THE EFFECT OF COGNITIVE BEHAVIORAL THERAPY (CBT) ON TIME MANAGEMENT AND WORK HABITS AMONG ADOLESCENTS WITH ADHD

A Systematic Literature Review

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Abstract: *This article presents a comprehensive literature review and meta-analytic synthesis of recent empirical studies examining the effectiveness of Cognitive Behavioral Therapy (CBT) in improving time management and study habits among adolescents diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD). The aim is to identify consistent patterns, treatment moderators, and practical implications for clinical and educational contexts.*

Method*: A total of ten peer-reviewed studies published between 2019 and 2024 were reviewed. Studies were included if they focused on adolescents or emerging adults with ADHD, employed CBT-based interventions, and reported outcomes related to executive functioning, time management, or academic behaviors. A narrative synthesis approach was used due to the heterogeneity of outcome measures and methodologies.*

Results: *CBT interventions demonstrated moderate to strong effects in enhancing time management skills, including planning, task initiation, and goal-setting. Improvements in study habits such as homework completion, organizational skills, and academic engagement were also reported. Treatment efficacy was moderated by factors such as parental involvement, intervention duration, and participant age. Improvements in executive functioning and emotional regulation frequently mediated the observed outcomes. However, objective academic measures (e.g, GPA) showed less consistent improvement.*

Conclusion*: CBT is an effective and adaptable intervention for adolescents with ADHD, particularly in improving time-based executive functioning and academic self-regulation. The findings support the integration of CBT into both clinical and educational settings, with attention to personalization, environmental support, and long-term follow-up. Further research is needed to clarify long-term outcomes and optimize intervention strategies*.

Keywords: *ADHD, adolescents, cognitive behavioral therapy, time management, study habits, executive functioning, academic skills*.

Literature review

ADHD in Adolescents: Time Management and Work Habits

Attention-Deficit/Hyperactivity Disorder (ADHD) in adolescence is marked by considerable challenges in executive functioning, which directly impact time management and the development of effective work habits. Executive functions (EFs)-including time perception, planning, and self-regulation-are fundamental for daily functioning, particularly in educational and developmental contexts. Adolescents with ADHD often experience delays or deficits in these domains, leading to significant disruptions in their academic performance, autonomy, and quality of life. Thompson (2023) emphasizes that impairments in core executive functions such as inhibition, working memory, and cognitive flexibility are prevalent in youth with ADHD, and these impairments manifest in poor self-monitoring, disorganization, and an inability to effectively plan and allocate time. Her systematic review underscores that these deficits, while variable, are commonly observed across ADHD populations, reinforcing the notion that executive dysfunction is a central feature of the disorder even if not universal.

Time management, as a specific subset of executive functioning, is particularly impaired in adolescents with ADHD. Wennberg et al. (2019) conducted a comparative study among children aged 9–15 with ADHD, intellectual disabilities, and typically developing peers, and found that those with ADHD exhibited significantly lower time-processing ability (TPA) and daily time management (DTM). Time-processing ability includes constructs such as time perception (the subjective experience of duration), time orientation (understanding sequences of events and clock time), and time management (applying this awareness functionally to daily tasks). Notably, children with ADHD had greater difficulty managing time than even children with intellectual disabilities, suggesting that ADHD-specific executive dysfunction contributes uniquely to temporal disorganization. These deficits in time management translated into reduced autonomy in daily activities, indicating that impaired time cognition not only affects task performance but also undermines adolescents' self-efficacy and independence (Wennberg et al, 2019).

Similar findings were reported by Geist (2024), who explored time-related deficits in adults with ADHD but highlighted developmental continuity from adolescence. Her thesis emphasized that poor time management in ADHD results in chronic tardiness, missed appointments, and general inefficiency, all of which negatively impact educational and occupational attainment. Geist further identified that time management is not a mere behavioral lapse but a reflection of compromised EF systems that require structured

intervention. The study presented evidence that even simple interventions such as web-based self-monitoring tools can yield measurable improvements in time-related behaviors, underscoring the modifiability of these deficits. Although Geist focused on adults, her findings reinforce the importance of early intervention during adolescence, when such habits begin to crystalize.

In a broader neuropsychological context, Weissenberger et al. (2019) provided a theoretical and empirical synthesis of the temporal perception deficits in ADHD, asserting that the core dysfunction lies not only in behavioral impulsivity but in the very sense of time itself. Individuals with ADHD tend to underestimate time intervals and overestimate task durations, leading to misalignments between perceived and actual task demands. These discrepancies contribute to procrastination, disorganized task execution, and a failure to anticipate future consequences-behaviors often mistaken for laziness or disinterest. The authors emphasize the necessity of addressing these distortions through targeted cognitive interventions that recalibrate time awareness and temporal planning.

Further supporting the link between ADHD, EF, and real-world functioning, Chan and Langberg (2024) investigated how different dimensions of executive functioning predict occupational outcomes in young adults with ADHD. Among EF domains, time management emerged as the most consistent predictor of success, correlating with lower job satisfaction, more disciplinary actions, and poorer peer relationships when impaired. While their study centered on occupational functioning, its implications for adolescents are profound: time management difficulties in youth are not transient developmental hurdles but predictors of long-term vocational and psychosocial challenges. The authors argue that interventions addressing time-related executive skills could mitigate these downstream impairments, reinforcing the urgency of early, targeted support for adolescents struggling in this domain.

Taken together, the reviewed literature offers converging evidence that time management and work habits in adolescents with ADHD are significantly compromised due to underlying executive function deficits. These impairments are evident across multiple domains—academic, social, and functional-and persist into adulthood if left unaddressed. The heterogeneity of ADHD presentations means not all adolescents will display the same profile of deficits, but time-based challenges appear consistently enough to warrant focused attention. Moreover, the studies reviewed illustrate that these deficits are measurable, clinically meaningful, and responsive to intervention, particularly those grounded in cognitive-behavioral frameworks. As such, understanding the nature of these challenges is essential for

designing effective therapeutic and educational strategies aimed at enhancing the daily functioning and future success of adolescents with ADHD.

Cognitive Behavioral Therapy (CBT) and Its Application in ADHD

Cognitive Behavioral Therapy (CBT) has gained increasing attention as a promising non-pharmacological intervention for adolescents with Attention-Deficit/Hyperactivity Disorder (ADHD), particularly in addressing the executive dysfunctions that underlie the core symptoms of the disorder. ADHD in adolescence is marked not only by persistent inattention and hyperactivity-impulsivity but also by deficits in planning, organization, and emotional regulation—domains directly targeted by CBT. Haugan et al. (2022) underscore the rationale for CBT in adolescents with ADHD by highlighting the limitations of pharmacological treatment. While stimulant medication may mitigate core symptoms, it is insufficient for addressing the functional impairments related to executive dysfunction. Many adolescents do not respond adequately to medication, discontinue treatment due to side effects, or remain impaired despite medical management. These observations align with the NICE guidelines, which recommend CBT as a complementary intervention when symptoms persist after pharmacological and psychoeducational treatment (Haugan et al. 2022). The analysis of the results of long-term therapeutic work provides evidence in favor of the effectiveness of applying an adapted version of CBT in the practice of child and adolescent counseling. A deeper understanding of the problems of adolescents requires supplementing the therapeutic strategy with approaches other than CBT. Of course, this is not an eclectic approach, but an integrative professional understanding and behavior. (Krasteva – Ivanova M, 2020)

CBT in the context of ADHD is typically structured around psychoeducation, cognitive restructuring, and behavioral skills training aimed at improving time management, task initiation, goal setting, and self-regulation. Yet, as Novik et al. (2020) note, despite the theoretical grounding and emerging clinical support, the evidence base for CBT in adolescents with ADHD remains limited compared to that for children or adults. Their randomized controlled trial protocol emphasizes the need for rigorously designed studies evaluating CBT specifically tailored to adolescents-an age group marked by increasing demands for autonomy yet continued reliance on external structure. The study further calls for identifying moderators and mediators of treatment outcomes, such as age, comorbid conditions, and socioeconomic status, which may influence CBT efficacy.

One important issue in applying CBT to adolescents is the format and structure of the intervention. Haugan et al. (2022) evaluated a 12-session group CBT program based on the

Young-Bramham Program (YBP), adapted for Norwegian adolescents and delivered without parent involvement. Contrary to expectations, the study found no significant differences in ADHD symptom reduction between the CBT and control groups. The authors attribute the lack of effect to several factors: insufficient treatment intensity, lack of individual tailoring, and absence of parental involvement. This finding contrasts with previous CBT programs that incorporated parent-teen collaboration, such as the Supporting Teens' Autonomy Daily (STAND) program or the Homework, Organization, and Planning Skills (HOPS) model, both of which demonstrated promising results, particularly in improving planning and organizational skills (Haugan et al. 2022).

The importance of treatment intensity and parental participation is further supported by Afshadi et al. (2024), who conducted a quasi-experimental study on university students with ADHD. Their findings demonstrate that a well-structured 12-week CBT group intervention, based on Safren's protocol, significantly improved symptoms of inattention, impulsivity, and deficits in executive functions such as time management and problem-solving. Notably, the intervention was administered without concurrent medication and still yielded significant effects, suggesting that CBT may be effective even as a standalone treatment when properly structured. The study provides robust statistical evidence of improvements across multiple executive function subscales, highlighting CBT's potential to enhance core cognitive capacities that underpin time-based behaviors.

A different perspective is offered by Rofiah et al. (2021), who examined the implementation of CBT among adolescents in inclusive Indonesian junior high schools. Although the sample size was small, the study found significant reductions in hyperactive behaviors after just five CBT sessions. The authors emphasize that adolescents with ADHD often experience chronic academic and social failures, which lead to negative self-perceptions, anxiety, and avoidance behaviors. CBT addresses this by challenging maladaptive cognitions and reinforcing adaptive behavioral patterns. Their work highlights the utility of CBT in culturally diverse and resource-limited settings, where short-term, behaviorally focused interventions may provide immediate relief from the most disruptive aspects of ADHD.

In contrast to short interventions, Solanto and Scheres (2021) tested a comprehensive CBT program for college students with ADHD, aimed at enhancing executive self-management functions such as time awareness, prioritization, and planning. The program included both cognitive elements-such as challenging irrational beliefs and enhancing motivation—and behavioral techniques like task chunking, distraction control, and sleep

hygiene improvement. Although the study population was older, the developmental continuity from adolescence to emerging adulthood underscores the relevance of these strategies for teenagers as well. Their results showed significant improvements in self-rated and clinician-rated inattentive symptoms, executive functioning, and academic behaviors, even in the absence of medication, affirming the broad applicability and adaptability of CBT frameworks.

Together, these studies point to a nuanced understanding of CBT's potential and limitations in treating adolescents with ADHD. CBT is not a monolithic intervention but a framework that requires tailoring to the individual's age, cognitive profile, and context. The variation in outcomes across studies suggests that several factors-intervention length, session frequency, inclusion of parents, therapist training, and cultural adaptability-play a crucial role in determining CBT's efficacy. Nonetheless, when delivered with sufficient intensity, focus on executive skills, and cognitive restructuring components, CBT appears to offer meaningful benefits for adolescents grappling with the cognitive and behavioral challenges of ADHD.

Method

The present meta-analytic synthesis was designed to evaluate the effectiveness of cognitive behavioral therapy (CBT) in improving time management and study habits among adolescents and young adults diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD). This analysis is based on a systematic review of ten empirical studies, published between 2019 and 2024, each of which directly examined CBT-based interventions in adolescent or emerging adult populations with clinically diagnosed ADHD. These studies were selected based on their methodological rigor and relevance to the two core outcome areas of interest: time-based executive functioning (e.g., planning, prioritization, and task initiation) and academic/study behaviors (e.g., organizational skills, homework completion, test preparation).

To be included in this meta-analysis, studies had to meet the following criteria: (1) involve participants aged approximately 12–25 years formally diagnosed with ADHD; (2) employ a CBT-based intervention, either alone or in combination with pharmacological or psychoeducational components; (3) include pre- and post-intervention measurement of outcomes related to time management or study habits, using either standardized instruments, observer ratings (e.g. parents, teachers), or academic performance indicators; and (4) be published in peer-reviewed journals in English. Studies were excluded if they focused solely on pharmacological treatment, if they lacked specific outcome measures relevant to time or academic functioning, or if the CBT intervention was not clearly delineated.

The selected studies were conducted across various geographic and clinical contexts, including Norway (Haugan et al., 2022; Andersen et al., 2024), Greece (Moustaka et al., 2024), Spain (Piqueras & Rama-Victor, 2020), and the United States (Sibley et al., 2023; Solanto & Scheres, 2021; Eddy et al., 2021). Participant populations ranged from early adolescents in high school to college students, with varying levels of ADHD severity. Several interventions, such as the Supporting Teens' Autonomy Daily (STAND) program (Sibley et al, 2023) and the Access Program (Eddy et al, 2021), focused on enhancing executive functioning through collaborative goal setting, self-monitoring, and task structuring. Others, such as the interventions described by Firoozi & Ehsani (2020) and Ladas et al. (2021), emphasized emotional self-regulation and working memory training alongside CBT components.

Outcome measures were heterogeneous across studies but consistently included domains relevant to the research aims. Tools such as time-use diaries, the ADHD Rating Scale-IV, the Executive Skills Questionnaire, and various self-report or parent-report measures were used to assess progress in time-related functioning and study behaviors. Academic outcomes were also examined in some studies through GPA scores or homework accuracy rates (e.g, Solanto & Scheres, 2021; Moustaka et al. 2024). Because effect sizes and statistical reporting varied widely, a narrative synthesis approach was chosen over a statistical meta-analysis. This method allows for the integration of both quantitative and qualitative findings, and enables the identification of recurring patterns, contextual moderators, and meaningful divergences between studies.

This review pays particular attention to variables that may moderate treatment effects, such as treatment format (individual vs. group), parental involvement, cultural adaptations, and intervention dosage. Additionally, mechanisms of change (e.g. improved executive functioning as a mediator of behavioral gains) are considered where data permits. This structured synthesis thus serves to clarify the current empirical landscape surrounding CBT's impact on time and academic functioning in ADHD youth, and sets the stage for discussing consistent findings, gaps in the literature, and future research needs in the sections that follow.

Effectiveness of CBT on Time Management

Time management is a crucial executive function domain often impaired in adolescents with ADHD, contributing to academic underperformance, procrastination, and general dysfunction in daily life. Across the ten studies reviewed, cognitive behavioral

therapy (CBT) consistently emerged as a promising intervention in improving time-related behaviors, although findings varied depending on intervention intensity, participant age, and methodological rigor. A number of studies provided robust evidence of CBT's efficacy in enhancing adolescents' ability to structure their time, initiate tasks, and meet deadlines-skills often underdeveloped in this population due to neurocognitive deficits in self-regulation and planning.

For instance, Solanto and Scheres (2021) reported significant improvements in time awareness, planning, and procrastination reduction following a 12-session CBT intervention tailored to college students with ADHD. Participants demonstrated large effect sizes on standardized scales measuring time management and overall executive function. Notably, these gains were achieved without the use of medication, suggesting the standalone potential of structured CBT protocols. Similarly, Eddy et al. (2021), in their randomized controlled trial of the ACCESS program, found moderate improvements in students' self-reported use of time management strategies and daily functioning across a two-semester intervention. These improvements were maintained across the follow-up period, indicating durable effects when CBT is delivered with sufficient intensity and contextual relevance (e.g. in academic settings).

Additional support for CBT's impact on time processing comes from the study by Weissenberger et al. (2019), which explored neurocognitive aspects of temporal dysfunction in ADHD. While not an interventional study per se, the article synthesized findings on how ADHD affects time perception-such as underestimation of durations and difficulty sequencing tasks-and reviewed cognitive training approaches including CBT that target these deficits. The authors concluded that CBT techniques which increase metacognitive awareness of time (e.g. goal-setting, structured routines, temporal self-monitoring) are particularly effective in realigning adolescents' subjective sense of time with actual temporal demands, thus bridging a core gap in ADHD-related functioning.

However, not all findings were uniformly positive. Haugan et al. (2022), in a well-powered RCT of a 12-week group CBT for adolescents aged 14–18 in Norway, found no significant improvements in time-related outcomes compared to a control group. The authors attributed the null findings to several methodological limitations: lack of parental involvement, low dosage per CBT component, and insufficient time for practice and skill generalization. Interestingly, Andersen et al. (2024) followed up on this same sample one year later and observed mild improvements in organization and daily routine management among participants who remained engaged in structured activities post-treatment, suggesting possible delayed or secondary effects of CBT exposure.

In terms of delivery format, Sibley et al. (2023) emphasized that parent-teen collaborative models (such as the STAND program) yielded greater improvements in time management skills than adolescent-only programs. In their qualitative follow-up four years post-treatment, participants consistently reported long-term retention of organizational habits and increased autonomy in managing time. This suggests that sustained change may depend not only on individual CBT but also on environmental scaffolding, such as consistent parental reinforcement or institutional support (e.g. schools, therapy settings).

The study by Firoozi and Ehsani (2020) contributes an additional dimension by integrating behavioral-emotional self-regulation into CBT. Their findings indicated that improvements in time management were most pronounced in participants who also developed greater emotional awareness and inhibitory control—further underscoring the interconnectedness of emotional and temporal self-regulation in ADHD. Similarly, Moustaka et al. (2024) reviewed 13 CBT-based interventions in university settings and concluded that improvements in time-based behaviors were among the most consistent treatment outcomes across studies.

Taken together, the reviewed studies indicate that CBT has a moderate to strong potential to improve time management among adolescents with ADHD, especially when the intervention is: (a) individualized, (b) delivered over a sufficient time span, (c) inclusive of parental participation, and (d) targets both cognitive and emotional aspects of self-regulation. Although not all CBT protocols yield statistically significant outcomes—particularly when underpowered or lacking in ecological support-the broader literature affirms the therapeutic value of structured, goal-oriented CBT approaches in addressing one of the most functionally impairing features of ADHD: poor time management.

CBT and Improvement in Study Habits and Academic Skills

Study habits and academic performance represent critical areas of functioning for adolescents with ADHD, who frequently struggle with initiating and completing homework, organizing materials, preparing for tests, and maintaining sustained attention during study periods. Across the ten studies reviewed, cognitive behavioral therapy (CBT) demonstrated a consistent, though sometimes variable, impact on improving academic behaviors. These gains are especially notable in interventions that directly target organizational skills, homework routines, and academic motivation, rather than focusing solely on symptom reduction.

Several studies demonstrated clear positive outcomes in academic skill development following CBT interventions. For example, Solanto and Scheres (2021) reported robust gains in academic planning, task follow-through, and concentration in a group CBT intervention designed for college students. Participants showed significant pre-post improvements in study-related executive functions such as scheduling, avoiding procrastination, and preparing for exams—skills directly linked to academic performance. Notably, these improvements were achieved even in the absence of GPA increases, highlighting the distinction between behavioral change and long-term academic achievement.

Similarly, Eddy et al. (2021) evaluated the "ACCESS" program, a CBT-based intervention for emerging adults with ADHD attending college. Participants reported significant improvements in study skills and strategies, including note-taking, self-monitoring, and test preparation. These self-reported changes were accompanied by increased self-efficacy and functional well-being. However, objective academic metrics such as GPA and credit accumulation did not differ significantly between intervention and control groups, a pattern echoed in several other studies. This suggests that while CBT may enhance students' capacity to study effectively, such improvements may not translate into immediate academic performance gains due to the complexity of academic systems and external factors like instructor grading variability and institutional support.

In younger adolescents, Sibley et al. (2023) conducted a qualitative follow-up of participants who had received behavior therapy including the STAND program. The study revealed strong long-term retention of study habits developed during treatment. Themes such as enhanced motivation, improved parent-teen collaboration on school tasks, and structured homework routines emerged as common benefits, with 81% of participants reporting sustained use of organizational strategies. These findings support the long-standing view that when CBT is paired with consistent environmental support—especially from parents-it can instill durable academic habits.

The importance of program structure and delivery format is further evidenced in Haugan et al. (2022) and Andersen et al. (2024), who examined a group CBT program offered without parental involvement. In contrast to more individualized or dyadic approaches, this intervention failed to produce significant changes in academic skills or homework completion. The authors speculated that the limited time allotted for behavioral rehearsal and the absence of home reinforcement limited the intervention's impact. This underscores that CBT's academic benefits depend not only on the content delivered but also on how it is integrated into the adolescent's daily routine and support system.

A broader overview provided by Moustaka et al. (2024) supports the consistent value of CBT in addressing academic functioning. Their review of 13 interventions found that CBT was particularly effective in reducing procrastination, enhancing school engagement, and improving students' academic self-concept. Furthermore, Ladas et al. (2021) compared CBT with Cogmed (a working memory training program) and found that while both yielded benefits, CBT was more effective in improving self-regulated learning behaviors and school-related organization, especially in adolescents with combined-type ADHD.

Interestingly, Firoozi and Ehsani (2020) integrated emotional regulation training into a CBT framework and observed parallel improvements in homework completion and academic engagement. Their results suggest that emotional dysregulation, common in ADHD, can hinder academic functioning even when cognitive skills are present. Addressing emotional barriers to learning—such as anxiety, frustration, or avoidance-may thus be a key mechanism through which CBT enhances study behaviors.

In contrast, Piqueras and Rama-Victor (2020) highlighted the importance of neuropsychological specificity in CBT interventions. Their analysis argued that academic deficits in ADHD are often rooted in distinct cognitive profiles, such as impairments in working memory, attentional control, or verbal reasoning. As such, CBT programs that tailor interventions to the individual's neurocognitive strengths and weaknesses—rather than adopting a generic protocol—may be more effective in producing meaningful academic change.

In summary, the literature indicates that CBT can significantly improve study habits, homework routines, and academic self-regulation in adolescents with ADHD, particularly when interventions are individualized, developmentally appropriate, and embedded in supportive contexts (e.g. with parent involvement or school coordination). However, while behavioral and motivational changes are well documented, the evidence for direct improvement in objective academic outcomes (e.g, grades, GPA) remains mixed. This suggests that while CBT enhances students' ability to learn and prepare effectively, broader systemic factors likely mediate whether these skills ultimately translate into academic success.

Moderators and Mediators of CBT Outcomes

While cognitive behavioral therapy (CBT) shows promise in improving time management and academic behaviors in adolescents with ADHD, its effectiveness is not

uniform across all settings or populations. Variability in outcomes across the reviewed studies points to the influence of moderating and mediating variables-factors that affect either the strength or the mechanism of treatment effects. Understanding these variables is crucial for optimizing intervention design, tailoring treatment to individual needs, and identifying adolescents who are most likely to benefit from CBT-based interventions.

One of the most consistently reported moderators is parental involvement. Studies incorporating parent-teen collaboration generally yielded stronger and more sustained outcomes compared to adolescent-only interventions. For instance, in the qualitative follow-up by Sibley et al. (2023), adolescents who had engaged in the STAND program-a modular CBT treatment involving structured parent-teen contracts and joint skill-building sessions-demonstrated long-term retention of organizational habits and improved academic motivation. Parents reported increased awareness of ADHD-related challenges and more constructive engagement with their children's schoolwork, highlighting the crucial role of the home environment in supporting behavioral change. In contrast, Haugan et al. (2022) found no significant benefits from a group CBT intervention delivered without parent involvement, suggesting that adolescents may struggle to generalize CBT skills without external scaffolding.

Another important moderator is intervention dosage and duration. Studies with longer interventions and greater contact hours tended to report more robust outcomes. For example, Eddy et al. (2021) conducted a two-semester CBT intervention (ACCESS), which yielded sustained improvements in time management and study strategies. These outcomes were more pronounced than those observed in shorter interventions such as the five-session programs reviewed by Moustaka et al. (2024). Moreover, Andersen et al. (2024) observed modest delayed effects one year after a relatively brief 12-session CBT intervention, suggesting that certain CBT principles may require extended application or booster sessions to manifest fully in behavioral change.

The developmental stage of participants also appears to moderate treatment efficacy. Emerging adults—typically aged 18 to 25-may derive greater benefit from CBT due to higher levels of cognitive maturity and personal investment in outcomes such as academic performance and future planning. This trend was evident in the college student samples of Solanto and Scheres (2021) and Eddy et al. (2021), where improvements in executive self-management and academic planning were stronger than those reported in mid-adolescent populations. Conversely, younger adolescents may require greater environmental support and

behavioral reinforcement to sustain treatment gains, as reflected in the findings of Haugan et al. (2022) and Firoozi and Ehsani (2020).

In terms of mediators, a recurring mechanism of change across studies is improvement in executive functioning—particularly in areas of planning, task initiation, and self-monitoring. For example, Solanto and Scheres (2021) found that gains in time awareness and reduction in procrastination mediated reductions in ADHD inattentive symptoms. Similarly, Firoozi and Ehsani (2020) showed that emotional self-regulation improvements mediated better academic engagement and task follow-through. These findings align with theoretical models that conceptualize ADHD as a disorder of executive dysfunction, and they underscore the centrality of executive skills in translating CBT techniques into daily functional gains.

Another potential mediator is therapeutic alliance and engagement, although few studies in this review directly measured these variables. Nonetheless, Sibley et al. (2023) reported that strong engagement between therapists, adolescents, and parents was associated with more frequent skill use and more positive perceptions of treatment. Programs that included motivational components, personalized goal-setting, and real-time feedback-such as STAND and ACCESS-seemed to foster deeper participant investment and more consistent behavioral change.

Cultural context and setting also moderated CBT outcomes. Studies conducted in school settings (e.g. HOPS and CHP, referenced in Haugan et al, 2022) showed differential results compared to those delivered in clinical or university contexts. CBT interventions tailored to specific academic environments-such as Moustaka et al.'s (2024) work in university populations-were more successful when aligned with local educational demands and student responsibilities. Moreover, Piqueras and Rama-Victor (2020) emphasized that individual differences in neuropsychological profiles (e.g. working memory vs. attention control deficits) should guide the selection and focus of CBT modules, suggesting the value of cognitive assessments as a tool for treatment personalization.

In sum, this review identifies several key factors that shape the efficacy of CBT for adolescents with ADHD. Among moderators, parental involvement, intervention length, and developmental stage stand out as particularly influential. Among mediators, improvements in executive function, emotional regulation, and therapeutic engagement appear critical in translating CBT techniques into real-world change. Future research should systematically measure these variables, incorporate adaptive treatment frameworks, and evaluate how tailoring interventions to individual profiles can maximize long-term functional outcomes.

Synthesis and Conclusion

The accumulated findings across the ten studies reviewed provide a cautiously optimistic picture of the potential of cognitive behavioral therapy (CBT) to improve time management and study habits in adolescents with ADHD. When CBT is delivered with sufficient structure, developmental sensitivity, and contextual support, it appears to offer significant benefits in enhancing executive functioning and academic-related behaviors—domains that are central to adolescents' autonomy, academic success, and long-term adjustment. Importantly, the reviewed studies converge on the finding that CBT helps adolescents become more aware of time, better at organizing their tasks, and more engaged in managing academic responsibilities.

Across the literature, the most consistent improvements were observed in self-reported time management and study-related behaviors—such as planning, initiating tasks, and reducing procrastination (Solanto & Scheres, 2021; Eddy et al, 2021). Interventions that included explicit training in executive skills (e.g., goal setting, self-monitoring, use of planners) produced more robust outcomes than those that focused only on cognitive restructuring. Long-term follow-up studies (e.g., Sibley et al., 2023) suggest that when CBT is embedded in family systems and reinforced over time, it can result in durable behavioral changes that extend into emerging adulthood.

However, the review also highlights significant limitations in the current body of evidence. First, methodological heterogeneity across studies complicates direct comparison. The studies varied in duration (ranging from 5 to 24 sessions), population (middle schoolers to college students), delivery format (group vs. individual; with or without parental involvement), and outcome measurement tools. While this diversity reflects real-world application, it also reduces the ability to draw strong generalizable conclusions. Second, many studies relied heavily on self-report measures, which are susceptible to bias and may not accurately capture behavioral change, particularly in populations with limited self-awareness—a common feature of ADHD. Only a few studies included objective academic outcomes (e.g. GPA), and even fewer demonstrated significant changes in these domains.

Another critical limitation is the lack of long-term follow-up data. Only one study in this review (Sibley et al. 2023) systematically assessed maintenance of treatment gains beyond six months, limiting our understanding of the sustained impact of CBT on adolescents' real-world functioning. Moreover, sample sizes were often small, particularly in pilot studies (e.g. Solanto & Scheres, 2021), reducing statistical power and increasing the risk

of Type II errors. Finally, few studies explored cultural or contextual moderators in depth, and most research was conducted in Western, high-resource settings. As such, the generalizability of findings to diverse populations, including those in low-resource educational environments or non-Western cultural contexts, remains uncertain.

Despite these limitations, the review underscores several implications for practice and research. From a clinical standpoint, CBT should be viewed not as a single rigid protocol, but as a flexible framework that can be tailored to the developmental, emotional, and cognitive needs of adolescents with ADHD. The most effective CBT programs incorporate behavioral rehearsal, motivational strategies, and family involvement, and focus on practical skill-building rather than abstract cognitive change. School-based adaptations, integration with educational supports, and culturally sensitive delivery models are essential for real-world applicability.

From a research perspective, future studies should prioritize longitudinal designs, include multi-informant assessments, and test mediators and moderators of treatment effects more explicitly. Additionally, the development of adaptive CBT protocols, which dynamically adjust based on participant response, may represent a promising direction for personalizing treatment and optimizing outcomes.

In conclusion, CBT represents a valuable tool in the treatment arsenal for adolescents with ADHD, particularly in addressing the chronic difficulties of time management and academic self-regulation. While not a panacea, when thoughtfully applied, CBT has the potential to empower adolescents with ADHD to take greater control over their learning, behavior, and future success.

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