

Research Paper

Evidence-Based Cognitive-Behavioural Therapy for Children and Adolescents with ADHD: A Comparative Analysis between Low-Middle and High-Income Countries

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ABSTRACT

The objectives of this study were multifold: (a) to comprehensively map the updated evidence base for cognitive behaviour therapy among children and adolescents with ADHD in low- and middle-income countries (LMIC), and high-income countries (HIC), (b) to study the potential effectiveness of these interventions, (c) to identify research gaps in the literature (d) to provide a comparative analysis between low-income and high-income countries. A systematic review design was employed. Electronic databases (PubMed, Medline, ERIC, ResearchGate, Google Scholar, ScienceDirect) were systematically searched for relevant research literature from the last 10 years (2015-2025). Several Boolean search strings, such as “cognitive behaviour therapy, cognitive behaviour training, or interventions, modeling, self-regulation, self-instructions, and self-monitoring were used with ADHD children and adolescents in India and low-middle income countries.” Data were extracted from the included studies for quality appraisal, summarization, and synthesis of the research findings. The database search resulted in the inclusion of 18 original articles. It is difficult to draw definitive conclusions about the effectiveness of these intervention programs. Several research gaps were identified. There was limited evidence base for Cognitive Behaviour Therapy modules for children and adolescents with ADHD in LMIC. The implications for future research and practice have been discussed.

Keywords: *Attention-Deficit Hyperactivity disorder, Cognitive-Behaviour Therapy, Systematic Review, LMIC*

Youth (children and adolescents) with Attention Deficit Hyperactivity Disorder (ADHD) exhibit significant impairments in academic, social, and interpersonal functioning. ADHD can be effectively managed using pharmacological or non-pharmacological approaches. Non-pharmacological interventions are beneficial in addressing common issues associated with ADHD, such as academic, social, cognitive, and behavioural dysfunctions that cannot be sufficiently addressed by pharmacotherapy. The guidelines of the National Institute for Health and Care Excellence (NICE, 2018) recommend a multimodal treatment approach for children, adolescents, and adults with ADHD. CBT can be used as a standalone treatment or as an adjunct to pharmacological or

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other psychological therapies. Cognitive Behavioural Therapy is based on scientifically established techniques that recognize the complex interplay of thoughts, behaviours, and emotions with each other and with the environment, which plays a critical role in causing and maintaining many psychological disorders (Craske et al, 2010). CBT incorporates principles of behaviour therapy based on operant and classical conditioning, along with cognitive approaches that emphasize the influence of appraisals and beliefs, and the modification of these to facilitate new learning (Craske, 2010). The goal of CBT is to foster self-guidance and strategic problem-solving skills, which serve as effective ways to manage the functional deficits and core issues of the disorder.

Several systematic reviews and meta-analyses have been conducted over the past 10 years to explore the effectiveness of CBT with children and adolescents with ADHD. Preliminary evidence from a systematic review suggested that group-based RCTs of CBT delivered directly to youth with or without caregiver involvement on core symptoms of ADHD and related impairments are limited, making it challenging to draw generalized conclusions (Padín-Caño & López-González, 2023). A meta-analysis suggested a combination of CBT and Methylphenidate showed a significant reduction in the primary symptoms of ADHD, resulting in improved functional and behavioural outcomes (Ojinna et al., 2022). Another meta-analysis suggested a significant effect of CBT on the primary symptomatology of ADHD in school children (Park et al, 2015). These reviews primarily focus on RCTs, with evidence mostly from HIC. Therefore, this present review sought to examine the effectiveness of CBT programs or techniques across all study designs in LMICs and HICs, providing an updated evidence base as several barriers to treatment have been reported in LMICs (Pipe et al, 2022): (a) limited access to treatment, which differs among different countries; (b) availability of pharmacological treatments as compared to non-pharmacological interventions; (c) cost, lack of resources, and stigma were associated with lack of treatment acceptance. In India specifically, tertiary care hospitals and clinics provide a comprehensive pathway of care for the diagnosis and management of ADHD, extending beyond regular school hours. Despite the availability of effective and standardized treatments for ADHD, a majority of patients either lack access to these services or delay significantly in seeking help, which may lead to poorer outcomes (Arya et al, 2015). Parents' socio-cultural beliefs restrict help-seeking behaviour, as well as a lack of awareness of the disorder (Anand et al, 2018). Children in LMICs are vulnerable to the impact of prejudices (Mascayano et al, 2015), misinformation, discrimination in schools, and negative attitudes towards psychological illnesses, which is a cause of great concern (Heim et al, 2020). These gaps must be bridged by providing adequate and accessible care pathways that enable these children to thrive.

In view of the above, the following research questions are examined: (a) What is the current evidence of CBT or interventions across LMIC and HIC? (b) What is the comparative analysis between the evidence base between the LMIC and HIC? (c) What are the standard components of CBT interventions used with children and adolescents? and (d) Are these interventions potentially effective? The review aims to inform best practices in CBT and recommend strategies for future investigations across these countries.

METHODS

Eligibility Criteria

The eligibility criteria included (a) various study designs, such as RCTs and non-RCTs (e.g., quasi-experimental, single-case designs, qualitative, mixed methods), (b) research conducted

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between 2015 and 2025, (c) original research articles, (d) studies with accessible full papers, (e) papers written in English, (f) children and adolescents with ADHD aged 3 to 18 years, (g) children diagnosed with ADHD and other comorbid psychiatric conditions, (h) studies using CBT, (i) studies assessing behavioural ratings (parent- or teacher-rated), or any other cognitive, behavioural, academic, or physical outcome measures, and (j) studies conducted in home, school, or clinical settings. Exclusion criteria included: (a) meta-analyses, narrative reviews, letters to the editor, unpublished theses, and study protocols were excluded, (b) Studies whose complete papers could not be accessed were discarded, and (c) Papers that were not in the English language were excluded.

Search Strategies

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement was used for this systematic review. A systematic review was conducted using electronic databases, including PubMed, Medline, ERIC, ResearchGate, Google Scholar, and ScienceDirect, and reference lists of other articles. The search was customized based on publication year (2015-2025). Several Boolean search strings, such as “cognitive behaviour therapy, cognitive behaviour training, or interventions, modeling, self-regulation, self-instructions, and self-monitoring were used with ADHD children and adolescents in India and low-middle income countries.”

Selection Process

The database retrieved 750 articles, with six records found through supplementary sources. After removing duplicates (n=136), 620 articles remained. During the initial screening, 597 records were excluded based on their abstracts. In the second phase, 23 full texts were evaluated for eligibility; however, a few were excluded due to study trial protocols (n = 2), language (n = 1), or interventions other than CBT or behavioural interventions (n = 2). Finally, 18 articles were included.

RESULTS

Quality Appraisal

To assess the methodological quality of the studies meeting the eligibility criteria, the Mixed Methods Appraisal Tool (MMAT) (Hong et al, 2018) was used. An overall percentage score was assigned to each study, categorized as low ($\leq 50\%$), average (51–75%), or high (76–100%). Twelve studies were assessed as high quality, five as average, and one as low. This may introduce a risk of bias, and therefore, the results must be interpreted with caution. Critically assessing the quality of the studies was essential to identify strengths and weaknesses, for concluding the effectiveness of the intervention. The quality appraisal has been discussed in Supplementary 1.

Data Extraction

The data was extracted based on the participant characteristics (authors, country, sample size, age range pharmacological treatment, subtype of ADHD, comorbidity, follow-ups), intervention characteristics (category of intervention, setting of the intervention, delivery of intervention, total duration of sessions, frequency of sessions, components of the intervention), outcome measures characteristics (domains and names of outcome measures, findings). The extracted data have been presented in Supplementary 2.

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Characteristics of Studies

A total of 18 research studies were reported. Several CBT programs and techniques based on the search results have been classified as: (a) module-based CBT (n=7), (b) intervention packages (n=5), and (c) standalone cognitive or behavioural techniques (n=6). Module-based CBT programs are comprehensive interventions that comprise multiple modules, each consisting of specific strategies. Additionally, these interventions have treatment manuals. Intervention Packages consist of several hybrid cognitive and behavioural strategies. A standalone cognitive or behavioural technique uses only one strategy. The purpose of each one of these is to address core symptoms of ADHD and its comorbid dysfunctions.

Participant Characteristics

The sample size ranged from 2 (Yin et al, 2022) in a case study to 159 participants (Boyer et al, 2018) in a large-scale RCT. Eight studies were conducted either on elementary school children, 6-12 years (Keshavaram & Yamuna, 2024; Sulu & Kiyak, 2023; Sluiter et al, 2020; Sasikala & Prema, 2018; Sellakumar, 2016; Vogelgesang et al, 2016; Nasako, 2016; Yin et al, 2022) or seven studies were conducted for middle school/higher secondary children or adolescents (Andersen et al, 2022; Haughan et al, 2022; Sprich et al, 2016; Sprich et al, 2015; Boyer et al, 2016; Boyer et al, 2018; Vidal et al, 2015). A single study focused on children in the age group of 7 to 14 years, inclusive of elementary and middle school students. Nine studies were from six LMICs such as India (Keshavaram & Yamuna, 2024; Sasikala & Prema, 2018; Thyagarajan et al, 2016; Sellakumar, 2016); China (Yin et al, 2022), Brazil (Coelho et al, 2017), Ghana (Senyamator et al, 2021), Cameroon (Nasako et al, 2016) and Turkey (Sulu & Kiyak, 2023) and nine studies were from HICs such as U.S.A (Sprich et al, 2016; Vogelgesang et al, 2016; Sprich et al, 2015), Norway (Andersen et al, 2022; Haughan et al, 2022), Netherlands (Sluiter et al, 2020; Boyer et al, 2018; Boyer et al, 2016), and Spain (Vidal et al, 2015). Seven were RCTs (Andersen et al, 2022; Haughan et al, 2022; Boyer et al, 2018; Coelho et al, 2017; Sprich et al, 2016; Boyer et al, 2016; Vidal et al, 2015) and the remaining 11 were non-RCT studies. Three focused on single group pre-post design (Keshavaram & Yamuna, 2024; Sasikala & Prema, 2018; Sellakumar, 2016); two on pre-post-test control group design (Nasako et al, 2016; Senyamator et al, 2021), four on single subject design (Sluiter et al, 2020; Vogelgesang et al, 2016; Sulu & Kiyak, 2023; Yin et al, 2022), case series (Sprich et al, 2015), case study (Thyagarajan, 2016). Four studies included only male participants (Yin et al, 2022; Sluiter et al, 2020; Thyagarajan et al, 2016; Vogelgesang et al, 2016). Out of 18 studies, only five studies reported the process of diagnosis (Andersen et al, 2022; Haughan et al, 2022; Sluiter et al, 2020; Boyer et al, 2018; Boyer et al, 2016). In 4 RCTs, control groups ranged from treatment as usual (Andersen et al, 2022) to passive (Haughan et al, 2022) and waitlist control (Sprich et al, 2016; Vidal et al, 2015). Three studies had two intervention groups (Boyer et al, 2016; Boyer et al, 2018; Coelho et al, 2017). Co-morbid conditions were reported in participants ranging from anxiety, depressive disorders, Tourette's, Tics, OCD, ODD, learning disorders, or CD (Andersen et al, 2022; Haughan et al, 2022; Boyer et al, 2018; Boyer et al, 2016; Sprich et al, 2016; Sprich et al, 2015; Vidal et al, 2015). All or a minor percentage of participants were also undergoing pharmacological treatments (Sulu & Kiyak, 2023; Andersen et al, 2022; Haughan et al, 2022; Sluiter et al, 2020; Boyer et al, 2018; Boyer et al, 2016). Follow-ups were conducted in three studies (Sulu & Kiyak, 2023; Andersen et al, 2022; Sprich et al, 2016).

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Intervention Characteristics

Nine studies were conducted in the schools during the regular hours (Keshavaram & Yamuna, 2024; Sulu & Kiyak, 2023; Yin et al, 2022; Andersen et al, 2022; Senyamator et al, 2021; Sluiter et al, 2020; Sasikala & Prema, 2018; Vogelgesang et al, 2016; Sellakumar, 2016), while intervention sessions in eight studies were held in tertiary care centers (Sprich et al, 2015; Sprich et al, 2016; Boyer et al, 2016; Boyer et al, 2018; Andersen et al, 2022; Haughan et al, 2022; Coehlo et al, 2017; Vidal et al, 2015) and one study did not report the setting of the conduct of the intervention. Single-case designs and non-randomized controlled trial (RCT) designs have been conducted primarily in school settings. The total number of sessions ranged from 3 (Sasikala & Prema, 2018) to 28 (Coehlo et al, 2017). Session duration ranged from 40 (Sulu & Kiyak, 2023) to 90 minutes (Andersen et al, 2022; Haughan et al, 2022). 10 studies were based solely on cognitive and behavioural principles (Keshavaram & Yamuna, 2024; Sulu & Kiyak, 2023; Yin et al, 2022; Senyamator, 2021; Sluiter et al, 2020; Boyer et al, 2018; Thyagarajan et al, 2016; Vogelgesang et al, 2016; Nasako, 2016; Boyer et al, 2016). Three studies were based on existing programs for ADHD (Andersen et al., 2022; Haughan et al., 2022; Coelho et al., 2017), primarily the Young and Bramham (2012) programme. Three studies have employed the principles of CBT and MI (Sprich et al., 2016; Sprich et al, 2015; Vidal et al, 2015). Two studies did not report the basis of their treatment (Sasikala & Prema, 2018; Sellakumar, 2016) Four studies involved teachers (Keshavaram & Yamuna, 2024; Sluiter et al, 2020; Vogelgesang et al, 2015; Nasako et al, 2016), while seven involved the parents (Boyer et al, 2018; Coehlo et al, 2017; Sprich et al, 2016; Boyer et al, 2016; Thyagarajan et al, 2016; Sprich et al, 2015; Sprich et al, 2016). A study involved teachers, parents, and siblings (Senyamator et al, 2021). Three involved direct intervention with the adolescents, without involving their parents (Vidal et al., 2015; Haughan et al., 2022; Andersen et al., 2022). Three studies did not report the involvement of caregivers (Yin et al, 2022; Sasikala & Prema, 2018; Sellakumar, 2016). Only eight studies reported the professional personnel involved in delivering the intervention. They were doctoral-level clinical psychologists (Sprich et al, 2015; Sprich et al, 2016), psychologists (Thyagarajan, 2016; Haughan et al, 2022), therapists/co-therapists (Boyer et al, 2018; Yin et al, 2022; Coehlo et al, 2017), and special education faculty (Sulu & Kiyak, 2023). Eight authors used a group format to deliver the intervention (Keshavaram & Yamuna, 2024; Sulu & Kiyak, 2023; Andersen et al, 2022; Haughan et al, 2022; Sluiter et al, 2020; Coehlo et al, 2017; Nasako et al, 2016; Vidal et al, 2015), while seven used an individual format (Boyer et al, 2018; Coehlo et al, 2017; Sprich et al, 2016; Boyer et al, 2016; Thyagarajan, 2016; Vogelgesang et al, 2016; Sprich et al, 2015). Three studies did not report the delivery of the intervention (Yin et al, 2022; Senyamator et al, 2021).

Among the CBT module, the most common component was psychoeducation (Andersen et al, 2022; Haughan et al, 2022; Vidal et al, 2015; Sprich et al, 2015; Sprich et al, 2016; Coehlo et al, 2017; Boyer et al, 2016; Boyer et al, 2018) followed by organization and planning (Andersen et al, 2022; Haughan et al, 2022; Boyer et al, 2016; Boyer et al, 2018; Coehlo et al, 2017, Sprich et al, 2016; Sprich et al, 2015 & Vidal, 2015). Four authors have used modules with emotional regulation, which delineates strategies related with managing frustration and anger (Andersen et al, 2022; Haughan et al, 2022; Coehlo et al, 2017; Vidal et al, 2015), and interpersonal relationships (Andersen et al, 2022; Haughan et al, 2022; Coehlo et al, 2017; Vidal et al, 2015). Three authors considered distractibility (Sprich et al, 2015; Sprich et al, 2016; Vidal et al, 2015) and procrastination (Sprich et al, 2016; Sprich et al, 2015; Vidal et al, 2015). For the comorbid symptoms with ADHD, strategies for the

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management of anxiety, depression, and sleep issues were reported by two studies (Andersen et al, 2022; Haughan et al, 2022). Two authors focused on problem solving (Coehlo et al, 2017; Vidal et al, 2015). Two studies focused on two core symptoms, such as attention and impulsivity (Andersen et al, 2022; Haughan et al, 2022), while two focused on concentration (Boyer et al, 2018; Boyer et al, 2016), and impulsivity, as a primary symptom of ADHD, was explored in one study (Vidal et al, 2015). Two authors focused on cognitive structuring (Sprich et al, 2016; Sprich et al, 2015). A single module focused on cognitive skills comprising self-instructions (Vidal et al, 2015). All the modular-based treatment programs are rooted in the cognitive and behavioural theoretical principles. Five authors have based their treatment on the previously established approaches, such as those by Young & Bramham (2012), modified version of adult CBT programs by Safren et al (2005), and Safren et al (2010) for adolescents and Barkley et al, 2008; Berger et al, 2008; Fabiano et al, 2009; DuPaul, Grace & Janusis, 2011; Boo & Prins, 2007; Knapp et al, 2003; Pfiffner, Barkley & DuPaul, 2006; Mocaiber et al, 2008.

Intervention packages included various components: self-monitoring (Sulu & Kiyak, 2023; Senyamator et al, 2021), self-control (Senyamator et al, 2021; Thyagarajan et al, 2016), self-instructions (Senyamator et al, 2021; Thyagarajan et al, 2016), self-evaluation (Sulu & Kiyak, 2023), self-motivation (Senyamator et al, 2021); parent training (Thyagarajan et al, 2016); token economy (Sulu & Kiyak, 2023) & attention enhancement techniques (Thyagarajan et al, 2016); modeling (Thyagarajan et al, 2016); and role-play (Thyagarajan et al, 2016). In contrast, some studies employed only one intervention technique exclusively, such as self-monitoring (Yin et al., 2022; Sluiter et al, 2020; Vogelgesang et al, 2016) or the token economy (Nasako et al, 2016).

Outcome Measures & Findings

The outcome measures primarily included cognitive tests, behavioural rating scales, global impairment scales, academic engagement, and planning problems. The results indicated a reduction in behavioural symptoms (Sprich et al, 2015; Sprich et al, 2016; Thyagarajan, 2016; Vidal et al, 2015), improvements in clinical global impressions (Senyamator et al, 2021), significant enhancement in cognition (Sluiter et al, 2020), a decrease in off-task behaviour (Sluiter et al, 2020), enhancement in on-task behaviour (Sulu & Kiyak, 2023; Yin et al, 2022), increased academic engagement (Vogelgesang, 2016; Sluiter et al, 2020), and better mathematics achievement (Nasako et al, 2016). Two studies showed no significant treatment effects (Coehlo et al, 2017; Haughan et al, 2022). Andersen et al (2022) demonstrated the acceptability and feasibility of the treatment. A study concluded that PML was more effective than SFT (Boyer et al, 2018). Large effect sizes were reported on adolescent, parent scores of symptom severity and functional impairment, in comparison with the control group (Vidal et al, 2015). Sprich et al, 2015 and Sprich et al, 2016 have demonstrated a decrease in symptom severity mean score by the independent evaluators. Boyer et al, 2016; 2018 has demonstrated moderate effect sizes on symptom severity and planning problems. Sluiter et al (2020) have demonstrated moderate to large effect sizes on teacher ratings, inhibition, and reduction in off-task behaviour. Similarly, Sulu & Kiyak, 2023 have shown moderate to large effect sizes on on-task behaviour using self-monitoring. The intervention packages have demonstrated improvement on the core symptoms of ADHD, but studies have not reported the effect sizes. Singular techniques were able to demonstrate on Mathematics achievement using token economy (Nasako et al, 2016).

DISCUSSION

In concordance with our objective 1, the current systematic review mapped 18 original research articles, which provide an updated, and comprehensive overview of evidence-based research from last 10 years conducted in HICs and LMICs for Cognitive Behaviour Therapy in children and adolescents with ADHD. Furthermore, as discussed in the results section, the paper classified the diverse range of interventions into (a) module-based CBT (n=7), (b) intervention packages (n=5), and (c) standalone cognitive or behavioural techniques (n=6).

The second objective was to conduct a comparative analysis between the LMIC and HIC. Globally, there are no standardized intervention packages, as each study has customized its approach with hybrid techniques and strategies of CBT. An ongoing debate regarding the group-based, one-size-fits-all approach versus an intervention tailored to individual needs is a subject worth exploring in further investigations (Haughan et al, 2022). There is relatively less focus on the core symptoms of ADHD. Academic outcomes are relatively unexplored in the research studies. Young & Smith (2017) developed several guidelines for caregivers and therapists to support children from 8 to 12 years, but this has been relatively underused in research studies. CBT has largely been underexplored without medicines. Most of the RCT have used CBT and pharmacological treatment to examine the impact of CBT. As expected, the interventions that employed singular techniques or intervention packages were of shorter duration compared to the comprehensive CBT modules, which utilized a larger number of sessions.

Although studies conducted in LMICs and HICs are almost equal in number, differences are evident in the qualitative aspects of methodological reporting. The critical appraisal identified methodological gaps in how research in LMICs is reported. Evidence for large-scale RCTs mainly comes from HICs. Modular-based CBT interventions are more common in HICs than in LMICs. LMICs and HICs tend to focus on unstructured intervention packages that involve multiple techniques. The intervention packages have been reported as effective in both LMICs and HICs. LMICs often lack CBT programs tailored to their diverse cultures. The intervention packages or single techniques have been designed primarily for children aged 6 to 12 years. However, studies in the HICs have also been conducted for adolescents, utilizing CBT modules for those 12 years and above. There are no modules for children below 8 years (Journeaux, 2023).

Our third objective was to understand the standard components of ADHD programs. 10 components were identified in modular based programs, namely, psychoeducation, organization and planning, emotional regulation, interpersonal relationships, cognitive structuring, distractibility, procrastination, problem solving, comorbid psychiatric conditions, self-instructions, attention and impulsivity. In the intervention packages and singular strategies of CBT, 10 components were reported, namely, self-monitoring, self-control, self-instructions, self-evaluation, self-motivation, parent training, token economy, attention enhancement techniques, and modelling. Typically, one technique or intervention package is used for children aged 6 to 12 years, while module-based techniques are applied to those above 12 years. Thus, there are differences in the strategies based on the target age groups of the designed interventions.

Our last objective was to assess the potential effectiveness of the interventions. Different studies have used different components of CBT, therefore, in the absence of standardization, it is difficult to achieve a unified conclusion about the potential effectiveness of the

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interventions. Nonetheless, findings from few studies have shown promise for module based studies with large effect sizes on adolescent, parent scores of symptom severity and functional impairment, in comparison with the control group (Vidal et al, 2015). Sprich et al, 2015 and Sprich et al, 2016 have demonstrated a decrease in symptom severity mean score by the independent evaluators. Boyer et al, 2016; 2018 has demonstrated moderate effect sizes on symptom severity and planning problems. Sluiter et al (2020) have demonstrated moderate to large effect sizes on teacher ratings, inhibition, and reduction in off-task behaviour. Similarly, Sulu & Kiyak, 2023 have shown moderate to large effect sizes on on-task behaviour using self-monitoring. The intervention packages have demonstrated improvement on the core symptoms of ADHD, but studies have not reported the effect sizes. Singular techniques were able to demonstrate on Mathematics achievement using token economy.

Strengths and Limitations

The review encompasses a diverse range of research designs, including the nature of interventions, outcomes, duration, and number of sessions, as well as the treatment and efficacy of CBT, which can be used effectively as part of a multimodal treatment modality to improve cognitive, behavioural, functional, and academic outcomes.

Implications for Practice

Evidence suggests that CBT can be delivered effectively for children with ADHD by mental health professionals, which can substantially aid in the decrease of primary symptoms of ADHD, namely attention, hyperactivity, and impulsivity, enhance cognitive abilities, and academic achievement. If parents, teachers, and children are trained and provided access to CBT, then CBT can aid in alleviating symptoms and deficits compared to access to pharmacological or no psychological intervention.

Implications for Research

Although CBT has an extensive evidence base as a non-pharmacological approach for managing children and adolescents with ADHD, several areas require further exploration. There is a need for several research-based investigations in LMICs to enhance and expand services in these countries (Arya et al, 2015). The potential effectiveness of the Cognitive Behaviour Therapy Modules must be developed and evaluated in LMICs. In the context of the technological boom and the altered realities shaped by the pandemic, CBT modules should be designed for effective online delivery, as this review did not find recent advances in evidence-based CBT. A comparative analysis of online and face-to-face CBT delivery methods should be conducted and evaluated. It is essential to examine the effects of the intervention across different subgroups, such as gender, age, type of schooling, education, subtype of ADHD, and socioeconomic status. Large-scale, multicenter randomized controlled trials should be promoted, especially in LMICs, to build a scientifically rigorous evidence base. Detailed follow-ups at multiple points after the intervention could help identify long-term outcomes (Sprich et al, 2016). LMICs should develop their own CBT modules and standardized intervention packages aligned with their diverse socio-cultural environments. Researchers, particularly in LMICs, should report methodological quality characteristics such as blinding, feedback, setting, duration, number of sessions, and session length. Globally, CBT modules are scarce for children under 8 years old; therefore, research should prioritize this area. Training parents and teachers in CBT could be explored to better equip them for managing children with ADHD. The CBT modules should also emphasize direct interventions with children and adolescents. The current evidence suggests that

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unstructured CBT interventions are more effective than standardized packages or modules. Agencies must focus on establishing a standardized framework for specific components to include in CBT modules, ensuring their effectiveness across different age groups. Factors influencing whether group or individual therapy is more appropriate should be studied. Additionally, factors affecting the success of direct or caregiver-mediated interventions must be explored. Addressing these research areas could help optimize CBT interventions, allowing children and adolescents with ADHD to achieve maximum benefits. The impact of the interventions on the associated academic and social skills impairments has yet to be investigated. However, there is preliminary evidence (Haughan et al, 2022) on the improvement in assertiveness and self-control, therefore, further trials may provide insight into this phenomenon.

CONCLUSION

Drawing definitive conclusions is challenging due to the heterogeneity of research studies, which explore various intervention techniques and components of CBT. Although evidence indicates improvement in the core symptoms of ADHD as evidenced by multiple intervention programs and techniques of CBT, but we need more trials with RCT with standardized components of CBT to arrive at definite conclusions.

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Conflict of Interest

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