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Happiness and health behaviour in Iranian adolescent girls

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A B S T R A C T

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This study was conducted to examine the association of happiness in adolescent females with leisure time and health related behaviours namely diet, physical activity and first or second hand smoking. Using a self-administered questionnaire, data were collected from 8159 female high school students ages 11–19 years. Multivariate linear regression analysis revealed statistically significant associations between happiness and weight, regular exercise, exposure to second-hand tobacco smoke, daily fruit or vegetable consumption and the way participants spent their leisure time. Happiness was associated with lower BMI, regular physical activity, absence of exposure to second-hand smoke, higher consumption of fruits and vegetables, and spending leisure time with family (all $P < 0.005$). These exploratory findings suggest that encouraging children and adolescents to adopt healthy behaviours, providing family time and a smoke-free environment may make them not only healthier but also happier.

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Happiness is a subjective emotional state associated with a vast and wide number of personal and socio-economic factors (Gerdtham & Johannesson, 1997; Melin, Fugl-Meyer, & Fugl-Meyer, 2003). For example, education, physical activity and general health are directly associated with happiness, while obesity, unemployment and smoking, are adversely associated with happiness. Some of the above factors are claimed to be more important contributors to happiness than financial status (Graham, 2008; Strine, Chapman, Balluz, Moriarty, & Mokdad, 2008). Although associations between self-reported happiness and specific contributing factors – in particular socioeconomic status – have been thoroughly investigated, mechanisms of effect are still subject to debate as findings are not consistent from country to country especially, between developed and developing countries (Graham, 2008; Ysamb et al., 2003). Reverse causality has also been suggested, for example, health related factors (especially BMI), marital status, education and income level may not only affect but also be affected by happiness (Graham & Felton, 2005; Katsaiti, 2011; Veenhoven, 2008).

Among the factors influencing happiness; some are non-modifiable (e.g. age, genetic and macro-socioeconomic factors) and some can be, to some extent, modified (e.g. personality, education, income, leisure, and social status) (Argyle, 1997; Natvig, Albrektsen, & Qvarnström, 2003). Health behaviours are also among modifiable factors which via their

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contribution to individual's physiological and psychological status may affect happiness. Diet for example seems to alter happiness significantly via specific molecular mechanisms (Blades, 2009; Gomez-Pinilla, 2008).

In adolescents, happiness is considered to be particularly important due to its contribution to their future success (Flouri & Buchanan, 2003; Lyubomirsky, King, & Diener, 2005; Natvig et al., 2003). Regarding the special importance of women's physiological and psychological well being (Frenk, Gomez-Dantes, & Langer, 2012), we investigate the association of happiness with a wide range of variables including health behaviours in Iranian high school girls living in the country's most deprived area (Kohkilooyeh and Boyerahmad province). Adjusted for known socioeconomic and demographic factors, we measured the associations with happiness family warmth, physical activity, dietary and leisure behaviours and exposure to tobacco smoke. The results may help to improve levels of life satisfaction and health in young females, and in particular those from more deprived backgrounds.

Methods

Participants and procedures

After brief explanation by trained staff, a self-administered questionnaire was distributed to volunteers among female high school students ages 11–19 years. Students provided information anonymously on their demographic and educational status, as well as on health-related behaviours. In total, out of 9867 high school girls from 67 schools registered in the province of Kohkilooyeh and Boyerahmad educational office, 8159 (82.7%) returned the questionnaire; the remainder were absent on the day that the questionnaire was distributed or chose not to participate.

Measures

To collect the data, a self-administered questionnaire was designed and a pilot study was conducted with 50 questionnaires completed and analysed. The questionnaire was revised and shortened to improve the response rate. Happiness was measured using the single-item scale developed by German Socio-Economic Panel, which has been extensively used in sociology (Schwarze & Winkelmann, 2005; Winkelmann, 2009; Zimmermann & Easterlin, 2006) and shown to have good stability, validity, reliability and viability (Abdel-Khalek, 2006).

The question "How happy are you at present with your life as a whole?" was answered on a Likert scale ranging from 0 (extremely unhappy) to 10 (extremely happy). The answers on the Likert scale were assumed to be ordinal and OLS regression was used to model associations of happiness with measured factors. Ferrer-i-Carbonell and Frijters (2004) discussed methodological considerations of using this method in detail (Ferrer-i-Carbonell & Frijters, 2004). Open ended, multiple choices and yes/no questions were used to measure the independent variables. Frequency of fruit and vegetable consumption and physical activity were measured by single item scales similar to those used by Janssen et al. (2005). Demographic information including parents' job and education was obtained via open or multiple choices questions. Height and weight were reported by the participants. Self-reported health information including self reported height and weight is widely used in psycho-social studies (Linna et al., 2013; Murphy, Donnelly, Shibli, Foster, & Nevill, 2012; Page et al., 2009; Veloso, Matos, Carvalho, & Diniz, 2012).

Data collection

In Iran, any activity involving research in educational fields has to be authorized and supervised by the provincial office of the Ministry of Education. After authorization was obtained a letter from the office was sent to all girls high schools introducing the trained local interviewers to the schools' principals with a sample of the questionnaire. Parental agreement on student's participation to the study was obtained by the principals who sent consent forms to students' parents/care givers. In addition to parental consent only willing students were interviewed. This study was approved and supervised by Yasuj University of Medical Sciences Research Committee.

Data analysis

Analysis of variance and univariate regression analysis were used to assess the unadjusted associations of student's happiness with the explanatory variables. Multivariate linear regression analysis was used to control for potential confounding factors. The final model was built nested in the saturated model which included the following 15 covariates: mother's and father's job and educational level, student's age, number of siblings, weight, height, grade point average for the last educational year, place of residency (rural/urban), being exposed to second-hand tobacco smoke, daily vegetable and fruit consumption, suffering from any disease at the time of questionnaire completion, and physical activity. Using a backward selection method, variables were retained/removed according to the Akaike Information Criterion (AIC). The final model was built with 12 explanatory variables (Table 3).

Results

Descriptive statistics are presented in Table 1 and unadjusted associations between happiness of school girls and their parents' jobs and education are presented in Table 2. There is a significant positive association between parent's education

Table 1
Descriptive statistics for continuous variables.

	N	Minimum	Maximum	Mean	Std. deviation
Weight, kg	7632	25.0	132.0	51.5	8.6
Height, cm	6815	95.0	200.0	157.6	10.5
Age, years	7862	11.0	19.0	15.9	1.2
Class score	6836	8.8	20.0	16.6	2.1
Siblings	7939	0.0	17.0	4.8	2.4
Happiness	7939	0.0	10.0	6.8	3.3

and their offspring's happiness: compared to lower parental level of educational attainment, happiness scores are highest for girls whose fathers had a university degree (mean = 7.30, SD = 3.16, $P < 0.001$) or those whose mothers' education reached to a high school level (mean score = 7.27, SD = 3.22, $P < 0.001$). Students' happiness also seems to have a significant association with their parents' job: highest for those with father working as teacher (mean = 7.52, SD = 3.08, $P < 0.001$) or mothers working as clerk (mean = 7.47, SD = 2.75, $P = 0.008$). A significant positive association was also found for regular exercise and perceived happiness ($P < 0.001$).

According to the results of multivariate analysis, although parent's job and education as well as number of siblings had a significant effect on the AIC of the final model, no significant association was found between these factors and children's happiness after controlling for the effects of other independent variables (all $P > 0.05$) (Table 3). On the other hand, compared to spending leisure time with family, happiness scores were significantly lower among those who spent time with friends or watching television. Those spend time with friends reported (on average) 1.25 points lower happiness scores compared to the highest score which was reported by students who spend their time mostly with their family ($P < 0.001$). Being exposed to tobacco smoke was also inversely associated with happiness: students exposed to second-hand smoke reported 0.71 points lower on average ($P < 0.001$). Also, significant associations were observed between happiness and physical activity and daily portions of fruit or vegetable consumed (all $P < 0.001$). Students with no physical activity (compared to regular exercise), no fruit in their daily diet (compared to 3–4 portions per day) or no vegetables (compared to 3–4 or more portions per day) reported lower happiness scores by approximately 0.68, 1.33 and 1.2 points respectively. Happiness was also inversely associated with weight, age and weight-age interaction ($P < 0.05$).

Discussion

This study was conducted to explore associations of happiness with family, health behaviour and demographic factors in high school female students. Previous studies have considered these factors separately (Blades, 2009; Chang & Nayga, 2010;

Table 2
Students' happiness by parents' socio-economic status.

Variable	N	Mean	SD	*P-value	
Father's education	Illiterate	1293	6.35	3.37	<0.001
	Primary	1734	6.60	3.30	
	Secondary	1237	6.72	3.25	
	High school	1593	6.98	3.29	
	University	1514	7.30	3.16	
	Missing	788	6.45	3.40	
Father's job	Unemployed	220	6.37	3.52	<0.001
	Private	4282	6.55	3.32	
	Technology	53	6.74	3.92	
	Army	222	6.97	3.31	
	Clerk	1453	7.20	3.15	
	Teaching	673	7.52	3.08	
	Retired	551	7.02	3.20	
	Missing	705	6.23	3.51	
Mother's education	Illiterate	2125	6.57	3.29	<0.001
	Primary	3221	6.69	3.30	
	Secondary	1305	7.09	3.25	
	High school	654	7.27	3.22	
	University	245	7.07	3.32	
	Missing	609	6.52	3.48	
Mother's job	Unemployed	7259	6.78	3.29	$P = 0.008$
	Private	186	6.84	3.32	
	Retired	39	6.87	3.18	
	Clerk	102	7.47	2.75	
	Teaching	138	7.17	3.34	
	Missing	435	6.10	3.65	

* ANOVA is used to compare happiness between categories.

Table 3

Associations of student's happiness with demographic and social factors.

Variable	Regression coefficient	SE	P-value
Age, years	−0.44	0.22	0.04
Weight, kg	−0.13	0.066	0.052
Height, cm	−0.0054	0.0046	0.24
Class Score	0.17	0.025	<0.001
Disease (Referent: No)	–	–	–
Yes	−0.91	0.18	<0.001
Exercise (Referent: No)	–	–	–
Sometimes	0.29	0.17	0.10
Regular	0.68	0.11	<0.001
Exposed to second hand smoke (Referent: No)	–	–	–
Yes	−0.62	0.098	<0.001
Fruit consumption (Referent: None)	–	–	–
More than 4 portions a day	1.29	0.43	0.0027
3–4 portions a day	1.33	0.42	0.0013
1–2 portions a day	1.16	0.41	0.0048
Some days of week	0.55	0.41	0.02
Vegetable consumption (Referent: None)	–	–	–
More than 4 portions a day	1.14	0.32	<0.001
3–4 portions a day	1.27	0.29	<0.001
1–2 portions a day	0.97	0.28	<0.001
Some days of week	0.86	0.28	0.0020
Leisure time spend with (Referent: Family)	–	–	–
Friends	−1.26	0.14	<0.001
TV	−0.74	0.13	<0.001
Family-friends	−0.37	0.41	0.37
Family-TV	0.15	0.32	0.64
Friends-TV	−1.028	0.41	0.016
Family-Friends-TV	0.011	0.22	0.96
Other	−0.76	0.16	<0.001
Father's education (Referent: Illiterate)	–	–	–
Primary	−0.011	(0.15)	0.94
Secondary	−0.073	(0.16)	0.66
High school	0.11	(0.17)	0.51
University	0.17	(0.20)	0.41
Father's job (Referent: Unemployed)	–	–	–
Private	0.089	0.29	0.75
Army	0.12	0.40	0.76
Technology	−0.27	0.60	0.66
Clerk	0.37	0.31	0.24
Teaching	0.31	0.35	0.38
Retired	0.12	0.34	0.73

Pairs with significant differences using Turkey test ($P < 0.05$).

Leisure time spend with: "friends vs. family-friends", "friends vs. Tv-family", "Tv-family-friends vs. friends", "others vs. TV-family-friends", "TV vs. TV-family-friends".

Father education: "high school vs. illiterate", "university vs. illiterate", "high school vs. primary", "university vs. primary", "university vs. secondary".

Fruit consumption (daily): "nothing vs. some days", "nothing vs. once to twice", "nothing vs. three to four times", "nothing vs. four times and more".

Vegetables consumption (daily): "nothing vs. once to twice", "nothing vs. three to four times", "nothing vs. four times and more", "some days vs. once", "some days vs. twice", "some days vs. three to four times", "some days vs. four times and more".

Chang, McBride-Chang, Stewart, & Au, 2003; Flouri & Buchanan, 2003; Frey, Benesch, & Stutzer, 2007; Furnham & Cheng, 2000; Hartog & Oosterbeek, 1998; Katsaiti, 2011; Torshizian & Mehrar, 2011), whereas this study measured associations of happiness with a wide range of factors and considered their combined effects.

Multivariate analyses suggested no significant association between parents' social status and their offspring well-being. Regarding leisure time, spending time with family members was positively associated with students' happiness. Flouri and Buchanan (2003) as well as Chang et al. (2003), investigated the effect of family life and in particular parental warmth on happiness (Flouri & Buchanan, 2003). They measured a wide range of family related issues including socio-economic status and suggested parental –especially fathers' – involvement in family relations is an important factor in adolescent's happiness. In addition, it was reported that non-structural and non-social leisure activities are inversely associated with well-being (Bruni & Stanca, 2008; A. Stutzer & B. Frey, 2006; Trainor, Delfabbro, Anderson, & Winefield, 2010). Personality (e.g. extraverted vs. introverted) may act as a major determining factor when choosing between social or solitary activities for leisure time (Lu & Hu, 2005). However, knowing that in Iran, during the time that schools are open, few or no structural or social activities are available to school girls, especially in rural areas; and the current study suggests that students who spend time with friends as the only or one of very few social activities or watching TV as extremely solitary leisure activity are less happy compared to those who spend time with their family. This is in line with studies that have emphasized the important role of family warmth in adolescent's subjective well-being (Boudreault-Bouchard et al., 2013; Offer, 2013; Operario, Tschann, Flores, & Bridges, 2006).

The significant inverse association between happiness and exposure to second-hand tobacco smoke can potentially be explained by at least two hypotheses: First, smoker parents behave differently with respect to their family and children (Kahler et al., 2009; de Leeuw, Scholte, Sargent, Vermulst, & Engels, 2010), or the association could represent a direct physiological or psychological effect on the child (Boden, Fergusson, & Horwood, 2010; Weiss et al., 2005).

Consistent with previous reports (Blades, 2009; Piqueras, Kuhne, Vera-Villaruel, Van Straten, & Cuijpers, 2011), this study suggests a strong and positive correlation between fruit and vegetable consumption and happiness. Similarly, controlling for a large number of potential confounders and measuring different aspects of well being (seven independent measures of well being) and socioeconomic status in a big random sample of British adults, Blanchflower, Oswald, and Stewart-Brown (2012) found a strong positive and monotonic correlation between vegetable and fruit consumption and well being (Blanchflower et al., 2012). In addition to healthy diet, the inverse association between student's happiness and their weight, as well as the positive association between happiness and physical activity support the idea of the importance of health behavior as determinants of perceived well-being (Blanchflower et al., 2012; Pastor, Balaguer, Pons, & García-Merita, 2003; Piqueras et al., 2011). The interaction between age and weight may be explained by the increasing importance of perceived body image and its association with happiness in older adolescents (Chang & Nayga, 2010; Stokes & Frederick-Recascino, 2003; A. Stutzer & B.S. Frey, 2006).

Conclusions

Although the cross-sectional design and possible effects of un-measured confounding factors should be considered while interpreting these results, the strong and significant associations reported here, adjusted for known confounders including parents' social and educational status, seem to be meaningful. Although the findings should be further explored and replicated, our results suggest that encouraging children and adolescents to adopt healthy behaviours, providing family time and a smoke-free environment may make them not only healthier but also happier.

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