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The Mediating Role of Academic Self-Efficacy in the Relationship between Curiosity and Academic Well-being among Adolescents with Physical and Motor Disabilities

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ABSTRACT

Aim: Adolescence is a very sensitive and important period in everybody's life, particularly in individuals with disabilities, because it can significantly impact their experiences. The present study aimed to investigate the mediating role of academic self-efficacy in the relationship between curiosity and academic well-being among adolescents with physical and motor disabilities.

Method and Materials: The statistical population in this descriptive correlational study included all the adolescents 12-18 years old with physical and motor disabilities in Khuzestan Province of Iran during the academic year 2022–2023. The study sample consisted of 282 adolescents who selected using purposive sampling. The research instruments included the Academic Wellbeing Questionnaire, the two-dimensional Curiosity and Discovery Inventory, and the Students' Academic Self-Efficacy Questionnaire (SASEQ). The proposed model was evaluated using structural equation modeling (SEM).

Findings: The results revealed that there was a significant direct path from curiosity to academic self-efficacy (P<0.001). However, the direct relationship between curiosity and academic well-being was not significant. In addition, a significant relationship, mediated by academic self-efficacy, was found between curiosity and academic well-being linked by an indirect path (P<0.001).

Conclusions: Overall, the modified final model exhibited a good fit. Accordingly, this model can be considered a useful step in identifying factors that influence the academic well-being of adolescents with physical and motor disabilities.

Keywords: Disabled children, Well-being, Self-efficacy, Curiosity.

Introduction

Individuals with congenital problems and organ defects often experience many mental and physical health disruptions [1]. If not addressed properly, any type or form of disability can give rise to psychological and behavioral crises in adolescents that may cause many problems for them [2]. Physical and motor disabilities are defined as injuries that limit one or more major life activities [3-5]. Adolescents with physical and motor disabilities commonly experience lower mental well-being, reduced satisfaction with their health, higher levels of depression, and lower levels of emotional support and social participation, and commitment [6]. Education for these adolescents is a significant concern of education systems.

One of the important factors that can promote a positive educational environment among students is academic well-being which, as the tendencies, standards, and persistence of students concerning school activities, can be influenced by many factors. Improving academic well-being among students leads to their academic progress [7]. In general, academic well-being indicates the role played by various factors that promote well-being in relation to the school context, and especially highlights the active role of students and their abilities in shaping a constructive and

desirable academic environment [8, 9].

The concept of academic well-being, as a branch of psychological well-being, has attracted considerable interest from many researchers [10]. Academic well-being was developed to establish a connection between emotional and educational functioning and improve the relationship between the learners and the schools [11, 12]. Accordingly, the construct of academic well-being was defined in relation to the four dimensions of school values, school burnout, task engagement, and academic satisfaction [13]. Therefore, this research studied the factors influencing the academic well-being of adolescents with physical and motor disabilities. In the field of education, there are challenging questions that necessitate rigorous investigation into the effects of various factors on students' academic well-being [14]. Previous research suggests that adolescents who possess a sense of independence and autonomy and base their decisions on their personal beliefs tend to exhibit higher levels of psychological well-being in their educational pursuits [15].

The academic well-being of adolescents with physical and motor disabilities can be influenced by their tendency to curiosity [16]. Curiosity is related to all aspects of human development because it is during this process that learning and the desire to acquire knowledge and skills occur. Tendency to curiosity is defined as the inclination to seek information without any external reward and as the primary motivator for the behavior of an individual [17]. In fact, curiosity is the driving force for change in adolescents, for their progress in schools that foster their scientific and behavioral explorations and sustains their motivation and cognitive processes [18]. Curiosity and exploratory behavior are considered essential for human development as curiosity plays a role in flexible adaptation to environmental conditions, the development of interactive patterns, and more effective problem-solving. Many psychologists highlight the crucial role of curiosity in enhancing memory and building a culture of learning [19]. In other words, individuals with high levels of curiosity are more motivated to organize the external environment and exhibit innovative behavior. Bardbar and Samadieh [16] demonstrated that improving constructive participation and active engagement of students in educational environments requires attention to their cognitive beliefs and cognitive-emotional experiences such as curiosity.

Furthermore, both curiosity and academic self-efficacy can impact the academic well-being of adolescents with physical and motor disabilities [20]. Self-efficacy is relevant in various domains, such as school, work, or family relationships, and can influence people's behavior in those domains [21]. An important aspect of self-efficacy is academic self-efficacy, which refers to students' beliefs about their ability to comprehend or perform academic tasks and achieve goals in a specific field of study. If students lack academic self-efficacy, they will become inefficient and unmotivated [22]. Research has shown a significant positive relationship between academic self-efficacy and academic well-being: academic self-efficacy enhances learners' academic well-being [20, 23].

Considering the above, it can be acknowledged that the concerns of families and educators point to the problems of academic underachievement and academic burnout. Recent research has criticized the current approach in education systems and has highlighted the need for linking students' emotions and educational achievement. By simultaneously addressing both academic and emotional functions, educational planning will substantially help in improving the learner-school relationship,

a relationship that will evidently help the academic well-being and adjustment of adolescents with physical and motor disabilities in the educational environment if it is a balanced relationship [24]. Moreover, identification of the factors that influence the academic well-being of these adolescents is a suitable approach for planning, developing, and evolving their educational programs that allow achieving the best possible results both for the educational institution and for the adolescents. Accordingly, this study aimed to investigate the mediating role of academic self-efficacy in the relationship between curiosity and academic well-being among adolescents with physical and motor disabilities.

Method and Materials

The present study employed a correlational research design utilizing structural equation modeling (SEM) to examine the relationships between the variables. The target population comprised all adolescents (ages 12 to 18) with physical and motor disabilities in the academic year 2022-2023 in Khuzestan Province (Iran). Considering the requirements for studies using SEM, which typically involve 15 to 20 participants per path and a total sample size exceeding to 200 individuals, a sufficient number of 250 participants were selected to test the proposed model and research hypotheses following the recommendations of Loehlin and Beaujean [25]. Initially, a total of 290 individuals were recruited using convenience sampling to account for potential participant attrition. Finally, by discarding the distorted questionnaires, 282 people remained. To take part in the research, the participants had to meet the following criteria: no diagnosed psychological disorders, no use of psychotropic medications, no sensory impairments such as blindness and deafness, students in high schools, and no history of dropping out of school. The exclusion criteria included participants' unwillingness to complete the questionnaires and incompletely filled-out questionnaires. Instruments of the study were as following.

Academic Wellbeing Questionnaire: This questionnaire, developed by Bagheri Hosseinabadi and Abedi [26], was utilized in this study. It consists of 48 items using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Items 8, 11, 27, 33, 34, 36, and 39 are reverse scored. The total score on this questionnaire ranges from 0 to 205. Scores falling within the ranges of 0-113, 113-144, 144-180, 180-195, and 195-205 indicate very low, low, normal, very good, and excellent academic well-being, respectively. Bagheri Hosseinabadi and Abedi [26] reported the reliability for this questionnaire equal to 0.84.

The two-dimensional Curiosity and Discovery Inventory: This scale, developed by Kashdan et al. [27], was employed to assess curiosity and discovery. It comprises seven items: four items measure the dimension of exploration and three items are related to the dimension of absorption. The items use a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). In this research, the total score on this scale was used in the analysis. Kaveh Farsani et al. [28] reported an alpha Cronbach coefficient of 0.84 for the questionnaire.

Students' Academic Self-Efficacy Questionnaire (SASEQ): The SASEQ developed by Mazaheri and Sadeghi [29] was used to assess students' beliefs in their academic abilities. This questionnaire consists of 26 items which use a five-point Likert scale. It includes three subscales that measure students' academic abilities in different situations. The subscales are future academic self-efficacy (four items), which assesses belief in the fulfillment of academic expectations, self-efficacy in academic performance (11 items), which

measures belief in the ability to perform academic tasks, learn, and master academic subjects, and self-efficacy in academic skills (11 items), which assess belief in the ability to concentrate, plan, and utilize effective study methods. The items use a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). In this study, the total score on this questionnaire was used for analysis. Mazaheri and Sadeghi [29] reported alpha Cronbach coefficient of 0.93 for the SASEQ. Due to tatistical analyses, the proposed model was evaluated using SEM, in SPSS-26 and AMOS 26.

Findings

The demographic characteristics of the adolescents with physical and motor disabilities revealed that 162 (57.55%) were girls and 120 (42.55%) were boys. In terms of educational level, 155 (54.96%) participants were in the first secondary level, and 127 (45.04%) were in the second secondary level. Table 1 presents the means, standard deviations, correlation matrices, and skewness and kurtosis values for all the variables. The absolute values of skewness and kurtosis coefficients for all the research variables were found to be below the thresholds of 2 and -2, respectively. This indicates that the data did not significantly deviate from normality, which confirmed the assumption of normality for the entire sample. An initial proposed model was developed to explain academic well-being based on curiosity and academic self-efficacy

Table 1) Descriptive statistics and Pearson correlation coefficient between variables

Variables	Mean ± SD	Academic well-being	Curiosity	Academic self-efficacy	Skewness	Kurtosis
Academic well-being	120.79 ± 23.62	1			-0.24	-0.71
Curiosity	27.31 ± 5.24	0.38**	1		0.20	-0.92
Academic self-efficacy	98.46 ± 42.53	0.46**	0.69**	1	0.55	-1.41

**: P<0.001

Table 2) Fit indicators of the initial and final models

Fit indicators	χ^2	df	(χ^2/df)	TLI	CFI	RFI	NFI	RMSEA
Initial model	0.015	1	0.015	0.99	0.99	0.91	0.86	0.556
Final model	147.75	1	147.75	0.98	0.98	0.96	0.97	0.060

χ^2: chi-square; χ^2/df: the ratio of chi-square to degree of freedom; TLI: Tucker–Lewis index; CFI: Comparative Fit Index; RFI: Relative Fit Index; NFI: Normed Fit Index; RMSEA: Root Mean Square Error of Approximation.

Table 3) Direct and indirect effects between research variables in the initial and final models

Path	Initial model		Final model	
	β	P	β	P
Curiosity to academic well-being	0.15	0.081	-	-
Curiosity to academic self-efficacy	0.74	0.001	0.74	0.001
Academic self-efficacy to academic well-being	0.35	0.001	0.46	0.001
Curiosity to academic well-being through the Mediating role of academic self-efficacy	1.52	0.001	2.02	0.001

among adolescents with physical and motor disabilities (Figure 1).

Considering the estimated Root Mean Square Error of Approximation (RMSEA) value in Table 2, it was evident that the initial model required modifications. After removing the path from curiosity to academic well-being, the final model demonstrated a good fit with the RMSEA value of 0.060 (Figure 2).

Table 3 presents the results of estimating path coefficients for testing the direct relationships. The results showed that there was a significant relationship between all direct paths (P<0.001) except curiosity to academic well-being. The bootstrap method was employed for mediation analysis. The confidence levels in Table 3 indicate the significance of the indirect path

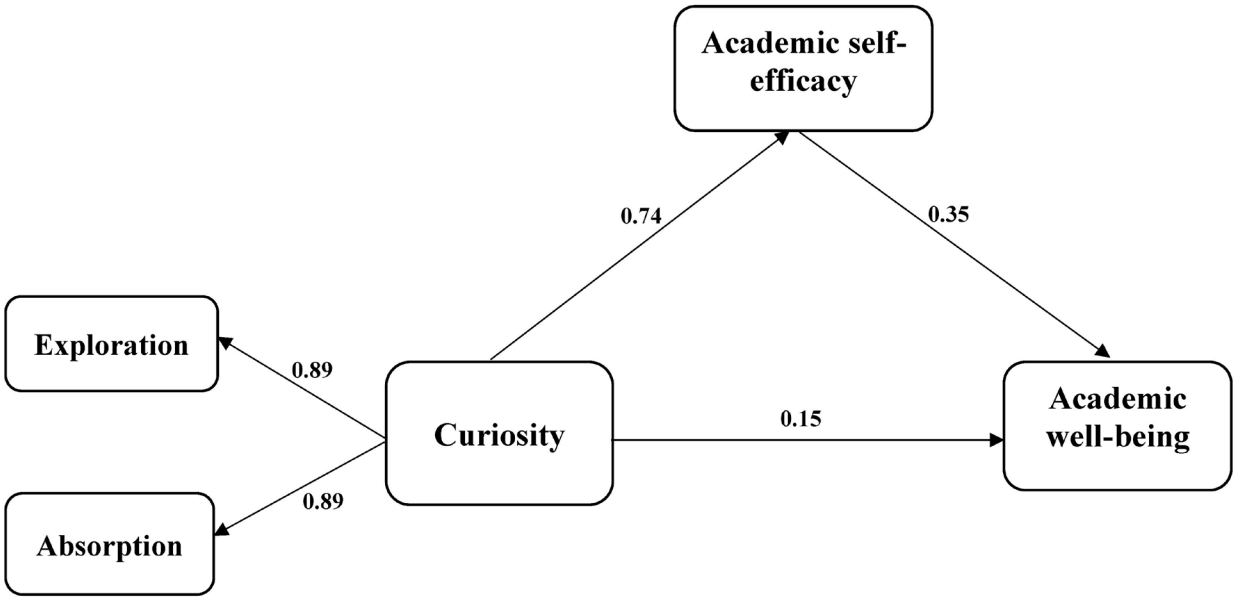

Figure 1) The initial model of the research

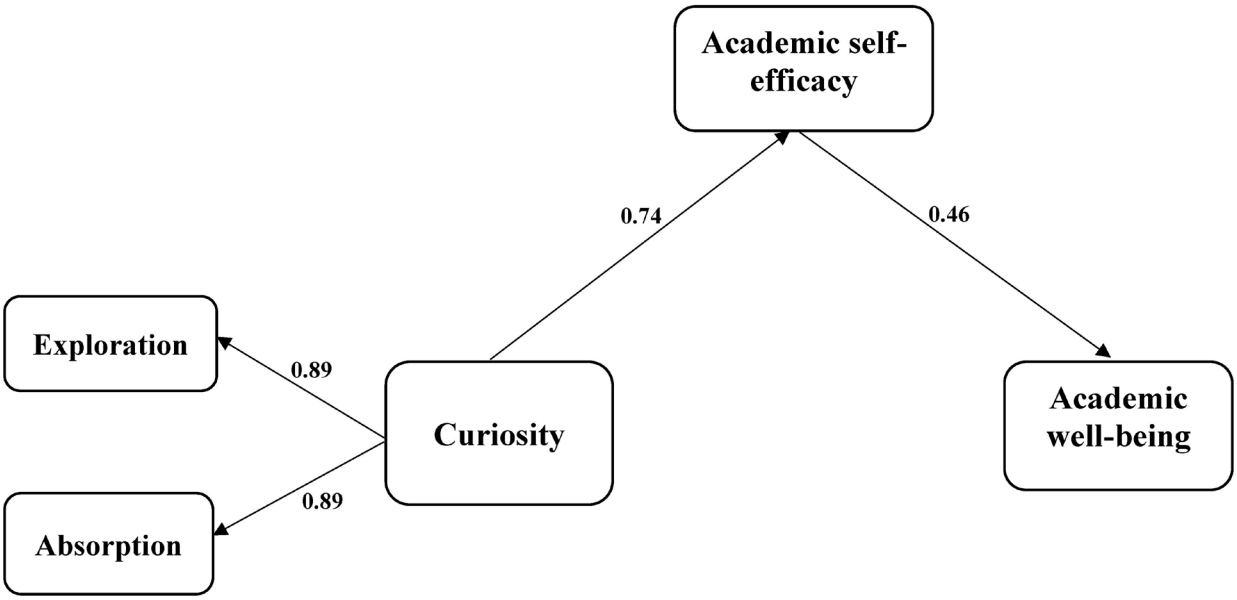

Figure 2) The final model of the research

from curiosity to academic wellbeing that was mediated by academic self-efficacy (P<0.001).

Discussion

The present study aimed to investigate the mediating role of academic self-efficacy in the relationship between curiosity and academic well-being among adolescents with physical and motor disabilities. The results of the present study indicated that there was no significant direct relationship between curiosity and academic well-being among adolescents with physical and motor disabilities. This finding disagrees with those of previous study by Bardbar and Samadieh [16] in which they used correlation coefficient tests and regression analysis and reported that there was a significant relationship between curiosity and academic well-being. However, the present study employed SEM to examine the relationships and, in this model, the effects of curiosity on academic well-being were explained through the mediating variables or indirect relationships. Therefore, although there was no direct impact of curiosity on academic well-being in the model, the curiosity variable still had an indirect influence on academic well-being through the mediating variables. In other words, in this model also the curiosity variable indirectly influenced academic well-being. In general, we can say that it is necessary to identify the antecedents and the factors influencing students' capacity in coping with academic challenges and difficulties because it will lead to academic well-being. Consequently, the present research aimed to study the role played by cognitive evaluation and cognitive curiosity in predicting the students' academic well-being.

Beliefs play a significant role in motivating individuals to seek new information and relationships. Curious individuals are more active and have more positive feedback in the workplace, in education, and in confrontation with the uncertainties of life. Curiosity helps an individual adapt better to the environment by improving their performance. Individuals with high levels of curiosity are driven to organize their situation and the environment they live in and behave the way innovators do [17]. In fact, curiosity is the driving force for children's development and progress in school, for the expansion of their scientific and behavioral discoveries, and for the maintenance of their motivation and cognitive processes. Curiosity is considered the prerequisite for the development of an individual's knowledge [16].

Another finding of the research was that academic self-efficacy and academic well-being among adolescents with physical and motor disabilities had a significant positive relationship. This finding is consistent with the research results of previous studies [20, 23]. This finding can be explained by the fact that adolescents with high levels of academic self-efficacy use their attributes for adaptive capacity. Therefore, even after facing failure experiences, they are less exposed to injury resulting from negative emotional experiences. Consequently, they are less likely to employ some behavioral patterns such as negative self-evaluations and negative self-talk patterns. In other words, they are more characterized by academic overvaluation, participation in academic activities, and satisfaction in performing academic tasks [20]. In fact, self-efficacy is an individual's ' beliefs and perceptions about their abilities to learn or carry out activities at a defined level. It is a person's belief about the things they are able to do. As a subclass of the component of personal competence, this concept plays an important role in coping with life tensions and threats and their undesirable effects

[23]. The conception that learners have self-efficacy originates from various sources such as their actual performance, physiological responses, others' encouragement, and experiences acquired by observational learning. As learners' levels of academic self-efficacy increase, their academic performance also improves, and they exhibit greater preparedness and endurance than individuals with lower levels of self-efficacy [30].

The results obtained from the indirect paths showed that academic self-efficacy played a mediating role in the relationship between curiosity and academic well-being. However, no studies were available to compare their findings with the results of the present research in this respect. The results of the present study indicated that the direct path of curiosity to academic well-being was not significant, but the indirect path of curiosity was able to influence the academic well-being of adolescents by influencing their academic self-efficacy. Generally, academic well-being was most influenced by academic self-efficacy. Consequently, we can conclude that academic self-efficacy was a competent mediator in this relationship. A decrease in curiosity was found to be associated with a reduction in academic self-efficacy of adolescents with physical and motor disabilities, which could lead to the absence of curious behavior in them at school and a reduction in their well-being and academic performance.

One limitation of this study was that the statistical population included only adolescents with physical and motor disabilities in Ahvaz. Consequently, caution should be exercised in generalizing the results to adolescents with physical and motor disabilities in other cities with different cultures. Therefore, further research is recommended using other populations to ensure the generalizability of the findings. Additionally, the study did not control for influential variables such as family socioeconomic status and education levels of the parents of adolescents with physical and motor disabilities.

Conclusions

The results indicated that the modified model had a good fit and can be an important step in identifying the factors influencing the academic well-being of adolescents with physical and motor disabilities. Consequently, it is suggested that counselors and therapists give top priority in their plans to holding educational workshops in order to teach academic and life skills to these adolescents. Additionally, conducting educational workshops focused on enhancing curiosity in adolescents with physical and motor disabilities is suggested. These workshops will increase their academic self-efficacy and hence will improve their academic well-being.

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Authors' Contributions

MAN, SS: designed and conducted the study and wrote the first draft of the manuscript. SS, MTS supervised all stages the study. SS revised the manuscript. All authors read and approved the final manuscript.

Conflict of Interest

There was no conflict of interest to declare.

Ethical Permission

All ethical principles were considered in this study. This study was approved by ethics committee of Ahvaz Branch, Islamic Azad University (code of ethics: IR.IAU.AHVAZ.REC.1402.031).

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