Original Article

The role of mental health, academic stress, academic achievement, and physical activity on self-rated health among adolescents in Iran: A multilevel analysis

Zahra Hosseinkhani[1], Hamid-Reza Hassanabadi[2], Mahboubeh Parsaeian[3], Saharnaz Nedjat[4], Zohre Foroozanfar[3]

Abstract:

BACKGROUND: Health promotion of adolescents requires appropriate evidences of its determinants. The aim of this study was to investigate predictors of self-rated health (SRH) among adolescents in Qazvin, Iran.

MATERIALS AND METHODS: In this descriptive cross-sectional study, with a multistage sampling method, we recruited 1740 adolescents aged 12–19 years from 53 schools in Qazvin, Iran (2018). We used the Strengths and Difficulties Questionnaire and Adolescents' Academic Stress Questionnaire for data collection. The analysis was conducted using a multilevel logistic regression model. Gender, educational period, and socioeconomic status were considered as confounders.

RESULTS: Almost 21% of the adolescents reported their SRH suboptimal. Suboptimal SRH was higher in girls and older adolescents. Mental health disorders and academic stress had a positive association with SRH. However, this association was negative for academic achievement and physical activity. The interaction between mental health disorders and academic stress with SRH had a significant association in a crud regression model.

CONCLUSION: Mental health, academic stress, academic achievement, and physical activity were important predictors for SRH. Interventions that focus on promoting mental health, academic stress, academic achievement, and physical activity such as physical activity for 1 h and each day for 3 days per week can improve SRH in adolescents. Hence, policymakers should pay more attention to this issue in health promotion programs of adolescents.

Keywords:

Academic achievement, academic stress, adolescents, Iran, mental health, physical activity, self-rated health

[1]Metabolic Diseases Research Center, Research Institute for Prevention of Non-Communicable Diseases, Qazvin, University of Medical Sciences, Qazvin, Iran, [2]Department of Educational Psychology, Kharazmi University, [3]Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, [4]Department of Epidemiology and Biostatistics, Knowledge Utilization Research Center, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Address for correspondence:
Dr. 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

Introduction

The United Nations defines adolescence the age of 10–19 years.[1,2] In this period, physical and psychological changes happen for transition from childhood to adulthood. Hence, many factors can affect adolescents' health.[3] According to the WHO reports, mental health disorders in half of the people start at 14 years. However, the early detection of this disorder is important not only for effective treatment but also in their future life achievements, which is not much more attention.[4] As in spite of adolescents, vulnerability is not considered in policy and planning. This is especially more evident in low-income and middle-income

countries.[3,5] In these countries, financial problems are a major obstacle for considering to adolescents' health.[5]

Self-rated health (SRH) is a global measure of people's health that reflects their daily health status. This measure is widely used in social sciences and public health researches. It covers different dimensions of social and personal health. It is associated with mortality and general health status.[2,6,7] By using SRH in investigates can predict health outcomes affordably, so, at the moment, this measure very used in health researches.[8] The reliability and validity of this measure have been confirmed in previous studies.[9,10]

The evidences show that adolescents with healthy lifestyle have good SRH.[2,11,12] Previous studies have been investigated the association between SRH and many factors such as social and behavioral factors,[13,14] gender,[7,13-18] high-risk behaviors,[13,16,17,19] mental health-related factors,[13,19,20] age,[14,16,21] socioeconomic status (SES),[14,19,22,23] academic stress,[20] and academic achievement.[2,24]

To our knowledge, there are few studies on SRH which have been done in this field in Iran. Available documents more investigated the inequality of SES and neighborhood role on SRH in adults. Since the unpleasant experiences in childhood period have a strong association with suboptimal SRH in different stages in adulthood, this can adversely affect health status and economic burden in society. Therefore, it is necessary to pay more attention to adolescents' health status. The current study aims to investigate the association between SRH and determinant factors in Iranian adolescents in Qazvin city.

Materials and Methods

This cross-sectional study conducted on adolescents in high schools of Qazvin city in northwestern Iran in 2018. The participants were selected using multistage sampling. The schools in Iran are divided into three types: governmental, private, and spatial (with entrance exam). We considered each type of schools as strata. Proportional to the population size of each type of schools, 53 high schools out of 221 were randomly selected. From each of the included schools, 30 students randomly selected based on students' list of all grades (between the ages of 7 and 12) from both educational periods (first and second). The inclusion criterion was willingness to participate in the study. The exclusion criterion was disability to answer questions solely. The questionnaires were completed with a self-administrated method. Overall, 1740 students included in this study. Oral and written informed consent was obtained from all participants and their parents.

We measured SRH using a single question: "How would you rate your general health status?" It has been suggested by the WHO and was a five-point Likert scale, ranging from 1 to 5 (very bad, bad, moderate, good, and very good). The participants who marked their health status as "good" or "very good" were assigned to the optimal group and others were classified as a suboptimal group.[9,10]

Mental health disorders were assessed using the Strengths and Difficulties Questionnaire. The validity of the Persian version of this questionnaire was reported in a previous study, and internal consistency was 0.628.[25]

Academic stress was assessed using "Iranian Adolescents' Academic Stress Questionnaire." To measure academic stress, a five-point Likert scale from "not at all/very little" to "very much/always" has been used. The Cronbach's alpha value for the domains of the questionnaire and intraclass correlation were 0.58–0.85 and 0.80 (95% confidence interval: 0.66–0.90), respectively.[26]

For evaluating the economic status of the family, we asked about their assets and some possibilities such as microwave, dishwashing machine, freezer, liquid crystal display-light-emitting diode television, play station, private laptop for student, owner private room for student, number of car in the family, the participation in additional classes (sports, art, etc.), and number of going to cinema, concert, and trips.

Based on the participant's response to the SRH question, we classified them into two groups of optimal and suboptimal. The ratio of the percentage of the students with optimal and suboptimal SRH was calculated based on different independent variables including age, gender, educational period, family SES, and school type. The association between SRH and key independent variables including mental health disorders, physical activity, academic stress, and academic achievement was examined in regression models separately. Gender, educational period, and SES entered the models as potential confounders and adjusted their effects. SRH was dichotomized as optimal and suboptimal groups. Hence, we used a logistic regression model for determining the association between SRH, the dependent variable, and independent variables. Because of the students were nested in schools, and multilevel nature of the data, we used multilevel model analysis. Before conducting each analysis, we tested the effect of hierarchical structure of data with ANOVA test. The association between SRH and some factors consist of: mental health, academic stress, academic achievement, physical activity were examined in separated models, also interaction between factors was analyzed. Gender, educational period, and

SES were considered as confounders. The analysis was conducted using STATA version 14.0 (StataCorp. LP).

The study was approved in Tehran University of Medical Sciences (IR.TUMS.VCR.REC.1396.4610).

Results

A total of 1724 adolescents out of 53 schools completed the questionnaires. The mean (standard deviation) age of the adolescents was 15 (1.7) years (range: 12–19). 50.12% were girls, and 52.3% were in the first educational period of high schools. The proportion of participants within each of the categories of economic status was equal approximately. Almost, the academic achievement score of all the participants was good or grate. 52.2% of them had more than 2-h physical activity in a week. About less than a quarter (16.2%) of them had mental health disorders. A total of 1348 (78.88%) of the adolescents reported their SRH optimal as "good or very good."

The background characteristics of the participants are presented in Table 1.

Overall, the proportion with gender (P = 0.024), educational period (P = 0.002), and age (P < 0.001) was significantly different between the two groups of optimal and suboptimal SRH.

Mental health disorders and academic stress had a positive association with suboptimal SRH. The association between academic achievement and physical activity with suboptimal SRH was negative. Only the interaction between mental health disorders and academic stress with suboptimal SRH had a significant association in crud regression multilevel analysis. The result of the association between different determinants and suboptimal SRH in multilevel logistic regression analysis is presented in Table 2.

The effect of gender, age, and SES was adjusted because of their confounding role in models.

Discussion

This study showed that the minority of the adolescents have perceived their SRH suboptimal as poor and fair (21.12%). The association between mental health disorders and academic stress with suboptimal SRH was positive, whereas this association for academic achievement and physical activity was negative. Furthermore, the interaction between mental health disorders and academic stress had a significant association with suboptimal SRH in crud regression analysis.

Because of forming adolescents' health knowledge in this period of the life and its role in their health promotion and healthy behaviors,[27] so should pay more attention to adolescents SRH. In this study, the percentage of optimal SRH in adolescents was desirable that was concordance with the result of studies in other countries.[27-34]

Suboptimal SRH in girls was higher than boys. SRH in girls and boys is affected by social aspects, so it is necessary to know how they interpret their SRH.

Table 1: The background characteristics of the adolescents in Qazvin city, Iran, in 2018 (*n*=1724)

Variables	n (%)/mean (SD)			Crud OR	P
	Total	**Optimal**	**Suboptimal**		
Individual level					
Gender					
Girl	864 (50.1)	652 (76.0)	206 (24.0)	1	
Boy	860 (49.9)	696 (81.8)	155 (18.2)	0.71 (0.53-0.95)	0.024*
School type					
Governmental	1001 (58.0)	791 (79.9)	202 (20.3)	1	
Special	424 (24.6)	318 (75.5)	103 (24.5)	1.34 (0.93-1.93)	0.115
Private	299 (17.3)	239 (81.0)	56 (19.0)	0.90 (0.59-1.38)	0.646
Educational period					
First	903 (52.3)	741 (82.4)	158 (17.6)	1	
Second	821 (47.6)	607 (74.9)	203 (25.1)	1.56 (1.18-2.05)	0.002*
School level					
Family socioeconomic status					
Very high	345 (20.0)	280 (20.8)	65 (37.6)	1	
High	345 (20.0)	277 (20.5)	66 (37.9)	0.03 (-0.35-0.43)	0.848
Moderate	345 (20.0)	276 (20.5)	68 (35)	0.08 (-0.31,0.47)	0.681
Low	345 (20.0)	260 (19.3)	82 (46.9)	0.33 (-0.05,0.71)	0.092
Very low	344 (19.9)	255 (18.9)	80 (42.6)	0.34 (-0.05-0.73)	0.088
Age	15.06 (0.04)	15.96 (0.04)	15.40 (0.08)	1.22 (1.12-1.34)	<0.001*

*Significant at 0.05 level. SD=Standard deviation, OR=Odds ratio

Table 2: Multi-level logistic regression models representing the association between different determinants

Models	Variables	Crud OR (95% CI)	Adjusted OR (95% CI)
Model 1	Academic stress	1.04 (1.03-1.04)***	1.04 (1.03-1.04)***
Model 2	Mental health disorders	1.17 (1.14-1.19)***	1.17 (1.14-1.20)***
Model 3	Physical activity	0.99 (0.98-0.99)***	0.99 (0.98-0.99)***
Model 4	Academic achievement	0.92 (0.89-0.96)***	0.94 (0.90-0.98)**
Model 5	Mental health disorders × Academic stress	1.03 (1.01-1.05)***	0.999 (0.998-1.001)
Model 6	Academic stress × Physical activity	0.99 (0.96-1.01)	0.99 (0.99-1.0)
Model 7	Academic stress × Academic achievement	1.00 (0.99-1.00)	1.00 (0.99-1.00)

**P<0.01, ***P<0.001. CI=Confidence interval

Therefore, age and gender are important factors that should be considered.[18] In other studies, similar ours, such as Peru, Sweden, Finland, SRH in boys were better than girls and and in some studies the association between SRH and gender was significant.[13,17,31,33,35]

Although, in this study, the association between SES and SRH was not significant, in many studies, SES has been associated with SRH.[19,36] Among African American adolescents, the odds of poor SRH have been significantly higher in low SES families.[29] Even interventions for improving the economic status of people have been a positive effect on their SRH.[35] However, no significant association was observed in few studies.[37]

The result of the present study shows that the percentage of suboptimal SRH was more among older adolescents. Adolescents in the second educational period had higher suboptimal SRH than of those in the first period, as well as with increasing the age of the adolescents, their suboptimal SRH have been increased. In other studies, optimal SRH has been less reported in older adolescents.[35] In Iran, likely, the adolescent's health is affected with academic stress. Because adolescents have to accepted in the competing national entrance exam (KONKOUR) for studying in the top universities in Iran.

Furthermore, in this study, academic stress had a positive association with suboptimal SRH. The studies conducted in other countries confirm this result and consider the effect of adolescents' perceived stress and SRH.[13,20] One of the main factors that should be considered in adolescents' stress is an academic achievement that in the present study had a negative association with suboptimal SRH. As regards, adolescents in Iran spend most of the times at school and doing homework at home, so their amount of assignments and academic achievement can have an important role in their academic stress and even their sleep that "this issue" can affect their SRH.[12,38-40] The social position among peers is another factor that associates with adolescents' health and affects their stress and consequently SRH.[17,38]

We found an association between mental health and SRH, and other studies reported similar findings.[27] Moreover, other studies have been mentioned the association

between SRH and some constructs such as life satisfaction, self-esteem, self-concept, and healthy spirituality that have a relationship with mental health.[29,31,33,35,41,42] However, difficult childhood experiences have an association with a risk of chronic diseases and suboptimal SRH in adulthood, but adolescents' health and mental health is neglected in both middle-income countries and low-income countries.[5,43]

Since the people's lifestyle is one of the most important factors in their SRH,[37] in this study, physical activity as one of the lifestyle factors was investigated. According to the result, in adolescents like adults, physical activity had a negative association with suboptimal SRH. This finding was concordance with the findings of other studies in Iran and other parts of the world.[2,11,15,33,34,44]

First, the limitation of this study was temporality in the association between SRH and predictors because of the cross-sectional design of the study. Second, since there is a difference in adolescents' perceived subjective health and their honesty, likely, the reply of the participants to question of SRH was not precise, so should consider this information bias in this study.

Conclusion

This study shows that the majority of the adolescents have optimal SRH. Gender, educational period, and age were associated with SRH. Mental health disorders and academic stress had a positive association with suboptimal SRH, whereas suboptimal SRH was lower in adolescents with physical activity and academic achievements. This issue demonstrates that school-related factors and mental health status are the most important constructs that should be considered in adolescence period.

Considering programs to reduce academic stress, including consulting with adolescents and their parents as well as extracurricular activities to increase adolescents' physical activity, can help improve SRH.

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Conflicts of interest

There are no conflicts of interest.

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