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Original/*Valoración nutricional*

Prevalence of disordered eating attitudes among University students in Wuhu, China

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Abstract

Objective: **the purpose of this study is to assess the current status of disordered eating attitudes and its related factors among University students in Anhui province, and to provide a basis for health intervention.**

Methods: **this is a cross-sectional study. The University students admitted to the routine health exams were included in current study, and completed self-administered questionnaires which consist of general information and the Eating Attitudes Test-26 (EAT-26). An EAT-26 score of 20 or higher indicated that a person has disordered eating attitudes. Data were analyzed using the SPSS13.0 software.**

Results: **a total of 1 328 subjects (469 male and 859 female), aged 16-24 years from a university in Wuhu were enrolled in this study. In our survey, the proportion of disordered eating attitudes among male, female, total students were 5.3%, 4.0% and 4.5%, respectively. The proportion of disordered eating attitudes among the students whose family annual income<10000 RMB, 10 000-30 000 RMB, 30 000-60 000 RMB and>60 000 were 4.2%, 3.9%, 4.3% and 6.9%, respectively. An interesting finding was that the female students are more likely to have disordered eating attitudes if their parents have more education.**

Conclusions: **our research reveals that the current status of disordered eating attitudes in Anhui province is relatively low. Parents' education level may be related to eating attitudes among University students. It is essential to increase awareness and understanding of eating disorders and its associated risk factors in University students whose parents have higher education.**

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Key words: *Students. University. Eating disorders.*

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PREVALENCIA DE TRASTORNOS ALIMENTARIOS ENTRE ESTUDIANTES UNIVERSITARIOS EN WUHU, CHINA

Resumen

Objetivo: **el proposito de este estudio es evaluar la situación actual de trastornos alimenticios y sus factores relacionados entre los estudiantes universitarios de la provincia de Anhui, y proporcionar una base para la intervención sanitaria.**

Métodos: **este es un estudio transversal. En el estudio se incluyeron estudiantes universitarios a los que se les realizaron exámenes de salud rutinarios y que completaron cuestionarios que consisten en información general y sobre las actitudes alimentarias: test-26 (EAT-26). Según el test EAT-26, una puntuación de 20 o mayor indica que el sujeto presenta trastornos alimentarios. Los datos fueron analizados mediante el software de SPSS13.0.**

Resultados: **en el estudio se incluyeron un total de 1.328 estudiantes de una universidad de Wuhu (469 hombres y 859 mujeres). En nuestro estudio, la proporción de trastornos alimentarios de hombres y mujeres y el total de estudiantes fueron 5,3%, 4,0%, 4,5%, respectivamente. La proporción de trastornos alimentarios entre los estudiantes cuya familia poseía unos ingresos anuales<10.000 RMB, 10.000-30.000 RMB, 30.000-60.000 RMB y>60.000 fueron 4,2%, un 3,9%, 4.3% y 6,9%, respectivamente. Un hallazgo interesante es que los estudiantes son más propensos a padecer trastornos alimentarios si sus padres tienen más educación.**

Conclusiones: **nuestra investigación revela que la situación actual respecto a trastornos alimentarios en la provincia de Anhui es relativamente baja. El nivel de educación de los padres puede ser relacionado con las actitudes de los estudiantes universitarios. Es esencial aumentar la conciencia y la comprensión de los trastornos de la alimentación y sus factores de riesgo asociados con respecto a los estudiantes universitarios cuyos padres tienen una educación superior.**

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Palabras clave: *Estudiantes. Universidad. Trastornos de la alimentación.*

Introduction

Obesity has become a major public health problem worldwide, both in children and adults[1-3]. Obesity is a risk factor of many diseases such as diabetes and stroke[4]. Nowadays, some studies find more and more students are concern about fat and desire a lower body mass index (BMI)[5]. Many students had a desire for thinness, whereas the ideal weight and BMI of those students were lower than the typical weight and BMI, especially in female students[6]. As a consequence, many people have disordered eating attitudes and engage themselves in unhealthy weight control behaviors[7]. Another study found that the proportion of disordered eating attitudes ranged from 33.1% to 49.1%[8]. Disordered eating attitudes is one of the risk factors contributing to the development of eating disorders[9]. Both anorexia nervosa and bulimia nervous are included in serious eating disorders[10]. Eating disorders affects about 0.5% women during their lifetime[11,12] and has a high mortality rate (up to 6% per decade of illness)[13].

Disordered eating attitudes are epidemic worldwide, and the adolescents are at high risk for disordered eating attitudes[14]. The prevalence of disorder eating attitudes varies in different countries: US: 22-26%[15], Canada: 16%[16], Japan: 35%[17], South Africa: 21.2%[18], Turkey: 45.2%[19], Spain: 7.8%[20], and Brazil: 13.3%[21]. However, there is little data on the prevalence of disorder eating attitudes and its risk factors among University students in China. This suggests disordered eating attitudes should be further studied.

In this study, we plan to assess the current status of disordered eating attitudes and its related risk factors among University students in Anhui province.

Method

Participants

A cross-sectional study was designed to collect the routine health exams data for University students in Wuhu. A total of 1,328 subjects (469 male and 859 female), aged 16 -24 years were enrolled in this study. All subjects agreed to provide their personal information, and written informed consent. This study was approved by the ethic committee of Wannan medical school.

Instruments

In this study, we used a set of self-administered questionnaires which consist of general demographics (sex, birthday, weight, grade, etc) and eating attitude test -26(EAT-26).The EAT-26 is widely-used screening instruments for disordered eating attitudes[22,23],which contain 26 questions, and each question (except the 25th question) have six response options ranging from 0 to 3 (3 = always, 2 = almost always, 1 = often, and 0 = seldom, hardly ever or never). The 25th question has a reversed scored (0 = always, nearly always or often, 1 = seldom, 2 = almost never, 3 = never). The total score of EAT-26 equal the sum of each question score. Scores 20 or above was defined as disordered eating attitude[23].

The reliability of EAT-26 was assessed in a pilot study which contain one hundred and ten subjects[24]. The Cronbach's α (alpha) of EAT-26 was 0.77 in our research.

Data analysis

Data were analyzed by using the SPSS13.0 software. Figure was drawn by GraphPad Prism 5.0 and Excel software.

Results

A total of 1328 subjects (469 male and 859 female) aged 16-24 years were enrolled in this study. The general demographics are shown in table I. The range, mean and standard deviation (SD) of demographics are shown in table II. Figure 1 shows the mean and SD of EAT-26 scores by sex.

In our survey, table III shows that the prevalence of disordered eating attitudes in male, female, total students were 5.3%, 4.0% and 4.5%, respectively. Figure 2 shows the distributions of participants from four different grades were one (4.5%), two (4.0%), three (5.6 %) and four (3.2%), respectively. An interesting finding is that the female students would endorse a higher education level of disordered eating attitudes if their parents have more education (Fig. 3). The students living in urban area have around double percentages of disordered eating attitudes compared with the students living in rural area, the proportion of them are 6.7% and 3.5% respectively. The proportion of disordered eating attitudes among the students whose family annual income < 10000 RMB, 10000-30000 RMB, 30000-60000 RMB and > 60000 were 4.2%, 3.9%, 4.3% and 6.9%, respectively. Percentage of underweight, normal weight and overweight among University students by total score of EAT -26 are shown in figures (4-6). Figures (7-10) reveal the relationship between education level of parents and the total EAT-26 score among University students. Figure 8 shows that the total EAT-26 scores of female students are lowest if their fathers only completed primary school or blow. Figure 10 shows a similar phenomenon that the total EAT-26 scores of female students are highest if their mother's education levels are at college school or above.

Table I
General demographic characteristics of the subjects (n = 1328)

Variable	Male		Female	
	n	%	n	%
Grade				
One	167	35.6	527	61.4
Two	179	38.2	195	22.7
Three	92	19.6	104	12.1
Four	31	6.6	33	3.8
Father education				
Primary school and blow	99	21.1	148	17.2
Middle school	305	65	606	70.6
College and above	65	13.9	104	12.1
Mother education				
Primary school and blow	218	46.6	373	43.5
Middle school	215	45.9	416	48.5
College and above	35	7.5	69	8
Location				
Rural area	321	68.4	599	69.8
Urban area	148	31.6	259	30.2
Income (RMB/ year)				
<10000	101	21.6	231	27
10000-30000	147	31.4	287	33.6
30000-60000	145	31	253	29.6
>60000	75	16	83	9.7

Table II
Range, Mean and SD of general demographic characteristics

Variable	n	Range	Mean	Std. deviation
Sex				
Male	468	73	7.73	7.84
Female	853	49	8.47	5.93
Father education				
Primary school and blow	245	59	7.11	5.73
Middle school	908	73	8.37	6.94
College and above	169	31	8.91	6.52
Mother education				
Primary school and blow	590	73	7.87	7.13
Middle school	627	49	8.23	6.30
College and above	104	31	9.96	6.28
Grade				
One	691	60	8.30	6.20
Two	374	73	7.98	7.63
Three	195	46	8.50	6.82
Four	63	30	7.60	5.63
Location				
Rural area	916	73	7.88	6.52
Urban area	406	59	8.96	7.03
Income (RMB/ year)				
<10000	331	72	7.97	7.01
10000-30000	432	44	7.92	5.95
30000-60000	395	73	8.33	6.90
>60000	159	59	9.22	7.39

Discussions

The data reported in this paper is derived from the self-reported questionnaires. With using the EAT-26 alone, only 4.5% students were defined as having disordered eating attitudes. Compared with other similar studies, such as US: 22-26%[15], Canada: 16%[16], Japan: 35%[17], South Africa: 21.2%[18], Turkey: 45.2%[19], Singapore: 10.5%[25], Spain: 7.8%[20], Brazil: 13.3%[21]. The prevalence of disordered eating attitudes in this study was at bottom of the range of these figures. This may be attributable in part to the fact that other studies' participants were located from a school population in urban areas. We can't explain the large discrepancy in prevalence among those studies. Thus, further investigation should be taken to confirm the detailed reason.

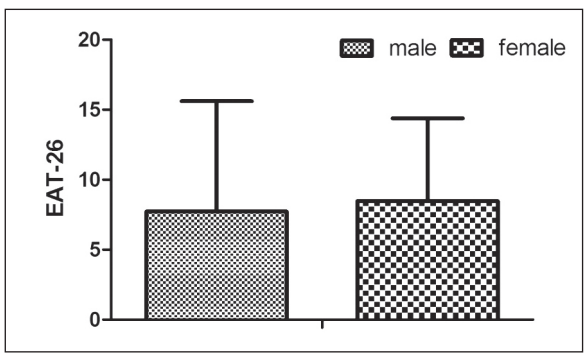

Fig. 1.—Mean and SD of EAT-26 scores by sex.

In the present study, an interesting finding is that the female students are more like to have disordered eating attitudes if their parents have higher education levels. However, our results disagree with a study performed in Singapore[25], which revealed that the students with disordered eating attitudes were less likely to have parents with higher education[25]. The reason may be that

Table III
The percentage of EAT-26 socre ≥ 20 by different varible

Varible	*EAT-26 socre ≥ 20*	
	n	*%*
Sex		
Male	25	5.3
Female	34	4.0
Grade		
One	31	4.5
Two	15	4.0
Three	11	5.6
Four	2	3.2
Father education		
Primary school and blow	5	2.0
Middle school	42	4.6
College and above	12	7.1
Mother education		
Primary school and blow	25	4.2
Middle school	28	4.5
College and above	6	5.8
Location		
Rural area	32	3.5
Urban area	27	6.7
Income(RMB/year)		
< 10000	14	4.2
10000-30000	17	3.9
30000-60000	17	4.3
> 60000	11	6.9

Fig. 2.—Percentage of disordered eating attitude among University students by sex.

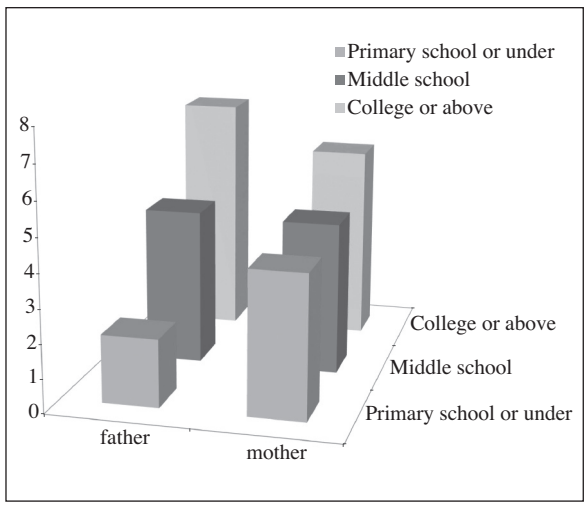

Fig. 3.—Percentage of disordered eating attitude among University students by parents'education level.

the parents give more restrain on their child dieting in China. In addition, female students also may be more obedient than male students. Thus, further research is still needed.

Previous studies documented that BMI was positively associated with EAT-26 scores, but not in our study. The possible reasons maybe that BMI was assessed using self-report data, which may result in an underestimation of BMI. Moreover, another possible explain was that female students had a desire for thinness. The relationship between disordered eating attitudes and BMI should be explored in future investigation.

There are some limitations in present research as following: First, we lack of more detailed analysis on EAT-26 and its related risk factors. Second, self-report measures may lead to underestimate the reliability status of eating disorders. Due to our participants are volunteers, a selection bias maybe exist in this study. Thus ,we can use clinical interviews for eating disorders in the future , such as anorexia nervosa, and bulimia nervosa.

Conclusions

It is essential for schools and governments to increase awareness and understanding of eating disorders and its associated risk factors for University students whose parents have higher education level. Parents' education level may be related to eating attitudes among University students, especially among female students, which is a topic for further epidemic study.

Acknowledgement

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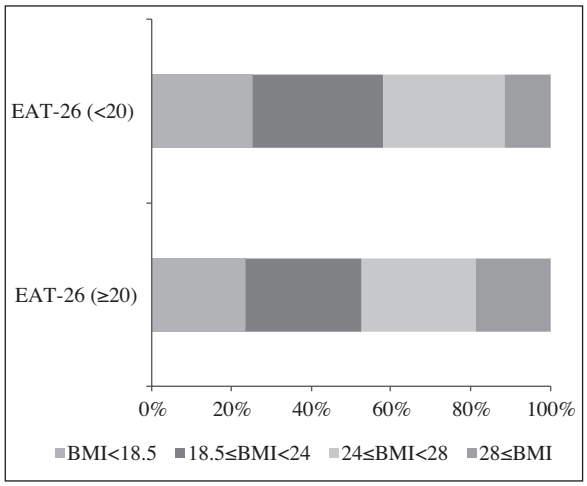

Fig. 4.—Percentage of body type among University students by total score of EAT -26.

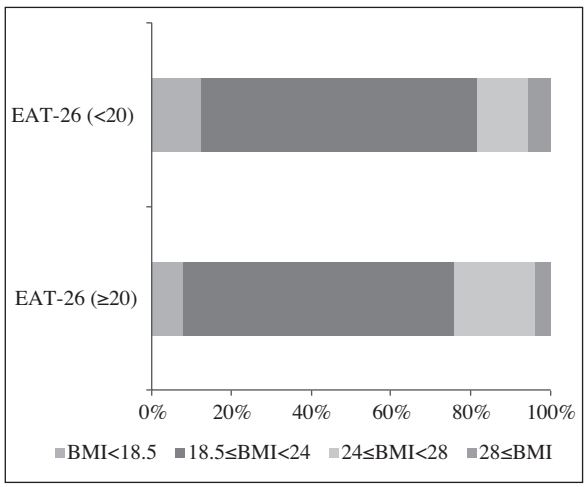

Fig. 5.—Percentage of body type among male students by total score of EAT-26.

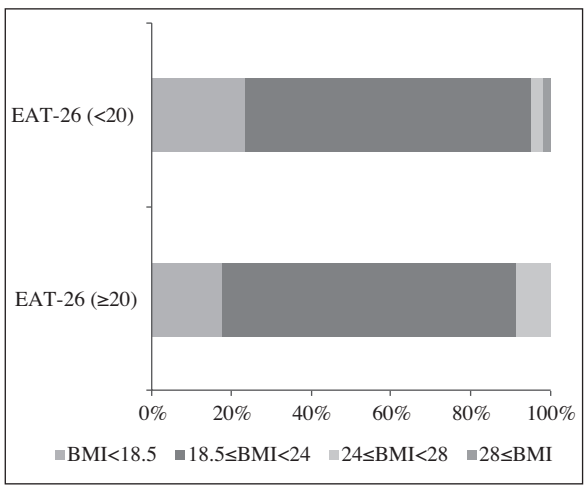

Fig. 6.—Percentage of body type among female students by total score of EAT-26.

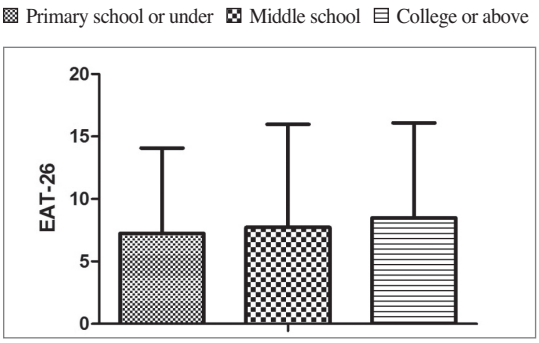

Fig. 7.—Father's education level and the total EAT-26 score of male students.

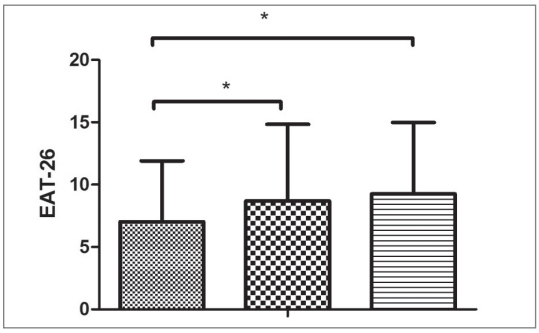

Fig. 8.—Father's education level and the total EAT-26 score of female students.

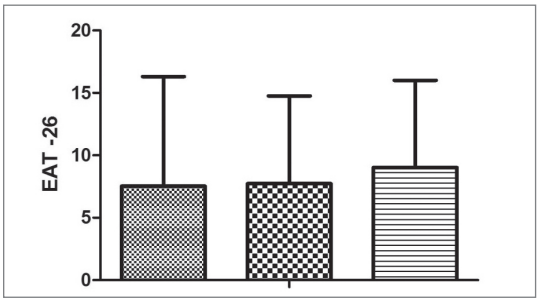

Fig. 9.—Mother's education level and the total EAT-26 score of male students.

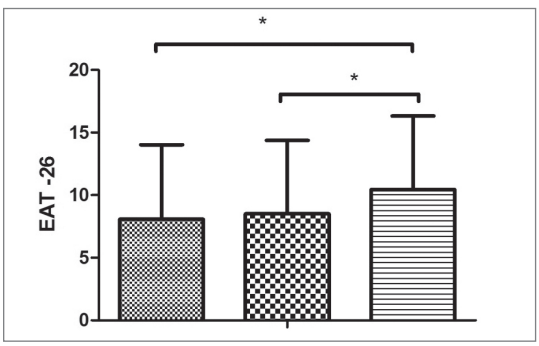

Fig. 10.—Mother's education level and the total EAT-26 score of female students.

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Conflict of interest

The authors declare no conflicts of interest.

Informed Consent

Written informed consent was obtained from all individual participants participants included in the study.

References

1. Ferreira Marques, C.D., C. Ribeiro Silva Rde, M.E. Machado, M.L. Portela de Santana, R. Castro de Andrade Cairo, J. Pinto Ede, et al., The prevalence of overweight and obesity in adolescents in Bahia, Brazil. *Nutr Hosp* 2013. 28(2): 491-6.
2. Jin, Y.L., L.L. Ding, Y.S. Yao, X.L. Song, H. Tang, L.P. He, et al., Obesity detection rate among primary school students in the People's Republic of China: a meta-analysis. *Ther Clin Risk Manag* 2013. 9: 383-90.
3. Ren, X., Y. Chen, L. He, Y. Jin, L. Tian, M. Lu, et al., Prevalence of Underweight, Overweight and Obesity in University Students from the Region of Anhui (China). *Nutr Hosp* 2014. 31(n03): 1089-93.
4. Dehlendorff, C., K.K. Andersen and T.S. Olsen, Body mass index and death by stroke: no obesity paradox. *JAMA Neurol* 2014. 71(8): 978-84.
5. Lee, S. and A.M. Lee, Disordered eating in three communities of China: a comparative study of female high school students in hong kong, Shenzhen, and rural hunan. *Int J Eat Disord* 2000. 27(3): 317-27.
6. Mase, T., C. Miyawaki, K. Kouda, Y. Fujita, K. Ohara and H. Nakamura, Relationship of a desire of thinness and eating behavior among Japanese underweight female students. *Eat Weight Disord* 2013. 18(2): 125-32.
7. Tomori, M. and M. Rus-Makovec, Eating behavior, depression, and self-esteem in high school students. *J Adolesc Health* 2000. 26(5): 361-7.
8. Musaiger, A.O., M. Al-Mannai and O. Al-Lalla, Risk of disordered eating attitudes among male adolescents in five Emirates of the United Arab Emirates. *Int J Eat Disord* 2014. 47(8): 898-900.
9. Nattiv, A., R. Agostini, B. Drinkwater and K.K. Yeager, The female athlete triad. The inter-relatedness of disordered eating, amenorrhea, and osteoporosis. *Clin Sports Med* 1994. 13(2): 405-18.
10. Klein, D.A. and B.T. Walsh, Eating disorders: clinical features and pathophysiology. *Physiol Behav* 2004. 81(2): 359-74.
11. Gotestam, K.G., L. Eriksen and H. Hagen, An epidemiological study of eating disorders in Norwegian psychiatric institutions. *Int J Eat Disord* 1995. 18(3): 263-8.
12. Walters, E.E. and K.S. Kendler, Anorexia nervosa and anorexic-like syndromes in a population-based female twin sample. *Am J Psychiatry* 1995. 152(1): 64-71.
13. Sullivan, P.F., Mortality in anorexia nervosa. *Am J Psychiatry* 1995. 152(7): 1073-4.
14. Chang, W.W., M. Nie, Y.W. Kang, L.P. He, Y.L. Jin and Y.S. Yao, Subclinical Eating Disorders in Female Medical Students in Anhui, China: A Cross-Sectional Study. *Nutr Hosp* 2015. 31(n04): 1771-77.
15. D'Souza, C.M., S.F. Forman and S.B. Austin, Follow-up evaluation of a high school eating disorders screening program: knowledge, awareness and self-referral. *J Adolesc Health* 2005. 36(3): 208-13.
16. Jones, J.M., S. Bennett, M.P. Olmsted, M.L. Lawson and G. Rodin, Disordered eating attitudes and behaviours in teenaged girls: a school-based study. *CMAJ* 2001. 165(5): 547-52.
17. Mukai, T., M. Crago and C.M. Shisslak, Eating attitudes and weight preoccupation among female high school students in Japan. *J Child Psychol Psychiatry* 1994. 35(4): 677-88.
18. Caradas, A.A., E.V. Lambert and K.E. Charlton, An ethnic comparison of eating attitudes and associated body image concerns in adolescent South African schoolgirls. *J Hum Nutr Diet* 2001. 14(2): 111-20.
19. Bas, M., E. Karabudak and G. Kiziltan, Vegetarianism and eating disorders: association between eating attitudes and other psychological factors among Turkish adolescents. *Appetite* 2005. 44(3): 309-15.
20. Rodriguez-Cano, T., L. Beato-Fernandez and A. Belmonte-Llario, New contributions to the prevalence of eating disorders in Spanish adolescents: detection of false negatives. *Eur Psychiatry* 2005. 20(2): 173-8.
21. Vilela, J.E., J.A. Lamounier, M.A. Dellaretti Filho, J.R. Barros Neto and G.M. Horta, [Eating disorders in school children]. *J Pediatr* (Rio J) 2004. 80(1): 49-54.
22. Miller, J.L., T. Vaillancourt and S.E. Hanna, The measurement of "eating-disorder-thoughts" and "eating-disorder-behaviors": Implications for assessment and detection of eating disorders in epidemiological studies. *Eat Behav* 2009. 10(2): 89-96.
23. Garner, D.M. and P.E. Garfinkel, The Eating Attitudes Test: an index of the symptoms of anorexia nervosa. *Psychol Med* 1979. 9(2): 273-9.
24. Pourghassem Gargari, B., D. Kooshavar, N. Seyed Sajadi, S. Safoura, M. Hamed Behzad and H. Shahrokhi, Disordered Eating Attitudes and Their Correlates among Iranian High School Girls. *Health Promot Perspect* 2011. 1(1): 41-9.
25. Ho, T.F., B.C. Tai, E.L. Lee, S. Cheng and P.H. Liow, Prevalence and profile of females at risk of eating disorders in Singapore. *Singapore Med J* 2006. 47(6): 499-503.