Attention Deficit Hyperactivity Disorder and Social Skills among Riyadh's Primary School Students

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Abstract

Students with mental deficits have worse academic and extracurricular performance. The little emphasis placed on the mental attitude of schoolchildren is a hindrance to their academic performance. This study aims to examine the correlation between Attention Deficit Hyperactivity Disorder (ADHD) and gender inequalities among Riyadh's elementary schoolchildren. This study's samples comprised 200 elementary-aged youngsters of both sexes, aged 9 to 13 years. For data analysis, the partial least square method is utilized. ADHD is shown to impact the social abilities of kids of both genders. It is advised that schools embrace such training and counseling programs to improve children's social skills. Such developmental initiatives must engage both parents and educators. This study has important theoretical, practical, and methodological implications for the field of literature. The next directions of this research are crucial for expanding our understanding of ADHD.

Keywords: ADHD, social skills, gender, primary school students, Saudi Arabia

Introduction

The disorder is characterized by repetitive actions and a lack or absence of focus on specific issues demanding concentration. It leads to the dispersion among these children, who cannot acquire talent or learn something without attracting attention. In addition to their hyperactivity and impulsivity, they also demonstrate a loss of attention, hyperactivity, and impulsivity (Hinshaw et al., 2002). The frequency of attention disorders associated with excessive motor activity among American children has reached 10 percent. ADHD manifests in a child's motor coordination, inability to maintain a single stance, and inability to customarily catch objects.

In addition, the youngster gets angry and irritated. The child's attraction also characterizes ADHD to external stimuli, fast anger, and interest in anything without thought or judgment (Wolraich et al., 2019). Symptoms of hyperactivity disorder include impulsivity, switching from one activity to another, a disruption in the discipline of other children, excessive movement, climbing, and fidgeting when seated for an extended period.

ADHD in children is linked to persistent tiredness in class and frequent peer confrontations (Hollingdale et al., 2020). In addition, sleep disturbances, excessive daytime drowsiness, and an insatiable need for sleep are all associated with unfavorable outcomes. Such youngsters have behavioral and cognitive difficulties, and earlier study reveals that ADHD kids are less hopeful and productive in numerous settings. Anxiety, sadness, and hyperactivity are all childhood ADHD symptoms (Cortese et al., 2018). Prior studies indicated high anxiety, mood disorders, and general depression among adolescents with a history of ADHD in childhood (Danielson et al., 2018). Children with ADHD have a negative model of cause attribution and rely on an external (unhealthy) control point. ADHD affects youngsters of all social classes and boys disproportionately more than girls (Lawrence et al., 2021). ADHD and social skills are significant because social skills help persons acquire independence and self-reliance and enhance self-confidence and social event participation (Melegari et al., 2018). When someone demonstrates acceptable social behavior, he is considered socially skilled (Darwish, Elgohary, & Nosair, 2019). Social skills are evident and unique behavioral characteristics (Xu et al., 2018). It is defined as "the child displaying affection and tact toward others and attempting to assist and care for them" (Brown, Samuel, & Patel, 2018). Social skills are essential for creating meaningful relationships with people, overcoming humiliation, effectively resolving conflicts, and feeling self-confident. Social skills are necessary for community adaptation (Narad et al., 2018). A previous study has demonstrated that children with ADHD have poor social skills, communication with others at home and school, and psychological and social integration. Social skills are the obvious and specific

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behavioral elements that drive conduct toward positivity and interaction (Evans et al., 2018). It is crucial to evaluate ADHD as one of the fundamental psychological characteristics creating unfavorable associations in individuals and its relationship to social skills among male and female primary school pupils.

Because of the psychological, theoretical, and empirical basis for the study of ADHD and its link to social skills in children, past research indicates that ADHD is negatively connected with social skills in children of both sexes. Consequently, the current study intends to assess the association between ADHD and gender disparities among Riyadh's elementary schoolchildren. This research sampled 200 primary school-aged youngsters of both sexes between the ages of 9 and 13 years. This study's model also contributes to our understanding of ADHD. This study has important theoretical, practical, and methodological implications for the field of literature. The next directions of this research are essential for expanding our understanding of ADHD.

Literature Review

Sheridan et al. (1996) examined the efficacy of a social skills training program. Five children diagnosed with ADHD and their parents participated in the study. The sessions lasted 10 weeks and emphasized developing social skills, relationships, and problem-solving techniques. Separate sessions were held to advise parents on how to aid their children in addressing and overcoming their challenges, including how to assist their children in achieving their goals and discovering agreeable solutions to problems. After statistically analyzing the study data, the researchers determined that the improvement of social skills in children with ADHD confirmed the positive effects of the counseling program. Merrell and Wolfe (1998) investigated the relationship between impairments in preschoolers' social skills and behavioral characteristics consistent with ADHD (primer). The study included 95 ADHD children and 99 children with normal development. The data revealed that children with ADHD have a worse social competence deficit than typically developing children.

Hinshaw et al. (2002) examined the characteristics of female pre-adolescents with ADHD. The study's sample consisted of (93) girls with ADHD and (74) ordinary girls of similar age to the (88) summer program participants. It was shown that girls with ADHD struggled with language and speaking, internal/external control, academic / scholarly activities, cognitive performance, parental authority, and peer agreement. Concurrently, it was revealed that normal females were less socially isolated and more welcoming of their classmates than hyperactive and preoccupied girls. The study highlighted the importance of conducting investigations on ADHD patients. Chang et al. (2004) conducted a study to assess the efficacy of a social skills training program for treating ADHD. The study included eight four- to six-year-old children with ADHD and their parents. It has been noticed that children with ADHD have difficulties controlling their emotions and are disinterested in forming positive social relationships with their classmates. Children with ADHD require early intervention to improve their social and emotional abilities.

While promising social skills development programs for school-aged children with ADHD have been implemented in Taiwan, there are no similar programs for preschoolers. As a result, the researchers conducted this study on the clinical experiences of schooling children and their parents in social skill development. Each eight-week program session includes social skills instruction for both the child and the father. The child's sessions lasted one hour, whereas the father's lasted forty minutes. Most parents (75 percent of the sample) noticed an improvement in their children's behavior following instructions. These enhancements were characterized by their precision and enhanced emotional control.

The study conducted by Shaw-Zirt et al. (2005) on psychological adjustment, social skills, and self-esteem among college students with ADHD revealed that this illness causes difficulties during adolescence. The goal of this study was to evaluate multiple aspects of adjustment for college students with ADHD, including their social skills and self-esteem. The study compared (21) undergraduates with ADHD to (20) normal students based on age, gender (male/female), and academic achievement. Individuals with ADHD displayed a reduction in multiple facets of university adjustment, a lack of social skills, and low self-esteem, according to the study's findings. The results demonstrated a negative connection between ADHD and university adjustment, suggesting that ADHD functions as a psychological mediator of positive/negative self-esteem in college students.

Ohan and Johnston (2011) compared the rates of social competence in girls with and without ADHD. The study included 42 ADHD children and 40 normal girls aged 9 to 12. Normal females were shown to have higher self-esteem and social competence than ADHD females. The psychological and social mismatch of girls with ADHD was greater than that of their typical peers. Past research indicates a statistically unfavorable correlation between ADHD and children's social abilities. Merrell and Wolfe discovered that children with ADHD lacked social skills and the ability to communicate positively with others (1998).

Hypotheses Development

Cortese et al. (2018) showed that mental insufficiency could negatively impact pupils' classroom performance. Similarly, Xu et al. (2018) concluded that the learning performance of students who are not mentally healthy is inferior to that of their peers. According to the research conducted by Danielson et al. (2018), decision-making is a significant obstacle for students with mental deficiencies, as they struggle to make specific types of decisions. In addition, the study by Melegari et al. (2018) indicated that a lack of mental development in students diminishes their decision-making skills, which might be detrimental to their personality. The research conducted by Lawrence et al. (2021) indicated that only engaged pupils possess adequate decision-making skills. Indeed, the research conducted by Darwish et al. (2019) showed that kids should be positively inspired by their parents to make decisive social judgments. However, Wolraich et al. (2019) found that a less productive attitude among students can negatively impact their life and study choices.

Meanwhile, Darwish et al. (2019) concluded that the attention of students who are not mentally robust is less manageable than that of mentally strong students. According to the research conducted by Brown et al. (2018), students' positive and productive attitudes must be enhanced over time to improve their learning ability. Moreover, Evans et al. (2018) indicated a risk of mental impairment in students who are not functioning well and whose attention to their work is unreliable. In addition, Ask et al. (2018) observed that only mentally robust students possess psychological capital and their attention-paying attitude towards many aspects is superior to that of other students. The research of DuPau et al. (2018) indicated, however, that counseling students must strengthen their decision-making skills to ensure that they pay adequate attention to their job and other problems.

According to research by Hollingdale et al. (2020), students are required to effectively manage their time, as poor time management negatively affects their performance. Moreover, the research conducted by DuPau et al. (2018) shed light on the fact that mental issues are significant obstacles to students' decision-making and productive performance. In addition, the research conducted by Narad et al. (2018) revealed that time management decisions are crucial for students and that males with strong minds can make these judgments effectively. Similarly, Cortese et al. (2018) reported in the literature that students' time management skills must be incorporated into their decision-making. Nonetheless, Ask et al. (2018) wrote in the literature that students' decision-making skills are essential for their time management. Indeed, the research conducted by Brown et al. (2018) revealed that time management is a crucial skill for students, but those with robust and productive minds are better at it. In addition, the students' time management skills are essential for their learning. Despite this, Hinshaw et al. (2002) found that most mentally impaired pupils failed to manage their time well. Based on past research, the following hypothesis can be formulated:

H1: The presence of ADHD negatively affects school students' decision-making.

H2: The presence of ADHD negatively affects school students' attention paying.

H3: The presence of ADHD negatively affects school students' time management.

The framework of this study is reported in Figure 1.

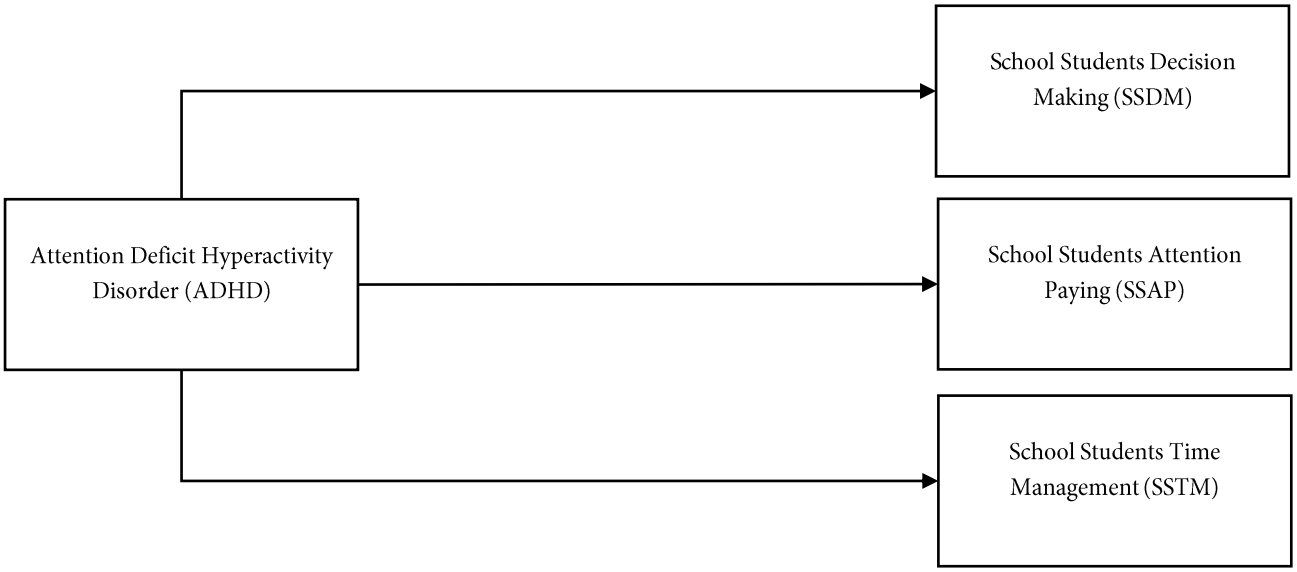

Figure 1. Research Model

Methodology

The research employed a descriptive (correlative / comparative) methodology, which depicts a phenomenon in its natural state. It seeks to assess the relationship between the study factors and the reality of Riyadh's elementary schools. In addition, gender differences in ADHD and social skills scores are considered. Male and female elementary school children in Riyadh with ADHD comprised the study sample's demographic. Children with visible physical impairments, those who do not live in a natural climate, and those who have experienced parental/family deprivation (via death or divorce) were excluded from the initial study sample. The sample was homogenized by month-based chronological age. Males were recruited from four elementary schools in Riyadh, whereas females were recruited from seven elementary schools. Riyadh elementary school, kids of all sexes with ADHD comprised a total sample size of 200.

Shaw-Zirt et al. (2005) created a test for ADHD and classified its characteristics as "inattention, hyperactivity, and impulsivity." In addition, the tool's creator picked the scale responses using the Likert method, which includes one to five options. The instrument's validity was tested by administering it to a sample of Saudi primary school kids in Riyadh over six weeks to ascertain the correlation coefficient between the two applications. The correlation value was 0.66, a statistically significant positive correlation coefficient suggesting the instrument's stability, capacity to assess this variable, and relevance to the current sample of primary school students from Riyadh. The evaluating children's social skills (ESS) scale was developed by Ogden and Lo (2012), Spooren, Mortelmans, and Denekens (2007), and Macan et al. (1990). The current study tried validating the tool by utilizing the study population of elementary school students in Riyadh, Saudi Arabia. The correlation coefficient achieved (.717), a statistically significant positive correlation coefficient confirming the instrument's reliability and capacity to assess this variable.

Findings and Data Analysis

This research's data analysis began with "skewness and kurtosis" findings. According to Bai and Ng (2005), "skewness is a measure of symmetry, or more accurately, its absence. A distribution or data set is symmetric if the appearance to the left and right of the central point is the same. In addition, Mardia (1974) found that "kurtosis is a measure of whether data have heavy or light tails relative to a normal distribution." The acceptable findings are presented in Table 1, and this study's data is "normal."

Table 1

Skewness and Kurtosis

Items	Mean	Standard Deviation	Excess Kurtosis	Skewness
ADHD1	3.271	1.482	-0.352	0.110
ADHD2	3.249	1.776	-0.520	0.462
ADHD3	3.507	1.853	-0.757	0.323
ADHD4	3.436	1.863	-0.718	0.411
ADHD5	3.538	1.702	-0.414	0.332
SSDM1	3.498	1.797	-0.680	0.251
SSDM2	3.516	1.824	-0.860	0.161
SSDM3	3.644	1.811	-0.705	0.192
SSDM4	3.702	1.868	-0.773	0.312
SSDM5	3.667	1.916	-0.748	0.376
SSDM6	3.524	1.852	-0.644	0.405
SSDM7	3.560	1.808	-0.541	0.370
SSAP1	3.587	1.841	-0.667	0.343
SSAP2	3.471	1.754	-0.420	0.456
SSAP3	3.493	1.884	-0.881	0.221
SSAP4	3.476	1.804	-0.613	0.323
SSAP5	3.667	1.746	-0.561	0.294
SSAP6	3.027	1.466	0.050	0.652
SSTM1	3.129	1.499	0.607	0.959
SSTM2	3.191	1.450	0.849	0.958
SSTM3	3.107	1.457	0.563	0.803
SSTM4	3.076	1.395	0.556	0.705
SSTM5	3.124	1.518	0.407	0.762
SSTM6	3.102	1.459	0.648	0.868
SSTM7	2.964	1.442	-0.233	0.475

According to Li et al. (2020), "factor loading (FL) is the variable-factor correlation coefficient. Factor loading reveals the proportion of variance explained by a variable on a specific factor. Meanwhile, Peterson (2000) found that "a factor loading of 0.7 or higher indicates that the factor extracts sufficient variance from the variable." The research has accepted "FL," and the corresponding values are listed in Table 2.

Table 2

Scale Items and Factor Loading

"Construct	Items	Description	FL
ADHD	ADHD1	I face a deficiency in attention.	0.901
	ADHD2	I fail in time management.	0.909
	ADHD3	The lack of interest in my common habit.	0.915
	ADHD4	I am not confident in decision-making.	0.898
	ADHD5	My parents support me in my choices.	0.882
SSAP	SSAP1	I lose attention to my work.	0.884
	SSAP2	I am not confident in my work.	0.895
	SSAP3	Attention to my objective is necessary.	0.909
	SSAP4	Sometimes, I am failed to get success.	0.906
	SSAP5	I face challenges in paying attention.	0.896
	SSAP6	Attention to work is necessary for me.	0.760
SSDM	SSDM1	I get the support of my parents in decision-making.	0.902
	SSDM2	My teachers assist me in decision-making.	0.890
	SSDM3	I am facing challenges in decision-making.	0.902
	SSDM4	My decisions are productive in output.	0.911
	SSDM5	I have sustainability in decision-making.	0.923
	SSDM6	I face challenges in my judgments.	0.908
	SSDM7	I make the right decisions at the right time.	0.861
SSTM	SSTM1	Time management is necessary for me.	0.893
	SSTM2	I face hurdles in the management of time.	0.898
	SSTM3	The challenges in time management can be reduced.	0.892
	SSTM4	Time management is productive work.	0.899
	SSTM5	Only mentally strong students can manage their time.	0.921
	SSTM6	Time management helps to achieve goals.	0.927
	SSTM7	Time management can be improved with peer support."	0.870

In addition, as reported by Taber (2018), "Cronbach's alpha (α > 0.70) is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability." Likewise, as reported by Moonen-van Loon et al. (2013), "composite reliability (CR > 0.70) is a measure of internal consistency in scale items, much like Cronbach's alpha." Meanwhile, as reported by Alarcón, Sánchez, and De Olavide (2015), "average variance extracted (AVE > 0.50) is a measure of the amount of variance that is captured by a construct about the amount of variance due to measurement error." The values reported in Table 3 and Figure 2 confirmed the "reliability and validity" of the research.

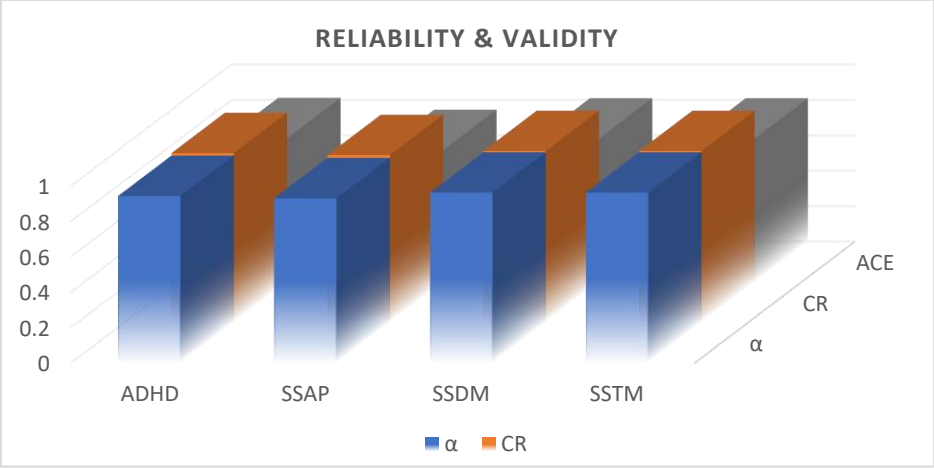

Figure 2. Cronbach' Alpha, CR, and AVE

Table 3

Reliability and Validity

Construct	α	CR	ACE
ADHD	0.942	0.956	0.812
SSAP	0.929	0.945	0.745
SSDM	0.961	0.968	0.810
SSTM	0.961	0.968	0.810

Table 4

Discriminant Validity – Cross Loadings

Items	ADHD	SSAP	SSDM	SSTM
ADHD1	**0.901**	0.831	0.844	0.709
ADHD2	**0.909**	0.822	0.849	0.599
ADHD3	**0.915**	0.825	0.845	0.601
ADHD4	**0.898**	0.828	0.840	0.661
ADHD5	**0.882**	0.845	0.867	0.651
SSAP1	0.820	**0.884**	0.863	0.562
SSAP2	0.820	**0.895**	0.844	0.537
SSAP3	0.857	**0.909**	0.895	0.599
SSAP4	0.826	**0.906**	0.844	0.616
SSAP5	0.814	**0.896**	0.813	0.608
SSAP6	0.608	**0.866**	0.586	0.822
SSDM1	0.863	0.824	**0.902**	0.640
SSDM2	0.855	0.829	**0.890**	0.625
SSDM3	0.840	0.846	**0.902**	0.586
SSDM4	0.844	0.884	**0.911**	0.612
SSDM5	0.868	0.875	**0.923**	0.587
SSDM6	0.841	0.853	**0.908**	0.610
SSDM7	0.823	0.829	**0.861**	0.601
SSTM1	0.646	0.657	0.621	**0.893**
SSTM2	0.609	0.614	0.586	**0.898**
SSTM3	0.616	0.611	0.583	**0.892**
SSTM4	0.660	0.658	0.641	**0.899**
SSTM5	0.651	0.638	0.615	**0.921**
SSTM6	0.687	0.657	0.638	**0.927**
SSTM7	0.636	0.628	0.576	**0.870**

Table 5

Discriminant Validity – HTMT

Construct	ADHD	SSAP	SSDM	SSTM
ADHD				
SSAP	0.784			
SSDM	0.699	0.795		
SSTM	0.651	0.768	0.704	

According to Alarcón et al. (2015), discriminant validity assesses whether theoretically unrelated constructs are unrelated. Cross-loading to prove discriminant validity at the item level, according to Li et al. (2020), implies a strong correlation between items of the same construct and a very weak correlation between items of a different construct. The results of "cross-loadings" have been acknowledged and are detailed in Table 4. Moreover, Heteritrait-Monotrait (HTMT) values near 1 imply a lack of discriminant validity, according to Alarcón et al. (2015). Similarly, Roemer, Schuberth, and Henseler (2021) proved that "using the HTMT as a criterion involves comparing it to a predefined threshold; if the HTMT's value is greater than this threshold, one can conclude that the test lacks discriminant validity." The "HTMT" findings are acknowledged and summarized in Table 5.

The results of this study's hypotheses are derived from the obtained "structural model results." First, H1 is acknowledged, and it is demonstrated that the presence of ADHD negatively impacts the decision-making of school kids. Second, H2 is accepted, and it is shown that the presence of ADHD negatively impacts the attentiveness of school kids. Thirdly and finally, H3 is acknowledged, and it is demonstrated that the presence of ADHD negatively impacts the time management of school kids. Figure 2 and Table 6 display the outcome data.

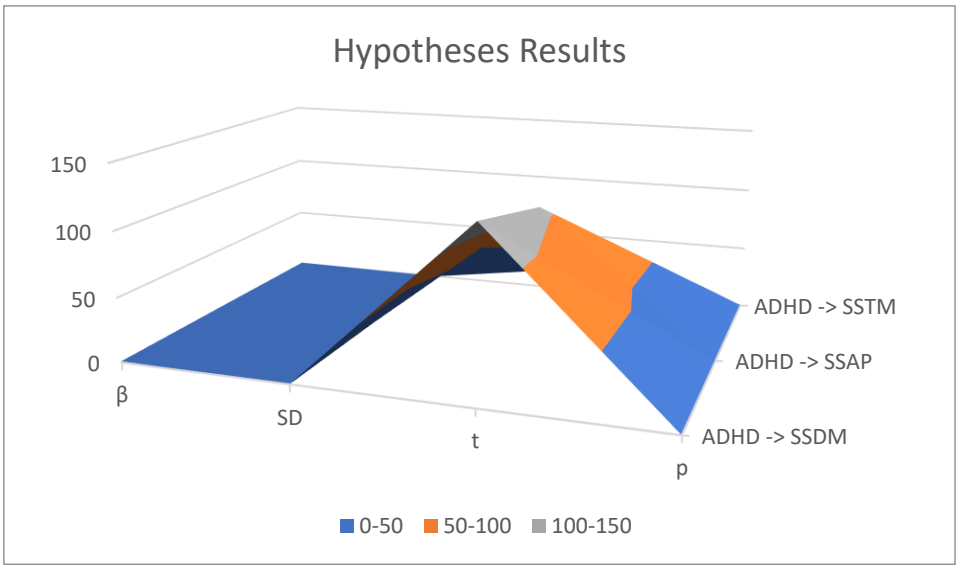

Figure 3. Hypotheses Results

Table 6

Hypotheses Test

Paths	β	SD	t	p
ADHD -> SSDM	0.943	0.007	128.957	0
ADHD -> SSAP	0.922	0.009	106.93	0
ADHD -> SSTM	0.716	0.036	20.078	0

Finally, the "productive relevance" of the research is tested. In this way, Wong (2016) reported, "predictive relevance is vital to measure how well-observed values are reproduced by the model." According to Sarstedt and Cheah (2019), "Q-square is predictive relevance, measures whether a model has predictive relevance or not ($Q^2 > 0$) is good." The outcome values are available in Table 7, which demonstrates that the research model has "strong predictive relevance."

Table 7

Predictive Relevance

Constructs	SSO	SSE	Q^2 (=1-SSE/SSO)
ADHD	1125	1125	
SSAP	1350	502.05	0.628
SSDM	1575	450.896	0.714
SSTM	1575	928.136	0.411

Discussion

Without a doubt, this study aims to examine the association between ADHD and gender disparities among elementary school students in Riyadh, Saudi Arabia. This data analysis revealed that ADHD negatively impacts pupils' social abilities. Based on the findings of Hypothesis 1, the existence of ADHD negatively impacts the decision-making of schoolchildren. In addition, the results of H2 indicated that the presence of ADHD negatively affects the attentiveness of schoolchildren. The data acquired from H3 suggest that the existence of ADHD negatively impacts the time management of school kids. These results are compared to previous investigations reported in the scientific literature. Consistent with the findings of Merrell and Wolfe, statistical evidence indicates that ADHD influences the social abilities of children of both sexes (1998). This study confirms prior findings that ADHD harms the social skills of both male and female children. Impulsiveness and contempt for social norms are defining characteristics of children with ADHD. They isolate individuals from others and impede their ability to engage in constructive dialogue (Whalen, 1989).

Furthermore, it was discovered that male children with ADHD outnumber female children. This conclusion is backed by theoretical and empirical data from the studies of Montiel et al. (2008). Furthermore, it has been demonstrated that children with ADHD lack social skills and interact constructively with others (Hinshaw et al., 2002). In terms of social skills, female youngsters outperformed male children, according to the study's findings.

In addition, this study demonstrates that children with ADHD may have unfavorable outcomes if they are successfully coached and transformed in developing their social skills. Male children appeared to have fewer social abilities than their female counterparts. The most obvious reason may be their social environment. In Arab society, female youngsters receive significantly more attention from their parents and older family members; hence, they appear to have superior social handling. In contrast, male children are typically disadvantaged relative to their female siblings; therefore, they lack social skills. In light of these findings, the school must be incentivized to implement interventions that will assist these pupils in developing social skills.

According to the findings of Darwish et al. (2019), only the most engaged pupils are capable of making sound decisions. According to Hinshaw et al. (2002), parents should encourage their children to make sensible social decisions. Nevertheless, according to the study by Narad et al. (2018), students' less productive attitudes can influence their life and education choices. According to the study by Ask et al. (2018), children's mental health can impact their classroom performance. Similarly, DuPau et al. (2018) asserted that children with psychological disorders perform less academically than other students. According to research by Danielson et al. (2018), learners with mental deficits have a significant problem with judgment since they repeatedly fail to make certain judgments. Hollingdale et al. (2020) also indicated that students' decision-making skills were impaired due to their slower mental development, which could negatively affect their personalities.

In addition, Cortese et al. (2018) discovered that only intellectually robust pupils can regulate their emotions and that these students have stronger attention-paying attitudes toward numerous aspects than other children. The study by Ask et al. (2018) indicated that counseling must help students make better decisions to ensure that they give their work and other concerns the attention they deserve. In contrast, the study by Narad et al. (2018) found that students with poor cognitive abilities had less attentional control than students with strong cognitive skills. According to the research conducted by Evans et al. (2018), paying attention is a quality of student behavior that must be cultivated over time to become better

learners. The additional conclusion of the Darwish et al. (2019) study is that students who are not performing effectively and whose attention to their work are unreliable may be mentally impaired.

Nonetheless, according to research by Narad et al. (2018), children's decision-making ability is crucial to job completion. According to a study by Brown et al. (2018), time management is vital for students, but only those with powerful and efficient minds can thrive. Additionally, the students' ability to manage their time is crucial to their capacity to study. However, Danielson et al. (2018) observed that most mentally disabled students had poor time management. The study by Melegari et al. (2018) suggests that children must efficiently manage their time to maintain productivity.

Moreover, Wolraich et al. (2019) research illuminated that mental health difficulties impede students' ability to make prudent judgments and perform successfully. In addition, the study by Darwish et al. (2019) emphasized that children must make decisions regarding their time management and that guys with strong minds may work well on these decisions. Similarly, the study by Xu et al. (2018) demonstrated that children's findings must be supported by their time management and organizational skills. According to Lawrence et al., students' productivity can be boosted if they have efficient time management abilities (2021). In light of the results of these studies, the accepted hypotheses of this research are supported by the relevant literature.

Conclusion

According to the results of this study, there must be an interest in implementing training and counseling programs to guarantee that parents and educators receive optimal counseling for the right educational treatment of children of both sexes with ADHD, especially those with ADHD. In addition, an attractive educational/study atmosphere must be developed for youngsters of both sexes with ADHD to facilitate academic achievement and comprehension. Similarly, the development of social skills must be addressed for children with ADHD disorder, as they are often singled out for blame and punishment by parents and educators to regulate their excessive movement and activity on the one hand and improve their concentration on the other. Additionally, the negative effects of ADHD, such as anxiety, aggression, and depression, must be addressed with therapeutic/counseling interventions with the child and environmental counseling with parents and educators.

Theoretical Implications, Practical Implications, and Future Directions

This study's approach, based on the negative characteristics of ADHD, is an essential contribution to the body of knowledge. Significantly, this study's data analysis contributed to the literature on the negative effects of ADHD on students' social skills. First, the research revealed that the existence of ADHD negatively impacts the decision-making of school kids. Prior research on ADHD has not identified this correlation between ADHD and its harmful impact on student decision-making. Second, according to the investigation provided in the ADHD information, the presence of ADHD negatively impacts the attentiveness of school pupils. Prior studies on ADHD have not found this correlation between ADHD and its detrimental effect on students' ability to pay attention. In addition, the study revealed in the ADHD knowledge that the existence of ADHD severely impacts the time management of school kids. Previous studies on ADHD have not shown this correlation between ADHD and its poor impact on students' time management. In this approach, this research has contributed to developing a novel relationship between ADHD and knowledge that future academics will need to examine. These unfavorable correlations between school testing and student achievement were not described in the literature before this study.

In the body of knowledge, the practical consequences of this research are notable. Families, educators, and children with ADHD of both sexes receive the highest-quality recommendations for the most effective educational intervention due to the research's contribution. In addition, another practical implication of this study is that to promote student accomplishment and comprehension, a friendly classroom environment for boys and girls with ADHD must be created. Similarly, another practical implication of this research is that the development of interpersonal skills must be prioritized for children with ADHD, as they are frequently singled out for blame and discipline by educators or parents to reduce their body movements and motion on the one hand and improve their concentration on the other. Similarly, another practical conclusion of this study is the significance of addressing the negative impacts of ADHD, such as stress, anger, and depression, through therapy and counseling services procedures with the child and parental and educational environment therapy. Without a doubt, by focusing on these practical aspects, schoolchildren can lessen the effects of ADHD and enhance their working and social abilities.

The study found that ADHD affects the social abilities of pupils of both genders. It is advised that schools embrace such training and counseling programs to improve children's social skills. Parents and educators must therefore be included in such developmental programs. This study has important theoretical, practical, and methodological implications for the field of literature. Indeed, the future directions of this research are essential for expanding our understanding of ADHD. Future research must evaluate the effectiveness of a counseling program for enhancing social skills in children with ADHD of both sexes. Second, the studies must measure the anxiety in children with ADHD of both sexes and its relationship to depression and aggressive behavior. Thirdly, the research must examine the relationship between parental parenting styles and social skills in male and female children with ADHD. Fourthly, the studies must evaluate the relationship between ADHD and self-efficacy in male and female primary school students. The studies must also analyze the effectiveness of a counseling program in lowering psychological stress among mothers of children with ADHD.

Declaration of Interest Statement

Acknowledgment

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Reporting on Human Participants

The purpose and the objectives of the study were conveyed to the participants properly. Consent was obtained from the participants of the survey. It was also ascertained that permission was given freely.

Conflict of Interest

We, the authors of this paper, earnestly declare that there is no conflict of interest or relationship, financial or otherwise (between us and any individual, organization, or group of people) that might be perceived as influencing our objectivity.

Originality

We certify that the submission is original work and is not under review at any other publication.

References

Alarcón, D., Sánchez, J. A., & De Olavide, U. (2015). Assessing convergent and discriminant validity in the ADHD-R IV rating scale: User-written commands for Average Variance Extracted (AVE), Composite Reliability (CR), and Heterotrait-Monotrait ratio of correlations (HTMT). In *Spanish STATA meeting* (pp. 1-39). STATA. https://www.stata.com/meeting/spain15/abstracts/materials/spain15_alarcon.pdf

Ask, H., Gustavson, K., Ystrom, E., Havdahl, K. A., Tesli, M., Askeland, R. B., & Reichborn-Kjennerud, T. (2018). Association of gestational age at birth with symptoms of attention-deficit/hyperactivity disorder in children. *JAMA pediatrics, 172*(8), 749-756. https://doi.org/10.1001/jamapediatrics.2018.1315

Bai, J., & Ng, S. (2005). Tests for skewness, kurtosis, and normality for time series data. *Journal of Business & Economic Statistics, 23*(1), 49-60. https://doi.org/10.1198/073500104000000271

Brown, K. A., Samuel, S., & Patel, D. R. (2018). Pharmacologic management of attention deficit hyperactivity disorder in children and adolescents: a review for practitioners. *Translational pediatrics, 7*(1), 36–47. https://doi.org/10.21037/tp.2017.08.02

Chang, C.-C., Tsou, K.-S., Shen, W. W., Wong, C.-C., & Chao, C.-C. (2004). A social skills training program for preschool children with attention-deficit/hyperactivity disorder. *Chang Gung Medical Journal, 27*(12), 918-923. http://cgmj.cgu.edu.tw/2712/271208.pdf

Cortese, S., Adamo, N., Del Giovane, C., Mohr-Jensen, C., Hayes, A. J., Carucci, S., Atkinson, L. Z., Tessari, L., Banaschewski, T., & Coghill, D. (2018). Comparative efficacy and tolerability of medications for attention-deficit hyperactivity disorder in children, adolescents, and adults: a systematic review and network meta-analysis. *The Lancet Psychiatry, 5*(9), 727-738. https://doi.org/10.1016/S2215-0366(18)30269-4

Danielson, M. L., Visser, S. N., Chronis-Tuscano, A., & DuPaul, G. J. (2018). A national description of treatment among United States children and adolescents with attention-deficit/hyperactivity disorder. *The Journal of pediatrics, 192*, 240-246. e241. https://doi.org/10.1016/j.jpeds.2017.08.040

Darwish, A. H., Elgohary, T. M., & Nosair, N. A. (2019). Serum interleukin-6 level in children with attention-deficit hyperactivity disorder (ADHD). *Journal of child neurology, 34*(2), 61-67. https://doi.org/10.1177/0883073818809831

DuPau, G. J., Franklin, M. K., Pollack, B. L., Stack, K. S., Jaffe, A. R., Gormley, M. J., AnastopouIos, A. D., & Weyandt, L. L. (2018). Predictors and trajectories of educational functioning in college students with and without attention-deficit/hyperactivity disorder. *Journal of postsecondary education and disability, 31*(2), 161-178. https://pubmed.ncbi.nlm.nih.gov/31225528

Evans, S. W., Owens, J. S., Wymbs, B. T., & Ray, A. R. (2018). Evidence-based psychosocial treatments for children and adolescents with attention deficit/hyperactivity disorder. *Journal of Clinical Child & Adolescent Psychology, 47*(2), 157-198. https://doi.org/10.1080/15374416.2017.1390757

Hinshaw, S. P., Carte, E. T., Sami, N., Treuting, J. J., & Zupan, B. A. (2002). Preadolescent girls with attention-deficit/hyperactivity disorder: II. Neuropsychological performance in relation to subtypes and individual classification. *Journal of consulting and Clinical Psychology, 70*(5), 1099–1111. https://doi.org/10.1037/0022-006X.70.5.1099

Hollingdale, J., Woodhouse, E., Young, S., Fridman, A., & Mandy, W. (2020). Autistic spectrum disorder symptoms in children and adolescents with attention-deficit/hyperactivity disorder: a meta-analytical review. *Psychological medicine, 50*(13), 2240-2253. https://doi.org/10.1017/S0033291719002368

Lawrence, D., Houghton, S., Dawson, V., Sawyer, M., & Carroll, A. (2021). Trajectories of academic achievement for students with attention-deficit/hyperactivity disorder. *British Journal of Educational Psychology, 91*(2), 755-774. https://doi.org/10.1111/bjep.12392

Li, Y., Wen, Z., Hau, K.-T., Yuan, K.-H., & Peng, Y. (2020). Effects of cross-loadings on determining the number of factors to retain. *Structural Equation Modeling: A Multidisciplinary Journal, 27*(6), 841-863. https://doi.org/10.1080/10705511.2020.1745075

Macan, T. H., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College students' time management: Correlations with academic performance and stress. *Journal of educational psychology, 82*(4), 760–768. https://doi.org/10.1037/0022-0663.82.4.760

Mardia, K. V. (1974). Applications of some measures of multivariate skewness and kurtosis in testing normality and robustness studies. *Sankhyā: The Indian Journal of Statistics, Series B, 36*(2), 115-128. https://www.jstor.org/stable/25051892

Melegari, M. G., Bruni, O., Sacco, R., Barni, D., Sette, S., & Donfrancesco, R. (2018). Comorbidity of attention deficit hyperactivity disorder and generalized anxiety disorder in children and adolescents. *Psychiatry Research, 270*, 780-785. https://doi.org/10.1016/j.psychres.2018.10.078

Merrell, K. W., & Wolfe, T. M. (1998). The relationship of teacher-rated social skills deficits and ADHD characteristics among kindergarten-age children. *Psychology in the Schools, 35*(2), 101-110. https://doi.org/10.1002/(SICI)1520-6807(199804)35:2<101::AID-PITS1>3.0.CO;2-S

Montiel, C., Peña, J. A., Montiel-Barbero, I., & Polanczyk, G. (2008). Prevalence rates of attention deficit/hyperactivity disorder in a school sample of Venezuelan children. *Child psychiatry and human development, 39*, 311-322. https://doi.org/10.1007/s10578-007-0090-5

Moonen-van Loon, J., Overeem, K., Donkers, H., Van der Vleuten, C., & Driessen, E. (2013). Composite reliability of a workplace-based assessment toolbox for postgraduate medical education. *Advances in Health Sciences Education, 18*, 1087-1102. https://doi.org/10.1007/s10459-013-9450-z

Narad, M. E., Kennelly, M., Zhang, N., Wade, S. L., Yeates, K. O., Taylor, H. G., Epstein, J. N., & Kurowski, B. G. (2018). Secondary attention-deficit/hyperactivity disorder in children and adolescents 5 to 10 years after traumatic brain injury. *JAMA pediatrics, 172*(5), 437-443. https://doi.org/10.1001/jamapediatrics.2017.5746

Ogden, J., & Lo, J. (2012). How meaningful are data from Likert scales? An evaluation of how ratings are made and the role of the response shift in the socially disadvantaged. *Journal of health psychology, 17*(3), 350-361. https://doi.org/10.1177/1359105311417192

Ohan, J. L., & Johnston, C. (2011). Positive illusions of social competence in girls with and without ADHD. *Journal of Abnormal Child Psychology, 39*, 527-539. https://doi.org/10.1007/s10802-010-9484-0

Peterson, R. A. (2000). A meta-analysis of variance accounted for and factor loadings in exploratory factor analysis. *Marketing letters, 11*, 261-275. https://doi.org/10.1023/A:1008191211004

Roemer, E., Schuberth, F., & Henseler, J. (2021). HTMT2–an improved criterion for assessing discriminant validity in structural equation modeling. *Industrial Management & Data Systems, 121*(12), 2637-2650. https://doi.org/10.1108/IMDS-02-2021-0082

Sarstedt, M., & Cheah, J.-H. (2019). Partial least squares structural equation modeling using SmartPLS: a software review. *Journal of Marketing Analytics, 7*(3), 196-202. https://doi.org/10.1057/s41270-019-00058-3

Shaw-Zirt, B., Popali-Lehane, L., Chaplin, W., & Bergman, A. (2005). Adjustment, social skills, and self-esteem in college students with symptoms of ADHD. *Journal of attention disorders, 8*(3), 109-120. https://doi.org/10.1177/1087054705277775

Sheridan, S. M., Dee, C. C., Morgan, J. C., McCormick, M. E., & Walker, D. (1996). A multimethod intervention for social skills deficits in children with ADHD and their parents. *School Psychology Review, 25*(1), 57-76. https://doi.org/10.1080/02796015.1996.12085802

Spooren, P., Mortelmans, D., & Denekens, J. (2007). Student evaluation of teaching quality in higher education: development of an instrument based on 10 Likert-scales. *Assessment & Evaluation in Higher Education, 32*(6), 667-679. https://doi.org/10.1080/02602930601117191

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in science education, 48*, 1273-1296. https://doi.org/10.1007/s11165-016-9602-2

Whalen, C. K. (1989). Attention Deficit and Hyperactivity Disorders. In T. H. Ollendick & M. Hersen (Eds.), *Handbook of child psychopathology* (pp. 131-169). Boston, MA: Springer US. https://doi.org/10.1007/978-1-4757-1162-2_7

Wolraich, M. L., Hagan, J. F., Allan, C., Chan, E., Davison, D., Earls, M., Evans, S. W., Flinn, S. K., Froehlich, T., & Frost, J. (2019). Clinical practice guideline for the diagnosis, evaluation, and treatment of attention-deficit/hyperactivity disorder in children and adolescents. *Pediatrics, 144*(4), e20192528. https://doi.org/10.1542/peds.2019-2528

Wong, K. K.-K. (2016). Mediation analysis, categorical moderation analysis, and higher-order constructs modeling in Partial Least Squares Structural Equation Modeling (PLS-SEM): A B2B Example using SmartPLS. *Marketing Bulletin, 26*, 1-22. http://marketing-bulletin.massey.ac.nz/V26/MB_v26_T1_Wong_2016.pdf

Xu, G., Strathearn, L., Liu, B., Yang, B., & Bao, W. (2018). Twenty-year trends in diagnosed attention-deficit/hyperactivity disorder among US children and adolescents, 1997-2016. *JAMA network open, 1*(4), e181471. https://doi.org/10.1001/jamanetworkopen.2018.1471