Original Article

Epidemiologic assessment of self-concept and academic self-efficacy in Iranian high school students: Multilevel analysis

Zahra Hosseinkhani, Hamidreza Hassanabadi[1], Mahboubeh Parsaeian[2], Saharnaz Nedjat[3]

Abstract:

INTRODUCTION: In social cognitive theory, self-efficacy and self-concept (SC) have been introduced as important constructs that associate with adolescents' achievements. The aim of this study was to investigate the determinant factors of academic self-efficacy (ASE) and SC in Iranian high school students based on the multilevel analysis.

MATERIALS AND METHODS: In this descriptive-analytical cross-sectional study, 1740 students from 53 high schools selected with stratified random sampling method in 2018 in Qazvin, Iran. Data collection tools were the Morgan and Jinks Self-Efficacy Scale and the Piers-Harris Children's SC Scale-Second Edition. The association between some of the students and school variables with ASE and SC was analyzed by hierarchical linear regression models.

RESULTS: The score of the students' standardized ASE was lower than SC. ASE and SC had a strong positive significant association with economic status, grade point average, and the educational period of high school. Sex had no association with any of them. Physical activity had a positive significant association with SC but was no found association by ASE.

CONCLUSION: These findings revealed that for improving the adolescents' ASE and SC should be attention to the adolescents' family condition and school-related factors. Proper educational, sports, and supportive programs can be effective on the adolescents' self-efficacy and SC.

Keywords:

Academic self-efficacy, adolescents, Iran, school, self-concept, students

Metabolic Diseases
Research Center,
Research Institute
for Prevention of
Non-Communicable
Diseases, Qazvin
University of Medical
Sciences, Qazvin,
Iran, [1]Department of
Educational Psychology,
Kharazmi University,
Iran, [2]Department of
Epidemiology and
Biostatistics, School
of Public Health,
Tehran University of
Medical Sciences,
Iran, [3]Department of
Epidemiology and
Biostatistics, Knowledge
Utilization Research
Center, School of Public
Health, Tehran University
of Medical Sciences,
Tehran, Iran

**Address
for correspondence:**
Prof. Saharnaz Nedjat,
Department of
Epidemiology and
Biostatistics, Knowledge
Utilization Research
Center, School of
Public Health, Tehran
University of Medical
Sciences, Tehran, Iran.
E-mail: nejatsan@tums.
ac.ir

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Introduction

According to Bandura, self-efficacy is a key component in social cognitive theory that was recognized as important research issue.[1,2] People with high self-efficacy have a strong belief about their achievements in specific situations. Self-efficacy shows the performance capability of people and is an important source for the quality of life.[1,3-5] This construct has defined in different types. One of them is academic self-efficacy (ASE). ASE introduces students' beliefs about their attainment to specific academic goals or educational achievements. It affects students' educational motivation, resistance, and success.[6]

Another construct that has an important role in students' life is self-concept (SC). SC was defined the whole of the attitude, emotions, and knowledge of people about their ability and skills that can affect their life. SC has five scales: social, educational, psychological, physical, and familial.[7,8] Many studies have been shown an association between ASE and SC with academic achievement that

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can predict high-risk behaviors such as substance use, smoking and hookah, internet addiction, and dissatisfy of life.[9-13] Students' SC and ASE are essential for coping with surrounding. They are psychological factors that associate with students' mental health, so considering them is important. In previous studies, the mediator role of self-efficacy and SC had been shown in the path diagram of different constructs such as academic stress and life satisfaction, motivation, emotion, and academic achievement.[14-18] Subsequently, fostering these constructs will promote psychological well-being and influence students' educational outcomes.[19] School-related factors in adolescence period, health behaviors, and family situation of adolescents have an important role on their health. Now, there have been few studies among Iranian adolescents about ASE and SC and their determinants in two levels of students and schools in adolescents. In this study, we investigated the association between ASE and SC with some of the factors in two levels of students and schools in adolescents, so that based on the result of this study can be carefully planned in students and schools levels for improving adolescents' ASE and SC.

Materials and Methods

This descriptive-analytical cross-sectional study is a part of the project about the association between academic stress and adolescent mental health through mediator variables: ASE and SC.[20] The participants consisted of 1740 students in the range of 12–19 years at 53 high schools in Qazvin (135 km from Tehran). Sampling method was the stratified multistage random sampling. First, we determined the number of all types of high schools: governmental, nongovernmental, and special. Overall, 53 schools randomly selected proportional to size in the city. Afterward, we randomly selected 1740 students of all the educational grades from selected schools, as we selected 30 students from each of the grades.[7-12] Inclusion criteria were residence in Qazvin city. Exclusion criteria were disinclining to participate in the study or disability in completing the questionnaires.

The Morgan and Jinks Self-Efficacy Scale consists of 30 items that was used to assess the adolescents' ASE. The scoring of the questionnaire was a four-point Likert scale ranging from 1 (really agree) to 4 (really disagree). This questionnaire consists of three scales: talent (13 items), effort (4 items), and context (13 items). The item scores ranged from 30 to 120. The high score indicates a high level of ASE.[21] The reliability and validity of the Persian version of the questionnaire were acceptable in previous studies.[22] Internal consistency with Cronbach's alpha as a global score was 0.74.[14]

The Piers-Harris Children's SC Scale-Second Edition questionnaire was used to assess adolescents'

SC. This questionnaire has 30 items that measure six scales: behavior, intellectual status, anxiety, popularity, happiness, and physical appearance. Each scale has five questions. The scoring of the questionnaire was a six-point Likert scale ranging from 1 (fully agreed) to 4 (fully disagree). The item scores were between 30 and 180. Six items of the questionnaire were reverse coded.[23] Cronbach's alpha to assess the internal consistency of the Persian version of the questionnaire was 0.94.[24]

We also asked the students' demographic, educational, and economic information such as sex, school type, educational period, academic achievement (grade point average [GPA]), and weekly exercise (hours). Economic status of the students' family was assessed with their assets such as having microwave, LCD-LED TV, dishwashing machine, owning the house, number of private cars, number of rooms in the house, adolescents' participation in educational assistance classes, having recruitment programs such as going cinema, art and sports programs, travel abroad, and having X-BOX or PS4.

Because of the multilevel nature of the data, statistical analysis was done using multilevel methods. A correlation between the variables was assessed by intraclass correlation. The schools and the educational period of high schools were considered as clusters and strata, respectively. Data of 1724 students nested in 53 high schools were analyzed. SC and ASE were considered as continuous dependent variables in separate multilevel linear regression models. Sex and the educational period of high schools were considered as school variables (level 2). Academic achievement, weekly exercise, and economic status of the students' family were considered as students' variables (level 1). Multilevel regression analyses were done in bivariate and multiple models. We classified the participants using principal component analysis into five socioeconomic status categories (very poor, poor, mild, rich, and very rich).[25-27] Data analysis was done using Stata software version 14.0 (StataCorp. LP).

The consents were obtained from the students' parents and themselves. Data collection was conducted during curriculum hours after the permission of the principal. The students completed the questionnaires self-administrated and anonymous; also, they were free to withdraw the study anytime. The study was approved by the Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.VCR.REC.1396.4610.).

Results

A small minority of participants (approximately 1%) decided not to answer to the questionnaires. The

participants' mean age (standard deviation [SD]) was 15 (SD = 1.7). The number of the students based on sex (females = 50.1%, males = 49.9%) and the educational period of high school (grades 7–9 [52.1%], grades 10–12 [47.9%]) was approximately equal. GPA of the students was 18.28 (SD = 0.8). The mean of weekly exercise was 259.03 (SD = 8.6) min. Two hundred and fifty-four students (14.7%) exercised less than an hour weekly. The SC of the adolescents was relatively desirable, but the ASE was low approximately. The scores of the students' ASE and SC were showed based on sex, educational period, economic status of the students' family, and school type separately [Table 1].

Table 2 shows the result of linear regression analysis of SC and academic self-efficacy and variables among the high-school students in two levels.

In individual-level variables, in both multilevel simple and multiple linear regression models, economic status of the students' family had a significant association with SC and ASE. Students' SC in mild, poor, and very poor families was less than very rich. Students' ASE in poor and very poor families was higher than very rich. GPA had a significant association with SC and ASE, but these effects were inverse in two constructs. Weekly exercise only associates with SC ($P < 0.001$).

Table 1: The scores of self-concept and academic self-efficacy among high school students (*n*=1724)

Variables	Self-concept		Academic self-efficacy	
	Mean (SD)	Mean (0-100)	Mean (SD)	Mean (0-100)
Sex				
Female	127.97 (19.20)	65.31	64.19 (7.84)	37.98
Male	129.10 (18.77)	66.06	63.82 (8.05)	37.58
Educational period				
First	132.27 (19.10)	68.18	62.66 (7.97)	36.29
Secondary	124.56 (18.04)	63.04	65.49 (7.66)	39.43
Economic status				
Very rich	123.05 (0.98)	62.03	61.30 (0.42)	34.78
Rich	122.39 (0.91)	61.59	61.55 (0.4)	35.05
Mild	119.6 (0.89)	59.73	62.86 (0.40)	36.51
Poor	117.6 (0.91)	58.4	62.62 (0.38)	36.24
Very poor	114.76 (0.93)	56.51	63.9 (0.43)	37.67
School type				
Talent	119.48 (0.55)	59.65	62.25 (0.25)	35.83
Government	118.63 (0.90)	59.09	62.86 (0.34)	36.51
Private	120.72 (0.9)	60.48	62.50 (0.44)	36.11
Total score	128.1 (18.72)	61.3	64.01 (7.95)	37.79

SD=Standard deviation

Table 2: Multilevel simple and multiple linear regression analyses of self-concept and academic self-efficacy determinants among high school students in Qazvin, Iran (*n*=1724)

Variables	Self-concept		Academic self-efficacy	
	Crud β coefficient, *P*	Adjusted, *P*	Crud β coefficient, *P*	Adjusted, *P*
Individual level				
Economic status				
Very rich	1	1	1	1
Rich	−0.5 (−0.45-0.35), 0.805	0.02 (−0.4-0.43), 0.939	−0.3 (−0.67-0.07), 0.109	0.37 (−0.01-0.75), 0.058
Mild	−0.50 (−0.91--0.09), 0.017	−0.43 (−0.85--0.005), 0.047	0.34 (−0.04-.72), 0.079	0.37 (−0.01-0.75), 0.058
Poor	−0.86 (−1.27--0.44), <0.001	−0.86 (−1.3--0.44), <0.001	0.38 (−0.007-0.76), 0.055	0.44 (0.06-0.83), 0.024
Very poor	−1.36 (−1.78--0.93), <0.001	−1.2 (−1.64--0.75), <0.001	0.8 (0.41-1.19), <0.001	0.83 (0.43-1.24), <0.001
GPA	0.11 (0.07-0.15), <0.001	0.09 (0.05-0.13), <0.001	−0.14 (−0.18--0.11), <0.001	−0.14 (−0.17--0.1), <0.001
Weekly exercise	0.001 (0.0008-0.002), <0.001	0.001 (0.0006-0.001), <0.001	−0.0001 (−0.0005-0.0002), 0.384	
School level				
Sex				
Female	1	1	1	1
Male	0.34 (−0.13--0.83), 0.156	-	0.12 (−0.36-0.61), 0.616	-
Educational period				
First	1	1	1	1
Secondary	−0.86 (−1.27--0.45), <0.001	−0.82 (−1.2--0.43), <0.001	0.6 (0.17-0.03), 0.006	0.6 (0.17-0.03), 0.006

P<0.05 is significant. GPA=Grade point average

In school level, the association between SC and the educational period of high school showed that students' SC in secondary period is less than first, while ASE was higher in secondary period. In this level, sex did not have a significant association with SC and ASE.

Discussion

The primary findings of the study showed that the standardized score of the students' ASE was low in comparison to SC.

According to the result of this study, the students' GPA had a positive significant association with their ASE and a negative significant association with their SC. Previous studies had indicated the association between academic achievement with self-efficacy and SC.[16,17,28] It is emphasis high level of self-efficacy can decrease the educational burnout and cause ability in the adolescents' education.[29,30]

These findings showed that the students' SC in the second educational period of high school was lower than first, while reverse association was observed for ASE. In Iran, the high school students should participate in the university entrance examination and get a high score for studying in top universities and favorite major. The students because of the importance of this examination in their future life compel to study hard and to bear a lot of academic stress. Since the students' SC is affected by condition of their life and social comparison, their SC is decreasing in a higher level of the educational period of the high school. This result was congruent with another study that, with growing up the students, their SC had been decreased.[31] Furthermore, in this study, sex had no association with any of the above constructs. In study Khodarahimi conducted in Fars Province adolescents, in Iran, the interaction between sex role and age on generalized self-efficacy was not confirmed but he emphasizes an important role of sex and age on generalized self-efficacy.[32] Nonetheless, the finding of the present study emphasizes foster SC of the students at schools and families.

One of the most important factors in adolescents' health is physical activity. This study showed that physical activity had a positive significant association with SC, as with increasing adolescents' weekly exercise increase their SC scores, but no difference was found an association between ASE and physical activity, while in the study on Koran high school students, self-efficacy had a positive association with physical activity.[33]

In this study, the students in family with lower socioeconomic status had a higher level of self-efficacy than others, while the students in family with higher socioeconomic status had a higher level of SC. It seems that the type of relationship between family members and the adolescents' attitude and beliefs are affected by economic status of their family. In the family with higher socioeconomic status, parents involve too much in their children's task and homework, and this issue can declare their self-efficacy. The findings suggested the importance of considering the adolescents' family condition and relationship for improving their ASE and SC.

Although the findings of this study are valuable, a few limitations had in conductiong the study. First, since the data collection was carried using self-administrated questionnaires, it is possible that the students' answers were bias by misunderstanding the questions. Second, due to the cross-sectional study, we could not detect the causal relationship. Third, there was the possibility of information bias because the students likely did not be honest in answering the questions.

Conclusion

According to the results of the present study, the adolescents' ASE had needed a lot of consideration. The adolescents' SC was relatively better than ASE. The current study showed the role of educational period of high school, academic achievement (GPA), socioeconomic status of family, and physical activity on the adolescents' ASE and SC. These results are applicable for planning some strategies and programs for improving adolescents' health. Policymakers should be consider many factors in management planning such as educational periods of high schools and school-related problems, socioeconomic status of the adolescents' family, and adolescents' health behaviors as physical activity. Considering the above factors in educational, sportive, and recreational programs can increase adolescents' self-efficacy and SC and subsequently improve their social skills.

Conflicts of interest
There are no conflicts of interest.

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