

REVIEW ARTICLE

Online interventions for the mental health and well-being of parents of children with additional needs: Systematic review and meta-analysis

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Abstract

Introduction: Parents of children with additional needs experience compromised physical and mental health and higher stress, and their ability to engage in meaningful occupations is impacted by their additional caregiving tasks. Online interventions targeting mental health, stress, and well-being for parents of children with additional needs have potential to increase supports alongside occupational therapy direct services. The aims of this review are to systematically identify and synthesise evidence of effectiveness of online interventions aimed at improving mental health, stress, and well-being of parents of children with additional needs.

Method: Eight databases were searched up to July 2024 to identify online interventions for parents of children with additional needs. Studies were appraised for methodological quality. Standardised effect sizes were calculated, and meta-analyses of randomised control trials (RCTs) were conducted on outcomes of mental health, well-being, and stress.

Consumer and Community Involvement: There was no consumer or community involvement.

Results: Systematic screening identified 30 papers that met inclusion criteria. Most were RCTs or controlled clinical trials (CCTs) with 'moderate' quality ratings: Three were designed by occupational therapists. There was substantial variation in intervention types, methods of delivery, outcomes, and outcome measures used. The pooled standardised effect size estimates (*ES*) and the lower and upper confidence intervals (*CI*) of online interventions from RCTs post-interventions were significant for mental health *ES* = 0.47, 95% *CI* (0.18, 0.77), *p* = 0.002; stress *ES* = 1.27, 95% *CI* (0.56, 1.98), *p* = 0.000; and well-being *ES* = 0.65, 95% *CI* (1.2, 0.06), *p* = 0.03, respectively.

Conclusion: The online interventions that aimed to improve mental health, stress, and well-being included in this meta-analysis were effective.

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Occupational therapists supporting families play an important role in guiding parents of children with additional needs to evidence-based interventions to support them with addressing their own mental health and well-being needs.

PLAIN LANGUAGE SUMMARY

Parents caring for children with disability or chronic medical conditions may experience poorer mental health and higher stress levels. Supporting parents to look after their own mental health and well-being contributes to their capacity to maintain care for their child. This study searched eight databases for recent studies into online interventions designed to target mental health, well-being, and stress levels of parents caring for children with additional needs. Thirty studies were identified, and information was collected from these to describe elements of these interventions. Results showed that these interventions used a range of approaches and formats. There was a wide variety in number and duration of sessions, mode of delivery, and who delivered the programmes and populations these were delivered to. Online interventions were effective at reducing stress and improving mental health and well-being for parents. However, there were significant differences in how these interventions were delivered and how outcomes were measured, so results must be interpreted cautiously, particularly for non-randomised studies. This study provides information for health professionals working with families with children with additional needs on the unique challenges these parents face with ensuring their own health and well-being is addressed. It highlights that interventions addressing parent mental health, stress, and well-being delivered via digital formats can be effective.

KEYWORDS

children with additional needs, mental health, online intervention, parent, stress, well-being

1 | INTRODUCTION

Whilst caring for children with additional needs is a rewarding experience, it is also one that comes with significant challenges (Esdaile, 2009). Caring places extra demands on a carer's time and resources and has long been described as 'caregiving as a career' (Raina et al., 2005). Congruent with other countries, recent Australian data indicated that 47% of primary caregivers of children with disabilities or chronic medical conditions, henceforth referred to as children with additional needs (CAN), spend at least 40 hours or more per week in caring and that, consequently, this group is significantly less employed (Australian Bureau of Statistics, 2018). Furthermore, evidence indicates that there are also physical and psychological health impacts for parent carers who experience higher stress levels, higher rates of chronic medical conditions, and increased incidence of mental health issues such as depression and anxiety (Bourke-Taylor et al., 2022; Lee et al., 2017; Marquis et al., 2020; Masefield et al., 2020).

Key Points for Occupational Therapy

- Online interventions utilising cognitive-behavioural, psychoeducational, and combinations of these with mindfulness can be effective in improving mental health, well-being, and stress of parents of children with additional needs.
- Occupational therapists can contribute to the development and delivery of evidence-based online interventions for parent stress, mental health, and well-being. These interventions address an unmet need for parents of children with additional needs and contribute to more equitable service delivery.

Occupational balance has been defined as 'the individual's perception of having the right amount of occupations and the right variation between occupations'

(Wagman et al., 2012). Occupational balance impacts health and well-being. McDougall et al. (2014) found that primary carers experienced occupational imbalance due to their occupational engagement being dominated by their prioritisation of the caregiving role. Parenting CAN involves considerable additional direct and indirect caregiving tasks, which impacts a parent's occupational balance (Dhas et al., 2023). Maintaining parents' capacity to care for their child is paramount. Occupational therapists working with families of CAN are uniquely positioned to support parents with engagement in meaningful occupations that support their own health and well-being (Gonzalo-Ciria et al., 2024) but need to have knowledge of effective, evidence-based interventions.

Parents play a critical role in ensuring positive outcomes for their children, and it is widely recognised that there is a need to ensure they are optimally supported to perform this role (Chafouleas et al., 2020; Collins et al., 2017). Interventions for parents have been broadly classified as 'parent implementation' where the focus is on building parents' skills to directly support the child and 'parent support' interventions, which directly support the parent with indirect benefits to the child (Bearss et al., 2015). With increasing evidence supporting family-centred approaches as integral to improved outcomes for CAN, it is critical that effective 'parent support' interventions that address the health and well-being needs of parent caregivers are developed (Bradshaw et al., 2019; Novak-Pavlic et al., 2023). A previous systematic review on interventions targeting maternal well-being indicated that these interventions have thus far been based on cognitive-behavioural, psychoeducational, mindfulness, or support group approaches (Bourke-Taylor, et al., 2021). Findings from this review indicated that 30 of the 31 studies reviewed were delivered face-to-face. Only one offered some sessions via Skype or phone (Arakkathara & Bance, 2019).

Despite a clear need for interventions that address the physical and mental health needs of parents of CAN, there remain numerous factors that impede parents' capacity to access face-to-face formats (Osborn et al., 2020). The additional time spent in caregiving activities results in parents finding it difficult to organise routines that allow them time to attend to their own physical and mental health needs. One study found that 75% of mothers of children with disabilities perceived a need for support for their own mental health, but only 58% sought support (Gilson, Davis, et al., 2018). Fathers of children with disabilities also experience higher rates of depression, anxiety, and stress symptoms and lower rates of participation in activities that promote their health (Bourke-Taylor, Cotter, et al., 2021). Some of the key barriers identified for parents accessing this

support were their 'caring responsibilities made it hard to schedule appointments' (Gilson, et al., 2021 p. 388), perception that their needs were not significant enough to seek services, reduced options for child care, and reduced sources of income given the ability to engage in paid employment was limited due to caregiving (Bourke-Taylor, Cotter, et al., 2021; Gilson, Davis, et al., 2018; Gilson, Johnson, et al., 2018; Osborn et al., 2020; Wondemu et al., 2022).

Delivering interventions via online or telehealth modalities can overcome some of these barriers by reducing the need for travel, increasing access at more convenient times for parents, and reducing costs (Pagoto et al., 2016). Technology-delivered parenting interventions have been identified as a potential solution due to popularity with parents and opportunity for easy access to information (Walker, 2021). Up until recently, there was still limited research available on interventions provided via online formats (Pagaki-Skaliora et al., 2022). A recent article reviewed telehealth interventions for caregivers of children with neurodevelopmental disorders, indicating that psychological telehealth interventions effectively reduce parental stress (Kelson & Dorstyn, 2023). However, this study also included parents of adults with neuro-disabilities and excluded participants with co-morbidities, which they noted is not reflective of the norm for this group. Another review investigated digital interventions for family caregivers of people with chronic diseases (Zhai et al., 2023). This review also was not specific to families of children and included studies with parent-implemented interventions rather than those that solely focused on parent support (Zhai et al., 2023).

The COVID-19 pandemic affected parents of CAN disproportionately (Dickinson & Yates, 2020; Pecor et al., 2021), with parents shouldering the increased needs of their children as schools were closed and supports limited. During this time, many health services switched to providing services through telehealth modalities (Eapen et al., 2021). Given this uptake in providing online and telehealth formats, this systematic review aimed as follows:

1. To provide a descriptive overview of empirically researched online interventions to date that primarily aim to improve mental health and well-being and reduce stress of parents/caregivers.
2. To synthesise the available evidence examining whether online interventions that have used a research design of randomised, non-randomised controlled trials, or cohort analytic design improve mental health and well-being and reduce stress of parents/caregivers.

2 | METHODS

The review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) following the procedures outlined in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins & Green, 2011). The protocol was registered with PROSPERO (number CRD42022357326).

2.1 | Positionality statement

All four authors identify as female and as mothers. Three of the authors are trained in occupational therapy and one in psychology and statistics. All authors acknowledge the systems and structures that afford us unearned privilege and are committed to improving our understanding and practice around decolonising research, guided by feminist, indigenist, and decolonising perspectives and by people with lived experiences different than their own.

2.2 | Design and procedure

This study is a systematic review and meta-analyses with the research question:

‘For parents of children with additional needs, what are effective interventions that can be delivered online or via telehealth compared to no or an alternative intervention, for improving mental health, well-being and stress reduction?’

2.3 | Search approach

Database search using Ovid Medline, PsychINFO, Embase, Emcare, Cochrane central register of controlled trials, CINAHL Plus, Proquest, and Scopus was completed for this systematic review. An initial search was conducted on 3 November 2022, with an updated search completed on 10 July 2024.

Search terms were determined by considering known research terms and identifying terms by collective agreement of the authors. MeSH words were used in the search strategy, which was based on a participant, intervention, control, outcome (PICO) model (see Appendix S1). Terms such as ‘online’, ‘telehealth/telemedicine’, ‘virtual’, ‘phone’, ‘web’, ‘internet’, ‘technology’, and ‘ehealth’ were included to

specifically identify online interventions. Dates for search were from year 2000 to current. Reference lists of articles were also manually checked for other relevant studies. For this review, a grey literature search was not completed.

2.4 | Study selection criteria and process

For this review, studies were selected for inclusion if they met the following criteria:

1. Participant may be a parent, primary carer, kinship carer, foster carer, or adult fulfilling the parenting role for a child with a disability or chronic medical condition.
2. Primarily reported parental stress, mental health, or health outcomes measured by validated instruments.
3. Reported parental well-being outcomes of parents of children with a disability or chronic medical condition, for example, quality of life, stress, life satisfaction, self-efficacy/empowerment, coping styles, positive health behaviours, or perceived social supports measured by validated instruments. Studies that measured parent outcomes as a secondary outcome were included.
4. A quantitative study with an intervention study comparing groups where at least one group involves online or telehealth interventions.
5. The intervention is delivered through telehealth, websites, an app, the internet, or any other virtual means.
6. Was published in English.

A study was excluded if it

1. Examined interventions that were pharmacological agents.
2. Examined interventions that were primarily focused on the children with disabilities or chronic medical conditions.
3. Included outcomes that were only measuring child-related factors.
4. Was a protocol or theoretical paper.
5. Included caregivers who had typically developing children only.
6. Included interventions that were only delivered face-to-face.

A four-step process was followed in the search and identification of studies:

1. Databases were systematically searched.

2. Retrieved articles were saved to Endnote reference manager and screened manually for duplicates, which were removed. This was then imported into Covidence (2022), an online screening and data extraction tool.
3. Two members of the research team independently reviewed titles and abstracts to exclude studies that clearly did not meet the inclusion criteria. Conflicts were resolved through discussion between the two authors.
4. Two members of the research team separately reviewed the full-text articles and applied inclusion and exclusion criteria. Reasons for exclusion were recorded. Conflicts were resolved by discussion and if not able to be resolved, a third reviewer was involved.

2.5 | Categorisation of interventions in all studies in this review

All included studies were appraised for methodological quality by Authors 1 and 4 using the Quality Assessment Tool for Quantitative Studies (QATQS) and dictionary from the Effective Public Health Practice Project (EPHPP, see <https://www.ehphp.ca/quality-assessment-tool-for-quantitative-studies/>) (Armijo-Olivo et al., 2012). This tool contains components to rate the sample selection (selection bias), study design, identification and management of confounders, blinding of outcome assessors and study participants, data collection method reliability and validity, and withdrawals and dropouts. Studies were independently rated, using the standardised guide and dictionary, as strong, moderate, or weak (Table 1). Differences in ratings were resolved through discussion until there was 100% agreement on QATQS categories.

2.6 | Data extraction

Descriptive information was extracted such as location, inclusion/exclusion criteria, population, study design, recruitment, intervention approach, and mode and format of delivery (Table 2). Other information about the intervention content and other outcomes measured were also extracted (Appendices S2 and S3a–c). To complete the meta-analysis, means, standard deviations, sample sizes, effect sizes (where provided), and scales used to measure mental health, stress, or well-being at baseline and post-intervention were also collected (Table 2). Scales were examined to determine and confirm the construct

measured (refer to Appendix S4). Where quantitative data pertaining to outcome measures of interest (mental health, stress, well-being) were not reported, attempts were made to contact authors to obtain the required information. Two studies were excluded from the meta-analysis due to missing data (Muñeton-Castaño et al., 2022; Whitney & Smith, 2015). The data from studies that did not include a control group were not combined with randomised control trials (RCTs) studies and were not included in the meta-analyses.

2.7 | Data synthesis

Meta-analyses for outcomes of mental health, stress, and well-being were conducted using STATA version 15 (Stata-Corp, College Station, TX, USA). To standardise the measurement of mental health, stress, and well-being outcomes across different studies and tools used in each study, standardised mean difference (SMD—Cohen's *d*) from baseline to post-intervention between intervention and control group was calculated for all the studies included in this systematic review (RCTs or group comparative design).

Inverse variance random effect meta-analyses were also performed by pooling standardised effect size estimates (*ES*) for outcomes of interest (mental health, stress, and well-being) for studies that have employed randomised controlled trial designs and where data were available.

Standardised *ES* summarised as Cohen's *d* effect sizes and 95% confidence intervals (*CI*) were used to compare results across all included studies. A small effect is indicated by a value of 0.2, a medium effect by 0.5, and a large effect by 0.8, respectively. To assess the consistency in results between the studies in the meta-analysis, I^2 was used, where a value of 0% reflects no heterogeneity and larger values show increasing heterogeneity (Higgins et al., 2003). Given only few studies reported short-term and long-term follow-up of outcomes, comparisons between all conditions were made only at post-intervention.

Cohort analytical and non-randomised group comparison studies were excluded from the meta-analysis. Sub-group analyses were initially planned to examine whether the intervention approach, delivery mechanism, or programme length explained variability in published outcomes. However, the high variability in these factors and low number of studies in the final review precluded this. Therefore, a narrative analysis of potential sources of heterogeneity was pursued.

3 | RESULTS

The initial search produced 3142 articles, of which 77 were retained for the full-text screening stage (see Figure 1) with 22 articles included. The updated search yielded a further 1259 articles of which 24 were retained for full-text screening, with six additional studies added. One paper found was a follow-up to a study already included (Lappalainen et al., 2021; Lappalainen et al., 2023) and hence has been counted as one study within this review. A further two studies that met the inclusion criteria were found from a manual search of the reference lists, providing a total of 30 studies included in the review that included 2540 participants in total. Figure 1 (PRISMA flowchart) shows the selection process of studies and the reasons for exclusion of the 73 studies not included.

Twenty-two of the studies were RCTs, four were controlled clinical trials (CCT), and four were cohort analytic studies. Mixed methods were used in six of the studies to evaluate the intervention; however, only the quantitative data from these studies were examined in this review (Bjornstad et al., 2021; Kulbas & Ozabaci, 2022; Lo et al., 2024; McMillan et al., 2020; Park et al., 2020; Portnoy et al., 2023) (Table 1).

3.1 | Quality ratings of all studies in this review

The QATQS highlighted a range of ratings across the studies (Table 1). One aspect of the studies that was difficult to report on was blinding, due to the fact that all studies used self-report measures and it is difficult to blind participants in non-pharmacological, behavioural studies. Three studies reported that they blinded their outcome assessors and were therefore rated as 'strong' globally (Hemdi & Daley, 2017; Liu et al., 2021; Whittingham et al., 2022). Eight studies were rated as 'weak' on two or more variables and therefore received a global rating of 'weak' (Bekhet, 2017; Bourke-Taylor et al., 2023; Clifford & Minnes, 2013; Lo et al., 2024; McMillan et al., 2020; Muñeton-Castaño et al., 2022; Portnoy et al., 2023; Whitney & Smith, 2015).

3.2 | Description of characteristics of the studies

Included studies originated from 12 different countries (Table 2). Ten of the studies were completed in the United States (Bekhet, 2017; Kuhlthau et al., 2020;

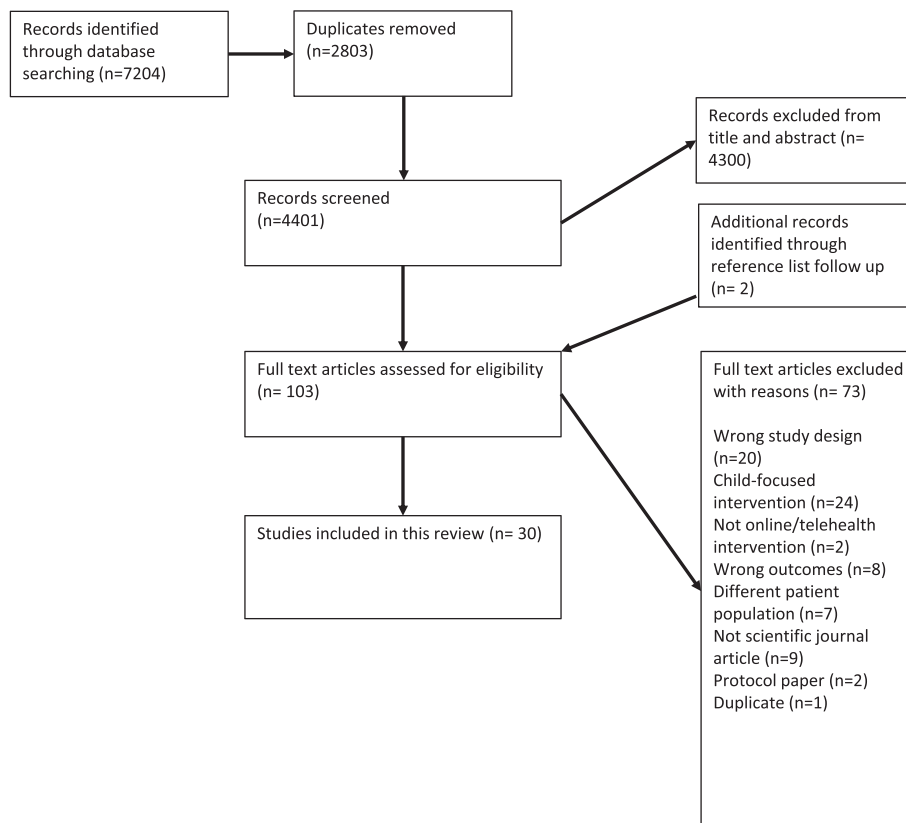


FIGURE 1 Flow chart of literature search using Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA).

TABLE 1 Quality assessment of included research papers using the Effective Public Health Practice Project, Quality Assessment Tool for Quantitative Studies.

Study	Design	Global rating	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts
Bekhet (2017)	CCT	Weak	Moderate	Strong	Weak	Weak	Strong	Strong
Bernie et al. (2023)	RCT	Moderate	Moderate	Strong	Strong	Weak	Moderate	Moderate
Bjornstad et al. (2021)	RCT	Moderate	Strong	Strong	Strong	Weak	Strong	Strong
Bourke-Taylor et al. (2023)	CCT	Weak	Strong	Strong	Weak	Weak	Strong	Moderate
Bourke-Taylor et al. (2024)	Cohort analytic	Moderate	Moderate	Moderate	Strong	Weak	Strong	Moderate
Clifford & Minnes (2013)	Cohort analytic	Weak	Weak	Moderate	Strong	Weak	Strong	Weak
Douma et al. (2021)	RCT	Moderate	Strong	Strong	Strong	Weak	Strong	Strong
Hemdi & Daley (2017)	RCT	Strong	Strong	Strong	Strong	Moderate	Moderate	Strong
Kuhlthau et al. (2020)	RCT (waitlist control)	Moderate	Moderate	Strong	Strong	Weak	Strong	Moderate
Kulbas & Ozabaci (2022)	CCT	Moderate	Strong	Strong	Strong	Weak	Strong	Strong
Lappalainen et al. (2021)	RCT	Moderate	Strong	Strong	Strong	Weak	Strong	Moderate
Lappalainen et al. (2023)	RCT	Moderate	Strong	Strong	Strong	Weak	Strong	Moderate
Liu et al. (2021)	Cohort analytic	Strong	Moderate	Moderate	Strong	Moderate	Strong	Strong
Lo et al. (2024)	RCT	Weak	Strong	Strong	Strong	Weak	Strong	Weak
McMillan et al. (2020)	RCT—stepped wedge design	Weak	Weak	Strong	Strong	Weak	Strong	Strong
Mulligan et al. (2022)	RCT	Moderate	Moderate	Strong	Strong	Weak	Strong	Moderate
Muñeton-Castaño et al. (2022)	RCT (waitlist control)	Weak	Weak	Strong	Strong	Weak	Strong	Weak
Pandya (2021)	RCT	Moderate	Strong	Strong	Strong	Weak	Strong	Moderate
Park et al. (2020)	RCT (waitlist control)	Moderate	Moderate	Strong	Strong	Weak	Strong	Moderate
Portnoy et al. (2023)	Cohort analytic	Weak	Weak	Moderate	Weak	Weak	Moderate	Strong
Raj et al. (2015)	RCT	Moderate	Strong	Strong	Strong	Weak	Strong	Strong
Raj et al. (2018)	RCT	Moderate	Strong	Strong	Strong	Weak	Strong	Strong
Sairanen et al. (2019)	RCT (waitlist control)	Moderate	Strong	Strong	Strong	Moderate	Strong	Weak
Sveen et al. (2017)	RCT (waitlist control)	Moderate	Moderate	Strong	Strong	Weak	Strong	Moderate

(Continues)

TABLE 1 (Continued)

Study	Design	Global rating	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts
Timmons and Ekas (2018)	CCT	Moderate	Moderate	Strong	Strong	Weak	Strong	Moderate
Toly et al. (2022)	RCT	Moderate	Moderate	Strong	Strong	Weak	Strong	Moderate
Wade et al. (2006)	RCT	Moderate	Strong	Strong	Strong	Weak	Strong	Moderate
Whitney and Smith (2015)	RCT	Weak	Weak	Strong	Strong	Weak	Strong	Weak
Whittingham et al. (2022)	RCT (waitlist control)	Strong	Strong	Strong	Moderate	Moderate	Strong	Strong
Zhao et al. (2021)	RCT (waitlist control)	Moderate	Strong	Strong	Strong	Weak	Strong	Strong
Zhao et al. (2024)	RCT	Moderate	Strong	Strong	Strong	Weak	Strong	Strong

Note: Global rating I Strong = no weak ratings; Weak = >1 weak rating; selection bias I Strong = participants very likely to be representative of the target population and >80% participation; Weak = participants not likely to be representative of the target population and <60% participation; study design I Strong = randomised controlled trial or controlled clinical trial; Weak = any design other than randomised controlled trial, controlled clinical trial, cohort analytic, case control, cohort, interrupted time series; confounders I Strong = controlled for at least 80% of relevant confounders; Weak = controlled for <60% relevant confounders; blinding I Strong = outcome assessor not aware of intervention status of participants and participants not aware of research question; Weak = both aware of the above; data collection method I Strong = data collection tools shown to be valid and reliable; Weak = data collection tools not shown to be valid; withdrawals and dropouts I Strong = follow-up rate 80% or greater; Weak = follow-up rate <60%. *Study design: Controlled Clinical Trial (CCT)*—an experimental study design where the method of allocating study subjects to intervention or control groups is open to individuals responsible for recruiting subjects or providing the intervention. The method of allocation is transparent before assignment, for example, an open list of random numbers or allocation by date of birth, and so forth; *Cohort analytic* (two group pre and post). An observational study design where groups are assembled according to whether or not exposure to the intervention has occurred. Exposure to the intervention is not under the control of the investigators. Study groups might be non-equivalent or not comparable on some feature that affects outcome.

Abbreviation: RCT, randomised control trial.

Muñeton-Castaño et al., 2022; Park et al., 2020; Raj et al., 2015, 2018; Timmons & Ekas, 2018; Toly et al., 2022; Wade et al., 2006; Whitney & Smith, 2015). The remaining studies originated from the United Kingdom (Bjornstad et al., 2021; Mulligan et al., 2022; Portnoy, et al., 2023), China (Liu et al., 2021; Zhao et al., 2021, 2024), Australia (Bernie et al., 2023; Bourke-Taylor et al., 2023, 2024; McMillan et al., 2020; Whittingham et al., 2022), Sweden (Sairanen et al., 2019; Sveen et al., 2017), and Finland (Lappalainen et al., 2023, 2021). There was also one each from Canada (Clifford & Minnes, 2013), Netherlands (Douma et al., 2021), Saudi Arabia (Hemdi & Daley, 2017), Turkey (Kulbas & Ozabaci, 2022), Hong Kong (Lo et al., 2024), and India (Pandya, 2021).

3.2.1 | Participants

Interventions either focused on mothers or were predominantly attended by mothers when the programmes were available to parents generally (Table 2). Eight studies

specifically delivered intervention to mothers (Bourke-Taylor et al., 2023, 2024; Hemdi & Daley, 2017; Kuhlthau et al., 2020; Liu et al., 2021; Pandya, 2021; Timmons & Ekas, 2018; Whitney & Smith, 2015). The remaining studies offered intervention to parents or carers, and no interventions were specifically designed for or delivered only to fathers. Five studies did not provide information on the gender distribution of the parents/carers (Clifford & Minnes, 2013; Portnoy et al., 2023; Raj et al., 2015, 2018; Wade et al., 2006).

Interventions were designed for parents of children with a wide range of conditions (Table 2). Eight studies provided interventions that were tailored for parents of children with autism (Bekhet, 2017; Clifford & Minnes, 2013; Hemdi & Daley, 2017; Kuhlthau et al., 2020; Liu et al., 2021; Pandya, 2021; Timmons & Ekas, 2018; Zhao et al., 2021, 2024), and one study was for parents of children on waitlists for an autism assessment (Bernie et al., 2023). Five studies examined interventions for specific medical conditions such as one for children on life-saving technology (Toly et al., 2022), one for children who were ventilator dependent

TABLE 2 Characteristics of studies included in review.

Author, year, country	Study design	Study population	N = baseline	n = post	Inclusion criteria	Intervention
Bekhet, 2017 USA	CCT	Caregivers of persons with ASD (child age range from 2 to 17 years) 94% females	N = 73	n = 64	No information on this	Intervention—positive thinking training (PTT) CBT
Bernie et al., 2023 ^a Australia	RCT	Parents of children waiting ASD assessment 50% male, 50% female.	N = 16	n = 12	Parents of children waiting for an ASD assessment, child 0–7 years. Excluded if already had an autism assessment or a parent was engaged in regular coaching or mental health support sessions.	Intervention groups 1—videoconferencing occupational performance coaching (OPC) 2—F2F OPC Other
Bjornstad et al., 2021 UK	RCT	Parent carers 96% female	N = 92	n = 83	Primary carers of children with additional needs or disability, able to attend group meeting sessions, access to online information. Only one parent per household	Intervention—healthy parent carers group programme and online resources Combined—PE and support
Bourke-Taylor et al., 2023 ^a Australia	CCT	Mothers of children with disabilities 100% mothers	N = 23	n = 16	(1) The mother of a child with disabilities receiving occupational therapy at the partnership organisation; (2) willing to participate in coaching sessions; and (3) willing to engage with the programme, including 6 h of online content over 12 weeks.	Intervention: Health promoting Activity Coaching, Healthy Mothers Healthy Families website, manual. Combined—PE and coaching
Bourke-Taylor et al., 2024 ^a Australia	Cohort analytic	Mothers of children with disabilities 100% mothers	N = 172	n = 116	Mother of child with disability who participated in HMHF workshops run through independent, not-for-profit peer support organisation who consented to participate.	Healthy Mothers Healthy Families PE
Clifford & Minnes, 2013 Canada	Cohort analytic	Parents of children with ASD 95% females	N = 45	n = 43	Parents of child with ASD, part of the larger study. Indicated interest in new online support group. Had to have access to internet connection	Intervention group: online parent support group. Other—support
Douma et al., 2021 Netherlands	RCT	Parents of children with chronic illness 100% female	N = 73	n = 67	Inclusion: caregiver of a child between the ages of 0 and 18 years with a physical CI diagnosis, according to the following criteria : (a) onset between ages 0 and 18; (b) diagnosis based on medical scientific knowledge; (c) the illness is not (yet) curable; and (d) the illness has been present for at least 3 months, or at least three episodes have occurred in the last year and access to a device with internet.	Intervention: Op Koers online (group led by facilitators, based on CBT/ACT) CBT

(Continues)

TABLE 2 (Continued)

Author, year, country	Study design	Study population	N = baseline	n = post	Inclusion criteria	Intervention
Hemdi & Daley, 2017 Saudi Arabia	RCT	Mothers of children with ASD	N = 67	n = 62	Exclusion: having cognitive disabilities or language problems which limited the ability to participate in the intervention and/or to fill out questionnaires. Mothers above the age of 18, living with their child with ASD, capable of reading and writing in Arabic, had smart phones with WhatsApp application.	Intervention: individual WhatsApp sessions with therapist PE
Kuhlthau et al., 2020 USA	RCT (waitlist control)	Parents of children with ASD 96% female	N = 51	n = 34	Parents 18 years or over, proficient in English and willing to engage in an online intervention. Excluded if using corticosteroids or if child had severe emotional or physical disorder	Intervention—SMART-3RP Combined—mindfulness/PE/CBT
Kulbas & Ozabaci, 2022 Turkey	CCT	Mothers of children with ID	N = 39	n = 35	Mothers of children with moderate to severe ID that were educated in 2019–202 school year. Scored 1 SD below mean on psychological well-being, self-compassion and dispositional Hope scale	Intervention—positive psychological-based group counselling method developed online CBT
Lappalainen et al., 2021 and Lappalainen et al., 2023 Finland	RCT	Parents of children with chronic conditions and developmental disabilities 93.6% female	N = 110	n = 82	Have a child under 18 with a chronic condition or developmental disability, scored greater than 2.75 on burnout questionnaire, not receiving other psychological treatment, no mental health condition, sufficient Finnish language skills and access to internet	Intervention 1—iACT. Web-based ACT intervention CBT
Liu et al., 2021 China	RCT	Mothers who were the primary caregivers of preschool children with ASD 100% mothers	N = 125	n = 109	(1) Mothers who were the primary caregivers of preschool children aged 3–7 years old who were diagnosed with ASD according to the (DSM-5) (2) Mothers who owned a smartphone and had a WeChat account (3) Able to read and understand Mandarin Chinese. Exclusion: children with Rett syndrome/CDD or other terminal illness, mothers receiving other psychosocial treatments in past 8 months, child diagnosed with covid or terminal illness during intervention.	Intervention—WeChat based parent training online JASPER course, online Q and A session and online parental psychological intervention course based on pandemic situations. Combined—mindfulness/PE/CBT
Lo et al., 2024 Hong Kong	Cohort analytic	Parents of children with ADHD 93% mothers 7% fathers	N = 47	n = 43	Inclusion: parents of child aged 6–18 with diagnosis of ADHD reported by parents, able to understand and speak Cantonese Chinese and primary caretaker of the child in last year.	Mindfulness-based programme delivered via daily videos and weekly session with instructor online Other—mindfulness

TABLE 2 (Continued)

Author, year, country	Study design	Study population	N = baseline	n = post	Inclusion criteria	Intervention
McMillan et al., 2020 Australia	RCT	Parents of children aged 12 months to 9 years with severe CP 77% female	N = 20	n = 18	Exclusion: parent diagnosed with developmental disability, psychosis or cognitive impairment, or had prior experience in mindfulness-based stress reduction/cognitive therapy. Parents over age of 18, active parenting role, sufficient English to participate, child diagnosed with severe CP (level IV or V GMFCS) at least 12 months prior to study enrolment Excluded if parent had other major trauma within 2 months prior to study enrolment	Intervention—take a breath programme CBT
Mulligan et al., 2022 UK	RCT—stepped wedge design	Parents of children with juvenile idiopathic arthritis 83.2% female	N = 220	n = 141	Parents with child under 12 or under recently diagnosis of juvenile idiopathic arthritis (within 6 months), internet access, able to speak and read English. Exclusion: current severe mental illness, major problems with literacy, likely to become distressed by study as seemed by rheumatologist	Intervention: access to website with psychoeducation PE
Muñeton-Castaño et al. (2022) USA	RCT	Parent or guardian of a child enrolled in the CAPE programme (ventilator dependent) 97% female	N = 30	n = 16	Mental health score of 45 or less on the global health scale, age 18 years or older, not currently receiving mental health counselling and were English or Spanish speaking. Exclusion: received MH treatment in 3 months prior, scheduled to being MH treatment, history of psychosis, exhibiting evidence of suicidal thoughts.	Intervention: TeleP (telepsychoeducational/CBT) consisted of 1 h sessions delivered by a social worker Combined—mindfulness/PE
Pandya, 2021 India	RCT (waitlist control)	Mothers of children with ASD	N = 137	n = 114	Willingness to participate Exclusion: prior participation in similar programme or advanced spirituality and mindfulness	Intervention: WhatsApp spiritual posts Other
Park et al., 2020 USA	RCT	Parents of children with LAD (learning and attentional disability) 90.6% female	N = 52	n = 36	Eligible parent participants were at least 18 years old and identified as having at least one child of any age with a diagnosed LAD, ability to participate in intervention delivered via videoconferencing, proficient in English Excluded if had child with severe emotional/physical disorder or ID	Intervention: SMART 3RP Combined—mindfulness/PE/CBT

TABLE 2 (Continued)

Author, year, country	Study design	Study population	N = baseline	n = post	Inclusion criteria	Intervention
Portnoy et al., 2023 UK	RCT (waitlist control)	Parents of children with chronic health conditions 95% female	N = 40	n = 37	No clear inclusion/exclusion criteria reported	Intervention: online mindfulness-based wellbeing programme Other—mindfulness
Raj et al., 2015 USA	Cohort analytic	Parents of children aged 3–9 years who were admitted for treatment of TBI	N = 40	n = 37	Child spending one or more nights at hospital due to TBI, and a lowest recorded GCS score of 12 or less, or a higher score coupled with evidence of visible brain injury on CT or MRI scan. Other: children residing with parent/guardian for duration of 6 month study, English as primary language in home, completed inpatient rehab related to TBI, access to internet Exclusions: non-blunt head trauma/tumours and parent hospitalisation in previous 12 months for psychiatric disorder. Children with severe cognitive impairment not able to interact through play also excluded. Lived more than 3 h away	Intervention: Internet-based Interacting Together Everyday: Recovery After Childhood TBI (I-InTERACT) PE
Raj et al., 2018 USA	RCT	Caregivers of children aged 3–9 years with moderate to severe TBI	N = 113	n = 96	Child spending one or more nights at hospital due to TBI, and a lowest recorded GCS score of 12 or less, or a higher score coupled with evidence of visible brain injury on CT or MRI scan. Other: children residing with parent/guardian for duration of 6 month study, English as primary language in home, completed inpatient rehab related to TBI, access to internet Exclusions: non-blunt head trauma/tumours and parent hospitalisation in previous 12 months for psychiatric disorder. Children with severe cognitive impairment not able to interact through play also excluded. Lived more than 3 h away	Intervention (1): Internet-based Interacting Together Everyday: Recovery After Childhood TBI (I-InTERACT) Intervention (2): I-InTERACT Express PE
Sairanen et al., 2019 Sweden	RCT	Parents of children with type 1 diabetes or functional diabetes 81% women	N = 74	n = 52	Parents suffering from burnout symptoms (i.e., score exceeding 2.75 points on Shirom-Melamed burnout questionnaire) Access to internet Exclusions: - poor knowledge of Swedish - undergoing other psychological treatment	Intervention: ACTParents, 5 online modules consisting of text and video materials and online discussion forum. Activity completed each module and feedback provided by coach via the platform. CBT

TABLE 2 (Continued)

Author, year, country	Study design	Study population	N = baseline	n = post	Inclusion criteria	Intervention
Sveen et al., 2017 Sweden	RCT (waitlist control)	Parents of children treated for burns from 2000 to 2013 68% women	N = 62	n = 40	Child <18 years at time of study, parent not being treated for burn at same time as child, burn of child was not intentional and no sign of abuse or neglect, ability to understand and respond in Swedish	Intervention: psychoeducation based on CBT and ACT, exercises, and homework. Combined—PE/CBT/mindfulness
Timmons & Ekas, 2018 USA	RCT (waitlist control)	Mothers of children under age of 18 with ASD 100% female	N = 82	n = 64	Child with ASD	Intervention 1: general gratitude Intervention 2: child-specific gratitude Other
Toly et al., 2022 USA	CCT	Parent caregivers of technology dependent children 83.9% female	N = 93	n = 49	Parent caregiver of a technology dependent child, able to speak and understand English, at least 18 years of age, technology dependent child under or equal to 17 years of age and receiving in home care from parent/caregiver. Parents of children with cancer diagnoses excluded.	Intervention: resourcefulness training PE
Wade et al., 2006 USA	RCT	Families of children with moderate to severe TBI	N = 45	n = 42	Child between 5 and 16 years and had to have sustained a moderate to severe TBI bw 1–24 months previously, TBI defined by GCS score of 8 or less for severe. Moderate GCS bw 9–12 or 13–15 with evidence on trauma related abnormality on imaging. Children with non-blunt trauma excluded. Child had to reside in the home, speak English and no evidence of child abuse.	Intervention: family problem solving Other
Whitney & Smith, 2015 USA	RCT	Mothers of children with known socially disruptive conduct 100% female	N = 120	n = 99	Child bw ages 3–18, self-identified as having a 'difficult or hard to parent child'	Intervention—Online journal writing Other
Whittingham et al., 2022 Australia	RCT	Families of young children (2–10 years of age) with CP 94% female	N = 67	n = 56	Had to have a child with CP between ages of 2–10 years and reliable internet access	Intervention—parenting ACT developed into an online course called PARENT101: parenting with purpose CBT
Zhao et al., 2021 China	RCT (waitlist control)	Parents of children with ASD 70.6% females.	N = 94	n = 75	Availability of one parent and one child, children's age was between 3 and 10 years old, and intervention children were diagnosed with ASD based on DSM-V criteria.	Intervention: web-based physical activity programme Other

TABLE 2 (Continued)

Author, year, country	Study design	Study population	N = baseline	n = post	Inclusion criteria	Intervention
Zhao et al., 2024 China	RCT (waitlist control)	Parents of children with ASD 29.5% male 70.5% female	N = 318	n = 263	Inclusion: (1) parents who experienced mental difficulties whilst parenting; (2) children diagnosed with ASD by a certified doctor according to DSM-V criteria ; and (3) children aged between 4 and 12 years. The exclusion criteria are as follows: (1) parents who have difficulty using computers or following instructions during the activity; (2) parents with traumatic brain injuries, epilepsy, or other serious neurological conditions; (3) parents currently undergoing other treatments, such as antidepressant therapy.	Web-based 24 h movement behaviour lifestyle education programme run by group leaders Web-based programme had teaching videos, live workshops, and WeChat group reminders. Other

Abbreviations: ACT, Acceptance and Commitment Therapy; CAPE, Child Adjustment and Parent Efficacy Scale; CCT, Cognitive Behavioural Therapy; CCT, controlled clinical trial; CES-D, Center for Epidemiologic Studies Depression Scale; CI, confidence intervals; CDD, Childhood Disintegrative Disorder; CP, Cerebral Palsy; DASS, Depression Anxiety Stress Scale; DCS, Depressive Cognitions Scale; ES, effect size estimates; F2F, face to face; FSCI, Family Stress and Coping Interview; GCS, Glasgow Coma Scale; GMFCS, Gross Motor Function Classification Scale; HADS, Hospital Anxiety and Depression Scale; HMFH, Healthy Mothers Healthy Families; IASPER, Joint Attention Symbolic Play Engagement and Regulation; MH, mental health; PCL, Post-traumatic Symptom Checklist; PE, psychoeducation; PHQ-4, Patient Health Questionnaire-4; PHQ-9, Patient Health Questionnaire-9; PIP, Pediatric Inventory for Parents; PSI-SF, Parent Stress Index-short form; PWBGI, Psychological General Wellbeing Index; PWI, Personal Wellbeing Index; PWS, Psychological Wellbeing Scale; RCT, randomised control trial; SDS, Self-rating Depression Scale; SMART-3RP, Stress Management and Resiliency Training-Relaxation Response Resiliency Program; STDS, State Trait Depression Scale; TBI, Traumatic Brain Injury; WEMWBS, Warwick Edinburgh Mental Wellbeing Scale.

^aInterventions designed and delivered by occupational therapists.

^bMeasured a factor related to MH, stress, or well-being (WB) but did not measure these directly so effect size not calculated and excluded from meta-analysis.

^cMeasured mental health overall, effect size for overall MH provided. Excluded from meta-analysis as did not provide scores for depression scale.

^dInsufficient data to calculate effect sizes.

TABLE 2 (Continued)

Author, year, country	Mode of delivery	Length of intervention and time of follow-up	Outcome measure used in meta-analysis	Effect size, CI (upper, lower)		
				MH	Stress	WB
Bekhet, 2017 USA	Recorded video presentation presented via online/telehealth group meeting	5 weeks (not clear?) Follow-up—post-intervention	Stress: PTSS [13] ^b	N/A	N/A	N/A
Bernie et al., 2023 ^a Australia	45–60 min sessions in person or via videoconferencing apps such as Zoom, WhatsApp, Skype.	4 sessions over up to 5 weeks Follow-up—post-intervention	Stress: PSI-SF [10]	N/A	ES = 1.43 [2.95, 08]	N/A
Bjornstad et al., 2021 UK	Group meetings in person and online resources.	Either 6 or 12 weeks Follow-up: post-intervention and 6 months post	MH: PHQ-9 [4] Well-being: WEMWBS [15]	ES = 0.22 [0.67, −0.23]	N/A	ES = 0.48 [0.01, −0.9]

TABLE 2 (Continued)

Author, year, country	Mode of delivery	Length of intervention and time of follow-up	Outcome measure used in meta-analysis	Effect size, <i>CI</i> (upper, lower)		
				MH	Stress	WB
Bourke-Taylor et al., 2023 ^a Australia	Self-directed website with modules blended with 1:1 coaching (8 mothers received F2F, 3 mothers received via phone).	6 sessions over 6–10 weeks Follow-up: post-intervention	MH and stress: DASS [1]	<i>ES</i> = 1.7 [2.95, 0.44]	<i>ES</i> = 1.8 [3.2, .61]	
Bourke-Taylor et al., 2024 ^a Australia	3 × 2 h e-workshops, website, and e-workbook	3 sessions over 6 weeks Follow-up: post-intervention	MH and stress: DASS [1] Well-being: PWBGI [18]	<i>ES</i> = 0.21 [−0.16, 0.59]	<i>ES</i> = 0.29 [−0.09, 0.66]	<i>ES</i> = 0.12 [−0.49, 0.24]
Clifford & Minnes, 2013 Canada	Online group videoconference meetings	Weekly or bi-weekly facilitated online support group meeting for 8 sessions (except one group ran for 7 sessions) Follow-up: post-intervention	MH: STDS [8] Stress: FSCI [11]	<i>ES</i> = −0.13 [0.45, −0.72]	<i>ES</i> = 0.21 [0.8, −0.38]	
Douma et al., 2021 Netherlands	Chatroom without use of video	6 weekly, 90 min sessions and a booster session 4 months after last session. Follow-up: post-intervention and 6 months post	MH: HADS [2]	<i>ES</i> = 0.35 [0.84, 0.15]		
Hemdi & Daley, 2017 Saudi Arabia	One f2f session, 4 × 30 min WhatsApp session with therapist, training manual	5 sessions Follow-up: post-intervention and 8 week post	MH: HADS [2] Stress: PSI-SF [10]	<i>ES</i> = 2.53 [3.2, 1.86]	<i>ES</i> = 1.79 [2.38, 1.2]	
Kuhlthau et al., 2020 USA	8 × 1.5 h virtual group sessions	8 weeks Follow-up: 3 months post enrollment and 6 months post enrollment	MH: PHQ-4 [5] ^c	Reported Cohen's <i>d</i> = 0.64 [13.42, 0.33]		
Kulbas & Ozabaci, 2022 Turkey	Videoconference group sessions	10 sessions (60–90 min) Follow-up: post and 2 month after post	Well-being: PWS [19]			<i>ES</i> = −2.92 [−1.74, 4.09]
Lappalainen et al., 2021 and Lappalainen et al., 2023 Finland	Intervention 1: web-programme called Uupu and 3 × online meetings with psychologist	Intervention 1–13 weeks Follow-up: post-intervention, 3 months and 6 months post	MH; PHQ-9 [4]	<i>ES</i> = 0.31 [0.74, −0.12]		
Liu et al., 2021 China	Online/videoconferencing	12 weeks Follow-up: post-intervention and 2 months post.	MH: SDS [6] Stress: PSI-SF [10]	<i>ES</i> = 0.19 [0.85, 0.09]	<i>ES</i> = 0.47 [0.84, 0.09]	
Lo et al., 2024 Hong Kong	Programme delivered via daily videos and 1 h weekly group session with instructor online	2 weeks Follow-up: post and 3 months post	MH: CES-D [3] Stress: PSI-SF [10]	<i>ES</i> = 0.01 [0.61, −0.59]	<i>ES</i> = 0.23 [0.84, −0.37]	

TABLE 2 (Continued)

Author, year, country	Mode of delivery	Length of intervention and time of follow-up	Outcome measure used in meta-analysis	Effect size, <i>CI</i> (upper, lower)		
				MH	Stress	WB
McMillan et al., 2020 Australia	Videoconferencing using Google hangouts	6 sessions Follow-up: post-intervention	Stress: PCL-5 [14] ^b	N/A	N/A	N/A
Mulligan et al., 2022 UK	Website	Access to website for 4 months Follow-up: post-intervention and 12 months	Stress: PIP [12]		<i>ES</i> = 2.80 [3.27, 2.33]	
Muñeton-Castaño et al. (2022) USA	Internet/online videoconferencing	8 sessions Follow-up: post-intervention and 4 weeks post	MH: PHQ-9 [4] ^d	N/A	N/A	N/A
Pandya, 2021 India	Mobile application	50 weekly posts Follow-up: within 2 weeks of completion of posts.	Stress: PSI-SF [10]		<i>ES</i> = 8.64 [9.83, 7.45]	
Park et al., 2020 USA	Videoconferencing group sessions	9 weeks (intake session + 8 intervention sessions), 1.5 h sessions Follow-up: post and 3 month follow-up	PHQ-4 [5] ^c		Reported Cohen's <i>d</i> = 0.71 [−3.42, −0.15]	
Portnoy et al., 2023 UK	Videoconferencing via zoom	8 × weekly 2 h group sessions Follow-up: post-intervention	Well-being: WHO-5 [20]		<i>ES</i> = 0.04 [0.69, −0.61]	
Raj et al., 2015 USA	Individual videoconferencing sessions	10 core sessions and up to 4 supplemental sessions. Follow-up: post-intervention approximately 6 months later	MH: CES-D [3] Stress: PSI-SF [10]	<i>ES</i> = −0.53 [0.18, −1.24]	<i>ES</i> = −0.06 [0.62, −0.74]	
Raj et al., 2018 USA	Individual videoconferencing sessions	Intervention 1: 10 core sessions and up to 4 supplemental sessions. Intervention 2: 7 sessions Follow-up: post and 6 months post	MH: CES-D [3] Stress: PSI-SF [10]	(1) <i>ES</i> = 0.56 [1.03, 0.09] (2) <i>ES</i> = 0.14 [0.62, −0.34]	(1) <i>ES</i> = 0.33 [0.79, −0.4] (2) <i>ES</i> = 0.13 [0.61, −0.35]	
Sairanen et al., 2019 Sweden	Internet/online platform	10 weeks Follow-up: post-intervention and 4 months post	MH and stress: DASS [1]	<i>ES</i> = 0.29 [0.84, −0.26]	<i>ES</i> = 0.18 [0.73, −0.36]	
Sveen et al., 2017 Sweden	Secure website platform	6 weeks Follow-up: post and 3 and 12 months post	Stress: PSI-SF [10]		<i>ES</i> = −0.05 [0.61, −0.71]	

TABLE 2 (Continued)

Author, year, country	Mode of delivery	Length of intervention and time of follow-up	Outcome measure used in meta-analysis	Effect size, <i>CI</i> (upper, lower)		
				MH	Stress	WB
Timmons & Ekas, 2018 USA	Email/online form	8 weeks Follow-up: post-intervention and 4 weeks post	MH; CES-D [3]	$ES = -0.14$ [0.44, -0.73]		
Toly et al., 2022 USA	3 × individual 50 min face-to-face sessions, intervention videos and weekly phone calls.	6 weeks? Follow-up: post-intervention, 3 and 6 months post	MH; DCS [7]	$ES = -0.01$ [0.5, -0.53]		
Wade et al., 2006 USA	14 self-guided modules and weekly or fortnightly meetings with therapist via videoconferencing	Unclear Follow-up: post-intervention	MH; CES-D [3]	$ES = 0.83$ [1.47, 0.18]		
Whitney & Smith, 2015 USA		8 weeks Follow-up: post-intervention	PSI-SF [10] ^d	N/A	N/A	N/A
Whittingham et al., 2022 Australia	Online/telehealth	10 weeks Follow-up: post-intervention and 6 month follow-up	MH and stress: DASS [1] Well-being: PWI [16]	$ES = 0.44$ [0.98, -0.1]	$ES = 0.34$ [0.88, -0.02]	$ES = -0.25$ [0.29, -0.79]
Zhao et al., 2021 China	Web platform, WeChat	10 weeks Follow-up: post-intervention	MH and stress: DASS [1]	$ES = 0.64$ [1.10, 0.17]	$ES = 0.95$ [1.43, 0.47]	
Zhao et al., 2024 China	2 sessions per week for 8 weeks = 16 sessions. Each session ran for 60 min	8 weeks Follow-up: post-intervention	MH and stress: DASS [1] SWLS [17]	$ES = 0.90$ [1.15, 0.64]	$ES = 0.83$ [1.98, 0.55]	$ES = -1.24$ [-0.75, -1.74]

Abbreviations: ACT, Acceptance and Commitment Therapy; CAPE, Child Adjustment and Parent Efficacy Scale; CBT, Cognitive Behavioural Therapy; CCT, controlled clinical trial; CES-D, Center for Epidemiologic Studies Depression Scale; *CI*, confidence intervals; CDD, Childhood Disintegrative Disorder; CP, Cerebral Palsy; DASS, Depression Anxiety Stress Scale; DCS, Depressive Cognitions Scale; *ES*, effect size estimates; F2F, face to face; FSCI, Family Stress and Coping Interview; GCS, Glasgow Coma Scale; GMFCS, Gross Motor Function Classification Scale; HADS, Hospital Anxiety and Depression Scale; HMFH, Healthy Mothers Healthy Families; JASPER, Joint Attention Symbolic Play Engagement and Regulation; MH, mental health; PCL, Post-traumatic Symptom Checklist; PE, psychoeducation; PHQ-4, Patient Health Questionnaire-4; PHQ-9, Patient Health Questionnaire-9; PIP, Pediatric Inventory for Parents; PSI-SF, Parent Stress Index-short form; PWBGI, Psychological General Wellbeing Index; PWI, Personal Wellbeing Index; PWS, Psychological Wellbeing Scale; RCT, randomised control trial; SDS, Self-rating Depression Scale; SMART-3RP, Stress Management and Resiliency Training-Relaxation Response Resiliency Program; STDS, State Trait Depression Scale; TBI, Traumatic Brain Injury; WEMWBS, Warwick Edinburgh Mental Wellbeing Scale.

^aInterventions designed and delivered by occupational therapists.

^bMeasured a factor related to MH, stress, or well-being (WB) but did not measure these directly so effect size not calculated and excluded from meta-analysis.

^cMeasured mental health overall, effect size for overall MH provided. Excluded from meta-analysis as did not provide scores for depression scale.

^dInsufficient data to calculate effect sizes.

(Muñeton-Castaño et al., 2022), one for children with juvenile idiopathic arthritis (Mulligan et al., 2022), one for children with type 1 diabetes (Sairanen et al., 2019), and one for children with burns (Sveen et al., 2017). Of the remaining studies, three were targeted to parents of children with traumatic brain injury (Raj et al., 2015, 2018; Wade et al., 2006); two involved parents of children with cerebral palsy (McMillan et al., 2020; Whittingham et al., 2022); seven included parents of children with a range of chronic medical conditions or disabilities (Bjornstad et al., 2021; Bourke-Taylor et al., 2023; Bourke-Taylor et al., 2024; Douma et al., 2021; Lappalainen et al., 2021; Park et al., 2020; Portnoy et al., 2023); one targeted parents of children with intellectual disability (Kulbas & Ozabaci, 2022); one targeted parents of children with ADHD (Lo et al., 2024); and one was for children with known socially disruptive conduct (Whitney & Smith, 2015).

3.2.2 | Recruitment of participants

All studies recruited participants through paediatric clinics, hospitals, or organisations, or via online services associated with children with a disability or known health conditions (Appendix S2). One study also recruited participants from a larger study (Clifford & Minnes, 2013), and another emailed participants from a previous research study (Timmons & Ekas, 2018). A vast range of inclusion and exclusion criteria was evident across the studies (Table 2). One study had no information on its inclusion/exclusion criteria (Bekhet, 2017). Nine studies excluded participants with known mental health conditions or who were receiving services or had sought services for psychosocial conditions within the past year (Bernie et al., 2023; Lappalainen et al., 2021; Lappalainen et al., 2023; Lo et al., 2024; Mulligan et al., 2022; Muñeton-Castaño et al., 2022; Raj et al., 2015; Raj et al., 2018; Sairanen et al., 2019). All studies required access to a computer/tablet or mobile device, although three studies provided a computer or tablet to participants (McMillan et al., 2020; Muñeton-Castaño et al., 2022; Wade et al., 2006).

3.2.3 | Mode of delivery

A blended approach combining interaction with a facilitator and online content was the predominant mode of delivery (Table 2). Twenty-two studies adopted a blended approach, with eight of these delivering interventions to individual parents (Bernie et al., 2023; Bourke-Taylor et al., 2023; Hemdi & Daley, 2017; Lappalainen et al., 2021; Lappalainen et al., 2023; Raj et al., 2015; Raj

et al., 2018; Toly et al., 2022; Wade et al., 2006). The remaining 14 provided group-based interventions (Bjornstad et al., 2021; Bourke-Taylor et al., 2024; Clifford & Minnes, 2013; Douma et al., 2021; Kuhlthau et al., 2020; Kulbas & Ozabaci, 2022; Liu et al., 2021; Lo et al., 2024; McMillan et al., 2020; Muñeton-Castaño et al., 2022; Park et al., 2020; Portnoy et al., 2023; Zhao et al., 2021, 2024). Three of the blended interventions were occupational therapy-based approaches, two included coaching of parents towards self-identified goals (Bernie et al., 2023; Bourke-Taylor et al., 2023), whilst the other provided facilitation around the specific online intervention (Bourke-Taylor et al., 2024). Eight of the interventions were delivered via asynchronous formats (Bekhet, 2017; Mulligan et al., 2022; Pandya, 2021; Sairanen et al., 2019; Sveen et al., 2017; Timmons & Ekas, 2018; Whitney & Smith, 2015; Whittingham et al., 2022). Of these, two studies had facilitators providing text response feedback via the platform (Sairanen et al., 2019; Sveen et al., 2017).

There were varying website and videoconferencing platforms used. Two studies used a messaging system known as WhatsApp (Hemdi & Daley, 2017; Pandya, 2021) to provide prompts, and two used the messaging system known as WeChat (Liu et al., 2021; Zhao et al., 2021) for parent sharing. A further two studies provided only prompts via email or telehealth as the intervention (Timmons & Ekas, 2018; Whitney & Smith, 2015).

3.2.4 | Facilitators

A range of professionals were utilised as facilitators delivering the interventions in this review (Appendix S2). Two studies had occupational therapists providing coaching to parents, one through parent-specific sessions (Bernie et al., 2023), and one within the child's therapy session or via telephone in combination with access to online modules (Bourke-Taylor et al., 2023). Fourteen of the studies had interventions delivered by either psychology students or qualified psychologists (Clifford & Minnes, 2013; Douma et al., 2021; Hemdi & Daley, 2017; Kuhlthau et al., 2020; Lappalainen et al., 2021; Liu et al., 2021; McMillan et al., 2020; Park et al., 2020; Portnoy et al., 2023; Raj et al., 2015; Raj et al., 2018; Sairanen et al., 2019; Sveen et al., 2017; Wade et al., 2006), and one study had one psychology professor and one professor in physical education as facilitators (Zhao et al., 2024). Of the other interventions, two were delivered by nursing students (Bekhet, 2017; Toly et al., 2022); two were delivered by trained parent facilitators (Bjornstad et al., 2021; Bourke-Taylor et al., 2024); and others included special educators (Clifford & Minnes, 2013), social workers (Muñeton-Castaño et al., 2022), a psychiatrist (Sveen

et al., 2017), trained mindfulness-based practitioners (Lo et al., 2024), and physical education teachers (Zhao et al., 2021). One study did not provide information on the training or qualifications of the people delivering the intervention (Kulbas & Ozabaci, 2022).

3.2.5 | Intervention approaches

There was a wide variety both in intervention approaches and whether a single or multicomponent approach was delivered (Table 2). Three of the studies delivered an occupational therapy-based intervention (Bernie et al., 2023; Bourke-Taylor et al., 2023, 2024). Eight of the studies delivered a single intervention based on cognitive-behavioural principles. Acceptance and Commitment Therapy (ACT) was delivered as single intervention in four of the studies (Lappalainen et al., 2021; McMillan et al., 2020; Sairanen et al., 2019; Whittingham et al., 2022). Bekhet (2017) and Kulbas and Ozabaci (2022) utilised a single approach of positive thinking/psychology approaches based on cognitive-behavioural therapy approach (CBT), and Douma et al. (2021) delivered a CBT/ACT-based intervention on coping strategies. Six of the studies provided solely psychoeducation (PE)-based interventions. One of these was focused on stress reduction (Hemdi & Daley, 2017), three provided information related to the child's diagnoses in addition to coping strategies (Mulligan et al., 2022; Raj et al., 2015, 2018), one occupational therapy intervention provided information on engagement in health promoting activities, health and stress management, and support seeking (Bourke-Taylor et al., 2023), and another provided information on resourcefulness (Toly et al., 2022).

Eight of the studies provided combined intervention approaches. Bjornstad et al. (2021) included both PE and social support. Bourke-Taylor et al. (2023) provided PE and health education combined with an occupational therapy coaching approach. Others included PE combined with specific mindfulness, relaxation, and CBT techniques (Kuhlthau et al., 2020; Liu et al., 2021; Lo et al., 2024; Muñeton-Castaño et al., 2022; Park et al., 2020; Sveen et al., 2017). A variety of intervention types were implemented in the remaining studies including support group (Clifford & Minnes, 2013), spiritual posts (Pandya, 2021), gratitude prompts for journaling (Timmons & Ekas, 2018), mindfulness (Portnoy et al., 2023), occupational performance coaching (Bernie et al., 2023), family problem solving (Wade et al., 2006), journalling (Whitney & Smith, 2015), and a physical activity intervention for both child and parents (Zhao et al., 2021, 2024).

Several of the interventions were based on approaches or programmes that have already been found to be

effective when delivered via in-person. Five of the studies employed online versions of CBT or ACT (Douma et al., 2021; Lappalainen et al., 2021; McMillan et al., 2020; Sairanen et al., 2019; Whittingham et al., 2022). Of these, four were also found to be effective when delivered in an e-version format (Douma et al., 2021; Lappalainen et al., 2021; McMillan et al., 2020; Sairanen et al., 2019). Wade et al. (2006) employed a family problem solving therapy approach, which was also found to be effective when delivered online. Kuhlthau et al. (2020) and Park et al. (2020) adapted the SMART-3RP programme, which has been used with adult populations, to deliver it online and reported large effect sizes on improving parental mental health. The Healthy Mothers Healthy Families programme was adapted for online delivery (Bourke-Taylor et al., 2024) and paired with an occupational therapy coaching approach (Bourke-Taylor et al., 2023) and reported it was effective at reducing stress and improving mental health. These studies compared the adapted interventions to control groups and not to the in-person formats. Bernie et al. (2023) conducted a three-arm RCT comparing a control group, videoconference, and face-to-face group using occupational performance coaching. Pre-post change scores for the online group were higher (21.4) than the face-to-face group (11.7) on parental stress.

Some of the interventions incorporated content to assist the parent with issues related to the child, in addition to the content designed to support the parent. Liu et al. (2021)'s intervention had one component that was focused on development of the child's social communication skills, and Zhao et al. (2021) delivered a physical activity intervention for both the child and parent to engage in together. Four other studies contained components that also provided some training for parents on managing child behaviours (Hemdi & Daley, 2017; Raj et al., 2015, 2018; Wade et al., 2006).

3.2.6 | Intervention duration

The number of sessions delivered within the interventions ranged from three (Bourke-Taylor et al., 2024) to 14 sessions (Lappalainen et al., 2021; Lappalainen et al., 2023), and session length ranged from 30 to 120 minutes (Table 2). Eighteen of the studies provided between 6 and 10 sessions (Bjornstad et al., 2021; Bourke-Taylor et al., 2023; Clifford & Minnes, 2013; Kuhlthau et al., 2020; Kulbas & Ozabaci, 2022; McMillan et al., 2020; Muñeton-Castaño et al., 2022; Park et al., 2020; Portnoy et al., 2023; Raj et al., 2015; Raj et al., 2018; Sairanen et al., 2019; Sveen et al., 2017; Toly et al., 2022; Whitney & Smith, 2015; Whittingham et al., 2022; Zhao et al., 2021; Zhao et al., 2024). Two interventions provided four sessions

(Bernie et al., 2023; Lo et al., 2024) with two providing five sessions (Bekhet, 2017; Hemdi & Daley, 2017), and two providing 12 sessions (Bjornstad et al., 2021; Liu et al., 2021). One study provided access to the website resources for 4 months (Mulligan et al., 2022), one provided 14 modules and a meeting with the facilitator after each (Wade et al., 2006), and one provided 50 weekly spiritual posts (Pandya, 2021). One study compared a longer 10 session version to an 'express' seven session format (Raj et al., 2018).

3.2.7 | Outcome measures

There was considerable disparity in tools used to measure parental outcomes (Appendices S2 and S3). Outcome measures were psychometrically sound, although psychometrics of scales was not clearly reported in four studies (Bernie et al., 2023; Hemdi & Daley, 2017; Portnoy et al., 2023; Raj et al., 2015). The Parent Stress Index-short form (PSI-SF) was utilised in nine of the studies (Bernie et al., 2023; Hemdi & Daley, 2017; Liu et al., 2021; Pandya, 2021; Raj et al., 2015, 2018; Sveen et al., 2017; Whitney & Smith, 2015; Zhao et al., 2021). Other scales used in more than two studies included the Hospital Anxiety and Depression Scale (HADS) (Douma et al., 2021; Hemdi & Daley, 2017; Lo et al., 2024; Mulligan et al., 2022); Patient Health Questionnaire-9 (PHQ-9) (Bjornstad et al., 2021; Lappalainen et al., 2021, 2023; Muñeton-Castaño et al., 2022; Park et al., 2020); Five Facet Mindfulness Questionnaire (Lappalainen et al., 2021; Lappalainen et al., 2023; McMillan et al., 2020; Sairanen et al., 2019); Depression Anxiety Stress Scale (DASS-21) (Bourke-Taylor et al., 2023, 2024; Whittingham et al., 2022; Zhao et al., 2021, 2024); Global Severity Index (Raj et al., 2015, 2018; Wade et al., 2006); Center for Epidemiologic Studies Depression Scale (CES-D) (Lo et al., 2024; Raj et al., 2015, 2018; Timmons & Ekas, 2018); and the Health Promoting Activity Scale (Bjornstad et al., 2021; Bourke-Taylor et al., 2023, 2024). A wide range of other outcomes were also measured (Appendix S3).

3.3 | The impact of online interventions' parental mental health, stress, and well-being

Scales used in the studies to measure parent mental health, stress, and well-being were extracted from each of the studies (Appendix S4). For mental health, there was considerable variation between studies in how this was measured, with some measuring overall mental health only and others measuring specific constructs

such as depression and anxiety separately. For this review, a meta-analysis reflecting mental health was completed using studies that measured 'depression' as there was a larger number of these studies.

For the purposes of this review, studies were categorised in relation to intervention approaches as follows:

1. CBT: where studies utilised cognitive-behavioural or other psychological approaches (i.e., ACT) that operated on the principles of thoughts, feeling, and behaviours being interconnected and use of cognitive strategies to influence behaviour change.
2. PE: programmes that provided education about health, mental health, anxiety, stress, coping, and so forth to educate or facilitate knowledge and understanding about thought patterns, emotions, and health and coping strategies.
3. Combination: interventions that employed two or more approaches such as CBT, PE, mindfulness, or others.
4. Other: interventions or programmes that were single intervention approaches that did not fit into the above three categories and included mindfulness, peer support, journalling, spiritual posts, family problem solving, and physical activity.

3.3.1 | Effectiveness of online interventions on parental mental health post-intervention

The standardised *ES* and the lower and upper 95% *CI* for the mental health outcome of all studies (where data were available) can be viewed in Table 2.

The studies using a CBT approach all had *small* to *moderate effect sizes* in improving parental mental health (Douma et al., 2021; Lappalainen et al., 2021; Sairanen et al., 2019; Whittingham et al., 2022), and there was little difference between those delivered synchronously (Douma et al., 2021; Lappalainen et al., 2021) compared to those delivered asynchronously (Sairanen et al., 2019; Whittingham et al., 2022). There was a greater variation in effect sizes in improving parental mental health, ranging from 0.01 to 2.53, for studies delivering a PE intervention approach (Hemdi & Daley, 2017; Raj et al., 2015, 2018; Toly et al., 2022), with two of these favouring the control (Raj et al., 2015; Toly et al., 2022). None of these were delivered asynchronously. Lo et al. (2024) combined mindfulness and PE and reported similar changes between groups. The two other combined interventions reported small effect sizes in improving parental mental health of 0.22 (Bjornstad et al., 2021) and 0.47 (Liu et al., 2021). Of the interventions classified as 'other', two studies that adopted physical activity approaches delivered synchronously reported large effect

sizes of 0.64 (Zhao et al., 2021) and 0.90 (Zhao et al., 2024), and a family problem solving approach delivered synchronously also had a large effect size of 0.83 (Wade et al., 2006).

3.3.2 | Meta-analysis of RCTs of online interventions on parental mental health outcome post-intervention

The pooled standardised effect estimate of RCTs' online interventions ($n = 14$) on mental health was $ES = 0.47$, 95% CI (0.18, 0.77), $p = 0.002$, in favour of the intervention at post-intervention. There was significant statistical heterogeneity in treatment effects across studies at post-intervention ($I^2 = 80.1\%$, $Cochran's Q = 65.38$, $df = 13$, $p < 0.001$) indicating high variation in the treatment effects across the studies (Figure 2).

3.3.3 | Effectiveness of online interventions on parental stress post-intervention

The standardised ES and the lower and upper 95% CI for stress outcome of all studies (where data were available) can be viewed in Table 2 (table of characteristics).

One study delivering spiritual posts asynchronously via WhatsApp had a *large effect size* in improving parental stress of 8.64 (Pandya, 2021). Two studies using physical activity interventions had *large effect sizes* in improving parental stress of 0.95 (Zhao et al., 2021) and 0.83 (Zhao et al., 2024), and both were blended interventions. Other studies with larger effect sizes were Hemdi and Daley (2017) using a facilitated psychoeducational intervention, Mulligan et al. (2022) with a PE website, and Bernie et al. (2023) that provided occupational performance coaching.

3.3.4 | Meta-analysis of RCTs of online interventions on stress outcome post-intervention

For the variable of parental stress, the pooled standardised effect estimate of RCTs' interventions ($n = 13$) was $ES = 1.27$, 95% CI (0.56, 1.96), $p = 0.000$, in favour of the intervention at post-intervention. There was significant statistical heterogeneity in treatment effects across studies at post-intervention ($I^2 = 95.7\%$, $Cochran's Q = 281.58$, $df = 12$, $p < 0.000$) indicating high variation in the treatment effects across the studies (Figure 3).

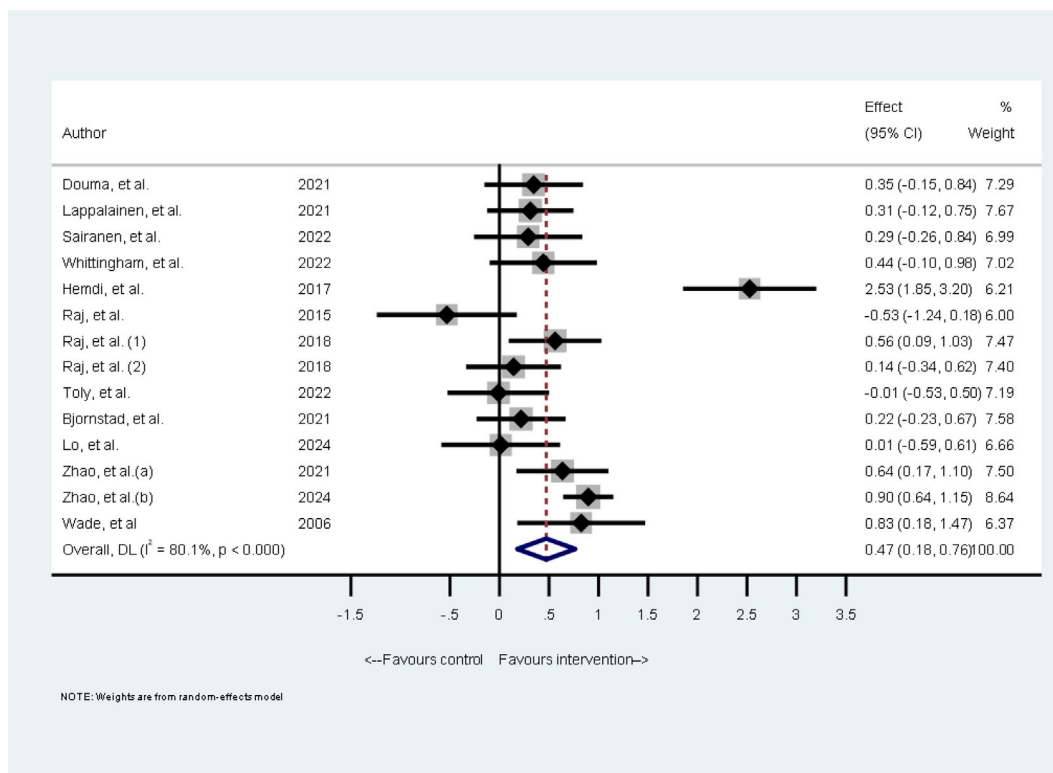


FIGURE 2 Forest plot of a random effect meta-analysis of randomised control trial (RCT) online interventions on mental health outcome measure post-intervention. Note: results presented as effect estimates from standardised mean differences and 95% confidence intervals (CI); Raj et al. (1) and Raj et al. (2) were three-arm RCTs comparing InTERACT versus InTERACT Express versus control.

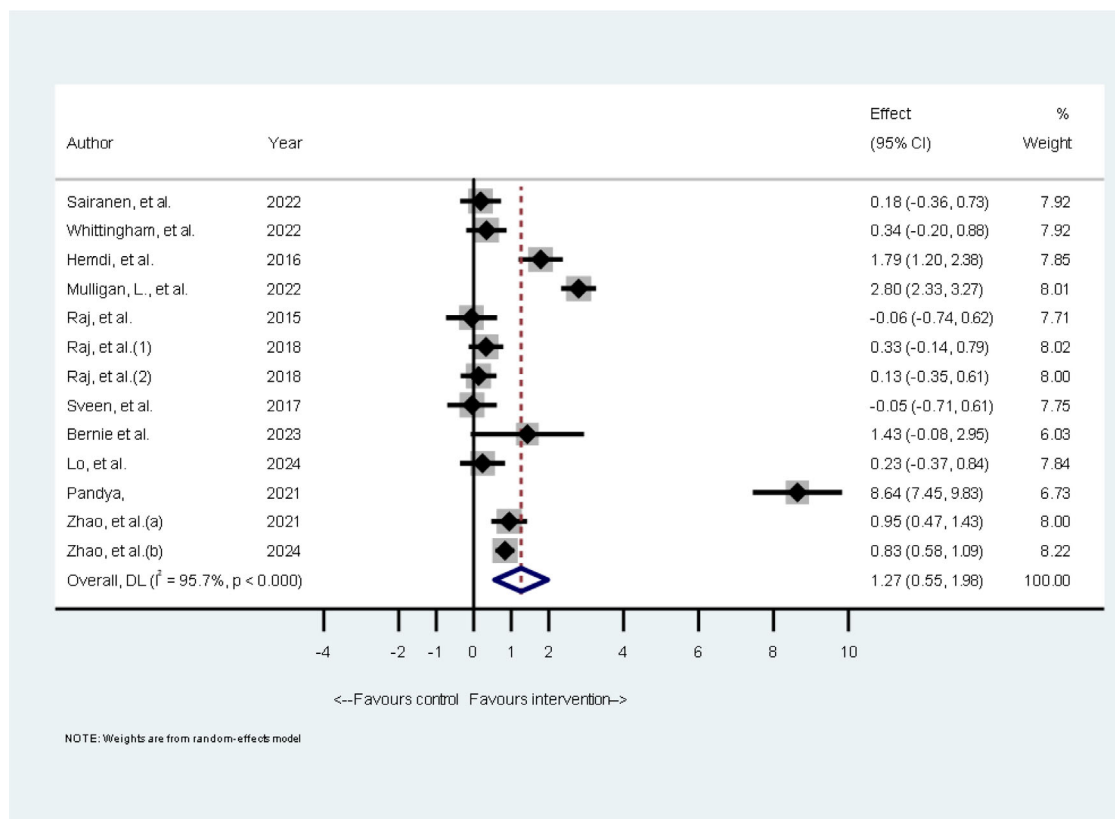


FIGURE 3 Forest plot of a random effect meta-analysis of randomised control trial (RCT) online interventions on stress outcome measure post-intervention. Note: results presented as effect estimates from standardised mean differences and 95% confidence intervals (CI).

3.3.5 | Effectiveness of online interventions on parental well-being post-intervention

The standardised *ES* and the lower and upper 95% *CI* for well-being of all studies (where data were available) can be viewed in Table 2. One study using a movement-based lifestyle education programme had a *large effect size* on parental well-being of 1.24 (Zhao et al., 2024).

3.3.6 | Meta-analysis of RCTs of online interventions on well-being outcome post-intervention

The pooled standardised effect estimate (95% *CI*) of group-based interventions ($n = 3$) on well-being was $ES = 0.65$ (1.2, .06), $p = 0.03$, in favour of the intervention (Figure 4). There was significant heterogeneity in these results at the immediate follow-up point ($I^2 = 76.2\%$, *Cochrane's* $Q = 8.40$, $df = 2$, $p = .015$) indicating high variation in the treatment effects across the studies.

4 | DISCUSSION

Caring for CAN can present challenges, which impact parental health and stress. Interventions that can support parents, and therefore reduce health impacts and stress, are essential. Online interventions increase accessibility to parents to access this support. The aggregate information and analysis of the effectiveness of online interventions to improve mental health, stress, and well-being for parents indicates that online interventions can be highly effective. Combined meta-analyses showed a *small effect* on mental health ($d = 0.41$ post-intervention) and a *large effect size* on stress and well-being ($d = 1.27$ post-intervention for stress; and $d = 0.65$ post-intervention for well-being). These results reflect acceptable levels of efficacy for online interventions for reducing stress and improving mental health and well-being of parents.

Providing intervention options via online formats offers several potential advantages for parents who typically experience difficulty accessing in-person formats. Overall, many of the studies in this review had 'strong' or 'moderate' ratings for withdrawals and dropouts in the qualitative analysis, indicating retention rates of

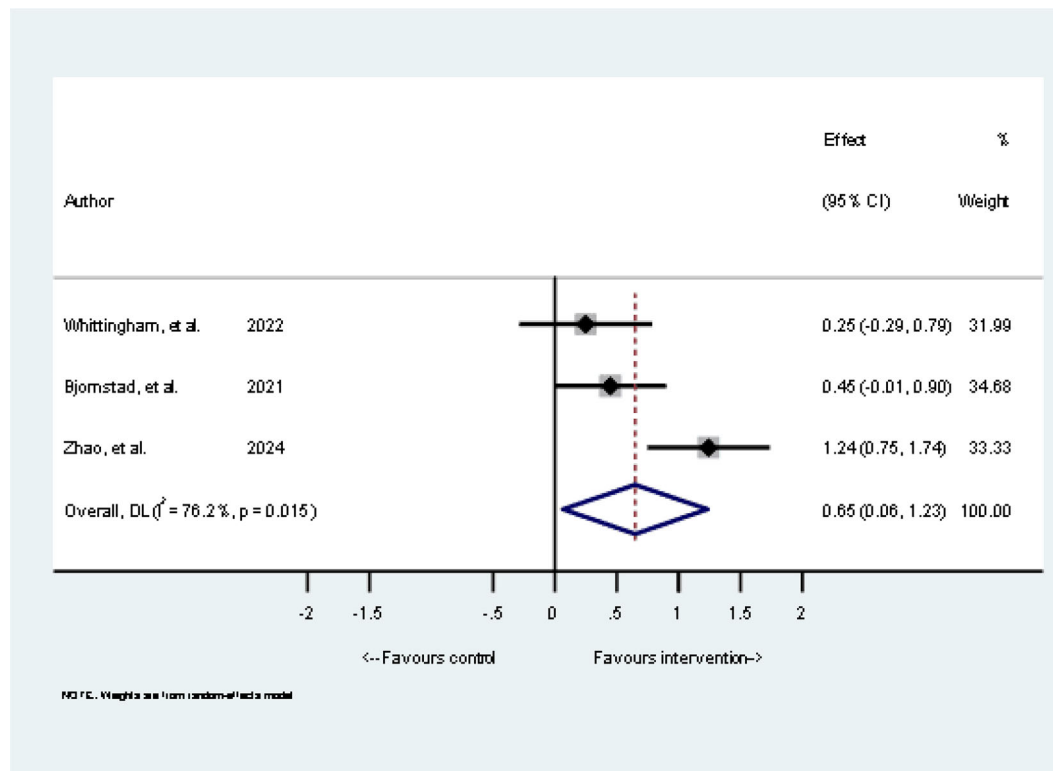


FIGURE 4 Forest plot of a random effect meta-analysis of randomised control trial (RCT) online interventions on well-being outcome measure post-intervention. Note: results presented as effect estimates from standardised mean differences and 95% confidence intervals (CI).

greater than 60% for most of the online interventions. For some families, online formats may reduce costs and travel requirements and provide more flexibility in when they can access interventions (Osborn et al., 2020; Pagaki-Skaliora et al., 2022). Being able to access these interventions from their own homes may also provide an opportunity to engage with supports privately, bypassing the perceived stigma associated with parenting children with disabilities or their own social anxiety. Given the many barriers these parents face with accessing supports, it is imperative that effective interventions can be provided in accessible formats to increase reach to more parents (Gilson et al., 2021). One study that investigated the feasibility of a blended approach combining coaching for mothers from occupational therapists providing therapy for the child further reinforces the need to explore alternative service entry points that increase opportunities for parents to engage with supports for their own mental health (Bourke-Taylor et al., 2023; Harris et al., 2022).

Out of the 30 studies in this review, only three interventions were delivered by occupational therapists. One provided occupational performance coaching (Bernie et al., 2023), and the other two were based on the psychoeducational and health education Healthy Mothers Healthy Families programme (Bourke-Taylor et al., 2023,

2024). Parents of CAN report occupational imbalance as they tend to make occupational adaptations to their own routines to meet the complex care needs of their child (Cantero-Garlito et al., 2020; Davy et al., 2022). This results in reduced time to engage in self-care and other meaningful activities for themselves and has been shown to impact their own health, well-being, and quality of life (Davy et al., 2024; Gonzalo-Ciria et al., 2024). Occupational therapists working with families of CAN play an important role in supporting parents in these families by guiding them to interventions that address their own stress and mental health needs and support engagement in meaningful self-care and leisure activities for themselves (Gonzalo-Ciria et al., 2024).

For occupational therapists to identify appropriate intervention points for parents of CAN, understanding their needs, preferences, and priorities is essential (Bourke-Taylor et al., 2023). Bradshaw et al. (2019) identified that the needs of parent carers are diverse and likely to be different depending on their child's issues and trajectory. This review highlighted that only three of the studies incorporated input from parents in co-design and co-delivery of the intervention (Bjornstad et al., 2021; Bourke-Taylor et al., 2023, 2024). Parents have highlighted in other research that they valued having parent facilitators (Miller et al., 2022) and other programmes

with mothers as credentialled peer facilitators have been demonstrated as effective (Bourke-Taylor, Grzegorzyn, & Joyce, 2021; Bourke-Taylor, Lee, et al., 2021). Further research involving parents in the design and delivery of interventions is required to ensure interventions are aligned to their complex needs and to ensure challenges they face with participating in services to support their mental health and well-being are adequately addressed.

Another interesting finding was the number of studies that excluded parents with known mental health conditions or who were receiving services or had sought services for psychosocial conditions within the past year (Bernie et al., 2023; Lappalainen et al., 2021; Mulligan et al., 2022; Muñeton-Castaño et al., 2022; Raj et al., 2015; Raj et al., 2018; Sairanen et al., 2019). Research has shown that parents of CAN report higher levels of anxiety and depression, often in clinically significant ranges (Gilson et al., 2021; Marquis et al., 2020; Scherer et al., 2019). Inclusion of parents with known mental health conditions in future research is warranted, as these carers may also experience improvements from interventions that are specifically targeting carer mental health.

A key finding in this review was the lack of consistency on variables being measured and outcome measures being used to evaluate these variables. For the outcome of mental health, some studies used measures of overall mental health, whilst others measured independent constructs such as depression or anxiety. The most used scales for evaluating depression were the HADS, DASS-21, the CES-D, and the PHQ. The PSI-SF and DASS-21 were the most frequently used scales to measure stress. Additionally for well-being, one study measured personal well-being, which encompassed physical and psychological well-being (Kulbas & Ozabaci, 2022), and another measured satisfaction with life (Zhao et al., 2024). Clearer identification of variables being impacted and consensus on tools to measure these would be useful in future research to ensure that what is being measured is more consistent. This will allow for more rigorous collation and analysis of evidence for different intervention approaches, formats, and with varying subgroups within parents of CAN.

Some limitations may be identified in this systematic review. Firstly, grey literature was not examined due to the decision to focus on group comparison studies. Secondly, specific data for subgroups of primary caregivers within many of the studies were not able to be extracted and described, such as numbers of mothers, fathers, or other primary caregivers. Furthermore, most studies did not include clear information on other potential confounding variables that may have influenced findings, such as medications, if children were receiving concurrent services from other providers, or if the carer was receiving other services. Lastly, given the high levels

of heterogeneity between studies in this review, the results should be interpreted cautiously.

Occupational therapists can enhance the supports provided to families of children with CAN through awareness and referral to effective online interventions for parents. Supporting parents to address their own health and well-being contributes to healthy outcomes for the child and family. Significant work is required by occupational therapists to contribute to the development of programmes and increase availability of evidence-based online programmes for parents. Occupational therapists who practise within a family-centred paradigm and who work closely with parents are in a key position to involve parents in the co-design and co-delivery of online interventions for parents.

AUTHOR CONTRIBUTIONS

Monica Leo conducted the search and transferred retrieved studies to Covidence, identified included studies via Covidence via screening of titles, abstracts, and full-text reviews including classifying excluded studies, classified modes, conducted independent quality ratings, extracted intervention details via excel table, conducted meta-analysis, and is the primary author of whole manuscript. Helen Bourke-Taylor designed the search terms and reviewed drafts of the manuscript. Sorcha Odgers screened studies in Covidence and reviewed drafts of manuscript. Loredana (Laura) Tirlea conducted independent quality ratings, conducted meta-analysis, and reviewed drafts of the manuscript.

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CONFLICT OF INTEREST STATEMENT

All authors declare that they have no conflict of interest.

ETHICAL APPROVAL

All procedures performed in this study were in accordance with the ethical standards of 1964 Helsinki declaration and its later amendments or comparable ethical standards.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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