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Original Article

A Comparison of Academic Motivation and Academic Self-concept of Children with and Without Attention Deficit Hyperactivity Disorder

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Abstract

Background: Attention-deficit/hyperactivity disorder (ADHD) is one of the most common neurological disorders in elementary school children. This study was conducted to compare he academic motivation and academic self-concept of students with and without ADHD.

Methods: The research population consisted of all male students aged 9 to 12 studying in the first semester of the school year 2023-2024 in Borujerd, Iran. The participants were 60 students who were selected via G*Power software using cluster sampling. The selected students were then divided into two groups with and without ADHD (each with 30 members). Data were collected using the revised Conners' Parent Rating Scale (CPRS-R), Harter's Academic Motivation Scale (AMS), and Chen's Academic Self-Concept Questionnaire. Data were analyzed using multivariate analysis of variance (ANOVA) via SPSS-22 software.

Results: The findings indicated no statistically significant difference between the two groups of students in terms of academic motivation and academic self-concept. Accordingly, the academic and general motivation of the students with ADHD was slightly different from that of the students without ADHD. Moreover, the internal and external academic self-concepts of the students with ADHD were slightly different from those of the students without ADHD. Moreover, the internal and external academic self-concepts of the students with ADHD were slightly different from those of the students without ADHD.

Conclusion: Factors such as parenting styles and an effective educational environment may have improved academic motivation and self-concept in students with ADHD in this study.

Keywords: Attention-deficit/hyperactivity disorder, Academic motivation, Academic self-concept

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Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a psychiatric disorder whose biological aspect is highly emphasized. This disorder is characterized by a combination of signs and symptoms of attention deficit, hyperactivity, and impulsivity. The prevalence of this disorder in boys is 2 to 9 times higher than in girls. Although the onset of ADHD is in childhood, it is prevalent in different ages from childhood to adulthood (1). About 30% to 50% of children with ADHD show symptoms of conduct disorder and antisocial behaviors (2).

ADHD is associated with inhibition deficits as the main core of executive functions (3). A dual path has been proposed to address the cognitive deficits of children with ADHD. The first path accounts for the deficit in executive functions and is related to the deficiency in response inhibition, and the second path accounts for the deficit in the motivational process, which shows the poor reward system in affected children (4).

Moreover, ADHD seems to be associated with certain types of motivational deficits, but not a complete lack of motivation. There are two main types of motivation: intrinsic and extrinsic. Intrinsic motivation comes from one's inner interests and desires (personal satisfaction), but external motivation is influenced by the presence of an external reward or benefit (2).

Academic motivation refers to the internal or external desire of individuals to participate in academic activities, pursue learning, and achieve educational goals, and involves psychological processes and factors that influence the behavior and efforts of individuals to perform academic tasks such as studying, attending classes, and doing assignments and other educational activities (5). Since most children with ADHD have problems maintaining attention and concentration in classwork, study, and other school-related tasks due to defects in executive functions,

their academic motivation decreases over time (6). In addition to cognitive deficits, these students have problems with motivational changes (5). Children with ADHD may have less academic motivation than normal children. In addition, the biggest difference between the two groups of children is related to intrinsic motivation (7).

The mental representation of people's abilities in educational and academic fields has been defined as academic self-concept (8). Given the cognitive and motivational problems of children with ADHD, they achieve few successes in their educational process and experience many failures, which lead to the weakening of the academic self-concept in these children. A study of 564 adolescents (12 to 15 years old) showed that adolescents with ADHD, specifically those with severe attention deficit symptoms, have lower levels of academic self-concept. However, hyperactive-impulsive symptoms were associated with the lowest behavioral self-concept (9).

Given the academic motivation and academic self-concept problems faced by students with ADHD and the paucity of research in this field, more studies are needed to compare the academic motivation and academic self-concept of students with and without ADHD. Accordingly, the insights from the study will be useful for teachers, administrators, and parents of students with ADHD and can help them develop the necessary training and support programs for these students to prevent a decrease in their academic motivation and academic self-concept, hence allowing them to improve their mental health and academic achievements. To this end, the present study aimed to find out whether there is a difference between academic motivation and academic self-concept of 9-12-year-old students with and without ADHD.

Methods

This analytical cross-sectional study was conducted on 9-12-year-old students studying in the first semester of the school year 2023-2024 in Borujerd, Iran. The participants were 30 students with ADHD and 30 students without ADHD who were selected from different schools based on the scores on the revised Conners' Parent Rating Scale (CPRS-R) using cluster sampling. The criteria for enrollment in the study were not taking ADHD medications such as Ritalin, obtaining at least a score of 34 on CPRS-R, not being a slow learner, and having a normal IQ. The exclusion criteria were the failure to complete all items in the questionnaires and having high levels of stress when filling out the questionnaires. In this study, the CPRS-R was first completed by the students' parents, and 30 students who scored 34 or higher were selected as the members of the ADHD group. Then, Harter's Academic Motivation Scale (AMS) and Academic Self-Concept Questionnaire were completed on two separate occasions by both groups of students with and without ADHD. To comply with ethical protocols, written consent was obtained from the parents of the students in the two groups, and the rights of all participants were preserved following the APA ethical guidelines. Furthermore, the students and their parents received some instructions about the research procedure. The participants' data were used anonymously and confidentially. All the students in this study, including 30 students with ADHD and 30 students without ADHD, were male aged 9-12 years.

Instruments

Conners' Parent Rating Scale: The CPRS-R is used to diagnose children with ADHD. The instrument has 26 items scored on a four-point Likert scale (not observed, mild, moderate, and severe). The total score for a respondent varies from 26 to 104. A score higher than 34 indicates ADHD in the child. The higher the score, the more severe the child's ADHD and vice versa. This scale measures five subscales including conduct problems, learning problems, psychosomatic problems, impulsivity-hyperactivity, and anxiety: (1) Conduct problems: This subscale has 8 items that measure problems such as rudeness, irritability, vandalism, and quarrels. Cronbach's alpha coefficient for this subscale was reported as 0.74 (10), (2) Learning problems: This subscale has 4 items that measure problems such as distraction, carelessness, and frustration in activities. Cronbach's alpha coefficient for this subscale was reported as 0.63 (10), (3) Psychosomatic problems: This subscale contains 4 items that assess headache, nausea, and sleeping problems. The reported Cronbach's alpha coefficient for this subscale was 0.91(10), (4) Hyperactivity-impulsivity: This subscale has 4 items that evaluate problems such as restlessness and distraction. The reported Cronbach's alpha coefficient for this subscale was 0.70 (10), and (5) Anxiety-passivity: This subscale also consists of 4 items, measuring problems such as shyness, timidity, and worry. The reliability of the scale has been reported as 0.90 (11). The validity and reliability of the Persian version of the scale have also been confirmed. The scale's validity was reported as 0.85 by the Institute of Cognitive Sciences (12). That reported a test-retest coefficient of 0.58 for the whole scale (13). The corresponding value ranges from 0.41 for the social problems subscale to 0.76 for the conduct problems subscale. They also reported Cronbach's alpha coefficient of 0.73 for the whole scale. Moreover, the corresponding values varied from 0.57 (social problems subscale) to 0.86 (anxiety-shyness subscale).

Harter's AMS: The scale was developed in 1980. It has 33 items that assess academic motivation among students. Harter's original scale measures academic motivation with dichotomous items, assessing intrinsic motivation and extrinsic motivation. Each item addresses either intrinsic motivation or extrinsic motivation. Since both intrinsic and extrinsic motivations play a role in many

academic subjects, that converted Harter's scale into a common scale, where each item addresses only one of the reasons for intrinsic and extrinsic motivation (14). The items on the scale are scored based on a five-point Likert scale, including almost always (1), most of the time (2), sometimes (3), rarely (4), and never (5). A respondent's total score ranges from 33 to 165. The higher the score, the more academically motivated the respondent is. that reported a Cronbach's alpha coefficient of 0.92 for this scale and reported a test-retest reliability coefficient of 0.72 within a 5-week interval (15). Furthermore, the convergent validity of this scale was reported equal to 0.62 by calculating the correlation coefficient with the AMS (15), which indicates the acceptable validity of the instrument. that reported the Cronbach's alpha coefficient of the scale as 0.81 and its retest reliability as 0.79(16). The reliability of the scale was confirmed with Cronbach's alpha of greater than 0.92 (17). Internal consistency values were reported between 0.30 and 0.78 by calculating the correlation of each item with the total score of the scale (18). Correlation coefficients to assess the internal consistency of the intrinsic motivation subscale for different items were reported from 0.30 to 0.78 ($P<0.01$). In addition, the internal consistency of the extrinsic motivation subscale ranged from 0.30 to 0.67 ($P<0.01$), except for items 3 and 23 showing low correlations (0.02 and 0.18) with the total score.

Chen's Academic Self-Concept Questionnaire: This questionnaire was developed by Yesen Chen after it was administered to 1612 Taiwanese elementary school students. This questionnaire has 15 items that assess a person's self-concept on three general, academic, and non-academic scales. The overall score and the score of the subscales are calculated separately. The items are scored on a 4-point Likert scale, including strongly agree (4), agree (3), disagree (2), and strongly disagree (1). The general subscale has five items (1, 3, 5, 12, and 13), the academic scale has 8 items (2, 4, 8, 9, 10, 11, 14, and 15), and non-academic subscale has 2 items (6 and 7). A respondent's total score varies from 15 to 60, with higher scores indicating a higher level of academic self-concept. The questionnaire was administered to a sample of 36 persons, and its Cronbach's alpha coefficient was 0.92(19). Additionally, the convergent validity of the questionnaire was reported to be 0.89(20). Furthermore, the content validity, construct validity, and convergent validity of the questionnaire were assessed and confirmed using Rosenberg's Self-Esteem Scale (21). The reliability of the questionnaire was confirmed with Cronbach's alpha of 0.78.

Procedure

The participants in this study were 9- to 12-year-old students selected from several schools in different regions. The CPRS-R was completed by the parents of the selected students. Based on the scores obtained from the scale, a total of 30 students with ADHD were selected as the members of the ADHD group, and the severity of ADHD in these students was moderate (a score of 57 to 80 from the CPRS-R). Moreover, a total of 30 students without ADHD were selected as the members of the normal group. In the next step, Harter's Academic Motivation Scale and Chen's Academic Self-Concept Questionnaire were administered to the members of both groups. After receiving the necessary instructions on how to complete the items, the students were asked to mark their responses to each item with honesty and without any stress caused by the test. After collecting the questionnaires, the students' scores for each variable were calculated and analyzed.

Data analysis

The research variables were described using descriptive statistics including mean (standard deviation) and frequency. First, by checking the statistical assumptions using kurtosis and skewness tests, outlier data were identified and excluded from the analysis. Data were then analyzed using the independent samples t-test and multivariate analysis of variance (ANOVA) at a significance level of 0.5 ($P<0.05$) with SPSS-22 software.

Results

The students in both groups were males and hence homogeneous in terms of gender. Besides, the participants were equally distributed in the two groups in terms of age and education. The chi-square test showed no significant difference between the two groups regarding age and education ($P=1.00$) (Table 1).

There was no significant difference between the mean intrinsic academic motivation scores of students with ADHD (64.70 ± 9.79) and normal students (66.31 ± 10.05) ($P=0.358$). Moreover, there was no significant difference between the mean scores for extrinsic academic motivation in students with ADHD (11.81 ± 53.30) and normal students (13.31 ± 52.50) ($P=0.423$). The mean score for general self-concept in students with ADHD (4.52 ± 20.53) and normal students (20.60 ± 3.82) did not differ significantly ($P=0.423$). The mean score for academic self-concept in students with ADHD (23.13 ± 5.48) and normal students (24.87 ± 5.0) had no significant difference ($P=1.033$), making a distinction in normal students in terms of academic motivation (intrinsic and extrinsic) and also academic self-concept (general and academic) as shown in Table 2.

The data from multivariate ANOVA indicated that the students with and without ADHD showed no significant differences in terms of intrinsic academic motivation ($F=0.374$; $P=0.358$), extrinsic academic motivation ($F=0.061$; $P=0.423$), general self-concept ($F=0.004$; $P=0.571$), school academic self-concept ($F=1.637$, $P=1.033$).

Table 1. The participants' demographic characteristics

Variable	Categories	Groups		*P* value
		ADHD	Normal	
Age (y)	9	8 (26.7)	8 (26.7)	1.000
	10	9 (30.0)	9 (30.0)	
	11	9 (30.0)	9 (30.0)	
	12	4 (13.3)	4 (13.3)	
Education	3rd grade	8 (26.7)	8 (26.7)	1.000
	4th grade	9 (30.0)	9 (30.0)	
	5th grade	9 (30.0)	9 (30.0)	
	6th grade	4 (13.3)	4 (13.3)	

Table 2. The descriptive statistics for academic motivation and academic self-concept among students with and without ADHD

Variable	Group	Mean ± SD	*P* value
Intrinsic academic motivation	ADHD	64.7 ± 9.79	0.358
	Normal	66.31 ± 10.05	
Extrinsic academic motivation	ADHD	53.30 ± 11.81	0.423
	Normal	52.50 ± 13.31	
General self-concept	ADHD	20.53 ± 4.52	0.571
	Normal	20.60 ± 3.82	
Academic self-concept	ADHD	23.13 ± 5.48	0.933
	Normal	24.87 ± 5.00	

Discussion

The present study compared the academic motivation and academic self-concept of students with and without ADHD. The results showed that the academic motivation and academic self-concept of students with and without ADHD were not significantly different. There was no statistically significant difference in the mean academic motivation scores of the two groups of students. In addition, the mean academic self-concept scores of normal students and students with ADHD were not statistically different. These findings are not consistent with the results reported in previous studies (6,7,22-25). Accordingly, it can be argued that various factors are associated with academic motivation, including students' personality traits, school characteristics such as classroom structure, teaching methods, and emotional relationships in the educational environment, parenting styles, birth order, and family structure. According to many scholars, parents, as the first effective factor in the social development of children, play a significant role in fulfilling the psychosocial needs of children and can increase the academic motivation of students (26). On the other hand, positive parenting styles have many benefits for parents and children with ADHD. Research has shown that positive parenting is the best predictor of students' motivation and academic achievement (27). Additionally, more involvement of mothers in children's activities and positive parenting could improve students' academic progress and increase their academic motivation (28). It can be also suggested that the educational environment that matched the needs of the students with ADHD in the present study made the students extrinsically motivated and as a result, their academic motivation did not change significantly compared to normal children. Research has shown that electronic education increases the academic motivation of students with disabilities (29).

The present study showed no difference in the academic self-concept of students with and without ADHD, which is not in line with the results of some studies (30,31). This is to argue that learning style is one of the factors that will lead to academic success, strengthening academic self-concept in students with ADHD. Learning style also affects students' academic performance (32). That has compared the learning styles of students with and without ADHD and found that these students have different preferred styles (33). That have examined students with ADHD and found that these students have difficulty sitting continuously in the classroom and it is difficult for them to concentrate and maintain attention in these classes (34). As a result, the matching of teachers' teaching methods with the learning styles of students with ADHD leads to the experience of academic success, hence strengthening the academic self-concept of these students. Another study suggested that authoritative parenting style has a significant relationship with students' academic self-concept (35). Since most of the parents of students with ADHD do not have the necessary knowledge and skills to communicate with these students and consequently use ineffective parenting styles, they will have a destructive effect on the formation of their children's self-concept. Accordingly, as no significant difference was observed in the academic self-concept of students with and without ADHD in this study, it is possible that the parenting style of students with ADHD was not ineffective and could help to improve the academic self-concept of these students.

Conclusion

Overall, the findings from the present study showed that the academic motivation and academic self-concept of students with ADHD were not significantly different from normal students, and researchers should pay attention to the role of authoritative parenting, learning styles, supportive educational environments, and the personality traits of students with ADHD in improving their academic motivation and academic self-concept. The findings from the present study also suggested that teachers and education professionals play a significant role in forming the academic motivation and academic self-concept of students with ADHD. They should provide the necessary context and structures to fulfill their role as much as possible. Moreover, the parents of students with ADHD should learn the correct ways of communicating with these students so that in addition to

reducing the conflicts in parent-child relationships, they can contribute to the growth of their children's academic motivation and self-concept.

Some students in this study could conditionally feel stressed when answering the items in the instruments or they intended to get the maximum score while completing the items, affecting the reliability of the findings. Moreover, this study focused on students aged 9 to 12 years. Thus, the findings may have limited generalizability to students in other age groups. Besides, the participants in this study were only male students. Accordingly, future studies should focus on students from both genders. Furthermore, other research designs such as block design can be employed to examine the contribution of intervening variables such as parenting styles, learning styles, and personality traits to the differences between the two groups of students. Finally, the findings from the present study implied that we should be more cautious when making judgments about the academic motivation and academic self-concept of students with ADHD.

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Authors' Contribution

Conceptualization: Satar Piryaee, Azade Niroomand.
Data curation: Satar Piryaee.
Formal analysis: Satar Piryaee, Azade Niroomand.
Investigation: Satar Piryaee, Azade Niroomand.
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Supervision: Satar Piryaee, Azade Niroomand.
Validation: Satar Piryaee, Azade Niroomand.
Visualization: Satar Piryaee, Azade Niroomand.
Writing–original draft: Satar Piryaee, Azade Niroomand.
Writing–review & editing: Satar Piryaee, Azade Niroomand.

Competing Intrests

The authors declare that they have no conflict of interest.

Ethical Approval

The current study was approved by the Research Committee of Kerman University of Medical Sciences. The code of ethics (IR.KMU.REC.1403.320) was received from the Research Vice Chancellor of Kerman University of Medical Sciences (https://ethics.research.ac.ir/IR.KMU.REC.1403.320).

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