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The association of socioeconomic status of family and living region with self-rated health and life satisfaction in children and adolescents: The CASPIAN-IV study

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Abstract

Background: Socioeconomic status (SES) is a major determinant of health inequality in children and adolescents. The aim of this study was to evaluate the association of SES of family and living region with self-rated health (SRH) and life satisfaction (LS) among children and adolescents.

Methods: This study was a part of the fourth survey of a national surveillance program, which was conducted in 30 provinces of Iran in 2011-2012. LS and SRH were assessed by a questionnaire based on the World Health Organization-Global School-based student Health Survey (WHO-GSHS). Family SES was estimated using principal component analysis (PCA) and based on family assets, parental education and occupation, and type of school. Region SES was calculated using PCA and some variables including literacy rate, family assets and employment rate.

Results: Out of 14,880 invited students, 13,486 (participation rate: 90.6%) completed the survey; of whom, 49.2% were girls, and 75.6% were from urban areas with the mean ± SD age of 12.47±3.36 years. In the multivariate model, SES of family and living region was associated with LS and good SRH. In the full models, in addition to all potential confounders, family and living region SES were included simultaneously. However, only the association of family SES with LS, and good SRH remained statistically significant.

Conclusion: The effect of families' SES on SRH and LS is more important than regional SES. The presented patterns of SRH and LS may be useful in developing better health policies and conducting complementary studies in this field.

Keywords: Life Satisfaction, General Health, Socioeconomic Status, Children, Adolescents.

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Introduction

Numerous studies have emphasized on a complex set of direct and indirect impacts of self-rated health (SRH) and life satisfaction (LS) on health issues, including morbidity and mortality (1-3). SRH is the individual's perception of health status and can represent the impact of non-biomedical factors as life style, psychosocial and socio-demographic conditions. LS is a subjective feeling of health that indicates general well-being. The association of LS and SRH has been documented in some previous studies (3,4).

Some studies showed that socioeconomic status (SES), which is extracted from parents' education, family income etc., might be associated with SRH (5-8). The same association was found between SES and LS (9,10). Recently, it has been documented that geographical and environmental factors could affect LS (11-13).

SES as a major determinant of health inequality in children and adolescents might lead to progressive inequities in different aspects of physical, mental and social health (14,15). In this respect, the comparative effects of SES at individual or community levels remain controversial (15-18). We could not find any research comparing the association of SES of the living area and familial SES with LS and SRH in the literature. Most studies have been conducted on adult populations and in high-income countries, and limited knowledge exists on the pediatric age groups and on low- and middle-income countries (7,8,19,20). Furthermore, we could not find any study on the mentioned subject in the Middle East and North Africa (MENA) region.

This study aimed to evaluate the association of family and living region SES with LS and SRH in a nationally representative sample of a pediatric population in Iran.

Methods

This study was a part of the fourth survey of a national surveillance program, entitled: Childhood and Adolescence Surveillance and Prevention of Adult Non-communicable Diseases (CASPIAN-IV) study, which was conducted in 30 provinces in Iran in 2011-2012.

The study methodology was published in detail (21), so we present it in brief in this study. Ethical committees of Tehran University of Medical Sciences and Isfahan University of Medical Sciences reviewed and approved the study protocols. After thoroughly explaining the procedure, we obtained written informed consent from the parents and oral agreement from the students.

The study participants were students from elementary, middle and high schools of urban and rural areas. They were selected by multistage cluster sampling method. Stratification was performed according to school grade and living area (urban, rural). The total sample size was calculated as 14,880 students (48 clusters of 10 students in each province).

The students' questionnaire was prepared in Farsi and based on the World Health Organization- Global School-based student Health Survey (WHO-GSHS). Another questionnaire was developed for the parents. The reliability and validity of the questionnaire have been confirmed previously (22). LS and SRH of students were assessed by the following questions:

SRH was assessed by the following item: "How would you describe your general state of health?" The categories of response were "perfect," "good," "moderate," and "bad". LS was measured by a single item as well; the participants were asked to indicate their degree of life satisfaction using a tenth-point scale from 1= very dissatisfied to 10 = very satisfied. Scores below 6 signified dissatisfaction and those equal to or more than 6 denoted satisfactions. The LS score was calculated according to this category.

To compare the SES of the living area, we categorized Iran into four subnational regions according to a previous study, which had used principal component analysis (PCA) based on geography and SES (23). Some variables from the 2006 nation-

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al census including literacy rate, family assets and employment rate were used to calculate SES. According to this classification, the Southeast and Central regions had the lowest and highest SES, respectively.

The method and variables used for calculating family SES were approved previously in the International Reading Literacy Study (PIRLS) (24). Using PCA, some variables including family assets (including house, car and computer), parental education and occupation, as well as the school type (private/public) were summarized in one main component for constructing family SES. Students were classified in low, moderate and high SES based on this component.

We reported the frequency of LS and good SRH with 95% confidence interval (CI). LS score (range: 1-10) was also considered as a continuous variable and reported as mean and 95% CI. The frequency of LS and good SRH across family SES was assessed using Chi-square test. The mean comparison of LS score across family SES was tested using ANOVA test. To adjust the potential confounders, logistic regression analysis was utilized to evaluate the association between SES of family and region with LS and SRH in different models. Model I was a crude model (without adjustment). In Model II, the association was adjusted for age, sex and living place; and in Model III, family size, physical activity, screen time activity, smoking status, birth order and living with parents were also adjusted. In Model IV, in addition to Model III variables', SES of family and regions were entered simultaneously in the model. Using survey analysis method, all analyses were performed at national, regional and individual levels. Data were analyzed using survey data analysis methods in the STATA Corp. 2011 (Stata Statistical Software: Release 12. College Station, TX: Stata Corp LP. Package).

Results

In this survey, 13,486 out of 14,880 invited students completed the study (participation rate: 90.6%). Their mean ± SD age was 12.47±3.36 years, with no significant difference between girls and boys. Students included 6,640 (49.2%) girls and 6,846 (50.8%) boys; of them, 75.6% were from urban and 24.4% were from rural areas. The number of participants in Southeast (lowest SES rank), North-Northeast (second low SES rank), West (second high SES rank) and Central (highest SES rank) regions were 1,181 (8.76%), 2,359 (17.49%), 6,119 (45.37%) and 3,827 (28.38%), respectively.

The mean of LS score, frequency of LS and good SRH according to SES of the living area are presented in Table 1, which displays that participants from the second low SES region had the highest mean of LS score (8.26), highest frequency of LS (82.05%) and good SRH (81.44%).

Table 2 demonstrates the same association between LS and SRH with family SES. The abovementioned variables were significantly associated with family SES, as the highest mean LS score (8.4), frequency of LS (85.2%) and good SRH (83.17%) were observed in the high family SES ($p<0.01$).

Table 3 describes OR of higher LS and SRH in different regional and familial SES levels in multiple logistic regression models. Regional SES showed a significant association with LS in the second low and the highest categories (OR: 1.36 and 1.27, respectively) and with good SRH in the second-low and the second-high categories (OR: 1.30 and 1.28, respectively) of the third model. In model III, high and moderate family SES, compared to low family SES, increased the OR of LS and good SRH. In the fourth model, in addition to all potential confounders, family and regions' SES were adjusted although a significant association was found in the third model in regions' SES with LS, and good SRH was not present. However, the association of family SES with LS and good SRH remained statistically significant. In this model (fourth model), moderate family SES, compared to low family SES, increased the OR of LS (OR: 1.42, 95% CI:

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Table 1. The association between life satisfaction and self-rated health with socioeconomic status of the living region: The CASPIAN-IV study

Regions' SES	LS score*	LS	Good SRH
	Mean [95%CI]	% [95%CI]	% [95%CI]
Lowest SES (Southeast)			
Boys	7.87[7.56,8.19]	72.81[66.68,78.18]	78.55[74.34,82.23]
Girls	8.17[7.95,8.39]	78.82 [74.66,82.46]	74.96[69.86,79.45]
Urban	8.0[7.75,8.26]	76.63[72.05,80.65]	75.39[70.88,79.4]
Rural	8.06[7.75,8.37]	75.28[69.2,80.51]	78.18 [72.93,82.65]
Total	8.03[7.83,8.22]	76.02[72.42,79.29]	76.64[73.27,79.7]
Second Low SES (North-Northeast)			
Boys	8.28[8.1,8.46]	82.06[79.02,84.74]	83.18[80.34,85.68]
Girls	8.25[8.08,8.42]	82.05[79.17,84.61]	79.66[76.68,82.34]
Urban	8.21[8.06,8.36]	81.87[79.5,84.03]	80.76[78.37,82.95]
Rural	8.41[8.15,8.67]	82.53[78.03,86.28]	83.23[79.02,86.74]
Total	8.26 [8.13,8.39]	82.05 [79.97,83.96]	81.44[79.38,83.33]
Second High SES (West)			
Boys	8.01[7.89,8.13]	78.89 [76.81,80.82]	80.74[78.93,82.44]
Girls	8.2[8.07,8.32]	79.67[77.53,81.65]	80.43[78.48,82.24]
Urban	8.07[7.97,8.17]	78.86[77.13,80.49]	80.21[78.71,81.62]
Rural	8.2[8.02,8.39]	80.54[77.35,83.37]	81.75[78.91,84.29]
Total	8.10 [8.01,8.19]	79.27 [77.77,80.7]	80.59[79.27,81.84]
Highest SES (Central)			
Boys	8.17[8.04,8.31]	81.03[78.6,83.24]	79.11[76.9,81.16]
Girls	8.15[8.01,8.29]	80.57[77.92,82.96]	79.06[76.83,81.12]
Urban	8.14[8.04,8.25]	80.42[78.46,82.25]	78.94 [77.31,80.48]
Rural	8.26[8.01,8.5]	82.89[78.54,86.5]	79.87 [75.03,83.97]
Total	8.16 [8.06,8.25]	80.81 [79.03,82.47]	79.08[77.53,80.56]
National			
Boys	8.09[8.01,8.17]	79.58 [78.22,80.88]	80.51[79.33,81.64]
Girls	8.18[8.11,8.26]	80.25 [78.91,81.53]	79.4[78.13,80.61]
Urban	8.11[8.05,8.17]	79.72 [78.62,80.78]	79.59[78.62,80.53]
Rural	8.23[8.11,8.35]	80.51 [78.44,82.42]	81.12[79.21,82.89]
Total	8.14 [8.08,8.2]	80.17 [79.18,81.13]	80.13 [79.25,80.99]

LS: life satisfaction; SRH: Self-rated health; SES: Socio-economic status, *The range of this score is 1-10

Table 2. The association between life satisfaction and self-rated health with family socioeconomic status: The CASPIAN-IV study

Family SES	LS score*	LS	Good SRH
	mean [95%CI]	% [95%CI]	% [95%CI]
Low			
Boys	7.86[7.73,7.99]	74.6[72.27,76.8]	78.13[75.98,80.15]
Girls	7.93[7.80 , 8.07]	75.29[72.82,77.61]	76.54 [74.14,78.77]
Urban	7.72[7.59,7.84]	71.84 [69.65,73.93]	75.11[73.01,77.09]
Rural	8.12[7.96,8.28]	78.89[76.09,81.44]	80.19[77.65,82.5]
Total	7.90[7.80,7.99]	74.95[73.21,76.6]	77.34 [75.72,78.88]
Moderate			
Boys	8.13[8.01,8.24]	80.24 [78.1,82.21]	79.69 [77.8,81.47]
Girls	8.22[8.11,8.33]	80.49 [78.35,82.47]	80.03[78.07,81.86]
Urban	8.09[8.0,8.19]	79.26[77.51,80.91]	79.24[77.72,80.68]
Rural	8.45[8.30,8.60]	84.33[81.48,86.81]	82.11[79.09,84.77]
Total	8.17[8.09, 8.25]	80.36[78.87,81.78]	79.86[78.5,81.15]
High			
Boys	8.37[8.27,8.47]	85.03 [83.07,86.8]	83.95[82.1,85.64]
Girls	8.43[8.33,8.54]	85.37 [83.51,87.05]	82.34[80.44,84.09]
Urban	8.40[8.33,8.48]	85.46 [84.08,86.74]	83.01[81.63,84.31]
Rural	8.37[8.10,8.63]	82.32[76.85,86.72]	84.93[80.14,88.72]
Total	8.40[8.33,8.47]	85.2 [83.86,86.44]	83.17[81.85,84.41]

LS: life satisfaction; SRH: Self-rated health; SES: Socio-economic status, *The range of this score is 1-10

1.25-1.60) and good SRH (OR: 1.21, 95% CI: 1.07-1.36). Moreover, high family SES, compared to low family SES, increased the OR of LS (OR: 2.09, 95% CI: 1.81-2.41) and good SRH (OR: 1.57, 95% CI: 1.36-1.81).

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Table 3. Odds Ratios (95% CI) for Life Satisfaction and Self-rated Health with Region and Family Socioeconomic Status in Iranian Adolescents and Children : The CASPIAN-IV study

Variables			LS	Good SRH
Model I[1]	Regions' SES	Lowest	Reference	Reference
		Second low SES	1.44 [1.14,1.83]*	1.33[1.07,1.67]*
		Second high SES	1.21[0.98,1.49]	1.27[1.04,1.54]*
		Highest	1.33[1.06,1.66]*	1.15[0.94,1.41]
	Family SES	Low	Reference	Reference
		Moderate	1.36[1.21-1.53]*	1.16[1.03-1.3]*
		High	1.92[1.68-2.19]*	1.44[1.27-1.64]*
Model II[2]	Regions' SES	Lowest	Reference	Reference
		Second low SES	1.43[1.15,1.79]*	1.33[1.08,1.65]*
		Second high SES	1.2 [0.98,1.46]	1.26[1.05,1.53]*
		Highest	1.30[1.05,1.60] *	1.14[0.93,1.38]
	Family SES	Low	Reference	Reference
		Moderate	1.40[1.25-1.58]*	1.18[1.05-1.32]*
		High	2.10[1.83-2.40]*	1.54[1.35-1.75]*
Model III[3]	Regions' SES	Lowest	Reference	Reference
		Second low SES	1.36[1.09,1.71]*	1.30[1.05,1.62] *
		Second high SES	1.17[0.95,1.43]	1.28[1.05,1.56]*
		Highest	1.27[1.02,1.57]*	1.16[0.94,1.41]
	Family SES	Low	Reference	Reference
		Moderate	1.41[1.25-1.60]*	1.19[1.06-1.34]*
		High	2.05[1.77-2.37]*	1.51[1.31-1.74]*
Model IV[4]	Regions' SES	Lowest	Reference	Reference
		Second low SES	1.27[0.98 , 1.61]	1.24[0.99,1.56]
		Second high SES	1.13[0.91,1.41]	1.25[0.99,1.54]
		Highest	1.15[0.91,1.45]	1.08[0.87,1.34]
	Family SES	Low	Reference	Reference
		Moderate	1.42[1.25-1.60]*	1.21[1.07-1.36]*
		High	2.09[1.81-2.41]*	1.57[1.36-1.81]*

LS: life satisfaction; SRH: Self-rated health; SES: Socio-economic status
[1]Without adjustment [crude models)
[2]Adjusted for age and sex, living place
[3]Additionally adjusted for family size, physical activity, screen time activity, smoking status, birth order, living with parents
[4]In this model, in addition to Model III variables', family SES and regions SES were simultaneously considered in the model
*Statistically significant

Discussion

To the best of our knowledge, this was the first national study in the MENA region to examine the association of family and living region SES on LS and SRH in a large population-based sample of children and adolescents.

Our finding revealed that the effect of families' SES on SRH and LS was more important compared to regional SES. A large body of evidence underscores the role of family structure on LS (15,16,25,26). SRH in a complex set of different determinants is influenced by different familial factors that most of the time might have more important roles than social and national factors (27,28). Recent extensive related analysis has revealed that higher national income inequality is related to more psychological and physical symptoms. Higher national income inequality is also related to larger SES differences in psychological and physical symptoms and life satisfaction (29).

Our study showed that participants living in the region with lowest SES had the lowest LS score compared to other three regions, and this might be attributed to different geographical, environmental, socioeconomical and even personal factors. From them, very hot climate of this region and SES had been more emphasized in previous studies (30,31).

Although the central region of Iran had the highest SES, children and adolescents of this region did not report the highest LS or good SRH. The highest LS score and LS and good SRH were reported from North and northeast of Iran. In addition to the studied factors such as ethnic differences and cultural behaviors, humid climate with the highest levels of rain in this region

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might have led to the differences in the participants' self-assessment of quality of life (32-35). In this respect, the role of individual factors was more highlighted than regional determinants. In the fourth model, simultaneous evaluation of all possible influencing factors revealed the impact of the association of family SES with LS and good SRH.

Based on our findings, children and adolescents living in rural areas had better LS score and SRH. An industrialized type of living and higher rate of air pollution in urban areas might be responsible for these differences (35,36). Our findings are in line with a previous study showing a negative relationship between local environmental problems and life satisfaction (35,37,38). In some studies, ambient ozone, SO2 and NO2 levels were negatively associated with LS (11,12). Poor air quality might decrease lung function, aggravate asthma, cause chronic bronchitis and premature death in people with heart and lung diseases (36). However, some controversies exist about the air pollution and LS relationship. Although some studies have found limited impact of pollution on LS, some evidences revealed inverse associations between them (11).

The main noteworthy strength of this study was its comprehensive approach, benefitting from a large national representative sample of Iranian children and adolescents. Moreover, this study was designed and conducted based on the World Health Organization- Global School-based student Health Survey (WHO-GSHS) standardized protocol. The main limitation of this study was its cross-sectional nature, and its other limitation was the recall bias of the participants in recollecting some of the information.

Conclusion

Our finding revealed that the effect of families' SES on SRH and LS is more important, compared to regional SES. The complex discussed patterns of SRH and LS could be useful for different stakeholders with diverse views in developing better health policies and conducting more targeted studies in related fields.

Acknowledgments

This nationwide survey was conducted in Iran with the cooperation of the Ministry of Health and Medical Education, Ministry of Education and Training, Child Growth and Development Research Center, Isfahan University of Medical Sciences, and Endocrinology and Metabolism Research center of Tehran University of Medical Sciences.

Conflict of interest

The authors declare that they have no conflict of interest.

Funding

This study was conducted as part of a national school-based survey.

Ethical Standard

A comprehensive verbal description of the nature and purpose of the study was provided to the students, their parents and teachers. Written informed consent was obtained from parents. Ethical committees of Tehran University of Medical Sciences and Isfahan University of Medical Sciences reviewed and approved study protocols.

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