of the efficacy of acceptance and commitment therapy for clinically relevant mental and physical health problems. *Psychotherapy and Psychosomatics, 84*(1), 30–36. https://doi.org/10.1159/000356764

Aldao, A., & Plate, A. J. (2018). Coping and emotion regulation. *Process-based CBT: The science and core clinical competencies of cognitive behavioral therapy*, 261–272.

Arlt Mutch, V. K., Evans, S., & Wyka, K. (2020). The role of acceptance in mood improvement during Mindfulness-Based Stress Reduction. *Journal of Clinical Psychology*. https://doi.org/10.1002/jclp.23017

Baer, R., Crane, C., Miller, E., & Kuyken, W. (2019). Doing no harm in mindfulness-based programs: Conceptual issues and empirical findings. *Clinical Psychology Review, 71*, 101–114. https://doi.org/10.1016/j.cpr.2019.01.001

Belsky, J. (1997). Variation in susceptibility to rearing influences: An evolutionary argument. *Psychological Inquiry, 8*, 182–186. https://doi.org/10.1207/s15327965pi0803_3

Blakemore, S. J., & Choudhury, S. (2006). Development of the adolescent brain: Implications for executive function and social cognition. *Journal of Child Psychology and Psychiatry, 47*, 296–312. https://doi.org/10.1111/j.1469-7610.2006.01611.x

Boland, A., Cherry, G., & Dickson, R. (Eds.). (2017). Doing a systematic review: A student’s guide. Sage.

Bränström, R., Duncan, L. G., & Moskowitz, J. T. (2011). The association between dispositional mindfulness, psychological well-being, and perceived health in a Swedish population-based sample. *British Journal of Health Psychology, 16*(2), 300–316. https://doi.org/10.1348/135910710X501683

Breedveld, J., Amanvermez, Y., Harrer, M., Karyotaki, E., Gilbody, S., Bockting, C., Cuijpers, P., & Ebert, D. D. (2019). The Effects of Meditation, Yoga, and Mindfulness on Depression, Anxiety, and Stress in Tertiary Education Students: A Meta-Analysis. *Frontiers in Psychiatry, 10*, 193. https://doi.org/10.3389/fpsyt.2019.00193

Brewin, C. R. (2015). Re-experiencing traumatic events in PTSD: New avenues in research on intrusive memories and flashbacks. *European Journal of Psychotraumatology, 6*, 27180. https://doi.org/10.3402/epjt.v6.27180

Bridges, L., & Sharma, M. (2017). The efficacy of yoga as a form of treatment for depression. *Journal of Evidence-Based Complementary & Alternative Medicine, 22*(4), 1017–1028. https://doi.org/10.1177/2156578717715927

Burrows, C. J. (2013). Acceptance and commitment therapy with survivors of adult sexual assault: A case study. *Clinical Case Studies, 12*(3), 246–259. https://doi.org/10.1177/1534650113479652

Caldwell, J. G., & Shaver, P. R. (2015). Promoting attachment-related mindfulness and compassion: A wait-list-controlled study of women who were mistreated during childhood. *Mindfulness, 6*(3), 624–636. https://doi.org/10.1007/s12671-014-0298-y

Chapman, D. P., Whitfield, C. L., Felitti, V. J., Duhe, S. R., Edwards, V. J., & Anda, R. F. (2004). Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders, 82*(2), 217–225. https://doi.org/10.1016/j.jad.2003.12.013

Chiesa, A., & Malinowski, P. (2011). Mindfulness-based approaches: Are they all the same? *Journal of Clinical Psychology, 67*(4), 404–424. https://doi.org/10.1002/jclp.20776

Classen, C. C., Hughes, L., Clark, C., Hill Mohammed, B., Woods, P., & Beckett, B. (2020). A pilot RCT of a body-oriented group therapy for complex trauma survivors: an adaptation of sensorimotor psychotherapy. *Journal of Trauma & Dissociation, 1*-17. https://doi.org/10.1080/15299732.2020.1760173

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20*(1), 37–46. https://doi.org/10.1177/00164992600200104

Cramer, H., Lauche, R., Langhorst, J., & Dobos, G. (2013). Yoga for depression: A systematic review and meta-analysis. *Depression and Anxiety, 30*(11), 1068–1083. https://doi.org/10.1002/da.22166

Crane, R. S., & Kuyken, W. (2013). The implementation of mindfulness-based cognitive therapy: Learning from the UK health service experience. *Mindfulness, 4*(3), 246–254. https://doi.org/10.1007/s12671-012-0121-6

DePrince, A. P., & Shirk, S. R. (2013). Adapting cognitive-behavioral therapy for depressed adolescents exposed to interpersonal trauma: A case study with two teens. *Cognitive and Behavioral Practice, 20*(2), 189–201. https://doi.org/10.1016/j.cbpra.2012.07.001

Dodge, K. A. (2020). Annual Research Review: Universal and targeted strategies for assigning interventions to achieve population impact. *Journal of Child Psychology and Psychiatry, 61*(3), 255–267. https://doi.org/10.1111/jcpp.13141

Domingues, R. B. (2018). Modern postural yoga as a mental health promoting tool: A systematic review. *Complementary Therapies in Clinical Practice, 31*, 248–255. https://doi.org/10.1016/j.ctcp.2018.03.002

Duggan, C., Parry, G., McMurrin, M., Davidson, K., & Dennis, J. (2014). The recording of adverse events from psychological treatments in clinical trials: Evidence from a review of NIH-funded trials. *Trials, 15*(1), 335. https://doi.org/10.1186/1745-6215-15-335

Dunne, J. (2018). Mindfulness in anorexia nervosa: An integrated review of the literature. *The Journal of American Psychiatric Nurses Association, 24*(2), 109–117.

Dunning, D. L., Griffiths, K., Kuyken, W., Crane, C., Foulkes., Parker, J. & Dalgleish, T. (2019). Research Review: The effects of
mindfulness-based interventions on cognition and mental health in children and adolescents - a meta-analysis of randomized control trials. *Journal of Child Psychology and Psychiatry*, 60(3), 224-258. https://doi.org/10.1111/jcpp.12980

Earley, M. D., Chesney, M. A., Frye, J., Greene, P. A., Berman, B., & Kimbrough, E. (2014). Mindfulness intervention for child abuse survivors: A 2.5-year follow-up. *Journal of clinical psychology*, 70(10), 933–941. https://doi.org/10.1002/jclp.22102

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Adverse childhood experiences. *American Journal of Preventive Medicine*, 14(4), 245–258. https://doi.org/10.1016/S0749-3797(08)00017-8

Felver, J. C., Celis-de Hoyos, C. E., Tezanos, K., & Singh, N. N. (2016). A systematic review of mindfulness-based interventions for youth in school settings. *Mindfulness*, 7(1), 34–45. https://doi.org/10.1007/s12671-015-0389-4

Fields, A. (2019). The Impact of Therapeutic Yoga on Adult Female Survivors of Child Sex Abuse in Nicaragua: Exploring the Mind-Body Relationship in a Culturally Embedded Healing Process (Doctoral dissertation, Universidad Centroamericana (Nicaragua)).

Follette, V., Palm, K. M., & Pearson, A. N. (2006). Mindfulness and trauma: Implications for treatment. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, 24(1), 45–61. https://doi.org/10.1007/s10942-006-0025-2

Ford, B. Q., Lam, P., John, O. P., & Mauss, I. B. (2018). The psychological health benefits of accepting negative emotions and thoughts: Laboratory, diary, and longitudinal evidence. *Journal of Personality and Social Psychology*, 115(6), 1075. https://doi.org/10.1037/pspp0000157

Gallegos, A. M., Lytle, M. C., Moynihan, J. A., & Talbot, N. L. (2015). Mindfulness-based stress reduction to enhance psychological functioning and improve inflammatory biomarkers in trauma-exposed women: A pilot study. *Psychological Trauma: Theory, Research, Practice, and Policy*, 7(6), 525. https://doi.org/10.1037-tra0000053

Germer, C., & Neff, K. D. (2019). Mindful Self-Compassion (MSC). In I. Ivtsan (Ed.), *The handbook of mindfulness-based programs: Every established intervention, from medicine to education* (pp. 357–367). London: Routledge.

Goldberg, S. B., Tucker, R. P., Greene, P. A., Davidson, R. J., Wampold, B. E., Kearney, D. J., & Simpson, T. L. (2018). Mindfulness-based interventions for psychiatric disorders: A systematic review and meta-analysis. *Clinical Psychology Review*, 59, 52–60. https://doi.org/10.1016/j.cpr.2017.10.011. Epub 2017 Nov 8. PMID: 29126747; PMCID: PMC5741505.

Goyal, M., Singh, S., Sibinga, E. M., Gould, N. F., Rowland-Seymour, A., Sharma, R., & Shihab, H. M. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine*, 174, 357–368. https://doi.org/10.1001/jamainternmed.2013.13018

Gratz, K. L., Tull, M. T., Baruch, D. E., Bornova, M. A., & Lejuez, C. W. (2008). Factors associated with co-occurring borderline personality disorder among inner-city urban clients: The roles of childhood maltreatment, negative affect intensity/reactivity, and emotion dysregulation. *Comprehensive Psychiatry*, 49(6), 603–615. https://doi.org/10.1016/j.comppsych.2008.04.005

Green, J. G., McLaughlin, K. A., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2010). Childhood adversities and adult psychopathology in the National Comorbidity Survey Replication (NCS-R) III: Associations with functional impairment related to DSM-IV disorders. *Psychological Medicine*, 40(5), 847. https://doi.org/10.1017/S0033291709999115

Greenberg, M. T., & Abenavoli, R. (2017). Universal interventions: Fully exploring their impacts and potential to produce population-level impacts. *Journal of Research on Educational Effectiveness*, 10(1), 40–67. https://doi.org/10.1080/19345747.2016.1246632

Greenberg, M. T., & Harris, A. R. (2012). Nurturing mindfulness in children and youth: current state of research. *Child Development Perspectives*, 6(2). https://doi.org/10.1111/j.1750-8606.2011.00215.x

Gu, J., Strauss, C., Bond, R., & Cavanagh, K. (2015). How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review*, 37, 1–12. https://doi.org/10.1016/j.cpr.2015.01.006. Epub 2015 Jan 31. Erratum in: Clin Psychol Rev. 2016 Nov;49:119. PMID: 25689576.

Harden, A. (2010). *Mixed-Methods Systematic Reviews: Integrating Quantitative and Qualitative Findings* [Ebook]. A Publication of the National Center for the Dissemination of Disability Research (NCDDR). Retrieved 26 January 2022, from https://ktdrr.org/klibrary/articles_pubs/ncddrwork/focus/25/Focus25.pdf.

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2011). Acceptance and commitment therapy: The process and practice of mindful change. Guilford Press.

Hayes, S. C., Strosahl, K. D., Wilson, K. G. (1999). Acceptance and commitment therapy: An experiential approach to behavior change. New York, NY: Guilford.

Heleniak, C., Jenness, J. L., Vander Stoep, A., McCauley, E., & McLaughlin, K. A. (2016). Childhood maltreatment exposure and disruptions in emotion regulation: A transdiagnostic pathway to adolescent internalizing and externalizing psychopathology. *Cognitive Therapy and Research*, 40(3), 394–415. https://doi.org/10.1007/s10608-015-9735-z

Heleniak, C., King, K. M., Monahan, K. C., & McLaughlin, K. A. (2018). Disruptions in emotion regulation as a mechanism linking community violence exposure to adolescent internalizing problems. *Journal of Research on Adolescence*, 28(1), 229–244. https://doi.org/10.1111/jora.12328

Hicks, A., Siwik, C., Phillips, K., Zimmaro, L. A., Salmon, P., Burke, N., ... & Sephton, S. E. (2020). Dispositional mindfulness is associated with lower basal sympathetic arousal and less psychological stress. *International Journal of Stress Management*, 27(1), 88. https://doi.org/10.1037/str0000124

Hong, Q. N., & Puye, P. (2019). A conceptual framework for critical appraisal in systematic mixed studies reviews. *Journal of Mixed Methods Research*, 13(4), 446–460. https://doi.org/10.1177/1558689818770058

Hong, Q. N., Gonzalez-Reyes, A., & Puye, P. (2018a). Improving the usefulness of a tool for appraising the quality of qualitative, quantitative and mixed methods studies, the Mixed Methods Appraisal Tool (MMAT). *Journal of Evaluation in Clinical Practice*, 24(3), 459–467. https://doi.org/10.1111/jep.12884

Hong, Q. N., Puye, P., Bujoj, M., & Wassef, M. (2017). Convergent and sequential synthesis designs: Implications for conducting and reporting systematic reviews of qualitative and quantitative evidence. *Systematic Reviews*, 6(1), 61. https://doi.org/10.1186/s13643-017-0454-2

Hong, Q. N., Puye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M. P., Griffiths, F., Nicolau, B., O’Cathain, A., Rousseau, M. C., & Vedel, I. (2018b). Mixed Methods Appraisal Tool (MMAT), version 2018b. Registration of Copyright (#1148552), Canadian Intellectual Property Office, Industry Canada.

Horowitz, J. L., & Garber, J. (2006). The prevention of depressive symptoms in children and adolescents: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 74(3), 401. https://doi.org/10.1037/0022-006X.74.3.401
Houser, M. E. (2015). A Mixed Methods Evaluation of the Effectiveness of a Group Yoga Intervention as an Adjunctive Trauma Therapy for Adolescent Girls. https://doi.org/10.3334/ES06172016-001

Javanbakht, A., King, A. P., Evans, G. W., Swain, J. E., Angstadt, M., Phan, K. L., & Liberson, I. (2015). Childhood poverty predicts adult amygdala and frontal activity and connectivity in response to emotional faces. Frontiers in Behavioral Neuroscience, 9, 154.

Jee, S. H., Couderc, J. P., Swanson, D., Gallegos, A., Hilliard, C., Blumkin, A., ... & Heinert, S. (2015). A pilot randomized trial teaching mindfulness-based stress reduction to traumatized youth in foster care. Complementary Therapies in Clinical Practice, 21(3), 201–209. https://doi.org/10.1016/j.ctcp.2015.06.007

Jonsson, U., Alaie, I., Parling, T., & Arnaberg, F. K. (2014). Reporting of harms in randomized controlled trials of psychological interventions for mental and behavioral disorders: A review of current practice. Contemporary Clinical Trials, 38(1), 1–8. https://doi.org/10.1016/j.cct.2014.02.005

Kabat-Zinn, J. (1990). Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness. New York, NY: Delacorte.

Kalmanowitz, D., & Ho, R. T. (2016). Out of our mind. Art therapy.

Kirlic, N., Cohen, Z. P., & Singh, M. K. (2020). Is there an ACE adult amygdala and frontal activity and connectivity in response to emotional faces. Frontiers in Behavioral Neuroscience, 9, 154.

Key, B. L., Rowa, K., Bieling, P., McCabe, R., & Pawluk, E. J. (2017). Mindfulness-based cognitive therapy as an augmentation treatment for obsessive-compulsive disorder. Clinical Psychology & Psychotherapy, 24(5), 1109–1120. https://doi.org/10.1002/cpp.2076

Kimbrough, E., Magyari, T., Langenberg, P., Chesney, M., & Berman, B. (2010). Mindfulness intervention for child abuse survivors. Journal of Clinical Psychology, 66(1), 17–33. https://doi.org/10.1002/jclp.20114-413

Kirlic, N., Cohen, Z. P., & Singh, M. K. (2020). Is there an ACE up our sleeve? A review of interventions and strategies for addressing behavioral and neurobiological effects of adverse childhood experiences in youth. Adversity and Resilience Science, 1–24. https://doi.org/10.1007/s42844-020-00001-x

Klingbeil, D. A., Renshaw, T. L., Willenbrink, J. B., Copek, R. A., Chan, K. T., Haddock, A., ... & Clifton, J. (2017). Mindfulness-based interventions with youth: A comprehensive meta-analysis of group-design studies. Journal of School Psychology, 67, 77–103. https://doi.org/10.1016/j.jspsy.2017.03.006

Kiken, S. G., Garland, E. L., Bluth, K., Palsson, O. S., & Gaylord, S. A. (2015). From a state to a trait: Trajectories of state mindfulness in meditation during intervention predict changes in trait mindfulness. Personality and Individual Differences, 81, 41–46. https://doi.org/10.1016/j.paid.2014.12.044

Lambert, H. K., Sheridan, M. A., Sambrook, K. A., Rosen, M. L., Asken, M. K., & McLaughlin, K. A. (2017). “The Varieties of Contemplative Experience: A Mixed-Methods Study of Meditation-Related Challenges in Western Buddhists.” PLOS ONE 12(5) https://doi.org/10.1371/journal.pone.0176239

Linehan, M. (1993). Cognitive behavioral treatment of borderline personality disorder. New York, NY: Guilford.

Lomas, T., Cartwright, T., Edginton, T., & Ridge, D. (2015). A qualitative analysis of experiential challenges associated with meditation practice. Mindfulness, 6, 848–860. https://doi.org/10.1007/s12671-014-0329-8

Lynch, T. R., Morse, J. Q., Mendelson, T., & Robins, C. J. (2003). Dialectical behavior therapy for depressed older adults: A randomized pilot study. The American Journal of Geriatric Psychiatry, 11(1), 33–45. https://doi.org/10.1097/00019442-200301000-00006

Mahey, F. S., Dozier, M., Geyer, A. E., Mandell, D., Peloso, E., Poeth, K. ... & Ernst, M. (2010). A preliminary study of medial temporal lobe function in youths with a history of caregiver deprivation and emotional neglect. Cognitive, Affective, & Behavioral Neuroscience, 10(1), 34–49. https://doi.org/10.3758/CABN.10.1.34

Maiello, M., Ward, M. J., & Bui, E. (2020). Mind-Body Treatments for Anxiety Disorders. In Clinical Handbook of Anxiety Disorders (pp. 269–282). Humana, Cham. https://doi.org/10.1007/978-3-030-36087-8_14

McElroy, S., & Hevey, D. (2014). Relationship between adverse early experiences, stressors, psychosocial resources and wellbeing. Child Abuse & Neglect, 38(1), 65–75. https://doi.org/10.1016/j.chiabu.2013.07.017

McKeering, P., & Hwang, Y. S. (2019). A systematic review of mindfulness-based school interventions with early adolescents. Mindfulness, 10(4), 593–610. https://doi.org/10.1007/s12671-018-0998-9

McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2012). Childhood adversities and first onset of psychiatric disorders in a national sample of US adolescents. Archives of General Psychiatry, 69(11), 1151–1160. https://doi.org/10.1001/archgenpsychiatry.2011.2277

Methley, A. M., Campbell, S., Chew-Graham, C., McNally, R., & Cheraghi-Sohi, S. (2014). PICO, PICOS and SPIDER: a comparison study of specificity and sensitivity in three search tools for qualitative systematic reviews. BMC health services research, 14, 579. https://doi.org/10.1186/s12913-014-0579-0

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. BMJ. https://doi.org/10.1136/bmj.b2535

Morse, J. M. (2012). Qualitative health research: Creating a new discipline. Left Coast Press.

Norman, S. P. (2018). Improving self-regulation and managing behavior with mindfulness based intervention (Doctoral dissertation, University of Alabama Libraries).

Nusslock, R., & Miller, G. E. (2016). Early-life adversity and physical and emotional health across the lifespan: a neuroimmune network hypothesis. Biological psychiatry, 80(1), 23–32. https://doi.org/10.1016/j.biopsych.2015.05.017

O’connell, B., & Dowling, M. (2014). Dialectical behaviour therapy (DBT) in the treatment of borderline personality disorder. Journal of psychiatric and mental health nursing, 21(6), 518–525. https://doi.org/10.1111/jpm.12116

Ortiz, R., & Sibinga, E. M. (2017). The role of mindfulness in reducing the adverse effects of childhood stress and trauma. Children, 4(3), 16. https://doi.org/10.3390/children4030016

Petticrew, M., Rehfues, E., Noyes, J., Higgins, J. P., Mayhew, A., Pantoja, T., Shemilt, I., & Cowden, A. (2013). Synthesizing evidence on complex interventions: how meta-analytical, qualitative, and mixed-method approaches can contribute. Journ, al of Clinical Epidemiology, 66(11), 1230–1243. https://doi.org/10.1016/j.jclinepi.2013.06.005

Pluye, P., & Hong, Q. N. (2014). Combining the power of stories and the power of numbers: Mixed methods research and mixed studies reviews. Annual Review of Public Health, 35, 29–45. https://doi.org/10.1146/annurev-publhealth-032013-182440

Rau, H. K., & Williams, P. G. (2016). Dispositional mindfulness: A critical review of construct validation research. Personality and Individual Differences, 93, 32–43. https://doi.org/10.1016/j.paid.2015.09.035

Rozental, A., Kottorp, A., Boettcher, J., Andersson, G., & Carlbring, P. (2016). Negative Effects of Psychological Treatments: An Exploratory Factor Analysis of the Negative Effects Questionnaire for
Monitoring and Reporting Adverse and Unwanted Events. *PLoS ONE*, 11(6), e0157503. https://doi.org/10.1371/journal.pone.0157503

Ruiz, F. J. (2012). Acceptance and commitment therapy versus traditional cognitive behavioral therapy: A systematic review and meta-analysis of current empirical evidence. *International Journal of Psychology and Psychological Therapy*, 12(3), 333–358.

Saini, M., & Shlonsky, A. (2012). Systematic synthesis of qualitative research. *OUP USA*. https://doi.org/10.1093/acprof:oso/9780195387216.00005

Salcedo, S., Gold, A. K., Sheikh, S., Marcus, P. H., Nierenberg, A. A., Deckersbach, T., & Sylvia, L. G. (2016). Empirically supported psychosocial interventions for bipolar disorder: Current state of the research. *Journal of Affective Disorders*, 201, 203–214. https://doi.org/10.1016/j.jad.2016.05.018

Sandelowski, M., Voils, C. I., & Barroso, J. (2006). Defining and designing mixed research synthesis studies. *Research in the Schools*, 13(1), 29.

Sandelowski, M., Voils, C. I., Leeman, J., & Crandell, J. L. (2012). Mapping the mixed methods-Mixed research synthesis terrain. *Journal of Mixed Methods Research*, 6(4), 317–331. https://doi.org/10.1177/1558689811427913

Sanders, M. R., & Morawaska, A. (2011). Prevention: The role of early universal and targeted interventions. In Clinical handbook of assessing and treating conduct problems in youth (pp. 435–454). Springer, New York, NY. https://doi.org/10.1007/978-1-4419-6297-3_17

Schutte, N. S., & Malouff, J. M. (2011). Emotional intelligence mediates the relationship between mindfulness and subjective well-being. *Personality and Individual Differences*, 50(7), 1116–1119. https://doi.org/10.1016/j.paid.2011.01.037

Segal, Z. V., & Teasdale, J. (2018). Mindfulness-based cognitive therapy for depression. Guilford Publications.

Segal, Z. V., Williams, J. M. G., Teasdale, J. D. (2002). Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse. New York, NY: Guilford Press.

Seligman, Reichenberg, Linda & Lourie. (2014). Theories of Counseling and Psychotherapy.New Jersey: Pearson Prentice Hall. pp. 354-356.

Selous, C., Kelly-Irving, M., Maughan, B., Eyre, O., Rice, F., & Collishaw, S. (2019). Adverse childhood experiences and adult mood problems: evidence from a five-decade prospective birth cohort. *Psychological Medicine*, 1-8. https://doi.org/10.1017/S003329171900271X

Shackman, J. E., Shackman, A. J., & Pollak, S. D. (2007). Physical abuse amplifies attention to threat and increases anxiety in children. *Emotion*, 7(4), 838. https://doi.org/10.1037/1528-3542.7.4.838

Shapero, B. G., Greenberg, J., Pedrelli, P., de Jong, M., & Desbordes, G. (2018). Mindfulness-based interventions in psychiatry. *Focus (American Psychiatric Publishing)*, 16(1), 32–39. https://doi.org/10.1176/appi.focus.20170039

Sheffler, J. L., Stanley, I., & Sachs-Ericsson, N. (2020). ACEs and mental health outcomes. In *Adverse Childhood Experiences* (pp. 47–69). Academic Press. https://doi.org/10.1016/B978-0-12-816065-7.00004-5

Shonin, E., Van Gordon, W., & Griffiths, M. D. (2013). Mindfulness-based interventions: towards mindful clinical integration. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2013.00194

Simpson, S., Mercer, S., Simpson, B., Lawrence, M., & Wyke, S. (2018). Mindfulness-based interventions for young offenders: A scoping review. *Mindfulness*, 9(5), 1330–1343. https://doi.org/10.1007/s12671-018-0892-5

Sitzer, D. L., & Stockwell, A. B. (2015). The art of wellness: A 14-week art therapy program for at-risk youth. *The Arts in Psychotherapy*, 45, 69–81. https://doi.org/10.1016/j.artspsy.2015.05.007

Spidel, A., Daigleault, I., Kealy, D., & Lecomte, T. (2019). Acceptance and commitment therapy for psychosis and trauma: Investigating links between trauma severity, attachment and outcome. *Behavioural and Cognitive Psychotherapy*, 47(2), 230–243. https://doi.org/10.1017/s1352465818000413

Spidel, A., Lecomte, T., Kealy, D., & Daigleault, I. (2018). Acceptance and commitment therapy for psychosis and trauma: Improvement in psychiatric symptoms, emotion regulation, and treatment compliance following a brief group intervention. *Psychology and Psychotherapy: Theory, Research and Practice*, 91(2), 248–261. https://doi.org/10.1111/papt.12159

Tang, Y. Y. (2017). Traits and states in mindfulness meditation. In *The neuroscience of mindfulness meditation* (pp. 29–34). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-51025-4

Taylor, J., McLean, L., Korner, A., Stratton, E., & Glozier, N. (2020). Mindfulness and yoga for psychological trauma: systematic review and meta-analysis. *Journal of Trauma & Dissociation*, 1-38. https://doi.org/10.1080/15299732.2020.1760167

The Scottish Government. (2012). Getting it right for every child. https://hub.scot/media/1512/a-guide-to-getting-it-right-for-every-child.pdf

The Scottish Government. (2017). The Mental Health Strategy 2017–2020. Crown copyright.

Van Dam, N. T., van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki, A., Meissner, T., Lazar, S. W., Kerr, C. E., Gorchov, J., Fox, K. C. R., Field, B. A., Britton, W. B., Brefczynski-Lewis, J. A., & Meyer, D. E. (2018). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science*, 13(1), 36–61. https://doi.org/10.1177/1745691617709589

Van der Gucht, K., Glas, J., De Haene, L., Kuppens, P., & Raes, F. (2019). A Mindfulness-Based Intervention for Unaccompanied Refugee Minors: A Pilot Study with Mixed Methods Evaluation. *Journal of Child and Family Studies*, 28(4), 1084–1093. https://doi.org/10.1007/s10826-019-01336-5

Varambally, S., & Gangadhar, B. N. (2016). Current status of yoga in mental health services. *Review of Psychiatry*, 28(3), 233–235. https://doi.org/10.1111/j.0022-3840.1994.2801_233.x

Wang, D., Hagger, M. S., & Chatzisarantis, N. L. (2020). Ironic Effects and Meditation: A Meta-Analysis. *Perspectives on Psychological Science*, 15(3), 778–793. https://doi.org/10.1177/1745691619898795

**Publisher’s Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.