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Original Article (Pages: 4951-4964)

Determinants of Self-Perceived Health in Iranian Children and Adolescents: the CASPIAN IV Study

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Abstract

Background: Health status is an individual's relative level of wellness and illness. Self-Perceived Health (SPH) is a single item considered as a health indicator for national and international survey. The aim of this study was to evaluate the SPH measure and its determinants in a National sample of Iranian children and adolescents.

Materials and Methods: This National study was performed as the fourth National survey of a school-based surveillance program entitled the Childhood and Adolescence Surveillance and Prevention of Adult Non-communicable Disease (CASPIAN-IV) study. 14,880 students aged 6-18 years old selected from 30 provinces of Iran by a multistage Cluster and stratified sampling method. Two sets of valid and reliable questionnaires were completed for students and their parents.

***Results* :** Overall 13,846 participated in the present study with 90.6 % participation. In this study, 80.5 % of boys and 79.4% of girls reported good SPH (95% confidence interval (CI), 79.3-81.6 versus 78.1-80.6, respectively). According to the living area, 79.5% from urban and 81.1% from rural area declared good SPH (95% CI, 78.6-80.5 versus 79.2-82.8, respectively). In the multivariate model, the subjects who had healthy weight compared with excess weight had significantly higher SPH (OR: 1.36; 95% CI, 1.17-1.59). Also, the subjects with high Socio-economic status (SES) had higher odds of SPH (odds ratio [OR], 1.23; 95% CI, 1.06-1.41).

***Conclusion*:** Our results showed that SPH can be influenced by both demographic and life style related characteristics among study population. This association was stronger for SPH and academic success, talking with both parents and having normal body image respectively.

Key Words: Adolescents, Children, Iran, Self-Perceived Health, Wellness.

*Please cite this article as: Zahedi H, Heshmat R, Payab M, Ardalan G, Motlagh ME, Shafiee G, et al. Determinants of Self-Perceived Health in Iranian Children and Adolescents: the CASPIAN IV Study. Int J Pediatr 2017; 5(5): 4951-64. DOI: **10.22038/ijp.2017.22735.1904**

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Received date: Feb.15, 2017; Accepted date: Mar.22, 2017

1- INTRODUCTION

Health status is an individual's relative level of wellness and illness often assesses in the population studies. Self-Perceived Health (SPH), also called Self-reported health, Self-assessed health or rated health, is a single item considered as a health indicator for national and international survey (1). It is a potentially useful measure to assess the perception of one's overall health status known as a reliable, valid and robust measure (2). By using this summary scale, individuals can rate their health perception ranging from "very good" to "very bad"(3). Although, most widely studies on the use of SPH and its determining factors have been conducted on the adults, it has a great potential to attract more research attention as a valid and reliable measure among adolescents. It has shown that SPH is more associated with multidimensional factors including personal, environmental, psychological, socio-behavioral and lifestyle factors in adolescents while in adults, it may reflect the acute and chronic status (4-6).

The increasing studies regarding the use of this common measure among adolescents has shown that the prevalence of poor SPH is high in this age group due to low morbidity rates (7). These evidences suggest that SPH deserves a special research attention especially among children and adolescents as an easily assessed, reliable and valid health indicator. Furthermore, according to our knowledge, few evidences exist on the SPH and its determining factors among children and adolescents. In addition, the formation of health status perception occurred during adolescence (3), and it may predict the rate of morbidity and mortality in the future (8, 9). Considering the importance of SPH, the aim of this study was to evaluate the SPH measure and its determining factors in a National sample of Iranian children and adolescents.

2- MATERIALS AND METHODS

2-1. Study design and population

This National study was performed as the fourth National survey of a school-based surveillance program entitled the Childhood and Adolescence Surveillance and Prevention of Adult Non-communicable Disease (CASPIAN-IV) study in 2011-2012. The methodology of this survey has been described by details previously (10) and, here, the methods of the present paper will be described.

2-2. Sampling Methods

This study was conducted among 13,486 students aged 6-18 (12.47± 3.36) years old and included 6,640 girls. The study population selected from 30 provinces of Iran (48 clusters of 10 students in each province) from urban and rural area in three levels of elementary, intermediate and high school students by a multistage cluster and stratified sampling method. Stratification was conducted according to school grade and residential area (urban and rural) proportional to size and with equal sex ratio.

2-3. Measuring tools: validity and reliability

The World Health Organization Global School-based Health Survey questionnaire in Persian (10), consisted of two sets of valid and reliable questionnaires, were completed for students and their parents. The students' one included life satisfaction, current and passive smoking, body image, Body Mass Index (BMI), physical activity and so on. SPH and its determinants were assessed by questions shown in **Table.1**. In order to calculate the BMI, weight and height of the students were measured by school health professionals with an accuracy of 0.1 kg

and 0.1 cm respectively. World Health Organization (WHO) standards were used to define the categorization of BMI: Underweight (< 5th percentile), healthy weight (5th- 85th percentile), overweight (85th- 95th percentile) or obese (> 95th percentile) (11).

In addition, the questionnaire of the parents was comprised of concern such as family history, place of living, family size and birth order. All of the questions were asked by trained personnel in a suitable location and atmosphere at schools. Also, this procedure was conducted and controlled by a skilled team.

2.5-Ethical consideration

This study was approved by ethical committee of Tehran and Isfahan university of Medical Sciences. All of the subjects received an explanation of the study and signed the informed consent. There were no obligation for participation in this study and all of the subjects were volunteers (ID number: 188092).

2-6. Inclusion and exclusion criteria

All students aged 6-18 years old with Iranian nationality (having Iranian identity card) were eligible to include in this study. Having a chronic disease, history of chronic medication consumption and obtaining from a special diet were considered as exclusion criteria. In addition, participants with full missing data were excluded.

2-7. Statistical analysis

The statistical analysis was performed using STATA package (state statistical software: Release 12, STATA Corporation 2011, College Station, TX, USA). The quantitative variables were presented as mean and standard deviation (SD) and the qualitative variables as number and percentage. The analysis of categorical data was done using the Chi-square test. A multivariate logistic regression was used to assess the most determinants of SPH. $P < 0.05$ was considered as statistically significant.

Table-1: Questions used to screen SPH and its determinants according to Global School-based Student Health Survey questionnaires(11)

Variables	Response
SPH What do you think about the overall status of your health?	Excellent (considered as good) Good (considered as good) Moderate (considered as poor) Bad (considered as poor)
Breakfast, lunch and dinner frequency How often do you eat breakfast in a week? How often do you eat lunch in a week? How often do you eat dinner in a week?	0-1 times 2-4 times 5-7 times
Fresh fruits (fruits and juices), vegetables, milk and fast food? How often do you consume fresh fruits? How often do you consume vegetables? How often do you consume milk? How often do you consume fast food?	Seldom Weekly Daily
Physical activity How many days in the last week, have you had a 30 minutes Physical activity?	0-1 days (considered as mild) 2-4 days (considered as moderate) 5-7 days (considered as high)
Watching Television and uses the computer How much time do you spend watching television in	≤ 2 hours >2 hours

your free times (every day and weekend)? How much time do you spend on a computer in your free times (every day and weekend)?	
Body image How do you think about your size?	Very thin (considered as thin) Slightly thin (considered as thin) Normal size (considered as normal) Slightly obese (considered as overweight) Obese (considered as overweight)
Tooth brushing Frequency How often do you brush your teeth?	More than once per day (considered as daily) Once per day (considered as daily) At least once per week (considered as nondaily) Only once per week (considered as nondaily) Less than once per week (considered as nondaily) Never (considered as nondaily)
Depression During the past 12 months, did you ever feel sad or hopeless?	Yes No
Anxiety During the past 6 month, how often did you experience Anxiety, so that you could not perform your daily activities?	Yes No
Passive smoking Have you ever used any tobacco products?	Yes No
Current smoking Are you currently using any tobacco products?	Yes No

3- RESULTS

Overall 13,846 out of 14,880 students (90.6%) participated in the present study. The subjects of this study consisted of 13,846 students (49.2% girls) selected from urban (75.6%), and rural (24.4%) areas. The mean age of the participants was 12.47±3.36 years without significant differences between boys (12.36±3.40) and girls (12.58±3.32).

The association of demographic characteristics with SPH according to level of education is presented in **Table.2 (***please see the end of paper***)**. There was a significant association between the demographic characteristics and good SPH (P< 0.05) except for gender, living area and spent time with friends in total population.

As presented, 80.5 % of boys and 79.4% of girls reported good SPH (95% CI, 79.3-81.6 versus 78.1-80.6, respectively). According to the living area, 79.5% from urban and 81.1% from rural area declared good SPH (95% CI, 78.6-80.5 versus 79.2-82.8, respectively). **Table.3 (***please see the end of paper***)** shows the association of life style related characteristics with SPH according to the level of education. As the table shows, there is significant association between all of the life style related characteristics and good SPH (P< 0.05). There were significant association between good SPH and daily consumption of breakfast, lunch and dinner (P<0.001).

The association between life style and demographic characteristics with good SPH (odds ratio [OR] and 95% confidence interval [CI]) in a multivariate logistic regression analysis is shown in **Table.4 (***please see the end of paper***)**.

In the multivariate model, the subjects who had healthy weight compared with excess weight had significantly higher SPH (OR: 1.36; 95% CI, 1.17-1.59). Also, the subjects with high SES had higher odds of SPH (OR, 1.23; 95% CI, 1.06-1.41), that means those with higher socio-economic

status had significantly higher SPH. Among the life style related characteristics, academic success (OR, 2.02; 95% CI, 1.82- 2.24), talking with both parents (OR, 1.42; 1.21-1.67) and having normal body image (OR, 1.53; 95% CI, 1.36-1.72) exhibited the strongest association respectively, so that students with academic success, ability to talking with their parents easily and having favorable body image had better SPH.

4- DISCUSSION

We aimed to identify the determinants of SPH among Iranian children and adolescents. We found in the present study that self-rated health can be influenced by both demographic and life style related characteristics among study population. This association is stronger for SPH and academic success, talking with both parents and having normal body image respectively. SPH can be recognized as a predictor of morbidity and mortality (12, 13). Our results are in line with the previous studies in which demographic characteristics are associated with SPH (6, 14). In this study, boys (80.0%) are more likely to report having good SPH than girls (79.4%). Similar to the findings of the present study, gender differences in SPH were also observed in previous studies (15-17). SES is an important predictor of SPH. The results of this study revealed that subjects who have had a good SES, were reported to have 23% higher score of SPH than those who had poor SES. In another study, 78% of adolescents with good SES were reported to have good/excellent SPH, compared to those with poor SPH (17). Other studies have also concluded that SPH is strongly associated with SES (6). Among demographics characteristics, the academic success variable has the greatest influence on SPH, that is, subjects who reported success were more likely to report good SPH (OR:2.02, 95%CI: 1.82-2.24). In this study, living with parent and having dialogue with them were strongly associated with good SPH. Finding of studies among Pakistani and Brazilian adolescents have shown that strong family support reduces the risk of poor SPH. Thus, Family support is important for physical and mental health throughout adolescence (6, 18). The results of this study showed that subjects who consumed more meals during the week (5-7 times per week), were found to enjoy better SPH than those who had consumed 0-1 times. Therefore, missing a meal was significantly suggestive of poor SPH. In addition, the consumption of fruits and vegetables during the day (every day) was associated with good SPH. Subjects with the level of fruit intake (OR: 1.37; 95% CI, 1.16-1.62), and vegetables intake (OR: 1.24; 95% CI, 1.07-1.43) had significantly higher odds ratio of reporting good SPH. Other studies have also shown that lack of fruit consumption during the week was related to poor SPH (19).

Physical activity is a very important factor influencing SPH among children and adolescents. Physical activity is positively associated with SPH (7, 19-21). Our study showed that students with higher and moderate physical activity were 1.27 and 1.34 times more in good SPH, respectively than those with mild physical activity. Also, among subjects, those who watched television and worked with computer less than two hours during the day, were found to be in better SPH than those who spend more time there ($\geq$ 2h). On the same basis, other studies have confirmed an association of physical inactivity in adolescents with lower levels of SPH (22). Elinder et al., have shown that >4h of physical activity per week was an important factor in improving SPH (23). More interestingly, some studies have indicated that the effect of physical activity on SPH can even be observed at lower levels of physical activity and

increases with activity intensity (24). Those who spent more time watching TV are more likely to report poor SPH (19). Our findings also support the significant association between body image and SPH.In their study, Sharma et al., observed no significant association for perceived body weight and SPH, and showed that being overweight or underweight are not considered as risk factors of poor SPH (19). However, other studies supported our finding and have shown that perceived weight status has an influence on SPH (25, 26). Among subjects who enjoyed an appropriate level of BMI, the levels of SPH was higher than those who were underweight and overweight. Students with healthy BMI were 1.36 times more in good SPH than those underweight. Meireles et al., achieved similar results as of ours. As well, according to other studies, a higher BMI influences the SPH (27). Our results support previous finding confirming that depression and anxiety have a strong influence on SPH. Depression and anxiety have been proved to be an important risk factor against good SPH among children and adolescents (OR: 0.64; 95% CI: 0.57-0.72 and OR: 0.60; 95% CI: 0.53-0.67) (15, 28).

4-1. Limitation and Strengths

There were some strengths and limitations which should be considered. One of the main strengths of the present study is that most studies have focused on elderly or adults, but this study is the first study conducted on children and adolescents with a large National sample size. The cross sectional design of the present study seems to be the main limitation of this study; therefore follow up surveys are need.

5- CONCLUSION

In conclusion, our study provides some evidence regarding the determinants of self-perceived health in children and adolescents. Being male, SES, smoking, family support, academic success, consumption of fruits and vegetables, physical activity, body image, and BMI significantly influenced SPH. Interventions that focus on providing fruits and vegetables, increasing physical activity, and strengthening family support may contribute to improve SPH among in children and adolescents. The risk factors examined in this study were found to not only have an impact on SPH throughout adolescence, but also were shown to have long-term implications for health in adulthood. An understanding of these factors can not only remove the individuals concerns but also may provide the health care system with the insight to deal with the consequences.

6- CONFLICT OF INTEREST

The authors declared no conflict of interest.

7- ACKNOWLEDGMENT

The authors would like to thank all students participated in this survey and their parents, the school staffs, data collectors, executive team, research scientists and all relevant administrators.

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Table-2: Association of demographic characteristics with good self-perceived health according to level of education: the CASPIAN IV study

Variables	Category	Elementary school			Middle school			High school			Total		
		Percent	95% CI	P-value*	Percent	95% CI	P-value*	Percent	95% CI	P-value*	Percent	95% CI	P-value*
Gender	Male	84.7	83.1,86.1	0.44	76.2	73.4,78.7	0.37	76.9	74.6,79.0	0.16	80.5	79.3,81.6	0.19
	Female	85.5	83.8,87.0		74.5	71.9,77.0		74.7	72.5,76.8		79.4	78.1,80.6	
Living area	Urban	84.6	83.2, 85.9	0.22	76.0	73.9,77.9	0.23	76.0	74.4,77.6	0.31	79.5	78.6,80.5	0.15
	Rural	86.1	84.0,87.9		73.3	69.0,77.2		73.6	68.9,77.9		81.1	79.2,82.8	
Family size	≤ 4	85.5	84.2,86.8	0.27	76.1	73.7,78.4	0.28	78.6	76.3,80.8	0.001	81.6	80.5,82.7	0.001
	> 4	84.5	82.8,86.0		74.5	72.0,76.8		74.0	71.9,75.9		78.3	77.1,79.4	
Living with parents	None of them	84.5	74.9,90.8	0.05	74.4	57.6,86.1	0.61	71.7	59.2,81.5	0.01	78.3	71.7,83.7	0.001
	One of them	79.2	72.8,84.3		72.1	65.1,78.2		68.0	61.2,74.1		73.0	69.2,76.5	
	Both of them	85.3	84.2,86.4		75.5	73.5,77.3		76.4	74.8,78.0		80.3	79.4,81.2	
Birth order	First	85.2	83.7,86.4	0.39	76.6	74.1,79.0	0.53	75.7	73.2,78.1	0.52	80.7	79.6,81.9	0.02
	Second	86.0	84.1,87.6		74.3	71.4,77.0		77.5	74.7,80.2		80.6	79.2,81.9	
	Third	83.3	80.3,85.8		74.4	70.0,78.4		75.3	71.4,78.9		78.6	76.5,80.5	
	Forth or more	84.8	81.7,87.4		74.6	70.5,78.3		74.5	71.3,77.5		78.1	76.1,79.9	
Talk with their mothers facing problems	Yes	85.3	84.1,86.4	0.15	77.2	75.3,79.1	<0.001	77.8	76.0,79.5	0.001	72.6	70.5,74.6	0.001
	No	83.2	80.1,86.0		64.6	60.4,68.5		69.2	65.8,72.4		81.3	80.4,82.1	
Talk with their fathers facing problems	Yes	86.9	85.6,88.2	0.001	79.7	77.3,81.9	0.001	82.0	79.9,84.0	0.001	84.2	83.2,85.2	0.001
	No	82.3	80.5,83.9		72.0	69.7,74.3		71.8	69.8,73.7		75.8	74.6,76.9	
SES	Weak	85.1	83.1,86.8	0.13	70.2	66.7,73.5	0.001	69.4	66.4,72.3	0.001	77.3	75.7,78.8	0.001
	Moderate	84.1	82.3,85.7		76.2	73.3,78.8		75.6	72.9,78.2		79.8	78.5,81.1	

	Good	86.6	84.7,88.3		80.1	77.4,82.5		81.0	78.5,83.3		83.1	81.8,84.4	
Feel accepted by peers	Yes	86.2	85.0,87.3	0.001	77.4	75.3,79.3	0.001	77.8	76.1,79.4	0.001	81.7	80.8,82.6	0.001
	No	78.1	75.2,80.8		67.7	63.8, 71.4		68.0	64.5,71.3		71.7	69.7,73.5	
Academic success by teacher	Yes	88.2	87.2,89.2	0.001	81.7	79.7,83.5	0.001	81.4	79.5,83.1	0.001	85.1	84.2,85.9	0.001
	No	72.8	70.0,75.4		63.9	60.9,66.8		68.5	66.0,70.8		68.4	66.8,69.9	
Likes school	Yes	85.4	84.3,86.5	0.001	76.3	74.3,78.2	0.001	76.9	75.3,78.5	0.001	80.8	80.0,81.7	0.001
	No	73.9	68.0,79.1		64.2	58.7,69.4		68.2	63.9,72.2		68.3	65.4,71.1	
Days spent time with friends	0 days	85.3	83.5,86.9	0.88	75.4	72.8,77.9	0.96	74.9	72.5,77.1	0.43	79.6	78.4,80.9	0.80
	1-3 days	85.0	83.3,86.5		75.0	72.4,77.4		76.8	74.5,78.9		80.2	78.9,81.3	
	>3 days	84.6	81.9,86.9		75.3	70.8,79.3		74.9	70.9,78.5		79.7	77.7,81.6	
Number of close friends	≤ 2 friends	84.2	82.5,85.8	0.17	74.2	71.5,76.8	0.25	73.5	71.0,75.8	0.009	78.5	77.2,79.7	0.001
	>3 friends	85.6	84.2,86.9		76.1	73.7,78.2		77.3	75.4,79.2		80.9	79.9,81.9	

* P < 0.05 was considered as statistically significant; SES: Socioeconomic Status; CI: Confidence Interval.

Table- 3: Association of life style variables with good self-perceived health according to the level of education: the CASPIAN IV study

Life style	Category	Elementary school			Middle school			High school			Total		
		Percent	95% CI	P value*	Percent	95% CI	P value*	Percent	95% CI	P value*	Percent	95% CI	P value*
Breakfast frequency in week	0-1 times	81.2	78.2,83.9	<0.001	67.7	63.9,71.2	<0.001	70.2	76.3,80.0	<0.001	73.4	71.5,75.2	<0.001
	2-4 times	81.8	78.5,84.7		72.4	67.5,76.8		74.2	70.5,77.6		76.7	74.5,78.8	
	5-7 times	86.3	85.1,87.4		78.5	76.4,80.5		78.2	67.1,73.0		82.4	81.4,83.3	
Lunch frequency in week	0-1 times	76.2	66.1,84.1	0.002	66.3	57.7,74.0	0.02	63.2	53.1,72.3	<0.001	68.2	62.6,73.2	<0.001
	2-4 times	79.6	74.0,84.2		72.2	66.8,77.0		69.9	64.0,75.3		73.8	70.6,76.8	
	5-7 times	85.5	84.3,86.5		76.1	74.1,78.0		76.7	75.1,78.3		80.7	79.8,81.6	
Dinner frequency in week	0-1 times	78.9	70.0,85.7	0.04	68.6	59.3,76.7	0.12	73.6	66.7,79.5	0.01	73.6	69.0,77.8	<0.001
	2-4 times	81.6	76.8,85.6		72.7	67.4,77.4		70.3	65.7,74.6		74.2	71.4,76.9	
	5-7 times	85.3	84.2,86.4		75.9	73.9,77.8		76.6	74.9,78.3		80.6	79.7,81.5	
Consume fresh fruits (fruits and juices)	Seldom	80.4	76.8,83.6	0.002	65.8	60.4,70.9	<0.001	65	60.4,69.3	<0.001	71.6	68.9,74.1	<0.001
	Weekly	85	83.3,86.6		72.8	69.7,75.7		72.1	69.4,74.7		78.2	76.7,79.5	
	Daily	86.1	84.7,87.4		78.9	76.6,81.0		80.1	78.2,81.8		82.6	81.6,83.6	
Consume vegetables	Seldom	82.6	80.0,85.0	<0.001	68.2	64.1,72.1	<0.001	72.1	68.4,75.5	<0.001	75.8	73.8,77.6	<0.001
	Weekly	84.2	82.6,85.6		73.9	71.4,76.4		74.2	72.0,76.4		78.9	77.7,80.1	
	Daily	87.4	85.7,88.9		80	77.6,82.3		79.6	77.3,81.8		83.2	82.0,84.3	
Consume milk	Seldom	78.3	74.8,81.5	<0.001	69.8	66.2,73.2	<0.001	72.4	69.8,74.9	0.001	73	71.1,74.7	<0.001
	Weekly	84.2	82.3,86.0		74.5	71.6,77.2		76.4	73.8,78.8		79.2	77.8,80.5	
	Daily	86.6	85.2,87.9		79.2	76.6,81.5		79.1	76.4,81.6		83.5	82.4,84.6	

Consume Fast foods	Seldom	85.6	84.4,86.7	0.08	74.5	72.3,76.6	0.05	75.9	74.0,77.6	0.38	80.3	79.3,81.2	0.04
	Weekly	83.1	80.7,85.2		78.2	75.0,81.1		76.3	73.7,78.8		79.5	77.9,80.9	
	Daily	85.8	78.3,91.0		69.7	59.7,78.2		71.5	63.9,78.0		75.3	70.6,79.5	
Physical activity	Low	82.3	80.2,84.3	0.001	71.8	68.7,74.8	0.001	72.5	70.2,74.8	<0.001	75.9	74.5,77.3	<0.001
	Moderate	85.2	83.5,86.8		75.4	72.5,78.0		77.3	74.9,79.5		80.6	79.3,81.8	
	High	87.1	85.3,88.7		79.3	76.4,81.9		80.7	77.7,83.4		83.8	82.4,85.1	
Watches Television (hours/day)	≤ 2	85.9	84.5,87.2	0.06	75.6	73.0,78.1	0.74	76.3	73.9,78.5	0.51	81.2	80.1,82.3	<0.001
	>2	84.1	82.5,85.6		75.1	72.9,77.3		75.4	73.6,77.2		78.7	77.6,79.8	
Uses the computer (hours/day)	≤ 2	85.2	84.0,86.3	0.12	75	73.0,76.9	0.48	75.7	73.9,77.3	0.94	80.1	79.2,81.0	0.03
	>2	81.7	76.7,85.9		76.7	71.9,80.9		75.8	72.1,79.2		77.4	75.0,79.7	
Current smoking	Yes	77.5	61.7,88.0	0.18	60	46.7,71.9	0.007	63.5	57.2,69.4	<0.001	64.6	59.3,69.6	<0.001
	No	85.1	84.0,86.2		75.5	73.6,77.3		76.7	75.1,78.2		80.3	79.5,81.2	
Passive smoking	Yes	80.9	79.1,82.6	<0.001	70.8	68.0,73.4	<0.001	72.8	70.5,75.0	<0.001	75.8	74.6,77.1	<0.001
	No	88.2	86.9,89.3		78.7	76.5,80.8		78.8	76.8,80.7		83.2	82.2,84.2	
Body image	Thin	83.1	81.4,84.7	<0.001	69.8	66.3,73.0	<0.001	67.7	64.6,70.6	<0.001	76.6	75.1,78.0	<0.001
	Normal	88	86.6,89.3		81.7	79.6,83.7		82.5	80.6,84.3		84.7	83.7,85.7	
	Overweight	81.2	78.2,83.8		69.1	65.4,72.5		71.4	68.2,74.5		74	72.1,75.8	
Tooth brushing Frequency	Daily	87.2	85.9,88.3	<0.001	77.3	75.2,79.4	<0.001	77	75.1,78.7	0.01	81.6	80.6,82.6	<0.001
	Non daily	81.1	79.1,82.9		71	68.0,73.7		73.1	70.3,75.8		76.5	75.1,77.9	

Body mass index	Underweight	80.2	77.1,83.0	0.001	71.1	66.5,75.3	0.01	68.1	63.1,72.6	0.002	75.1	72.8,77.2	<0.001
	Healthy	86.3	85.0,87.5		77	74.8,79.0		76.7	74.8,78.4		81.2	80.2,82.2	
	Excess wight	84.6	82.1,86.7		73	69.5,76.2		76.1	72.9,79.1		78.8	77.1,80.4	
Depression	Yes	73.6	70.2,76.7	<0.001	63.7	60.0,67.2	<0.001	66.5	63.7,69.2	<0.001	67.7	65.9,69.5	<0.001
	No	86.8	85.7,87.8		78.7	76.7,80.6		80.1	78.3,81.7		83.1	82.2,84.0	
Anxiety	Yes	71.8	68.7,74.7	<0.001	66.7	63.3,69.9	<0.001	67.1	64.5,69.7	<0.001	68.3	66.6,69.9	<0.001
	No	87.4	86.3,88.5		79	76.9, 80.9		80.9	79.1,82.5		83.8	83.0,84.7	

*P < 0.05 was considered as statistically significant

Table- 4: Association of life style and demographic characteristics with good self-perceived health in multivariate logistic regression analysis: the CASPIAN IV study

Characteristics	Category	OR	95% CI	P-value*
Level of education (Elementary school)	Middle school	0.74	0.65 , 0.84	<0.001
	High school	0.92	0.80, 1.06	0.289
Family size (≤4)	>4	0.89	0.79 , 1.00	0.054
Living with Parents (None of them)	One of them	0.58	0.33 , 1.03	0.065
	Both of them	0.81	0.50 , 1.30	0.390
Birth order (First)	Second	1.06	0.93 , 1.20	0.347
	Third	1.00	0.84 , 1.17	0.999
	Fourth or more	1.22	1.04 , 1.43	0.012
SES (Weak)	Moderate	1.08	0.95 , 1.23	0.194
	Good	1.23	1.06 , 1.41	0.004
Talk with parents (None of them)	One of them	1.17	1.00 , 1.36	0.042
	Both of them	1.42	1.21 , 1.67	<0.001
Feel accepted by peers (No)	Yes	1.30	1.15 , 1.47	<0.001
Academic success (No)	Yes	2.02	1.82 , 2.24	<0.001

Likes school (No)	Yes	1.35	1.13 , 1.60	0.001
Dinner consumption (0-1 times/week)	2-4 times	0.90	0.64 , 1.27	0.573
	5-7 times	0.91	0.67 , 1.24	0.577
Breakfast consumption (0-1 times/week)	2-4 times	0.98	0.83 , 1.17	0.897
	5-7 times	1.10	0.95 , 1.27	0.191
Lunch consumption (0-1 times/week)	2-4 times	1.15	0.81 , 1.64	0.409
	5-7 times	1.22	0.90 , 1.66	0.189
Fresh Fruits consumption (Seldom)	Weekly	1.18	1.00 , 1.40	0.047
	Daily	1.37	1.16 1.62	<0.001
Vegetables consumption (Seldom)	Weekly	1.05	0.92 , 1.21	0.414
	Daily	1.24	1.07 , 1.43	0.004
Milk consumption (Seldom)	Weekly	1.01	0.88, 1.16	0.792
	Daily	1.11	0.96 , 1.27	0.132
Fastfoods consumption (Seldom)	Weekly	1.11	0.98 , 1.25	0.075
	Daily	1.05	0.79 , 1.39	0.722
Physical activity (Low)	Moderate	1.13	1.00, 1.27	0.042
	high	1.27	1.11 , 1.45	<0.001
Passive smoker (No)	Yes	0.76	0.69 , 0.84	<0.001
Active current smoker (No)	Yes	0.76	0.58 , 1.00	0.054
TV watching (≤2 hours/day)	>2	1.02	0.92 , 1.13	0.695
Computer working (≤2 hours/day)	>2	1.02	0.86 , 1.22	0.745
Body image (Thin)	Normal	1.53	1.36 , 1.72	<0.001
	Fat	0.94	0.80 , 1.10	0.473
Anxiety (No)	Yes	0.60	0.53 , 0.67	<0.001
Depression (No)	Yes	0.64	0.57 , 0.72	<0.001
Tooth brushing (Nondaily)	Daily	1.12	1.00 , 1.25	0.037
BMI (Healthy weight)	Under weight	1.36	1.17 , 1.59	<0.001
	Excess Weight	1.33	1.09 , 1.62	0.005

Reference group are presented in the parentheses; *P < 0.05 was considered as statistically significant; SES: Socioeconomic Status; OR: Odds Ratio; CI: Confidence Interval.