AMERICAN UNIVERSITY OF BEIRUT

SYSTEMATIC REVIEW OF THE MISDIAGNOSIS OF GIFTED STUDENTS WITH ADHD (2000-2023)

by

LYNN MOHAMAD AL HAGE SLEIMAN HAIDAR

A thesis
submitted in partial fulfillment of the requirements
for the degree of Master of Arts
to the Department of Education
of the Faculty of Arts and Sciences
at the American University of Beirut

Beirut, Lebanon
January 2024

AMERICAN UNIVERSITY OF BEIRUT

SYSTEMATIC REVIEW OF THE MISDIAGNOSIS OF GIFTED STUDENTS WITH ADHD (2000-2023)

by

LYNN AL HAGE SLEIMAN HAIDAR

Approved by:

Signature Anies Al-Hroub

Dr. Anies Al-Hroub, Associate Professor
Department of Education — Advisor

Signature

Dr. Lina Khalil, Assistant Professor
Department of Education — Member of Committee

Signature Farah El Zein

Dr. Farah El Zein, Assistant Professor
Emirates College for Advanced Education — Member of Committee

Date of thesis defense: January 18, 2024

AMERICAN UNIVERSITY OF BEIRUT

THESIS RELEASE FORM

	Al Hage Sleiman Haidar	Lynn	Mohamad
Student Name:	Last	First	Middle

I authorize the American University of Beirut, to: (a) reproduce hard or electronic copies of my thesis; (b) include such copies in the archives and digital repositories of the University; and (c) make freely available such copies to third parties for research or educational purposes:

☒ As of the date of submission

☐ One year from the date of submission of my thesis.

☐ Two years from the date of submission of my thesis.

☐ Three years from the date of submission of my thesis.

Lyn Haidar_____February 22, 2024_____

Signature Date

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my parents; my mother, my sister, my brothers, and my uncle Jad for their unwavering support and encouragement throughout my academic journey. I am especially grateful to my late father, whose inspiration has guided me since childhood to pursue my dreams, and his memory continues to guide me every step of the way.

I extend heartfelt thanks to my friends for their continuous support and encouragement, for which I am deeply thankful.

My sincere appreciation goes to my advisor, Dr. Anies Al Hroub, for his unwavering guidance and mentorship throughout my academic endeavors, from coursework to the completion of this thesis. I also want to express my gratitude to Mrs Nabila Shehabedine and Sally Naalbandian, for their invaluable assistance and support in navigating the research process.

Finally, I am profoundly grateful to the committee members, Dr. Farah Al Zein and Dr. Lina Khalil, for their insightful feedback and constructive input, which have significantly enriched the quality of my work.

To everyone who has been a part of this journey, your contributions have made a profound impact on my academic and personal growth. Thank you from the bottom of my heart.

ABSTRACT

OF THE THESIS OF

Lynn Al Hage Sleiman Haidar for Master of Arts
Major: Education

Title: Systematic Review of the Misdiagnosis of Gifted Students with ADHD (2000-2023)

Given the complexities required in diagnosing a gifted child with ADHD, educators, physicians, psychologists, and parents often overlook or underestimate the relationship between ADHD and giftedness. Traditional identification approaches used by school professionals and clinicians, such as standardized testing and observational checklists, are ineffective in identifying gifted individuals who also have ADHD. As a result, the incidence of misdiagnosis has become a major concern. The purpose of the study, focusing on both diagnostic issues and research methodologies, is to synthesize and evaluate the available research evidence on the misdiagnosis of ADHD and giftedness based on peer-reviewed and internationally acclaimed academic journals published between 2000 and 2023 using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). 6 articles were included using the study's inclusion criteria. Some of the research conducted recently involves case studies, others are comparative studies, some are correlational in nature, and most are descriptive, focusing on participants' characteristics and how they were identified. The results of this systematic review demonstrate a scarcity of research regarding the misdiagnosis of gifted students with ADHD. The study has uncovered a notable pattern of misclassification, indicating that gifted students often exhibit characteristics that overlap with ADHD symptoms. The analysis has unveiled the critical significance of discerning between these dual exceptionalities, recognizing that giftedness can mask or mimic ADHD traits and vice versa. The findings underscore the complexity of differentiating between ADHD symptoms and the characteristics of giftedness, urging a more individualized and careful approach in both educational and clinical settings. The study underscores the imperative need for specialized training and awareness among professionals who interact with this unique population.

TABLE OF CONTENTS

ILLUSTRATIONS

TABLES

CHAPTER 1

INTRODUCTION

Attention-Deficit/Hyperactivity Disorder (ADHD) has garnered significant interest and concern within the field of education, particularly when it comes to its impact on gifted children. However, there exists a substantial gap in understanding the coexistence of ADHD and giftedness (Kaufman et al., 2000). ADHD is characterized by simultaneous behaviors such impulsivity, inattention, and hyperactivity, while the assessment of giftedness has evolved beyond traditional intelligence or IQ tests to encompass multiple abilities or areas of intelligence (Leroux & Levitt-Perlman, 2000).

In this intersection of giftedness and ADHD, misdiagnosis becomes a critical issue. Most educational and/or medical professionals struggle to accurately identify giftedness, especially when it coincides with a learning disorder like ADHD. This often leads to the misidentification of gifted students, resulting in unmet learning needs, underestimation of their abilities, or boredom with the general school curriculum. Consequently, it is imperative for educational professionals to be well-informed about the likelihood of children receiving a dual diagnosis (Kaufman et al., 2000).

In recent years, researchers like (Baum et al., 1998; Silverman, 1998; Webb & Latimer, 1993), as cited in Kaufmann et al., 2000 have raised concerns about the misinterpretation of giftedness as ADHD among the gifted population. They argue that the over diagnosis of ADHD among this group has become a significant issue. Mistakenly, they believe that sustained attention displayed by gifted children engrossed in high-interest activities excludes the possibility of ADHD. This misconception stems from the

assumption that complete engagement in an activity indicates the absence of ADHD symptoms as other stimuli are presumed to fade away (Kaufman et al., 2000).

Activities that are constantly reinforcing, such as video or computer games or leisure reading, do not differentiate children with ADHD from children without ADHD, but effortful tasks do. Since gifted children have a greater variety of tasks that are seen as effortless, their ADHD may be less noticeable than in children who struggle more visibly and to a lesser extent (Kaufman et al., 2000).

Various gifted students are misdiagnosed with ADHD by psychologists, psychiatrists, pediatricians, and health care experts. This typical misdiagnosis results from specialists' misunderstanding of key social and emotional features of gifted children, which are subsequently misinterpreted as symptoms of the disease by these professionals (Norma Lu Hafenstein et al., 2000).

The intensity, sensitivity, and impatience of a gifted students might readily be misconstrued for ADHD. Some gifted children do have ADHD and hence have a dual diagnosis of gifted and ADHD. However, when compared to ordinary children, the gifted child's developmental level is different, and health care experts should inquire whether the student’s inattentiveness or impulsive behaviors occur only in certain settings but not in others (e.g., at school but not at home). If the problem behaviors are purely situational, the student is not likely to have ADHD (Norma Lu Hafenstein et al., 2000).

Purpose of the study

Given the intricacies involved in diagnosing a gifted child with ADHD, the relationship between ADHD and giftedness is often overlooked or underestimated by educators, physicians, psychologists, and parents. Conventional identification procedures utilized by school professionals and physicians, including standardized testing and

observational checklists, prove inadequate in recognizing gifted students who also present with ADHD. As a result, the occurrence of misdiagnosis becomes a pressing concern (Norma Lu Hafenstein et al., 2000).

This study's main objective of this study is to conduct a comprehensive synthesis and critical evaluation of the existing research evidence pertaining to the misdiagnosis of ADHD and giftedness. By examining the literature from 2000 to 2023, the study seeks to offer educators an incisive understanding of the interconnections between these two conditions, enabling them to identify instances of misdiagnosis effectively. Consequently, equipped with such knowledge, teachers can engage in constructive discussions with parents concerning potential misdiagnoses and, consequently, provide tailored educational interventions specifically designed to accommodate the needs of gifted students, surpassing the conventional approaches solely catering to ADHD (Edward, 2009).

Moreover, the present synthesis aspires to appraise the quality and sufficiency of evidence-based research evident in each of the reviewed studies by employing esteemed and reliable indicators. By implementing rigorous evaluation criteria, the study aims to discern and present the most valid and reliable findings, offering valuable insights to educational practitioners and researchers alike. Ultimately, the research endeavors to enhance the accuracy of identifying gifted students with ADHD, thus promoting their comprehensive development and academic success.

Research Question

- What does the available research evidence reveal about the misdiagnosis of gifted students with ADHD during the period between 2000 and 2023?

Rational

Much akin to the intricate interplay observed in gifted/learning disabled children, where their disabilities may obscure their exceptional abilities, the realm of giftedness may similarly mask the presence of Attention-Deficit/Hyperactivity Disorder (ADHD), and vice versa. Regrettably, the dearth of comprehensive investigation into the domain of gifted/ADHD individuals might signify that many of these exceptional learners are not being accurately identified (Leroux & Levitt-Perlman, 2000).

Defined as a condition encompassing deficits in attention development, execution, and adaptive behavioral regulation, ADHD has stirred debates regarding its impact on gifted children, leading to claims of "misdiagnosis" stemming from their exceptional abilities (Budding & Chidekel, 2012). Nonetheless, erudite researchers within the domain of gifted education have drawn attention to the symptomatic resemblance between gifted attributes and the diagnostic criteria for ADHD (McChoach et al., 2020). It is crucial to acknowledge that some gifted students may genuinely exhibit ADHD symptoms, and disregarding their diagnostic needs can yield serious repercussions. For instance, the DSM-V highlights that inattentiveness among gifted children might arise when they are subjected to academically under-stimulating environments (American Psychiatric Association, 2013).

However, a noteworthy caveat pertains to the cross-cultural applicability of the DSM, which is rooted in Western-defined symptoms while failing to account for cultural variations and heterogeneity (Shehab & Al-Hroub, 2019). Consequently, misdiagnosis becomes a common occurrence when working with individuals from diverse cultural backgrounds. As such, the cultural suitability of the latest DSM edition may not be universally relevant, particularly in the context of Lebanese children with ADHD.

Notwithstanding, the DSM tool remains a precise diagnostic system, necessitating familiarity among school psychologists, counselors, and teachers as a requisite for professional practice. Nevertheless, this should not be misconstrued as an endorsement of the DSM's cross-cultural suitability, as existing literature has highlighted its shortcomings in diagnosing populations from different cultural contexts (Shehab & Al-Hroub, 2019).

Furthermore, the developmental disparities that distinguish gifted children from their peers underscore the need for healthcare experts to discern whether inattentiveness or impulsivity is context specific. Gifted students typically manifest keen focus and self-control within areas of interest or when surrounded by intellectual peers. In contrast, gifted students with ADHD may present a distinct profile characterized by deficits in working memory, lower self-esteem/behavioral self-concepts, compromised executive functioning, attentional difficulties, emotional challenges, social maturity, and struggles with homework completion (McCoach et al., 2020). This synthesis review, thus, seeks to enrich the understanding of preceding studies, glean novel insights, and identify prevailing gaps in the literature, ultimately contributing to informed decision-making and targeted support for gifted students with ADHD.

Significance of the study

The present study serves as a meticulous review of empirical research on the misdiagnosis of giftedness and ADHD, drawing from peer-reviewed and internationally acclaimed academic journals published between 2000 and 2023.

This systematic review delves into the critical intersection of giftedness and Attention-Deficit/Hyperactivity Disorder (ADHD), shedding light on the challenges associated with the accurate identification and diagnosis of gifted students with ADHD.

The importance of this study extends beyond the academic realm to a broader audience comprising counselors, teachers, researchers, and parents (Edward, 2009). It equips parents to support their children by understanding the nuanced interplay between gifted traits and ADHD characteristics, to enable them to communicate effectively with educators and counselors, ensuring a comprehensive approach to their child's development. Also, this study provides teachers with the tools to distinguish between manifestations of giftedness and symptoms of ADHD, contributing to more tailored educational strategies, and fostering an environment conducive to the optimal development of gifted students. Moreover, it will help counselors to refine their assessment approaches, providing more accurate support and intervention strategies for gifted students navigating the complexities of both giftedness and ADHD. And lastly, offers researchers in education and psychology new insights and evidence-based practices, providing a foundation for further research and the development of more effective identification and intervention strategies.

Accurate identification of gifted children holds profound importance, as misdiagnosis, such as labeling a gifted child as having ADHD, may hinder the fulfillment of their academic potential (Budding & Chidekel, 2012). Consequently, the implications of precise identification resonate across their educational trajectory, positively impacting their intellectual growth and achievement.

By adhering to fundamental systematic review criteria rigor, transparency, and replicability, this study enriches the quality and robustness of conventional literature reviews in diverse ways (Mallett et al., 2012). Emphasizing broadness while maintaining focus, grounding conclusions in scientific evidence rather than preconceived notions, and practicing transparency and replicability are essential facets that enhance the credibility

of the research. Such an approach fosters a more evidence-based and informed policymaking process, as researchers can prioritize empirical evidence, impact assessment, and causal inferences. Moreover, systematic reviews serve to mitigate potential researcher bias, encouraging scholars to engage with studies more critically and prioritize empirical evidence over preexisting knowledge (Mallett et al., 2012).

This study significantly contributes to researchers by advancing and expanding upon the current state of research on the identification, diagnosis, and misdiagnosis of gifted children with ADHD. It offers novel insights into the complex interplay between giftedness and ADHD and endeavors to enrich the understanding of scholars and practitioners alike. Ultimately, this study empowers educational professionals and healthcare experts to make well-informed decisions in identifying and supporting gifted students with ADHD, ensuring the optimal realization of their exceptional potential.

CHAPTER 2

LITERTURE REVIEW

The review of the literature entails a comprehensive exploration of key themes, encompassing systematic reviews and traditional literature reviews, giftedness, ADHD, identification criteria for ADHD, and giftedness diagnosis according to the DSM-5, as well as the misdiagnosis of gifted students with ADHD.

Introduction to Literature Review

Literature reviews have long served as valuable tools for summarizing and providing an overview of current and historical knowledge derived from a body of literature. They may encompass research papers presenting information and conceptual or theoretical literature focusing on specific subjects (Aromataris & Pearsn, 2014).

A literature review entails a methodical approach to gathering and analyzing prior research, establishing a robust foundation for knowledge expansion and theory development. It affords the unique strength of combining results and perspectives from multiple empirical studies, enabling the examination of research problems in a comprehensive manner (Syder, 2019).

Furthermore, literature reviews play a vital role in offering an overview of diverse and multidisciplinary research areas. They facilitate the integration of study findings, presenting evidence at a meta-level, and identifying avenues for further research, essential for developing theoretical frameworks and conceptual models. Nonetheless, traditional methods of depicting literature reviews often lack thoroughness and consistency (Syder, 2019).

Conversely, systematic reviews adopt a significantly more structured approach, aiming to provide a comprehensive and unbiased synthesis of all relevant data, both quantitative and qualitative, to address a focused research question (Aromataris & Pearson, 2014; Mallet et al., 2012; Strech & Sofaer, 2012). Originally employed in the medical sciences during the 1970s to assess the efficacy of healthcare treatments, systematic reviews have expanded their scope to promote evidence-based practices across various disciplines (Mallet et al., 2012).

In the realm of scholarly inquiry, systematic reviews stand as a beacon of methodological rigor and evidence synthesis, distinguished from traditional literature reviews by their meticulous procedures and distinct objectives. Unlike their narrative counterparts, systematic reviews adhere to a systematic, replicable approach that minimizes bias and subjectivity. The systematic review process commences with a comprehensive search strategy, meticulously designed to retrieve all relevant literature across various databases (Magarey, 2001). This is in stark contrast to traditional reviews, which might rely on a less structured exploration of sources. The stringent criteria applied during study selection ensure that only high-quality, pertinent studies are included, guarding against the potential bias that can arise from cherry-picking evidence.

The advantage of systematic reviews lies in their replicability, offering the ability to repeat the process to validate findings (Snyder, 2019). By incorporating clear and systematic procedures when assessing papers and relevant material, systematic reviews aim to minimize bias and produce accurate results, informing robust conclusions and decision-making (Snyder, 2019). Therefore, systematic reviews are regarded as a review of existing research that employs explicit, accountable, and rigorous research methods (Zawacki-Richter et al., 2020).

Systematic quantitative reviews and meta-analyses, when appropriately conducted and reported, play pivotal roles in resolving controversies arising from conflicting studies, generating new hypotheses for clinical research, identifying areas requiring further investigation, and discerning beneficial and harmful therapies far earlier than other review types (Johnson & Hennessy, 2019; Klassen et al., 1998).

Notably, the Cochrane Collaboration specializes in examining the effectiveness of interventions or therapies, with a strong emphasis on synthesizing evidence from randomized controlled trials (RCTs) to facilitate causal attributions (Ledford & Zimmerman, 2018). Additional designs, such as quasi-experimental group comparison and single-case research, contribute relevant evidence by establishing causal connections between interventions and outcomes (Ledford & Zimmerman, 2018).

Furthermore, systematic reviews extend beyond mere aggregation of findings. They critically appraise the methodological quality of each study included, allowing for a nuanced evaluation of the overall body of evidence. This assessment, often facilitated by standardized tools, illuminates the strengths and weaknesses of individual studies, ultimately contributing to a more robust synthesis of findings (Kolaski et al., 2023). The amalgamation of results, often bolstered by meta-analyses, empowers evidence-based decision-making by quantifying effect sizes and identifying patterns that might not be discernible in single studies. The Cochrane Collaboration, a paragon of excellence in evidence synthesis, has indelibly shaped this landscape. Through their rigorous methodologies and dedication to minimizing bias, they have elevated systematic reviews to the vanguard of informing medical and healthcare interventions. In doing so, they epitomize the pivotal role systematic reviews play in advancing knowledge, enhancing practice, and promoting informed decision-making.

Giftedness

The concept of giftedness in children has evolved considerably over the last two decades, moving beyond the traditional emphasis solely on academic performance or intelligence. Contemporary definitions, as posted by Gomez et al., 2020 and the National Association for Gifted Children, encompass a broader spectrum of attributes, including exceptional intellectual capacity, creativity, high academic achievement, leadership potential, and unwavering task commitment. The National Association for Gifted Children definition of giftedness encompasses more than simply academic performance, extraordinary levels of aptitude, defined as a remarkable capacity to think and learn or achieve (proven performance or success in the top 10% or rarer) in one or more domains (Budding & Chidekel, 2012).

Since the early twentieth century, the notion of giftedness has been linked with significant intelligence and performance (Mcclain & Pfeiffer, 2012). Students with gifts and talents have the potential to perform at greater levels in one or more domains than others in their age, experience, and environment. They are also extremely creative, inventive, and driven thinkers with a lot of intellectual resources (Mcclain & Pfeiffer, 2012). They need to modify their educational experience(s) to learn and attain their full potential.

The current federal definition (U.S. Department of Education, Office of Educational Research and Improvement, 1993) directed the work of the National Research Center on the Gifted and Talented (NRC/GT's) investigators and collaborating researchers in examining recent definitions of giftedness, identification methods and procedures, and the development of alternative choices for nominating, identifying, and placing gifted children (Gubbins et al., 2014).

> Children and youth with outstanding talent perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment. These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. They require services or activities not ordinarily provided by the schools. Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor. (p. 26)

Over the last two decades, there has been a substantial shift in how giftedness is described and conceived, particularly in professional literature. However, all too frequently, especially as shown in today's educational systems, giftedness is still considered as something that is largely determined by a score on a well-standardized Intelligence quotient (IQ) (Gomez et al., 2020; Mcclain & Pfeiffer, 2012). Gifted as cited in Budding and Chidekel, 2012, refers to those who perform at an exceptional level in certain, recognized fields such as music or who perform in the top 3–5% of the nation on objective, standardized criteria. This suggests that giftedness can exist outside of the realm of general intellectual aptitude (Budding & Chidekel, 2012).

The conventional reliance on Intelligence Quotient (IQ) scores to identify giftedness persists in some educational systems, as evident in the use of cutoff values such as 120, 125, or 130 on IQ tests like the Wechsler Intelligence Scale (WISC-IV) (Gomez et al., 2020). However, experts have recognized the limitations of solely relying on IQ scores for identification, leading to a more comprehensive and nuanced approach encompassing diverse criteria and domain-specific talents (Mcclain & Pfeiffer, 2012, Worell et al., 2019)

At the turn of the twenty-first century, scholars and authorities in the field acknowledged the significant limitations of using solely an IQ test score to identify gifted children (Mcclain & Pfeiffer, 2012). Recent conceptualizations of giftedness extend beyond traditional IQ-based paradigms to incorporate other dimensions of intelligence and domain-specific talents, emphasizing a more complete, conceptually nuanced, and diagnostically defensible approach (Worrell et al., 2019). This transition has been accompanied by calls for refined criteria and practices in gifted diagnosis, prompting the need for enhanced, extended, and differentiated gifted programming programs (Mcclain & Pfeiffer, 2012).

Beyond the historical emphasis on high IQ scores, contemporary perspectives on giftedness reflect a more intricate framework. Sternberg (1986) proposes a triarchic theory that delineates giftedness into three interconnected facets: analytical, creative, and practical intelligence (Worell et al., 2019). These distinct but interrelated dimensions highlight the capacity to engage in critical thinking, problem-solving, and adaptive application of knowledge in practical contexts (Worell et al., 2019).

Furthermore, as cited in Worell et al., 2019, and Al-Hroub and Krayem, 2018, according to Gardner's multiple intelligences theory (1983, 1999), giftedness extends beyond traditional IQ-based assessments and encompasses various facets such as linguistic (verbal comprehension, syntax written and spoken expressions), logical – mathematical (inductive and deductive thinking), the musical which comprises pitch discrimination, rhyming sensitivity, texture sensitivity, and timbre sensitivity., bodily – kinesthetic, defined as the capacity to complete a task using all or portions of one's body, spatial (the ability to represent and manage three-dimensional configurations), interpersonal, which is the capacity to comprehend others' behaviors and intentions and

behave wisely based on that understanding and intrapersonal intelligences which is a person's awareness of his or her own cognition, strengths and limitations, thinking style, feelings, and emotions. This paradigm broadens the scope of giftedness, acknowledging unique aptitudes and talents that may not align with conventional IQ measures.

Educators now recognize that giftedness manifests in diverse areas, including artistic abilities, leadership potential, and creativity (Mcclain & Pfeiffer, 2012). As a result, identification processes have evolved to encompass multiple criteria, incorporating data from various sources, such as IQ tests, parent and teacher referrals, nonverbal ability assessments, achievement tests, curriculum-based performance evaluations, and student portfolios (Worell et al., 2019).

Giftedness, according to Ziegler, 2005, is a characteristic that evolves over time within an environmental context and is the outcome of different interactions between the individual and the environment. Gifted behavior is shown when a person wants to accomplish something, the ability to do it, and the understanding that it is possible, and the environment recognizes this behavior as gifted.

According to Renzulli, 1988, the three-ring conception of giftedness resulted from an analysis of the wide array of research and supported in part by some of the insights that has been carried out since Terman's time who firmly established the tradition of a unified definition of giftedness, as well as the subsequent reliance on IQ scores for practically all identification decisions. As cited in Baum et al., 1998, Renzulli, 1988 represents giftedness as a result of an interaction among three clusters of traits: above average but not necessarily exceptional overall ability, task commitment, and creativity. It is also vital to note that each cluster contributes significantly to the exhibition of gifted behaviors. Above average ability can be described in two ways: general ability and

specific abilities. General ability includes the ability to comprehend information, integrate experiences that result in appropriate and adaptable responses in new situations, and engage in abstract thinking. Examples include verbal and numerical thinking, spatial relations, memory, and word fluency. These abilities are typically assessed using general aptitude or intelligence tests. Specific abilities are defined as the ability to acquire information, expertise, or the ability to conduct one or more specific tasks within a limited range. These abilities are described in a way that reflects how humans express themselves in real-life settings. Examples include chemistry, ballet, mathematics, musical composition, sculpture, and photography. Task commitment represents energy focused on a specific task or performance area. Perseverance, endurance, hard work, persistent practice, self-confidence, and belief in one's competence to carry out crucial tasks are the most common phrases to express task commitment. The third cluster of traits that distinguish gifted people comprises of factors that are commonly grouped together under the general title of creativity (Renzulli, 1988).

The exploration of giftedness transcends conventional paradigms, signaling us to reconsider educational policies and practices in the pursuit of inclusivity and excellence. The traditional notion of giftedness, often confined to narrow intellectual domains, has encountered transformation through the adoption of broader dimensions. This metamorphosis bears significant implications for educational frameworks, as a more comprehensive understanding of giftedness opens avenues for recognizing and nurturing talents that were previously overshadowed. The incorporation of Howard Gardner's Multiple Intelligences theory, for instance, has emerged as a promising strategy to unveil latent talents within underrepresented populations. By recognizing various forms of intelligence beyond the confines of conventional testing, this theory has the potential to

unearth gifted individuals who might have remained unnoticed within traditional frameworks (Garcia-Martinez et al., 2021, Lucia et al., 2016,).

The salient connection between diverse dimensions of intelligence and the enduring achievements of gifted individuals across various disciplines requires meticulous investigation. In dissecting this relationship, we unravel how these multifaceted cognitive attributes intertwine with long-term outcomes, influencing the trajectory of gifted individuals in realms as diverse as arts, sciences, and entrepreneurship. Furthermore, the evolution towards inclusive identification criteria is not just a conceptual shift; it's a transformative force with the potency to address historical disparities and engender equitable opportunities. The pivot towards broader, more inclusive criteria has the power to untangle the web of privilege that has sometimes been interwoven with traditional gifted programs (Gardner, 2017, Jung, 2012).

Significant research identifies characteristics suggesting increased skill development that are typical of gifted students. First, gifted students have greater information processing speed for both basic and complicated activities. Second, gifted students are generally more thorough problem solvers demonstrating a wider variety of strategies during problem-solving than their classmates of ordinary aptitude. Third, gifted students employ more metacognitive strategies during learning and are better at assessing their abilities for a learning task than their non-gifted peers. Fourth, gifted students pay greater attention to a problem or task. Fifth, gifted students have superior memory and more efficient retrieval. Sixth, gifted students demonstrate advanced abilities for abstraction and generalization during learning. Seventh, gifted students can learn with minimal instruction (Kettler, 2014).

Attention Deficit Hyperactivity Disorder (ADHD)

Prevalence of ADHD

The term "neurodevelopmental" encompasses the intricate interplay between the evolving brain and the nervous system during an individual's lifespan (Budding & Chidekel, 2012). Among the most prevalent neurodevelopmental psychiatric conditions affecting children stands attention deficit hyperactivity disorder (ADHD) (Berri & Al-Hroub, 2016). Throughout its history, two divergent viewpoints have held sway in characterizing ADHD (Berri & Al-Hroub, 2016). One end of the spectrum depicts ADHD as a biological brain disorder stemming from genetic factors and the physical environment. When a child receives an ADHD diagnosis, this information often reverberates through family dynamics, necessitating educators to engage in more informed and constructive communication with parents (Berri & Al-Hroub, 2016). The opposing view portrays ADHD as a psychological variation rather than a disorder, attributing its manifestations to broader societal conditions, parenting practices, and school disciplinary methods (Berri & Al-Hroub, 2016). It's important to acknowledge that the construct of ADHD is intricately interwoven with cultural nuances, as culture profoundly influences an individual's cognitive and emotional development (Shehab & AL-Hroub, 2019). Consequently, counselors must be equipped with cultural sensitivity and an awareness of the strengths and limitations of the DSM criteria to determine its appropriateness within different cultural contexts (Berri & Al-Hroub, 2016, Shehab & AL-Hroub, 2019).

ADHD, presently understood as a neurobiological developmental condition, is typified by pervasive symptoms of inattention, hyperactivity, and impulsivity (Berri & Al-Hroub, 2016; Budding & Chidekel, 2012). These behaviors often emerge by age

seven, although challenging behaviors might surface even earlier. This prevalent and multifaceted disorder commonly persists into adolescence and adulthood, warranting longitudinal attention (Wilens & Spencer, 2010). Children grappling with ADHD exhibit challenges encompassing impulsivity, hyperactivity, difficulty sustaining attention, following instructions, and completing tasks (Budding & Chidekel, 2012).

ADHD's impact reverberates through school environments, affecting approximately 9% of school-age children (Berri & Al-Hroub, 2016; McCoach et al., 2020). In the context of Lebanon, the prevalence of ADHD has been reported at 0.3%, 1.2%, and 1.7% for ADHD inattentive, hyperactive-impulsive, and mixed presentations, respectively, within a sample of 1,000 children aged 6-10 years across diverse educational settings (Berri & Al-Hroub, 2016). Individuals grappling with ADHD often exhibit an inappropriate level of attention, impulsivity, and hyperactivity, impacting various facets of their lives – personal, social, academic, and professional – and necessitating therapeutic interventions (Wilens & Spencer, 2010, Wolraich et al., 2019).

The prevalence of Attention-Deficit/Hyperactivity Disorder (ADHD) invites a comprehensive investigation into its multifaceted dimensions, crossing cultural boundaries and disciplinary domains. Cultural factors wield a profound influence over the identification, diagnosis, and treatment of ADHD, weaving a complex narrative that intertwines societal norms, perceptions of behavior, and healthcare practices. The interplay between cultural contexts and ADHD underscores the imperative of understanding how diverse societies shape the recognition and response to this neurodevelopmental condition. This journey necessitates an exploration of the evolving conceptualization of ADHD, a trajectory that has shifted from a primarily biological lens to encompassing a broader tapestry of sociocultural and psychological threads. This

transition marks a paradigmatic shift, acknowledging that while biological mechanisms play a pivotal role, contextual factors and psychosocial elements also hold sway over the ADHD narrative (Reason, 1999; Reyes et al., 2013).

Examining the long-term outcomes of individuals grappling with ADHD opens a vista of insights into the efficacy of interventions that seek to mitigate its impact on academic and professional trajectories. By dissecting the intricate interconnections between interventions and outcomes, we unravel the intricate dance between tailored support and enduring success. In parallel, the role of early intervention strategies emerges as a linchpin in sculpting the arc of an individual's life journey. The repercussions of ADHD, if left unaddressed, can reverberate through one's quality of life and social integration. However, judiciously implemented early interventions hold the promise of mitigating these lifelong consequences, facilitating improved adaptation, learning, and interpersonal relationships (Hare et al., 2021; Sonuga-Barke et al., 2011).

In essence, this exploration elucidates the nuanced intertwinement of ADHD within the fabric of society, calling for a holistic understanding that spans medical, cultural, and psychological realms. The quest to fathom ADHD's essence unveils a narrative that transcends conventional disciplinary confines, culminating in an enriched comprehension that can pave the way for more effective interventions and enhanced societal integration.

History of ADHD

Defining Attention Deficit Hyperactivity Disorder (ADHD) has been a journey marked by evolving perspectives. The term "attention deficit hyperactivity disorder" gained prominence in the late 1980s. The disorder affects numerous children, with a

higher prevalence among males than females, often attributed to genetic and psychological factors (Budding & Chidekel, 2012).

The historical backdrop of ADHD traces back to Heinrich Hoffman, a German physician, who provided an early account of the disorder. He characterized ADHD-like symptoms as a moral character flaw, describing children with restless, inattentive, and over-aroused behaviors. Hoffman speculated that these behaviors could stem from brain injuries, inherited traits, or environmental influences (Wolraich et al., 2019).

Early descriptions of brain damage syndrome, fir linked to brain injuries, led to the definition of minimal brain damage. Subsequently, the focus shifted towards symptomatology, leading to the inclusion of the syndrome in the Diagnostic and Statistical Manual (DSM) by the American Psychiatric Association in 1968 (Berri & Al-Hroub, 2016).

ADHD's classification underwent significant changes within successive DSM editions. Initially, DSM-II categorized it as a hyperactive condition. However, it wasn't until 1980, with the DSM-III, that formal subtypes of attention deficit disorder (ADD) were introduced—ADD with and without hyperactivity. The term "attention deficit hyperactivity disorder" emerged with the DSM-III-R update in 1987 (Berri & Al-Hroub, 2016). Further refinements took place in the DSM-IV, which classified ADHD into three subtypes—predominantly inattentive, hyperactive/impulsive, and combined—in 1994 (Wolraich et al., 2019).

The DSM-V, published in 2013, aimed to provide a more comprehensive representation of individuals' experiences with ADHD. It acknowledged that the disorder manifests differently across the lifespan, prompting a shift from subtypes to "presentations." This approach recognizes that an individual's ADHD characteristics may

evolve as they age. Additionally, the DSM-V extended its scope to include adult ADHD diagnoses beyond the age of 17 (Berri & Al-Hroub, 2016, Wolraich et al., 2019).

While the diagnostic criteria for ADHD remained largely consistent between the DSM-IV and DSM-5, the latter emphasized the fluid nature of subtypes, underscoring that these presentations can change over time. The foundation for diagnosis rests upon the individual's personal history, diagnostic background, and treatment journey (Wolraich et al., 2019).

The Diagnostic and Statistical Manual (DSM), published by the American Psychiatric Association, serves as the primary diagnostic tool for ADHD (Wilens & Spencer, 2010). Practitioners rely on the DSM criteria, ensuring that child or adult patients align with the established guidelines. The diagnostic symptoms encompass several key aspects: impulsivity, marked by difficulty waiting one's turn and frequent interruptions; inattention, characterized by challenges in sustaining attention, forgetfulness, and distractibility; and hyperactivity, including fidgeting, excessive talking, and restlessness. The DSM-V specifically requires symptom onset before the age of 12, impaired functioning in at least two contexts (home, school, work), and a duration exceeding six months (Wilens & Spencer, 2010). (See Appendix).

Presently, ADHD is categorized into three subtypes: predominantly inattentive, predominantly hyperactive-impulsive, and the combined type. The combined type, often the most prevalent and associated with greater comorbidities, necessitates six or more inattentive symptoms and six or more hyperactive-impulsive symptoms for classification. To meet the diagnostic criteria for the inattentive or hyperactive-impulsive subtypes, an individual must exhibit six or more of the nine symptoms outlined in either group (totaling 18 possible traits). Importantly, these symptoms must lead to significant impairment to

confirm an ADHD diagnosis (American Psychiatric Association, 2013; Lee & Olenchak, 2015; Wilens & Spencer, 2010).

For adults to receive an ADHD diagnosis, a history of persistent and ongoing symptoms in childhood is required. While a complete adherence to childhood criteria is ideal, partial persistence or a lack of overt childhood symptoms may also suffice. Notably, ADHD has been linked to struggles in various cognitive domains, leading to challenges in vigilance, motoric inhibition, organization, planning, complex problem-solving, verbal learning, and memory in affected individuals, particularly during their formative years (Wilens & Spencer, 2010).

Most children with ADHD exhibit conspicuous signs that emerge through ongoing behavior observation and comparison with peers over time (Kaufman et al., 2000). These children often face difficulties in waiting their turn, tend to be excessively talkative, may appear inattentive during conversations, and can disrupt class discussions, posing challenges for teachers tasked with educating a growing number of students diagnosed with ADHD (Berri & Al-Hroub, 2016). Thus, educators should familiarize themselves with the specific signs, symptoms, and subtypes of ADHD in order to accurately identify and address the needs of these students (Budding & Chidekel, 2012). Diagnostic criteria play an essential role in making informed referrals when required (Kaufman et al., 2000).

A multidisciplinary team of qualified clinicians, including pediatricians, family physicians, psychiatrists, neurologists, and psychologists, play a pivotal role in assessing the intricate physical and psychological aspects associated with ADHD and subsequently making an accurate diagnosis (Kaufman et al., 2000). The diagnostic process necessitates a comprehensive evaluation encompassing prenatal and perinatal history, family history,

school performance, environmental factors, and a meticulous physical examination – all of which are currently recommended to identify potential ADHD cases (Wolraich et al., 2019). Diverse methods are available for identifying and diagnosing ADHD. Some healthcare professionals employ checklists administered to parents and teachers, while others directly evaluate patients. Furthermore, specific tests measuring cognitive functions, attention, and memory are utilized as part of the diagnostic arsenal (Lee & Olenchak, 2015).

However, despite the pivotal role of the DSM in professional practice, criticisms have arisen regarding its cultural sensitivity (Shehab & Al-Hroub, 2019). This concern gains prominence given the prevalence of ADHD in the Arab World. Research indicates that ADHD, originally perceived as predominantly an American condition, might be influenced by social and cultural factors specific to American culture. Consequently, the impact of cultural variations on an individual's behavior and experiences must be factored into counselors' diagnostic assessments. The DSM tool has been subject to scrutiny, revealing its limitations in diagnosing populations from different cultural backgrounds. This casts doubt on the universal applicability of the latest DSM edition to Lebanese children with ADHD (Shehab & Al-Hroub, 2019).

A study conducted by Shehab & Al-Hroub, 2019 scrutinized the perceptions of Lebanese counselors regarding ADHD and DSM-V as a culturally appropriate assessment tool. The study highlighted that Lebanese schools present numerous stimuli, particularly within classrooms, that challenge students with ADHD, causing distractions from extraneous sources. Importantly, this distraction does not necessarily signify ADHD. For instance, excessive talking, a criterion in the DSM-V, is aligned with Lebanese cultural norms. Consequently, diagnosing a student with ADHD based solely on this criterion

becomes problematic, as it fails to account for cultural influences. Moreover, Lebanese society's dynamic nature introduces an array of stimuli, rendering the impulsivity criterion in the DSM-5 overly inclusive for Lebanese children. This risks labeling a significant portion of Lebanese children with ADHD due to a cultural mismatch with the criteria (Shehab & Al-Hroub, 2019).

The historical trajectory of understanding Attention-Deficit/Hyperactivity Disorder (ADHD) casts light on the intricate interplay between clinical science, cultural contexts, and diagnostic paradigms. As we scrutinize the pages of this history, one thread becomes apparent: the imperative of cultural sensitivity in the diagnosis and treatment of ADHD. The efficacy of culturally tailored diagnostic approaches emerges as a critical axis in the pursuit of accuracy across diverse populations. By acknowledging and integrating cultural nuances that shape symptom expression, these approaches hold the potential to transcend the limitations of standardized diagnostic criteria, fostering a more nuanced and precise assessment process (Asherson et al., 2012; Dong etal., 2020; Slobodin & Crunelle, 2019; Slobodin & Masalha, 2020).

Parallel to this pursuit is the role of cultural competency training for healthcare professionals, which serves as a lighthouse guiding clinicians through the complex terrain of ADHD diagnosis and treatment. Equipped with an understanding of how cultural norms, beliefs, and practices influence symptom presentation, these professionals can navigate the diagnostic landscape with heightened precision and empathy. Delving deeper, the exploration of cultural variations underscores the intricate mosaic of ADHD symptomatology, shedding light on how cultural contexts can modulate the manifestation of symptoms and influence the response to therapeutic interventions.

The question of adapting ADHD diagnostic criteria across diverse cultural contexts, including the Arab World, invites both scrutiny and exploration. This endeavor is marked by both challenges and potential benefits. The process necessitates a delicate balance – retaining the core diagnostic essence while accommodating cultural idiosyncrasies. The Arab World, with its rich tapestry of traditions and values, presents a unique terrain where the universality of ADHD intersects with the mosaic of cultural diversity. As we delve into these complexities, we embark on a journey to decipher the intricate codes that inform the Arab perspective on ADHD – an expedition that extends beyond symptoms to encompass societal perceptions, familial dynamics, and educational frameworks.

Gifted learners with ADHD

Over time, the evident repercussions of overlooking gifted individuals have underscored the intricate relationship between their unaddressed talents and their scholastic demeanor (Al-Hroub & Krayem, 2020). The failure to duly acknowledge giftedness often precipitates a cascade of predicaments, as unacknowledged gifted children grapple with social challenges, deficits in attention, academic underperformance, oppositional tendencies, hyperactivity, and despondent behaviors – a constellation of manifestations that could easily be misconstrued as conventional hallmarks of neurodevelopmental and psychiatric disorders like ADHD (Al-Hroub & Krayem, 2020).

The DSM-V, remarkably, has expunged the term "giftedness" from its lexicon, despite its mention in the DSM-IV-TR. Notably, the assertion that "Inattention in the classroom may also occur when children with high intelligence are placed in academically under-stimulating environments,"(American Psychiatric Association, 2013) (p. 91) has been conspicuously excised from the DSM-V, leaving a palpable void in its reasoning and

warranting a deeper exploration into the rationale for this omission (Mullet & Rinn, 2015).

The surge in referrals for attention deficit-related concerns among gifted children has emerged as an unforeseen phenomenon, bearing testament to the intricacies of their cognitive landscape (Baum et al., 1998). The diagnostic panorama of ADHD encompasses an array of disruptive behaviors encompassing impulsivity, hyperactivity, attentional fragility, organizational deficits, and challenges in maintaining task persistence – all of which can be particularly complex in the context of gifted children (Baum et al., 1998). Owing to the heterogeneous symptomatology of ADHD, a school of thought posits that numerous gifted learners with learning challenges may also present behaviors akin to those exhibited by individuals with ADHD (Baum et al., 1998).

Echoing prior observations, it is evident that the prowess of gifted children both in academics and emotions sets them distinctly apart from their non-gifted counterparts (Kitano, 1990). Their fervent intellectual curiosity, propensity for inquiry, and affinity for coherence are coupled with an uncanny ability to discern alternatives and nuances (Beljan et al., 2006). However, the terrain of gifted students' emotional landscape is fraught with intricacies. Their emotional acumen often translates into heightened self-critique and critique of others, frequently accompanied by heightened motor activity and physical restiveness (Beljan et al., 2006). Notably, experts attuned to the unique challenges of gifted learners underscore a divergence in their social and emotional profile, one that frequently places them in a tenuous balance with their environment (Kitano, 1990). The contours of this profile include attributes such as perfectionism, acute sensitivity to the expectations and sentiments of others, a penchant for nonconformity, an intrinsic sense of divergence, a fervent commitment to justice, emotional intensity, and, at times, a sense

of isolation. This distinction, as noted by Kitano, 1990 engenders a paradox where gifted students' exceptional cognitive prowess coexists with potential interpersonal friction, particularly in interactions with their peers and challenges in conforming to established norms.

Empirical investigations consistently elucidate a discernible nexus between intellectual or academic prowess and various shades of psychological intensities, substantiating the multifaceted relationship between cognition and emotion (Kitano, 1990). This cognitive intensity, characterized by a fervent commitment to excellence, an intrinsic yearning for recognition, and a proclivity to circumvent arduous tasks, could potentially contribute to variances in performance, potentially contingent upon the intricacy of the tasks at hand (Kitano, 1990). As such, the portrait of gifted learners emerges as one adorned with characteristics that set them apart: a predilection for unconventional approaches, impatience, a propensity to engage with abstract constructs, a proclivity for independent work, resolute persistence, unwavering energy in problem-solving pursuits, and an insistent demand for acknowledgment (Kitano, 1990).

Scrutinizing the spectrum of gifted learners with ADHD in comparison to their non-ADHD counterparts offers a nuanced panorama. The convergence of these dual dimensions unfurls a fascinating narrative where giftedness and ADHD interplay. Notably, when these groups were subjected to the Wechsler Intelligence Scale for Children (WISC), it was discerned that gifted individuals with ADHD exhibited marked underperformance in domains like Full Scale IQ, Working Memory, and Processing Speed (Lovecky, 2018). Moreover, their performance dipped notably in evaluations assessing attention, swiftness, and inhibitory response capacity (Lovecky, 2018).

In the realm of executive functioning, the distinction between gifted children with ADHD and average children with ADHD emerges as an arena of inquiry. When subjected to tasks of planning, organization, and verbal memory, both cohorts displayed deficits in executive function, attention, susceptibility to distraction, and impulsiveness – as expected. However, it was intriguingly observed that gifted children showcased higher scores compared to their average counterparts with ADHD (Lovecky, 2018).

The conventional vantage point attributes giftedness, gauged through intelligence quotient (IQ) assessments, to an enhanced trajectory of academic and vocational accomplishments. Nevertheless, a subtle undercurrent reveals that under certain conditions, this intellectual prowess might also pose a dichotomy, potentially fomenting emotional, behavioral, and social quandaries (Gomez et al., 2020).

When evaluating gifted students for ADHD, their tendency to be overexcited should be considered. Overexcitability (OE) which are forms of greater mental performance, have been discovered to be prevalent in gifted individuals on a continuous and reliable basis (Al-Hroub & Krayem, 2020; Chae et al., 2003; Krayem & Al-Hroub, 2019; Rinn & Reynolds, 2012). OE in a gifted child is difficult to distinguish from ADHD symptoms. Because some of the features and behaviors of gifted children mimic those of special education students, there have been several cases of misdiagnosis. Gifted students may have more than one, if not several, types of OE (Al-Hroub & Krayem, 2020).

According to several researchers, overexcitabilities arise from Dabrowski's (1964) theory of positive disintegration, which is a theory of personality development. Gifted people may exhibit exceptional sensitivity to stimulus or mental OE in one or more of the following areas: psychomotor overexcitability, sensory overexcitability, intellectual overexcitability, imaginative overexcitability, and emotional overexcitability.

Psychomotor overexcitability, akin to hyperactivity, manifests as an endogenous surplus of energy, with its manifestations ranging from a compelling urge for movement, rapid speech, intense physical activity, impulsivity, and restlessness, to an inner compulsion to act (Al-Hroub & Krayem, 2020; Baum et al., 1998; Chae et al., 2003; Rinn & Reynolds, 2012). In a similar vein, imaginative overexcitability might camouflage as daydreaming and wandering attention, while emotional overexcitability could be entangled with the emotional volatility often associated with ADHD (Chae et al., 2003). The intricate interplay between high IQ (IQ >120) and ADHD within the same individual adds complexity to the discourse. Both ADHD and high IQ/gifted children might share traits of impulsivity, over activity, and social challenges (Antshel, 2007).

This has raised concerns about the validity of an ADHD diagnosis in gifted children, prompting some to contend that ADHD symptoms in high IQ children are situational and may be connected to boredom produced by unstimulating educational situations (Antshel, 2007). Hence, gifted children may seek consolation in their minds' eye, where daydreams are considerably more enticing than schoolwork (Baum et al., 1998; Chae et al., 2003).

Moreover, it is possible that when gifted children look impulsive, it is just because they have an extra need to learn more about the world, thus they must be actively involved in their education. Their curiosity and drive for knowledge might take precedence over the school's requirement for a prescribed curriculum, sequence, and space. In this respect, the traditional classroom might be excessively confining for students who are prone to excessive excitement (Baum et al., 1998).

As a result, it is critical to distinguish ADHD symptoms from overexcitabilities in gifted children (Al-Hroub & Krayem, 2018). Before gifted children are diagnosed with a

neurological condition, it must first be assessed if the presenting symptoms are true indications of a neurological disorder, resulting in functional impairment, or merely expressions of overexcitability (Chae et al., 2003).

According to several researchers, gifted children with ADHD may underachieve academically and have issues with their social interactions. Their difficulties may not be obvious when they first start school since they can compensate for them with their academic ability. However, these students may struggle with situations that need self-control and responsibility, or that force them to cope with complex activities on their own (Chae et al., 2003). As a result, gifted children must get early ADHD screening to determine the root reason for their attention issues, whether it is primarily neurological, familial, or environmental (Chae et al., 2003).

In addition, because education focuses primarily on linguistic and logical-mathematical skills, alternative means of learning and communicating are not only limited, but also frequently undervalued (Baum et al., 1998). Many gifted children who struggle in school have extraordinary spatial ability. Teachers frequently describe these children as disruptive, off-task, and very skilled at escaping unpleasant school tasks. These same children, on the other hand, may be incredibly calm, focused, and persistent during a non-verbal intelligence such as building with Lego bricks or sketching cartoon characters (Baum et al., 1998). Therefore, even boring tasks appear to be completed without associated behavioral difficulties when some hyperactive children are pushed to study and communicate in an area of strength (Baum et al., 1998).

Therefore, when assessing ADHD, intelligence should not be only determined by Wechsler scores, but checklists and teacher observations must be assessed in the context of the child's placement in the classroom. As a result, a profile of strengths and

weaknesses must be compiled from a variety of sources, including family, school, and other activities. These should then be compared to the child's meaning rather than absolute age norms. If simply age norms are employed as a measure of ability or accomplishment, deficiency areas in gifted children with ADHD may be neglected. This also applies to tests of executive functioning, memory, and processing that are used to identify areas of strength and weakness (Lovecky, 1999).

Misdiagnoses are exacerbated by contextual circumstances. Gifted students sometimes spend one-fourth to one-half of ordinary classroom time waiting for others to catch up, resulting in being bored. Gifted children's peer relationships are frequently difficult since they are not with their intellectual peers. Interpersonal issues might arise from a lack of understanding by family members, educators, coworkers, and health-care providers. If the educational method is not differentiated adequately, or if the job or home setting is not supportive, these interpersonal difficulties may be misconstrued and lead to misdiagnoses (Belgan et al., 2006).

Misdiagnosis

Because of the alarming number of referrals for attention disorders among gifted children (Webb & Latimer, 1993), there is concern that some nonintellectual characteristics of gifted children may be misinterpreted as ADHD symptoms. The characteristics of gifted children, such as intensity, sensitivity, impatience, and high motor activity, can easily be misconstrued for ADHD. Many gifted children and adults are misdiagnosed by psychologists, and other health care professionals who wrongly interpret key social and emotional features of gifted individuals as indications of disease (Belgan et al., 2006). Few health care workers are aware of the caution concerning ADHD in the DSM-IV-TR (2000), which states that it is "...inconsistent with developmental level.

When compared to other children, the gifted child's developmental level differs, and health care experts should examine whether the child's inattentiveness or impulsivity happens only in some contexts but not in others. Gifted children seldom struggle with focused concentration or impulsivity in areas of interest or when surrounded by actual intellectual peers (Belgan et al., 2006).

According to Mullet & Rinn (2015), a study conducted by Hartnett et al. (2004) studied the first empirical investigation to demonstrate the potential for ADHD and giftedness misdiagnosis. It hypothesized that a variety of concerns common to gifted children would aggravate the ADHD misdiagnosis due to an overlap in symptoms or behaviors associated with giftedness and those associated with ADHD, such as high activity levels, trouble paying attention, and impulsivity (Table 1). These actions in the gifted can be described by boredom in the classroom, or by asynchronous development in which higher cognitive abilities and heightened intensity combine to produce inner experiences and awareness that are qualitatively different from the norm (Silverman, 1997). This asynchrony grows as one's intellectual capacity grows. The gifted are more prone due to their uniqueness, which necessitates changes in parenting, education, and counseling to develop effectively (Silverman, 1997).

Table 1

The diagnostic criteria for Attention Deficit Hyperactivity Disorder compared to characteristics associated with giftedness

Diagnostic criteria for ADHD (APA, 2000, p. 92) 12	**Some characteristics associated with giftedness**
1a) "Often fails to give attention to details or makes careless mistakes in schoolwork, work or other activities" **1b) "Often has difficulty sustaining attention in tasks or play activities"** **1c) "Often does not seem to listen when spoken to directly"** **1i) "Is often forgetful in daily activities"** **1g) "Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books or tools)"**	• In specific situations there can be boredom, lack of attention and daydreaming. • A gifted child could be able to master tasks quickly as they can quickly see patterns and relationships. • This could mean the child has difficulty sustaining attention on some tasks they have quickly mastered. • A child who is intellectually playful, imaginative or enjoys fantasy may be inattentive • Dabrowski's (1972) imaginational overexcitability includes dramatization to escape from boredom
Lack of concentration (exhibited as forgetfulness, sloppiness or imaginative daydreaming).	
1d) "Often does not follow through on instructions and fails to finish schoolwork, chores or duties in the workplace (not due to oppositional behavior or failure to understand instructions" **1e) "Often has difficulty organizing tasks and activities"** **1f) "Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)"** **1h) "Is often distracted by extraneous stimuli"**	• Lack of tolerance to persist on tasks that appear irrelevant • A gifted child who strives for high achievement may avoid tasks to prevent failure • Failing to complete work, organize tasks or a reluctance to apply effort could relate to how a gifted child does not want to practice skills they have already mastered and can become easily bored with repetitive tasks
Dislike of completing tasks (perhaps relating to high expectations, being easily distracted, impulsiveness, risk-taking and dislike of repetition or too much challenge)	
2d) "Often has difficulty playing or engaging in leisure activities quietly" **2g) "Often blurts out answers before questions have been completed"**	• High in intelligence but lacks judgment • A gifted child may constantly interrupt and correct other children and the teacher in their strive for accuracy

2i) "Often interrupts or intrudes on others (e.g., butts into conversations or games)"	• McAlpine and Reid suggested gifted children can be wary of 'authoritarian pronouncements,' contest 'arbitrary decisions' and press educators and other adults for explanations • Gifted children with imaginational overexcitability often carry out their own activities (e.g., drawing or writing stories) rather than participating in class discussions.
Lack of understanding of common courtesies (e.g., may interrupt) or deliberate defiance of authority	
2a) "Often fidgets with hands or feet or squirms in seat" **2b) "Often leaves seat in classroom or other situations in which remaining seated is expected"** **2c) "Often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)"** **2e) "Is often 'on the go' or acts as if 'driven by a motor'"** **2f) "Often talks excessively"** **2h) "Often has difficulty awaiting turn"**	• A high activity level (Webb, 1993) • It is possible that movement could occur when gifted children are bored with mundane tasks.
High energy, a need to move.	

Note. Reprinted from Edwards, K. (2009). Misdiagnosis, the recent trend in thinking about gifted children with ADHD. *APEX, 15*(4), 29-44. Retrieved online from http://www.giftedchildren.or.nz/apex

Within the stimulating confluence of highly active gifted children, ADHD diagnosis can cover itself amidst their fervor, while those gifted children capable of immersing themselves in sustained focus on their areas of intrigue may escape the ADHD label even if it applies (Loveckey, 1999). Distinct attributes and vulnerabilities interlace, creating an environment where one brilliance may often obscure the other, ultimately

fostering an environment where dual diagnosis finds resonance (Mullet & Rinn, 2015). The mutual narrative of interaction manifests across three distinct scenarios, each revealing how the coexistence of giftedness and ADHD perpetuates diagnostic obfuscation.

In the first instance, ADHD becomes the master illusionist, casting its spell to make the child's behavior and academic performance mirror norms or perhaps dip below the average threshold. In this realm, ADHD overshadows the gift, and the diagnostic path leads to ADHD but not to the recognition of giftedness. Furthermore, educators may become entangled in the disruptive actions of adept ADHD students, diverting their observation from the unique markers of exceptional aptitude (Neihart, 2003). In the second chapter of this complex narrative, it is the gift that plays the part of concealer. The gifted child deploys their remarkable abilities to compensate for their weaknesses, acquiring praises for their talents while the struggles remain underground. Kaufman et al.'s research, as cited by Neihart, 2003 highlights the potential for extraordinary capability to hide ADHD, as attentional distresses and impulsivity cautiously misrepresent academic achievements that often serve as the conduit for identifying giftedness.

However, the tale doesn't conclude here; the narrative's third act introduces the interplay of reciprocal masking, where giftedness and ADHD ingeniously obscure each other's presence. Within this symphony, the child emerges as seemingly average both intellectually and behaviorally. The stage now revolves around the executive functions, where working memory, processing speed, and auditory-verbal memory assume center stage, often marred by impairment. The symphony of executive dysfunction casts a shadow over academic accomplishments, interpreting them as a dissonant note that fails

to resonate in harmony with their intellectual prowess. Undesirably, healthcare providers, from psychologists to pediatricians, remain largely ignorant of the nuanced traits of gifted children and adults, yielding a disconcerting reality where expertise is a scarce commodity (Beljan et al., 2006).

As the outlines of this chapter have illustrated, the connection of symptoms between ADHD and giftedness within the student populace creates a complex landscape, fertile ground for misdiagnosis. Within this terrain, the clarion call for a systematic review resonates with urgency. Such an endeavor stands poised to unveil pertinent studies, meticulously assess their quality, and synthesize findings across diverse contexts. In doing so, a stronghold of knowledge emerges, illuminating the complexities of misdiagnosing gifted students involved in the labyrinth of ADHD's shadow.

The purpose of the study, focusing on both diagnostic issues and research methodologies, is to synthesize and evaluate the available research evidence on the misdiagnosis of ADHD and giftedness based on peer-reviewed and internationally acclaimed academic journals published between 2000 and 2023. Such synthesis is effective to broaden the understanding of individuals who are gifted with ADHD from and across different contexts to increase individuals' knowledge on the misdiagnosis of gifted students with ADHD.

CHAPTER 3

METHODOLOGY

Research Design

A systematic review of research pertaining to the misdiagnosis of gifted students with ADHD was meticulously conducted within the framework of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al. 2021). PRISMA, renowned for its role in ensuring systematic, transparent, and reliable reviews, was employed to structure and execute their research endeavor, enhancing the credibility of the study.

The overwhelming abundance of search results posed a notable challenge during this systematic review's initial phases. While the volume of results was significant, many articles strayed from the study's core focus. To effectively address this challenge, the screening process was conducted with extreme precision. Both the titles and abstracts of identified studies underwent meticulous scrutiny to ascertain their relevance to the research question at hand. Furthermore, a comprehensive evaluation of full text articles was performed to ascertain their alignment with the inclusion criteria. It is important to highlight that no articles were excluded prematurely; each underwent careful examination.

Search Strategy and Inclusion/Exclusion Criteria

In crafting the search strategy, it is vital to specify which sources will be searched and how they will be searched. A thorough search approach would typically include all these sources and other bibliographic databases. Bibliographic databases, which often index academic articles, are a significant potential source. However, significant research

in most subjects, including education, is published in a variety of journals that may be indexed in different bibliographic databases, thus it may be necessary to search numerous bibliographic databases (Zawacki-Richter et al., 2020).

We selected educational and psychological bibliographic databases that index academic journals relevant to the topic of our review. We identified numerous databases, including multidisciplinary databases, to locate the most references since relevant research could be published in a variety of journals. Education Research Complete and ERIC are two educational databases. APA PsycINFO, and APA PsycArticles are two psychological databases. Academic Search Ultimate is a transdisciplinary database, with Scopus being the largest peer-reviewed literature database. We conducted an electronic search on all of them (Zawacki-Richter et al., 2020).

The search process continued across the three PRISMA phases. Preliminary searches were based on keywords derived from the research question. The search was built using terms for the population of interest (gifted students with ADHD), and the condition of interest (misdiagnosis). It used both keywords and controlled terms, the asterisk (*) (used to specify any number of characters) and the Boolean operators 'OR' and 'AND' to combine terms. All searches were retained to ensure replicability. Keywords for searching were as follow: gifted* OR talented OR genius* OR creative OR "highly able" OR prodigious OR superior OR exceptional OR bright OR "mentally advanced" OR "high IQ" OR "high ability" OR skilled OR skillful OR accomplished OR competent OR smart OR intelligent OR "high achiev*" OR "intellectually advanced" OR "academically advanced" OR "intellectually able", AND "attention deficit hyperactivity disorder*" OR impulsiv* OR "attention problem*" OR "attention deficit disorder*" OR hyperkine* OR hyperactiv* OR inattentive* OR ADHD, AND Misdiagnos* OR "dual

diagnos*" OR mis-diagnos* OR "diagnostic error*" OR "differential diagnos*" OR "educational diagnos*" OR identification OR diagnos*.

In the refinement of keywords, collaboration with a skilled librarian was sought. The librarian's expertise contributed to the optimization of the search strategy, ensuring its thoroughness and precision. This collaborative effort further attested to the rigorous approach taken in crafting the search strategy. One professor of special education, one professor of systematic reviews and one professor of research methodology reviewed the keywords and agreed on the list of terms that can be used during the search procedure. For relevance to the current review, the studies' titles, abstracts, and full reviews were screened by two independent reviewers against the inclusion criteria to agree on which study is included or excluded before conducting the systematic review to make the findings more reliable and decrease the risk of bias. The systematic review will emphasize quantitative, qualitative and mixed studies conducted over the last 23 years. Information is extracted from the study type, authors, date, type of publication, and language. In addition, information is gathered about the research design, and outcomes described.

Data Collection and Analysis Methods

It is imperative to acknowledge certain constraints related to data collection methods. Regrettably, due to unforeseen circumstances, certain data collection approaches could not be implemented as intended. These constraints will be elaborated upon in the respective sections of the systematic review.

In line with the comprehensive nature of this review, it is pivotal to clarify that no articles were excluded during the screening process. This approach ensures that a wide spectrum of perspectives and findings is integrated, enriching the depth and breadth of the systematic review.

Inclusion Criteria for Systematic Review

Afterward the formulation of the research question that informs readers about the review's keys details and objectives, it is vital to create a set of criteria that clearly identifies the study population from which the research team will eventually sample (Maggin et al., 2017).

The pre-description of the review's inclusion and exclusion criteria, which make the study eligible for inclusion in the review, ensures transparency (Cook et al., 2014). The types of participants, types of the phenomenon of interest, and the types of outcomes estimated are discussed in the eligibility criteria for the review.

Studies in the present systematic review study must meet the following inclusion criteria:

1. Studies participants are gifted students aged between 6 to 16 years' old who has ADHD;

2. Studies should be specific to the misdiagnosis of gifted students with ADHD;

3. Studies should be quantitative evidence-based;

4. Studies should be written and published in English;

5. Studies retrieved should be limited to 20 years.

Prior to undertaking systematic searches for articles, we set inclusion and exclusion criteria. Articles were required to be relevant for the topic under investigation. As in this current study of the misdiagnosis of gifted and ADHD, the population of interest is any talented and ADHD student (both boys and girls) aged 6 to 18 who are gifted, display talent in an academic domain or academic potential and have ADHD, the setting of interest is schools, and the condition of interest is misdiagnosis. In addition, articles were considered if they were published in a peer-reviewed publication in

English prior to 2023 and studies which are qualitative, quantitative, correlational or comparative that report empirical studies.

Commonly excluded for not meeting the inclusion criteria were:

1) Articles that did not clearly demonstrate individuals with a medical diagnosis of ADHD
2) Articles which focused on exploring disorders or learning disabilities in addition to ADHD such as (Autism Spectrum Disorder, Intellectual disability, and other specific learning disabilities…)
3) Articles which merely included gifted students without having ADHD.
4) Dissertations, conference papers, editorials, and book chapters.
5) Articles which are not peer-reviewed
6) Articles published in other languages than English
7) Articles not limited to 2000-2023.

CHAPTER 4

FINDINGS AND ANALYSIS

The PRISMA diagram (see figure 1) provides information on the number of articles analyzed at each stage of the systematic review process, including how many articles met the inclusion criteria. Following the initial search, 616 articles were identified. To ensure the precision and relevance of the study, an automated software tool rayan.ai combined with a manual check were utilized to identify and remove duplicates. This process resulted in the exclusion of 139 duplicate records, leaving us with a more refined set of articles for further screening

The screening stage involved a meticulous examination of the titles and abstracts of 477 articles. The aim was to assess each article's potential relevance based on predefined criteria, where were established to align with the research objectives of this paper. This phase led to the exclusion of 453 articles for reasons that did not meet our criteria, such as being outside the scope of our research question or lacking necessary data. Notably, articles like Wiener et al. (2011) and Beljan et al. (2006), were excluded because they focused on exploring disorders or learning disabilities in addition to ADHD. Thee emphasized the misdiagnosis of gifted and talented children by psychologists and health professionals as having attention deficit hyperactivity disorder (ADHD), oppositional disorder (OD), obsessive compulsive disorder (OCD), or another of the mood disorders (Beljan et al, 2006; Wiener et al., 2011). Similarly, Wood (2012) and Cordeiro et al. (2010) were because they did not discuss the misdiagnosis but solely focused on how gifted children often have ADHD, highlighting the prevalence of ADHD traits among this population. While these studies contribute valuable insights into the

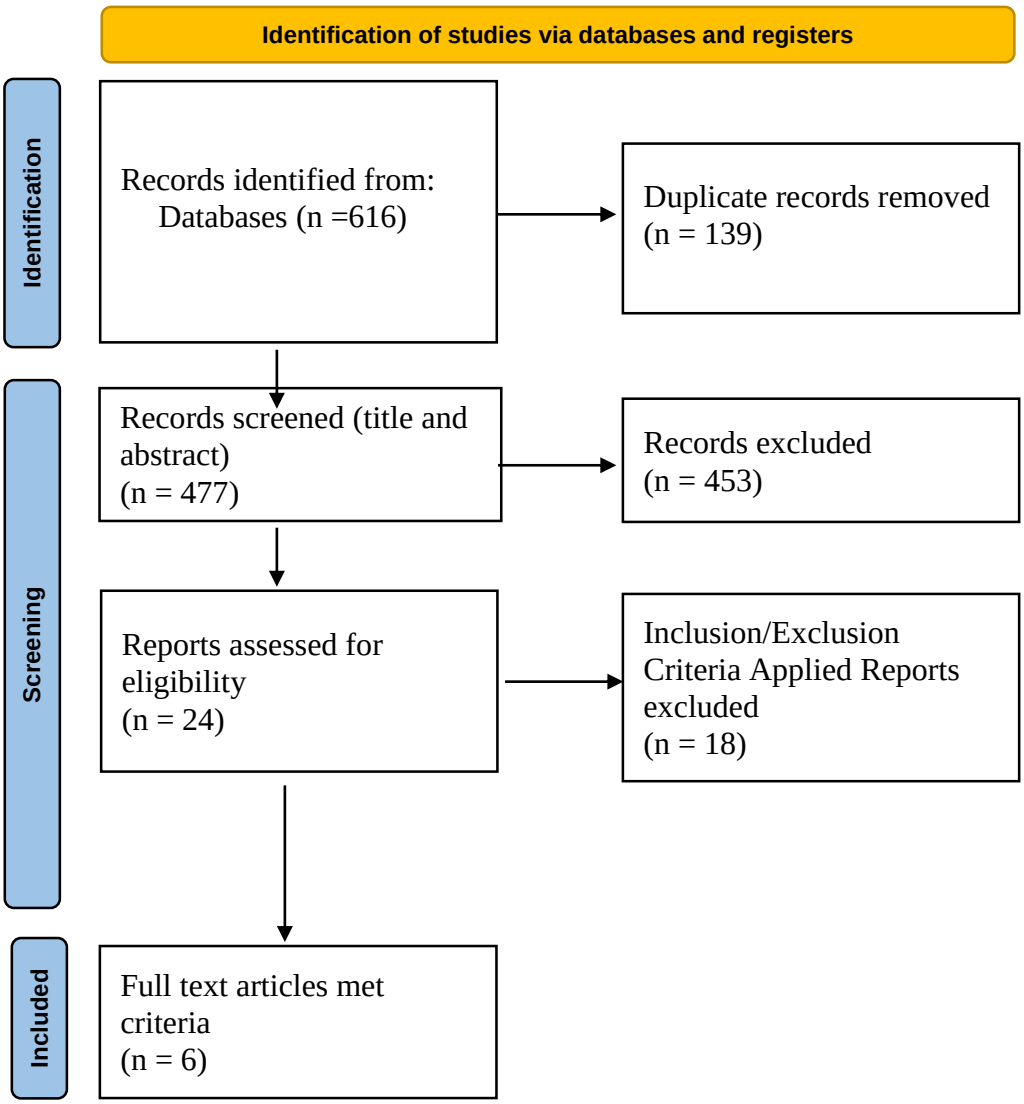
relationship between giftedness and ADHD, our study specifically targeted articles with a primary focus on the misdiagnosis of ADHD in gifted individuals. This refined focus ensures precision and relevance to our research question, underscoring the critical aspect of accurate identification and potential pitfalls in the diagnosis process.

The remaining 24 articles underwent a full-text review for eligibility. This review was guided by stringent inclusion and exclusion criteria, focusing on the population of interest, relevance to the research question, and the quality of the studies. During this phase, we encountered challenges in retrieving 18 articles, where were subsequently excluded from our review. The reasons for non-retrieval were diverse, including access restrictions, unavailability, mismatches with our targeted population, irrelevance to the central theme of our research, and non-empirical studies.

After applying all the criteria, we were left with 6 articles that were deemed suitable for inclusion in our systematic review. These articles were considered robust in their methodology, relevant to the topic of misdiagnosis of gifted children with ADHD, and significant in their contributions to the field.

Figure 1

PRISMA Diagram



Research Methodology Used

Of the six articles retrieved, two explored the potential for misdiagnosis of ADHD in gifted students using a hypothetical case study of a young boy (Hartnett et al., 2004; Rinn et al., 2009) using a vignette of a child displaying symptoms of both ADHD and giftedness. The former presented the vignette to 44 graduate students in a school counseling program, the research focused on assessing how these future counselors would diagnose a child exhibiting traits of both giftedness and ADHD. Whereas the latter aim

was to replicate and extend the former's using a sample of 132 preservice teachers to examine the potential for the misdiagnosis of giftedness and ADHD.

One article utilized correlational research methods to examine the relationship between characteristics of OE forms and ADHD (Al- Hroub & Krayem, 2020). Two presented comparative studies to understand ADHD among gifted individuals by comparing gifted/ADHD, ADHD/not gifted, gifted/non-ADHD, and non-gifted/non-ADHD groups (Gomez et al., 2020; (François-Sévigny et al., 2022). One article used a qualitative methodology to analyze 12 semi-structured in-depth interviews were conducted with secondary classroom teachers including one school counselor to examine Jordanian teachers' knowledge and perceptions on overexcitability, and attention deficit hyperactivity disorder (ADHD) in gifted students (Krayem, & Al-Hroub, 2018).

A summary of the literature including each of their respective study design & methodology and outcomes & results is visually described in Table 2.

Table 2

Definitions of Giftedness and ADHD, and Evidence of Misdiagnosis of Gifted with ADHD in Studies Included in the Review

#	Author(s) and Year	Location and Sample Size	Method and Instruments	Gifted Definition and/or Identification	ADHD Definition and/or Identification	Evidence of Misdiagnosis of Gifted with ADHD
1	Al-Hroub, and Krayem, 2018	**Location:** Jubilee Institute in Jordan **Sample Size:** Twelve faculty members including teachers and one counselor	**Qualitative research methodology** Twelve semi-structured in-depth interviews	Did not constantly use quantitative cutoffs to define giftedness Gifted students must meet the following requirements: - Score high on the Jordanian version of the Stanford-Binet Intelligence Scale (30%) - Score high on the Jubilee Scholastic Aptitude Test (JSAT), which measures verbal, mathematical, and logical reasoning abilities (30%) - Pass the Evaluation of Potential Creativity (EPoC) test (20%) - Meet the behavioral characteristics of gifted individuals (10%) - Pass the personal interview (10%).	Operationalized ADHD according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, (DSM-V).	Teachers both lacked background knowledge on OE and the characteristics of ADHD, making them mistake their students' disruptive behaviors for disciplinary problems, leading to a misdiagnosis, and/or mislabeling when no multidisciplinary diagnostic technique is used..
2	Al-Hroub, and Krayem, 2020	**Location:** Jubilee School -Jordan. **Sample Size:** Participants included 265 (91 girls, 174 boys) gifted students at the secondary level from grades 9 to 11	**Correlational research methodology** Participants were administered the OE Questionnaire (OEQII) and the Conners Third Edition Self-Report Scale	Same as Al-Hroub, and Krayem, 2018	DSM-V	The results emphasized and clarified the overlap of ADHD and OE characteristics. Significant positive correlation between Imaginational OE and Inattentive ADHD scores, as well as Imaginational OE and Hyperactive-Impulsive ADHD scores were showed, indicating that gifted

			(ADHD/DSM-V) in Arabic			adolescents may exhibit ADHD symptoms, which might contribute to an ADHD misdiagnosis.
3	François-Sévigny et al., 2022	**Location: Sample Size:** Ninety-two children aged 6 to 16 years	**Comparative research methodology** Participants were split into three groups: Gifted/ADHD, ADHD, and Gifted. Utilizing K-SADS and the WISC-V	FSIQ cutoff scores of 120, 125, and 130 or higher have been employed to determine giftedness on the Wechsler Intelligence Scale for Children Fifth Edition WISC-V.	DSM-V	All these findings may be related to the concept of the masking effect. Since giftedness can mask the difficulties of ADHD, it can be difficult for teachers to notice the significant signs of ADHD in gifted students
4	Gomez et al., 2020	**Location:** The Academic Child Psychiatry Unit (ACPU) of the Royal Children's Hospital, Melbourne, Australia. **Sample Size:** 507 participants (boys = 359, girls = 148)	**Comparative research methodology** Anxiety Disorders Interview Schedule for Children (ADISC-IV) WISC-IV Strengths and Weaknesses of ADHD-Symptoms and Normal Behavior Scale (SWAN)	FSIQ cutoff scores of 120, 125, and 130 or higher have been employed to determine giftedness on the Wechsler Intelligence Scale for Children Fifth Edition WISC-V.	DSM-V	Children can be gifted while also showing ADHD symptoms. A misunderstanding of children's behavior might arise leading to a misdiagnosis.

5	Hartnett et al., 2004;	**Location:** Alarge, public, Midwestern university **Sample Size:** Forty-four first year graduate students enrolled in a school counseling program.	**Case study** Participants were given a vignette consisted of two forms: form A and form B, both of which provided a hypothetical case study of a young boy with characteristics of both giftedness and ADHD	Did not constantly use quantitative cutoffs to define giftedness Gifted children may exhibit "overexcitabilities" in five areas: psychomotor, sensual, intellectual, imaginational, and emotional more than non-identified or non-gifted learners	DSM-V	Significant likelihood of misdiagnosis, lack of awareness/training in differentiating ADHD and giftedness.
6	Rinn et al., 2009	**Location:** university in the South. **Sample Size**: Participants for this study included 132 preservice teachers	**Case study** Survey of preservice teachers using a vignette describing a child with symptoms of ADHD and giftedness.	Did not constantly use quantitative cutoffs to define giftedness Performing at exceptionally high levels of accomplishment, showing exceptional intellectual, creative, and/or artistic abilities, extraordinary leadership abilities, or thrive in specialized academic sectors	DSM-V	The results revealed a tendency to diagnose ADHD in the presence of giftedness indicators, suggesting an educational bias. This disposition is a pivotal scene in the misdiagnosis narrative, revealing how educational settings and the perceptions of those within can shape, and sometimes distort, the story of a gifted child's life.

Giftedness Operationalized

Of the six studies that were included in the systematic review, four articles did not constantly use quantitative cutoffs to define giftedness (Al-Hroub, and Krayem, 2020; Hartnett et al., 2004; Krayem, & Al-Hroub, 2018; Rinn et al., 2009). They used a holistic approach, such as performing at exceptionally high levels of accomplishment, showing exceptional intellectual, creative, and/or artistic abilities, extraordinary leadership abilities, or thrive in specialized academic sectors (Rinn et al., 2009). Four of them mentioned that gifted children are considered to have intense manifestations in certain fields, stressing on Dabrowski's hypothesis of positive disintegration, which claim that gifted children may exhibit "overexcitabilities" in five areas: psychomotor, sensual, intellectual, imaginational, and emotional more than non-identified or non-gifted learners (Al-Hroub & Krayem, 2020; 2018; Hartnett, et al., 2004; Rinn et al., 2009). The psychomotor and imaginational overexcitabilities are particularly relevant for this subject. Psychomotor overexcitabilities are characterized by behaviors such as quick speech, impulsive acts, and increased bodily activity, whereas imaginational overexcitabilities are characterized by vivid visualization and daydreaming. Hartnett, et al., 2004 introduced the notion of OE and indicated a clear disparity between Psychomotor OE and ADHD hyperactivity. It is important to note that gifted individuals who are registered in the Jubilee Institute for gifted students in both Al-Hroub, and Krayem (2020) and Al-Hroub and Krayem (2018) studies has a strict multiple-criteria admissions approach. These requirements are as follows: (a) academic distinction and high intellectual functioning on the Jordanian version of the Stanford-Binet Intelligence Scale (30%); (b) the highest scores in the Jubilee Scholastic Aptitude Test (JSAT), which measures verbal, mathematical, and logical reasoning abilities (30%); (c) passing the

Evaluation of Potential Creativity—EPoC test (20%); (d) meeting the behavioral characteristics of gifted individuals (10%); and (f) passing a personal interview (10%). The remaining two articles utilized quantitative cutoffs to define giftedness. They relied on Full-Scale IQ (FSIQ) to operationalize giftedness (Gomez et al., 2020; (François-Sévigny et al., 2022). FSIQ cutoff scores of 120, 125, and 130 or higher have been employed to determine giftedness on the Wechsler Intelligence Scale for Children Fifth Edition WISC-V.

ADHD Operationalized

All seven articles operationalized ADHD according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, (DSM-V), as one of the most common neurodevelopmental disorders affecting 3 to 7% of school-aged children, characterized by six or more symptoms of inattention and hyperactivity-impulsivity that appear before the age of 7 and interfere with daily functioning in at least two settings (e.g., at home and at school) (Al-Hroub & Krayem, 2020; François-Sévigny et al., 2022; Gomez et al., 2020; Hartnett, et al., 2004; Krayem, & Al-Hroub, 2018; Rinn et al., 2009).

Evidence of Misdiagnosis

The two case study articles explored the potential for misdiagnosis of ADHD in gifted students using a hypothetical case study of a young boy (Hartnett, et al., 2004; Rinn et al., 2009). The former surveyed 132 preservice teachers using a vignette of a child displaying symptoms of both ADHD and giftedness. The study aimed to understand the biases and perceptions of future educators. The results indicated a tendency towards diagnosing ADHD when indicators of giftedness were also present, pointing to potential misdiagnoses due to a lack of awareness among preservice teachers (Rinn et al., 2009). The current study's findings are similar to those of the latter's study, which revealed that

future school counselors were uncertain of the idea of giftedness explaining typical ADHD behaviors. Participants in both studies who were presented with the idea of giftedness as a possible explanation for the actions described in the vignette were more likely to consider giftedness as a possible explanation than those who were not. However, without the positive concept of giftedness, participants only thought of ADHD or other difficulties when asked to describe the behaviors in the scenario. According to Hartnett et al. (2004), there is a possibility that graduate students in this school counseling program are not being appropriately informed about the differences and similarities between gifted and ADHD children, which could lead to a misdiagnosis.

One correlational study article emphasized and clarified the overlap of ADHD and OE characteristics raising some concerns (Al-Hroub, and Krayem, 2020). There was a significant positive correlation between Imaginational OE and Inattentive ADHD scores, and Imaginational OE and Hyperactive-Impulsive ADHD scores. This demonstrates that gifted adolescents with an Imaginational OE may exhibit ADHD symptoms, which might contribute to an ADHD misdiagnosis. Psychometric and Intellectual OEs were adversely linked with inattention and positively with hyperactivity-impulsivity which might create some confusion.

One comparative study article by Gomez et al 2020 focused on the symptomatology of all three ADHD characteristics (IA, HI, and total ADHD) in gifted versus non-gifted children. The researchers grouped children into four categories: those with average intelligence with and without ADHD, and those with gifted intelligence with and without ADHD. The ADHD group reported consistently higher scores than the gifted/ADHD for IA and HI symptoms than the gifted/ADHD group. ADHD gifted children seem to report higher scores) from non-ADHD gifted children, primarily when

specific HI behaviors involving modulation of motor and verbal activity along with reflecting on questions are considered. These findings raise the concern that children can be gifted while also showing ADHD symptoms. Although, these symptoms might be useful for the diagnosis of ADHD among individuals who are gifted to distinguish them from non-gifted ADHD individuals, if the three abovementioned items for HI were not given much importance, a misunderstanding of children's behavior might arise leading to a misdiagnosis and/or mislabeling (Gomez et al., 2020). Another comparative study by François-Sévigny et al., 2022, aimed to examine parents' and teachers' responses to the Conners 3 behavioral rating scale of gifted students with ADHD compared to gifted students without ADHD and non-gifted students with ADHD. The study comprised 92 children aged 6 to 16 years. The researchers grouped children into three categories: gifted/ADHD, ADHD, and gifted. The findings showed that responses to the Conners 3 rating scale by parents and teachers distinguished effectively between the gifted group and the other two groups, but not between the gifted/ADHD and ADHD groups. The findings of the 2 comparative studies emphasize the need of many informants complementing each other in the ADHD assessment process in a gifted setting to overcome the masking effect between giftedness and ADHD.

CHAPTER 5

DISCUSSION

The results of this systematic review demonstrate a scarcity of research regarding the misdiagnosis of gifted students with ADHD. Only 6 articles met the inclusion criteria on this topic with no empirical evidence investigations regarding intervention. Studies indicated that gifted individuals; mainly children and adolescents with ADHD have been identified, with other primary evidence that suggested which screening and diagnostic measures can differentiate gifted individuals from individuals having ADHD and gifted individuals with ADHD.

The journey through the diagnostic landscape, as illuminated by these studies, reveals a complex interplay of symptoms, behaviors, and cognitive abilities. The core challenge, as highlighted by Hartnett et al. (2004), lies in unravelling the symptoms common to both giftedness and ADHD. This task is akin to navigating a maze where each turn, representing a symptom or behavior, can lead to multiple paths, each corresponding to a different diagnosis. The overlapping characteristics create a mirage of ADHD in a gifted child, or vice versa, demanding a discerning eye to see through this illusion.

Through a case study approach with graduate students, it demonstrated how easily giftedness could be mistaken for ADHD. It underscores the difficulty professionals face in distinguishing between high intellectual capability and ADHD symptoms, primarily due to similar behavioral manifestations like inattention and hyperactivity (Hartnett et al. 2004; Rinn et al., 2009)

The role of educational settings in the diagnosis of ADHD among gifted students is a critical subject (Rinn et al., 2009). Rinn et al., 2009 study on preservice teachers'

perceptions revealed a tendency to diagnose ADHD in the presence of giftedness indicators, suggesting an educational bias. This disposition is a pivotal scene in the misdiagnosis narrative, revealing how educational settings and the perceptions of those within can shape, and sometimes distort, the story of a gifted child's life. Conversely, Hartnett et al. (2004) observed that the suggestion of giftedness could significantly alter the diagnosis by graduate students in a school counseling program. This difference indicates a discrepancy in how giftedness is perceived in relation to ADHD, depending on the level of professional training and awareness. The former suggests a potential for over diagnosis in educational settings (Rinn et al., 2009), while the latter points towards an underdiagnosis or misdiagnosis when gifted traits are considered (Hartnett et al. 2004).

The interpretative journey further leads us to the question of how high intelligence, often a hallmark of giftedness, interacts with ADHD symptoms. François-Sévigny et al., 2022 study objective was to examine parents' and teachers' responses to the Conners 3 behavioral rating scale regarding gifted/ADHD children compared to gifted children without ADHD and non-gifted ADHD children. The research findings indicated that on the one hand, parents and teachers of ADHD children reported more issues with inattention, learning, and hyperactivity-impulsivity than those of gifted children (François-Sévigny et al., 2022). Teachers, on the other hand, reported more executive and learning problems in ADHD students than in gifted/ADHD students, but more hyperactivity-impulsivity problems (DSM-5 scale) in gifted/ADHD children than in ADHD children. It was discovered that both gifted/ADHD and ADHD students were classified as underachievers. The executive function impairment associated with ADHD helps explain this underperformance in school (François-Sévigny et al., 2022). These findings support those of Gomez et al. 2020 study on ADHD symptom severity in gifted

versus non-gifted children who discovered that mothers of gifted children revealed less symptoms of inattention than mothers of gifted/ADHD and ADHD children. In terms of hyperactivity-impulsivity symptoms, Gomez et al. 2020 study found that parents and teachers reported more hyperactive-impulsive behaviors in gifted/ADHD and ADHD children than in gifted children. Furthermore, when only mother assessments were evaluated, gifted/ADHD and ADHD children showed equal levels of hyperactivity-impulsivity symptoms, according to these researchers (Gomez et al., 2020) However, when the teachers' observations were considered, which Gomez et al. 2020 did not, gifted/ADHD children displayed greater hyperactivity-impulsivity signs than ADHD children. This dichotomy challenges the conventional understanding of ADHD symptomatology and suggests that gifted children may display a different expression of ADHD symptoms, necessitating a more tailored diagnostic approach (Gomez et al., 2020).

Additionally, the findings of Al-Hroub and Krayem, 2020 which have emphasized and clarified the overlap of ADHD and OE characteristics confirm previous qualitative study by Al-Hroub and Krayem, 2018 and Hartnett et al., 2004 study, showing that many people might confuse the characteristics of ADHD with those of overexcitability. Teachers with limited knowledge of overexcitability may mistake their students' disruptive behaviors for disciplinary problems, which could lead to a misdiagnosis, and/or mislabeling when no multidisciplinary diagnostic technique is used (Al-Hroub & Krayem, 2018; Hartnett et al., 2004).

As we interpret these findings, we seek clarity in a world where the realities of giftedness and ADHD overlap and sometimes collide. The narrative unfolds a landscape where symptoms are not just clinical indicators but markers of identity and potential. The

challenge is not merely to label but to understand, not just to diagnose but to sympathize with the unique experiences of each child. This journey through the findings emphasizes the need for a paradigm shift in how we perceive, diagnose, and support gifted children who may or may not have ADHD. It calls for a story of understanding, one that recognizes the individuality of each child beyond the limits of diagnostic categories.

Implications for Practice

The studies by Hartnett et al., 2004 and Rinn et al., 2009 offer crucial insights for enhancing diagnostic accuracy. Their findings emphasize the need for heightened awareness among clinicians and educators regarding the overlapping symptoms of ADHD and giftedness. These studies underline the importance of training and education for professionals who play a pivotal role in early identification and referral for ADHD. The tendency of educators to lean towards an ADHD diagnosis, as shown in their study, highlights a gap in current training programs. Integrating findings from this research into professional development curriculums could equip educators with the skills to better identify and support gifted students, potentially reducing the risk of misdiagnosis (Rinn et al., 2009). These studies advocate for a paradigm shift in diagnostic processes, urging practitioners to consider a broader spectrum of behaviors and to differentiate between high intellectual capability and ADHD symptoms with greater precision (Hartnett et al., 2004; Rinn et al., 2009).

The collective findings of the studies underscore the necessity of an individualized approach in both clinical and educational settings. The unique intersection of giftedness and ADHD in each child demands a personalized strategy in diagnosis, intervention, and support. Practitioners are encouraged to tailor their assessments and interventions to cater

to the individual needs of each child, considering their cognitive abilities, symptom patterns, and educational environments.

The implications of these studies for clinical practice are profound. They call for a reevaluation of current diagnostic criteria, a deeper understanding of the nuances of ADHD symptoms in gifted children, and an emphasis on individualized approaches. Integrating these insights into clinical practice not only enhances the accuracy of ADHD diagnosis in gifted children but also ensures that these children receive the appropriate support and interventions they need to thrive.

Limitations of the Study

This section critically examines the limitations inherent in this systematic review, drawing upon the analyses and interpretations of the six studies previously discussed. The identification of these limitations is essential for contextualizing the findings and guiding future research directions.

First, while we made every attempt to acquire the whole corpus of published literature on this topic, the way electronic databases are indexed may have altered the Boolean search. To mitigate this potential, we evaluated the reference lists of all papers throughout the full-text review process. We decided not to conduct hand searches of specific journals because the research on this topic has been published in a variety of journals, which may have affected the results. To avoid this issue, future studies should involve manual searches. Second, the unpublished literature, such as PhD dissertations, was not included in this systematic review. We decided not to include this information since the quality of research published in that body of literature changes because it is not peer-reviewed. Future systematic reviews on this subject should consider incorporating data from these and other sources. Third, while the review

comprehensively covered studies from a specific time frame (2000-2023), focusing on the misdiagnosis of ADHD in gifted students, the selection criteria may have inadvertently excluded relevant research outside this scope. For instance, studies published in languages other than English, or those considering wider age ranges or different educational settings, were not included. This limitation could potentially narrow the breadth of perspectives and findings considered in the review.

Also, most reviewed studies, such as those by Hartnett et al., 2004 and Rinn et al., 2009 used survey-based or hypothetical case study methodologies. While these approaches provide valuable insights, they may not capture the full complexity of real-world clinical and educational scenarios. The absence of longitudinal studies limits the depth and applicability of the findings. Furthermore, given the specific focus on gifted students and ADHD, the generalizability of the findings to broader populations is limited. The unique characteristics of gifted students, as discussed in the studies, may not be representative of all children diagnosed with or exhibiting symptoms of ADHD. This limitation is crucial when considering the application of the review's findings to general clinical or educational practices. Lastly, the review's reliance on published studies might also introduce publication bias, where studies with significant or positive findings are more likely to be published than those with negative or inconclusive results. Also, interpretative biases could arise from the subjective analysis of the studies, particularly in areas where findings were contradictory or not straightforward.

Suggestions for Future Research

In light of the insights and limitations identified in this systematic review, several avenues for future research emerge as essential to advancing our understanding of ADHD diagnosis in gifted students. First, there is a clear need for longitudinal studies that follow

gifted children over time to observe the long-term implications of ADHD diagnosis and misdiagnosis. Such studies could provide a more dynamic understanding of how ADHD symptoms evolve and interact with the developmental trajectories of gifted individuals.

Secondly, expanding the research to include a more diverse demographic range is critical. Future studies should consider variations in cultural backgrounds, socioeconomic statuses, and educational systems to explore how these factors influence the diagnosis and management of ADHD in gifted children. This approach would enhance the generalizability of the findings and provide a more inclusive perspective.

Thirdly, there is a need for interdisciplinary research that integrates perspectives from education, psychology, neuroscience, and other relevant fields. Such collaborative efforts could lead to a more holistic understanding of the complexities involved in diagnosing and supporting gifted children with ADHD.

Finally, research exploring the effectiveness of various intervention strategies and educational accommodations for gifted children with ADHD would be invaluable. This would include examining the outcomes of differentiated teaching methods, counseling approaches, and other support mechanisms tailored to the unique needs of these children.

In conclusion, future research in this area should aim to fill the gaps identified in the current literature, with a focus on longitudinal, diverse, and qualitative studies that embrace an interdisciplinary approach. Such research would significantly contribute to more effective and empathetic practices in diagnosing and supporting gifted children who may have ADHD.

CHAPTER 6

CONCLUSION

In summation, this systematic review has delved into the multifaceted issue of diagnosing gifted students with Attention-Deficit/Hyperactivity Disorder (ADHD). It has meticulously combed through two decades of research, examining the intersection of giftedness and ADHD, illuminating the potential for misdiagnosis in this exceptional cohort. The study has uncovered a notable pattern of misclassification, indicating that gifted students often exhibit characteristics that overlap with ADHD symptoms. The analysis has unveiled the critical significance of discerning between these dual exceptionalities, recognizing that giftedness can mask or mimic ADHD traits and vice versa. Furthermore, the systematic review has emphasized the profound implications of misdiagnosis, not merely within academic realms but also in the social and emotional domains. They highlighted the need for specialized training, increased awareness, and more refined diagnostic criteria to ensure accurate identification and support of these unique student populations. The findings underscore the complexity of differentiating between ADHD symptoms and the characteristics of giftedness, urging a more individualized and careful approach in both educational and clinical settings. By offering a comprehensive synthesis of existing literature, this study contributes to a more profound comprehension of the complexity surrounding the diagnosis of gifted students with ADHD.

Final Thoughts and Recommendations

In closing, this systematic review serves as a clarion call for educators, psychologists, and policymakers to adopt a more discerning and tailored approach when

dealing with gifted students. The study underscores the imperative need for specialized training and awareness among professionals who interact with this unique population. This includes educators who should be equipped with the tools to distinguish between giftedness and ADHD, psychologists who must employ a more nuanced assessment framework, and policymakers who should advocate for differentiated educational strategies. To this end, the creation of guidelines or protocols specific to the identification and support of gifted students with ADHD is imperative. Moreover, nurturing an inclusive and empathetic environment within educational institutions, where gifted students are celebrated for their diversity and provided with personalized learning experiences, is a vital step toward addressing misdiagnosis issues.

Looking ahead, it is evident that further research is warranted to explore this intricate terrain. Future studies should delve deeper into the factors contributing to misdiagnosis, such as cultural considerations and potential biases in assessment tools. Additionally, longitudinal research tracking the educational trajectories and socio-emotional development of gifted students with ADHD can provide invaluable insights. In the grand tapestry of education, these students are a unique thread, their exceptionalities weaving a complex narrative. As we conclude this systematic review, we do so with the hope that our findings will inspire a paradigm shift, fostering an educational landscape where gifted students with ADHD are recognized, supported, and empowered to reach their full potential, contributing their extraordinary talents to society.

APPENDIX

CRITERIA FOR THE DIAGNOSIS OF ADHD IN DSM-V

1) Six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with the developmental level:

   Inattention

   a) Often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities,
   b) Often has difficulty sustaining attention in tasks or play activities,
   c) Often does not seem to listen when spoken to directly,
   d) Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
   e) Often has difficulty organizing tasks and activities,
   f) Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework),
   g) Often loses things necessary for tasks or activities (e.g. toys, school assignments, pencils, books, or tools),
   h) Is often easily distracted by extraneous stimuli,
   i) Is often forgetful in daily activities.

2) Six (or more) of the following symptoms of hyperactivity/impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with the developmental level:

Hyperactivity

a) Often fidgets with hands or feet or squirms in seat,
b) Often leaves seat in classroom or in other situations in which remaining seated is expected,
c) Often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness),
d) Often has difficulty playing or engaging in leisure activities quietly,
e) Is often "on the go" or behaves as if "driven by a motor",
f) Often talks excessively,

Impulsivity

a) Often blurts out answers before questions are completed,
b) Often has difficulty waiting in turn,
c) Often interrupts or intrudes on others (e.g. butts into conversations).

In addition, the following conditions must be met:

a) Some inattentive or hyperactive-impulsive symptoms were present before age 12 years.
b) Some symptoms occur in two or more settings (e.g. at school or work and at home).

c) There is clear evidence of clinically significant impairment in social, academic, or occupational functioning.

d) The symptoms do not occur exclusively during the course of Schizophrenia, or other Psychotic disorders, and are not better explained by other mental disorders (e.g. Mood Disorder, Anxiety Disorder, Dissociative Disorder, or Personality Disorder).

REFERENCES

Al-Hroub, A., & Krayem, M. (2018). Teachers' Knowledge and Perceptions on ADHD and Overexcitabilities in Gifted Learners. *International Journal for Talent Development and Creativity (IJTDC)*, *6*(2), 36–43.

Al-Hroub, A., & Krayem, M. (2020). Overexcitabilities and ADHD in gifted adolescents in Jordan: Empirical evidence. *Roeper Review*, *42*(4), 258–270. https://doi.org/10.1080/02783193.2020.1815264

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders. *Diagnostic and Statistical Manual of Mental Disorders*, *5*(5). https://doi.org/10.1176/appi.books.9780890425596

Antshel, K. M., Faraone, S. V., Stallone, K., Nave, A., Kaufmann, F. A., Doyle, A., Fried, R., Seidman, L., & Biederman, J. (2007). Is attention deficit hyperactivity disorder a valid diagnosis in the presence of high IQ? Results from the MGH longitudinal family studies of ADHD. *Journal of Child Psychology and Psychiatry*, *48*(7), 687–694. https://doi.org/10.1111/j.1469-7610.2007.01735.x

Antshel, K. M., Hendricks, K., Faraone, S. V., & Gordon, M. (2011). Disorder versus disability: The challenge of ADHD in the context of a high IQ. *The ADHD Report*, *19*(2), 4–8. https://doi.org/10.1521/adhd.2011.19.2.4

Aromataris, E., & Pearson, A. (2014). The Systematic Review: An Overview. *AJN The American Journal of Nursing*, *114*(3), 53. https://doi.org/10.1097/01.NAJ.0000444496.24228.2c

Asherson, P., Akehurst, R., Kooij, J. J. S., Huss, M., Beusterien, K., Sasané, R., Gholizadeh, S., & Hodgkins, P. (2012). Under diagnosis of adult ADHD:

Cultural influences and societal burden. *Journal of Attention Disorders*, *16*(5 Suppl), 20S-38S. https://doi.org/10.1177/1087054711435360

Baum, S. M., Reis, S. M., & Maxfield, L. R. (1998). *Nurturing the Gifts and Talents of Primary Grade Students.* Creative Learning Press, Inc. https://eric.ed.gov/?id=ED445428

Baum, S. M., Olenchak, F. R., & Owen, S. V. (1998). Gifted Students with Attention Deficits: Fact and/or Fiction? Or, Can We See the Forest for the Trees? *The Gifted Child Quarterly*, *42*(2), 96–104. https://doi.org/10.1177/001698629804200204

Beljan, P., Webb, J. T., Amend, E. R., Web, N. E., Goerss, J., & Olenchak, F. R. (2006). Misdiagnosis and Dual Diagnoses of Gifted Children and Adults: ADHD, Bipolar, OCD, Asperger's, Depression, and Other Disorders. *Gifted and Talented International*, *21*(2), 83–86. https://doi.org/10.1080/15332276.2006.11673478

Berri, H. M., & Al-Hroub, A. (2016). *ADHD in Lebanese Schools*. Springer International Publishing. https://doi.org/10.1007/978-3-319-28700-3

Budding, D., & Chidekel, D. (2012). ADHD and Giftedness: A Neurocognitive Consideration of Twice Exceptionality. *Applied Neuropsychology: Child, 1*(2), 145–151. https://doi.org/10.1080/21622965.2012.699423

Chae, P. K., Kim, J.-H., & Noh, K.-S. (2003). Diagnosis of ADHD Among Gifted Children in Relation to KEDI-WISC and T.O.V.A. Performance. *Gifted Child Quarterly*, *47*(3), 192–201. https://doi.org/10.1177/001698620304700303

Cook, B. G., Buysse, V., Klingner, J., Landrum, T. J., McWilliam, R. A., Tankersley, M., & Test, D. W. (2015). CEC's Standards for Classifying the Evidence Base

of Practices in Special Education. *Remedial and Special Education*, *36*(4), 220–234. https://doi.org/10.1177/0741932514557271

Cordeiro, M. L., Farias, A. C., Cunha, A., Benko, C. R., Farias, L. G., Costa, M. T., Martins, L. F., & McCracken, J. T. (2011). Co-occurrence of ADHD and high IQ: A case series empirical study. *Journal of Attention Disorders, 15*(6), 485 490. https://doi.org/10.1177/1087054710370569

Dong, Q., Garcia, B., Pham, A. V., & Cumming, M. (2020). Culturally Responsive Approaches for Addressing ADHD Within Multi-tiered Systems of Support. *Current Psychiatry Reports*, *22*(6), 27. https://doi.org/10.1007/s11920-020-01154-3

Edwards, K. (2009). Misdiagnosis, the Recent Trend in Thinking about Gifted Children with ADHD. *Apex*, *15*(1), 29–44. https://doi.org/10.21307/apex-2009-005

François-Sévigny, J., Pilon, M., & Gauthier, L.-A. (2022). Differences in Parents and Teachers' Perceptions of Behavior Manifested by Gifted Children with ADHD Compared to Gifted Children without ADHD and Non-Gifted Children with ADHD Using the Conners 3 Scale. *Brain Sciences*, *12*(11), 1571. https://doi.org/10.3390/brainsci12111571

García-Martínez, I., Gutiérrez Cáceres, R., Luque de la Rosa, A., & León, S. P. (2021). Analysing Educational Interventions with Gifted Students. Systematic Review. *Children*, *8*(5), 365. https://doi.org/10.3390/children8050365

Gardner, H. (2017). Taking a multiple intelligences (MI) perspective. *The Behavioral and Brain Sciences*, *40*, e203. https://doi.org/10.1017/S0140525X16001631

Gomez, R., Stavropoulos, V., Vance, A., & Griffiths, M. D. (2020). Gifted Children with ADHD: How Are They Different from Non-gifted Children with ADHD?

International Journal of Mental Health and Addiction, *18*(6), 1467–1481. https://doi.org/10.1007/s11469-019-00125-x

Gubbins, E. J., Callahan, C. M., & Renzulli, J. S. (2014). Contributions to the Impact of the Javits Act by the National Research Center on the Gifted and the Talented. *Journal of Advanced Academics*, *25*(4), 422–444. https://doi.org/10.1177/1932202X14549355

Hafenstein, N., Rainey, F., Baum, S. (2000). *Perspectives in Gifted Education: TwiceExceptional Children. Perspectives in Gifted Education.* University of Denver. https://digitalcommons.du.edu/perspectivesingifteded/2

Hare, M. M., Garcia, A. M., Hart, K. C., & Graziano, P. A. (2021). Intervention response among preschoolers with ADHD: The role of emotion understanding. *Journal of School Psychology*, *84*, 19–31. https://doi.org/10.1016/j.jsp.2020.11.001

Hartnett, D. N., Nelson, J. M., & Rinn, A. N. (2004). Gifted or ADHD? The Possibilities of Misdiagnosis. *Roeper Review*, *26*(2), 73–76. https://doi.org/10.1080/02783190409554245

Johnson, B. T., & Hennessy, E. A. (2019). Systematic reviews and meta-analyses in the health sciences: Best practice methods for research syntheses. *Social Science & Medicine (1982)*, *233*, 237–251. https://doi.org/10.1016/j.socscimed.2019.05.035

Jung, J. Y. (2022). Physical giftedness/talent: A systematic review of the literature on identification and development. *Frontiers in Psychology*, *13*, 961624. https://doi.org/10.3389/fpsyg.2022.961624

Kaufmann, F., Kalbfleisch, M. L., & Castellanos, F. X. (2000). *Attention Deficit Disorders and Gifted Students: What Do We Really Know? Senior Scholars Series*. National Research Center on the Gifted and Talented, University of Connecticut, 2131 Hillside Rd, Unit 3007, Storrs, CT 06269-3007. https://eric.ed.gov/?id=ED447666

Kettler, T. (2014). Critical Thinking Skills Among Elementary School Students: Comparing Identified Gifted and General Education Student Performance. *Gifted Child Quarterly*, *58*(2), 127–136. https://doi.org/10.1177/0016986214522508

Kitano, M. K. (1990). Intellectual abilities and psychological intensities in young children: Implications for the gifted. *Roeper Review*, *13*(1), 5–10. https://doi.org/10.1080/02783199009553296

Klassen, T. P., Jadad, A. R., & Moher, D. (1998). Guides for Reading and Interpreting Systematic Reviews: I. Getting Started. *Archives of Pediatrics & Adolescent Medicine*, *152*(7), 700–704. https://doi.org/10.1001/archpedi.152.7.700

Kolaski, K., Logan, L. R., & Ioannidis, J. P. A. (2023). Guidance to best tools and practices for systematic reviews. *BMC Infectious Diseases*, *23*, 383. https://doi.org/10.1186/s12879-023-08304-x

Krayem, M., & Al-Hroub, A. (2019). Gender Differences in Teachers' Recognition of Overexcitabilities among Gifted Adolescent: An Experimental Vignette Study of Twice-Exceptionality. *International Journal for Talent Development and Creativity*, *7*, 113–124.

Ledford, J. R., & Zimmerman, K. N. (2018). *Guide for the Use of Single Case Design Research Evidence*. Division for Research of the Council for Exceptional Children.

Lee, K. M., & Olenchak, F. R. (2015). Individuals with a gifted/attention deficit/hyperactivity disorder diagnosis: Identification, performance, outcomes, and interventions. *Gifted Education International*, *31*(3), 185–199. https://doi.org/10.1177/0261429414530712

Leroux, J. A., & Levitt-Perlman, M. (2000). The gifted child with attention deficit disorder: An identification and intervention challenge. *Roeper Review*, *22*(3), 171–176. https://doi.org/10.1080/02783190009554028

Lovecky, D. V. (1999). *Gifted children with AD/HD*. https://eric.ed.gov/?id=ED439555

Lovecky, D. V. (2018). Misconceptions about giftedness and the diagnosis of ADHD and other mental health disorders. In *Twice exceptional: Supporting and educating bright and creative students with learning difficulties* (pp. 83–103). Oxford University Press. https://doi.org/10.1093/oso/9780190645472.001.0001

Magarey, J. M. (2001). Elements of a systematic review. *International Journal of Nursing Practice*, *7*(6), 376–382. https://doi.org/10.1046/j.1440-172x.2001.00295.x

Maggin, D. M., Talbott, E., Van Acker, E. Y., & Kumm, S. (2017). Quality indicators for systematic reviews in behavioral disorders. *Behavioral Disorders*, *42*(2), 52–64. https://doi.org/10.1177/0198742916688653

Mallett, R., Hagen-Zanker, J., Slater, R., & Duvendack, M. (2012). The benefits and challenges of using systematic reviews in international development research.

Journal of Development Effectiveness, *4*(3), 445–455. https://doi.org/10.1080/19439342.2012.711342

Mcclain, M.-C., & Pfeiffer, S. (2012). Identification of gifted Students in the United States today: A look at state definitions, policies, and practices. *Journal of Applied School Psychology*, *28*(1), 59–88. https://doi.org/10.1080/15377903.2012.643757

McCoach, D. B., Siegle, D., & Rubenstein, L. D. (2020). Pay Attention to Inattention: Exploring ADHD Symptoms in a Sample of Underachieving Gifted Students. *Gifted Child Quarterly*, *64*(2), 100–116. https://doi.org/10.1177/0016986219901320

Mullet, D. R., & Rinn, A. N. (2015). Giftedness and ADHD: Identification, Misdiagnosis, and Dual Diagnosis. *Roeper Review*, *37*(4), 195–207. https://doi.org/10.1080/02783193.2015.1077910

Neihart, M. (2003). *Gifted Children with Attention Deficit Hyperactivity Disorder (ADHD). ERIC Digest*. ERIC Clearinghouse on Disabilities and Gifted Education, 1110 N. https://eric.ed.gov/?id=ED482344

Norma Lu Hafenstein, Rainey, F., & Baum, S. M. (2000). *Perspectives in Gifted Education: Twice-Exceptional Children. 2.*

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., . . . Moher, D. (2021). The PRISMA 2020 statement: An Updated Guideline for Reporting Systematic Reviews. *PLoS Medicine*, 18(3), e1003583-e1003583. https://doi.org/10.1371/JOURNAL.PMED.1003583

Reason, R., & Working Party of the British Psychological Society. (1999). ADHD: A psychological response to an evolving concept (report of a working party of the british psychological association). *Journal of Learning Disabilities, 32*(1), 85-91 https://doi.org/10.1177/002221949903200108

Renzulli, J. S. (1988). A decade of dialogue on the three-ring conception of giftedness. *Roeper Review, 11*(1), 18–25. https://doi.org/10.1080/02783198809553154

Reyes, N., Baumgardner, D. J., Simmons, D. H., & Buckingham, W. (2013). The potential for sociocultural factors in the diagnosis of ADHD in children. *WMJ: Official Publication of the State Medical Society of Wisconsin, 112*(1), 13–17.

Rinn, A., & Reynolds, M. (2012). Overexcitabilities and ADHD in the Gifted: An Examination. *Roeper Review, 34*, 38–45. https://doi.org/10.1080/02783193.2012.627551

Rinn, AnneN., & Nelson, JasonM. (2009). Preservice Teachers' Perceptions of Behaviors Characteristic of ADHD and Giftedness. *Roeper Review, 31*(1), 18–26. https://doi.org/10.1080/02783190802527349

Shehab, N., & Al-Hroub, A. (2019). Is the DSM-5 a Culturally Appropriate Assessment Tool for Identifying Learners with ADHD in Lebanese Schools? *International Journal of Special Education, 34*(1), 166–181.

Slobodin, O., & Crunelle, C. L. (2019). Mini Review: Socio-Cultural Influences on the Link Between ADHD and SUD. *Frontiers in Public Health, 7*, 173. https://doi.org/10.3389/fpubh.2019.00173

Slobodin, O., & Masalha, R. (2020). Challenges in ADHD care for ethnic minority children: A review of the current literature. *Transcultural Psychiatry, 57*(3), 468–483. https://doi.org/10.1177/1363461520902885

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Sonuga-Barke, E. J. S., Koerting, J., Smith, E., McCann, D. C., & Thompson, M. (2011). Early detection and intervention for attention-deficit/hyperactivity disorder. *Expert Review of Neurotherapeutics, 11*(4), 557–563. https://doi.org/10.1586/ern.11.39

Strech, D., & Sofaer, N. (2012). How to write a systematic review of reasons. *Journal of Medical Ethics, 38*(2)), 121-126. https://doi.org/10.1136/medethics-2011-100096

Webb, J. T., & Latimer, D. (1993). ERIC Digest ADHD and Children Who are Gifted. *Exceptional Children, 60*(2), 183–184. https://doi.org/10.1177/001440299306000213

Wiener, J., Webb, J. T., Amend, E. R., Webb, N. E., Jean, G., Paul, B., Olenchak, F. R., Subhi, Y. T., Neber, H., Sandra, K. L., & Hava, E. V. (2011). *Misdiagnosis and dual diagnoses of gifted children and adults: ADHD, bipolar, OCD, asperger's, depression, and other disorders*. Routledge. https://doi.org/10.1080/15332276.2011.11673601

Wilens, T. E., & Spencer, T. J. (2010). Understanding Attention-Deficit/Hyperactivity Disorder from Childhood to Adulthood. *Postgraduate Medicine, 122*(5), 97–109. https://doi.org/10.3810/pgm.2010.09.2206

Wolraich, M. L., Chan, E., Froehlich, T., Lynch, R. L., Bax, A., Redwine, S. T., Ihyembe, D., & Hagan, J. F., Jr. (2019). ADHD Diagnosis and Treatment

Guidelines: A Historical Perspective. *Pediatrics*, *144*(4), e20191682. https://doi.org/10.1542/peds.2019-1682

Wood, S. C. (2012). Examining parent and teacher perceptions of behaviors exhibited by gifted students referred for ADHD diagnosis using the conners 3 (an exploratory study). *Roeper Review, 34*(3), 194-204. https://doi.org/10.1080/02783193.2012.686426

Worrell, F. C., Subotnik, R. F., Olszewski-Kubilius, P., & Dixson, D. D. (2019). Gifted students. *Annual Review of Psychology*, *70*(1), 551–576. https://doi.org/10.1146/annurev-psych-010418-102846

Zawacki-Richter, O., Kerres, M., Bedenlier, S., Bond, M., Buntins, K., & SpringerLink (Online service). (2020;2019;). *Systematic reviews in educational research: Methodology, perspectives and application* (1st 2020.;1; ed.). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-27602-7

Ziegler, A. (2005). The Actiotope Model of Giftedness. *Conceptions of Giftedness*, 411–436. https://doi.org/10.1017/cbo9780511610455.024