Asian Journal of Clinical Nutrition

ISSN 1992-1470

science alert

ANSInet
an open access publisher
http://ansinet.com

OPEN ACCESS Asian Journal of Clinical Nutrition

ISSN 1992-1470
DOI: 10.3923/ajcn.2017.30.36

Research Article
Overweight/Obesity, Eating Behaviors and Behavioral Problems Among School-age Children

Arunrat Charoenarparasmee, Orawan Louthrenoo and Kulnipa Kittisakmontri

Department of Pediatrics, Faculty of Medicine, Chiang Mai University, 50200 Chiang Mai, Thailand

Abstract

Background: Overweight/obesity has shown an increasing trend in many countries. Unhealthy eating behaviors have frequently been related to overweight/obesity. **Objective:** This study aimed to determine the association of overweight/obesity and eating behaviors with behavioral problems in school-age children. **Methodology:** A cross-sectional study of school-age children aged 7-12 years was conducted. Body mass index for age z-score was measured and participants were classified into 3 groups including normal weight, overweight and obesity. Caregivers provided information regarding eating behaviors and completed the child behavior checklist. **Results:** There were 430 participants included for analysis. The mean age of the study sample was 10.56 (1.44) years of which 51.39% were male. Children with overweight and obesity were 21.40 and 20.47%, respectively. Unhealthy eating behaviors, including skipping breakfast and media use during meals were more common in the obesity group than the normal weight group without statistical significance. Although, there was minimal correlation between sweetened beverage intake and the total behavioral scores, the mean total behavioral problems scores were not different among the three groups. However, some eating behaviors including sweetened beverage intake, dessert intake and frequent eating outside were found to be associated with the total behavioral problem scores from the multiple linear regression analysis ($p = 0.001$, 0.02 and 0.008, respectively). **Conclusion:** Although the association between overweight/obesity and behavioral problems was not found in this study, some unhealthy eating behaviors were found to be related to behavioral problems. Promoting healthy eating behaviors may be a primary step to prevent behavioral problems and obesity.

Key words: Overweight, obesity, eating behaviors, behavioral problems, children

Received: September 21, 2016 Accepted: November 14, 2016 Published: December 15, 2016

Citation: Arunrat Charoenarparasmee, Orawan Louthrenoo and Kulnipa Kittisakmontri, 2017. Overweight/obesity, eating behaviors and behavioral problems among school-age children. Asian J. Clin. Nutr., 9: 30-36.

Corresponding Author: Orawan Louthrenoo, Department of Pediatrics, Faculty of Medicine, Chiang Mai University, 50200 Chiang Mai, Thailand
Tel: 66-53-935412 Fax: 66-53-936461

Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Childhood overweight and obesity have shown an increasing trend in most developing countries. There are changes in urban areas of Thailand toward Westernized lifestyle patterns and dietary habits including increased fast food consumption and sugar-sweetened beverage intake and a decreased intake of fruit and vegetables[1,2]. Moreover, there has been a decrease in physical activity level and an increased in sedentary behaviors. The prevalence of obesity in 2-19 years old children and adolescents in the 2011-2012 nationally representative National Health and Nutrition Examination Survey in the US[3] was approximately 17%, whereas in Thailand, the Thai National Health Examination Survey between 2008 and 2009 reported that 8.7% of 6-11 years old and 11.9% of 12-14 years old were overweight and obese[4]. Children living in urban and sub-urban areas were 1.6-1.8 times more likely to be overweight than those in rural area[4].

Currently obesity in children has been of greater concern because it increases the risk of obesity in adults. Risk of adult obesity is likely to be 41% if a child[5] is obese at 7. Various measures using to define obesity include weight for height and Body Mass Index (BMI). Weight for height z-score (WHZ) is often used in pre-school children while BMI z-score and weight for height are used in school-age children and adolescents.

Obesity is a multifactorial disorder affecting all organ systems. Becoming obese earlier in life increases health risks including hypertension, diabetes, dyslipidemia, obstructive sleep apnea and metabolic syndrome[6,7], paralleling an increasing prevalence in younger children[5]. In addition, obesity is also interrelated with a lower quality of life, negative self-perceptions, learning problems and increased behavioral problems as well as bullying problems[8-10]. Unhealthy eating behaviors including the number of meals served outside the home, fast food meals, the type of snacks served at school or at home, skipping breakfast and eating when watching television have frequently been reported as being related to obesity from previous studies in children[11] and adults[12,13].

Behavioral or psychological problems have been viewed as both causes and effects of overweight. Overweight/obesity can be a possible result of psychological symptoms and psychological symptoms may be a result of being overweight[14,15]. Further review studies have found associations of behavioral and emotional problems with overweight in adolescents[16,17]. Some evidence has suggested that overweight/obesity was related to emotional and behavioral problems in pre-school, school-age children and adolescents[18-20]. Higher BMI was reported to be associated with increased likelihood of developing internalizing problems in middle childhood[21]. However, an association between behavioral problems and BMI in children has not been observed in other studies[14,22-24]. These inconsistent findings may be a result of different settings, different measurements, or various samples. Findings regarding correlations between eating behaviors and emotional problems directly have been limited. A study has found that eating behaviors were related to depressive symptoms in children[25]. Therefore, this study aimed to determine the association of overweight/obesity and eating behaviors with behavioral problems in school-age children.

MATERIALS AND METHODS

Participants: A descriptive cross-sectional study of school-age children was performed in a primary school in a city of Northern Thailand. School children aged from 7-12 years from 1st to 6th grade were enrolled. Caregivers were approached through school teachers and questionnaires were sent from January, 2016 to March, 2016. Twenty children from each classroom were randomly selected. Children whose BMI was lower than 5th percentile, who had chronic illness or were on any medication which may have an effect on weight (such as corticosteroids) were excluded. Informed consent was obtained from all participant's caregivers. The study was approved by the Ethics Committee of the Faculty of Medicine, Chiang Mai University.

Measurement: Participants were classified into 3 groups depending on their nutritional status: Obese, overweight and normal weight using the Body Mass Index (BMI) for age z-score. The "WHO AnthroPlus" software (version 2009) was used for the assessment of the nutritional status according to World Health Organization (WHO) Child Growth Standards. The BMI z-score of +1 to +1.99 was classified as overweight, +2 to +2.99 was obesity and +3 and higher was classified as morbid obesity[26].

The child behavior checklist (CBCL) for age 6-18 was used to evaluate behavioral problems in this study[27,28]. The CBCL, developed by Achenbach TM is a widely-used tool to facilitate the identification of problem behavior in children, consisting of 113 behavioral items[27]. The total behavioral problem scores from the CBCL comprises internalizing behavior problems (anxiety/depression, with drawal and somatic complaints) and externalizing behavior problems (aggressive behavior and delinquent behavior) as well as other problems such as social problems, thoughts and attention problems. Higher scores indicate a greater number of emotional and behavioral

problems. Caregivers were also asked to provide information regarding eating behaviors and completed the child behavior checklist.

Data analysis: The SPSS software version 22.0 (IBM, Inc., Chicago, IL) for windows was used for data analysis in this study. Descriptive data were presented as a percentage, mean, range and standard deviation. An ANOVA and chi-square test were used to compare mean and proportion among the three groups. The Pearson correlation was used to identify correlations between eating behaviors and behavioral problems. Multiple linear regression analysis was used to determine factors influencing behavioral problems. The dependent variable was the total problem scores and independent variables were age, gender and unhealthy eating behaviors.

Since the prevalence of obesity could not be estimated before the study, the sample size cannot be determined. However, after the enrollment of participants, there were 88 cases of obesity, 92 cases were overweight and 250 cases within normal weight ranges. From a prospective study, high externalizing behavior was associated with a higher BMI with an odds[29] ratio of 2.9. With α of 0.05 and only obesity and normal weight groups, this provided a power of 0.7.

RESULTS

There were 449 participants returned the questionnaires. Since there were 11 cases with incomplete information regarding demographic characteristics and 8 cases did not fulfill the inclusion criteria, therefore, 430 cases were included in the analysis. The mean age of the study sample was 10.56 (1.44) years of which 51.39% were male. Children with overweight and obesity were 21.40 and 20.47%, respectively. Characteristics of all participants are shown in Table 1.

Regarding unhealthy eating behaviors, approximately 20% of participants reported daily consumption of sweetened beverage and 25% reported a daily intake of dessert. There were 17% of participants reported skipping meals which was usually breakfast and 60% reported using media during meals. Almost 30% of children reported daily exercise or physical activities. When classified into 3 groups, children from the overweight and obesity groups were younger and there were a higher percentage of males than in the normal weight group. Unhealthy eating behaviors including skipping breakfast and media use during meals were more common in the obesity group than the normal weight group without statistical significance. Frequent and daily physical activities were significantly more common in the normal weight group than the obesity group (Table 2).

Although there was minimal correlation between sweetened beverage intake and the total behavioral scores as shown in Table 3, there was no statistically significant difference in the mean total behavioral problem scores among the three groups. However, some eating behaviors including sweetened beverage intake, dessert intake and frequent eating outside (both eating out in a restaurant and take away) was found to be associated with the higher total behavioral scores from the multiple linear regression analysis ($p = 0.001$, 0.02 and 0.008, respectively) as shown in Table 4.

DISCUSSION

The findings from this study have revealed that overweight and obesity in school age children between 7 and 12 were 21.40 and 20.47%, respectively. This might not reflect the precise prevalence of overweight/obesity because there was a low response rate (44.9%) was found in this study and those caregivers of children with overweight/obesity might be more interested in participating in the study. However, this study was conducted in a primary school in a city where participants were from middle and middle to high income socioeconomic, so that overnutrition can be found more often than a previous report of the prevalence across the whole province. According to the Department of Health, the prevalence of overweight/obesity in 5-14 years old children in Chiang Mai was 10.4%[30]. Overweight/obesity was found in all ages from the full range of 7-12 years old children and more common in males. These findings were similar to the report from the Centers for Disease Control and Prevention in a

Table 1: Characteristics of participants included in analytic sample

	Years						
Characteristics	7	8	9	10	11	12	Total
N	21	23	93	114	76	103	430
Male (%)	57.14	60.87	43.01	53.50	55.26	48.50	51.39
Mean BMI for age z-score (SD)	2.22 (2.47)	0.84 (1.80)	0.75 (1.40)	0.64 (1.69)	0.45 (1.54)	0.22 (1.40)	0.61 (1.63)
Overweight (%)	14.29	26.09	22.58	25.44	18.42	18.45	21.40
Obesity (%)	42.86	30.43	21.51	21.05	21.05	11.65	20.47

BMI: Body mass index, SD: Standard deviation

Table 2: Behavioral problem scores and eating behaviors in children classified as normal weight, overweight and obesity

Parameters	Normal weight (n = 250)	Overweight (n = 92)	Obesity (n = 88)	p
Age, mean (SD)	10.73 (1.39)	10.49 (1.37)	10.15 (1.55)	0.004[a]
Sex, N (%)				
Male	104 (41.60)	53 (57.61)	64 (72.73)	<0.001[a,b]
Female	146 (58.40)	39 (42.39)	24 (27.27)	
Eating behaviors				
Sweetened beverage intake, N (%)				
Not frequent	148 (59.20)	59 (64.13)	53 (60.23)	0.48
Sometimes	52 (20.80)	21 (22.83)	15 (17.04)	
Daily	50 (20.00)	12 (13.04)	20 (22.73)	
Dessert intake, N (%)				
Not frequent	122 (48.80)	48 (52.17)	49 (55.68)	0.06
Sometimes	52 (20.80)	28 (30.43)	21 (23.86)	
Daily	76 (30.40)	16 (17.39)	18 (20.45)	
Skipping breakfast, N (%)				
Yes	42 (16.80)	15 (16.30)	18 (20.45)	0.70
No	208 (83.20)	77 (83.70)	70 (79.55)	
Eating outside, N (%)				
Not frequent	186 (74.40)	77 (83.70)	71 (80.68)	0.27
Frequent	38 (15.20)	7 (7.61)	8 (9.09)	
Daily	26 (10.40)	8 (8.69)	9 (10.23)	
Media use during meals				
Yes	143 (57.20)	63 (68.48)	55 (62.50)	0.15
No	107 (42.80)	29 (31.52)	33 (37.50)	
Exercise/physical activity, N (%)	(n = 249)	(n = 91)		
None	12 (4.82)	5 (5.49)	13 (14.77)	0.04[a]
Not frequent	108 (43.37)	37 (40.66)	42 (47.73)	
Frequent	52 (20.88)	21 (23.07)	12 (13.64)	
Daily	77 (30.92)	28 (30.77)	21 (23.86)	
Behavioral problem scales				
Internalizing behavioral problems, mean (SD)	12.49 (8.12)	12.62 (9.70)	11.56 (7.83)	0.63
Externalizing behavioral problems, mean (SD)	10.55 (8.65)	9.10 (6.78)	8.55 (6.07)	0.07
Total behavioral problems, mean (SD)	41.74 (27.06)	41.02 (26.32)	38.83 (22.59)	0.67

ANOVA for continuous variables and χ^2 for categorical variables, SD: Standard deviation, [a]Normal weight vs obesity groups, [b]Normal weight vs overweight groups

Table 3: Correlation between unhealthy eating behaviors and behavioral problem scores

Parameters	Internalizing behavioral problems	Externalizing behavioral problems	Total behavioral problems
Sweetened beverage intake	0.15**	0.28**	0.25**
Dessert intake	0.10*	0.20**	0.17**
Skipping breakfast	0.04	0.09	0.08
Frequent eating outside	0.11*	0.10*	0.15**
Media use during meals	0.06	0.12*	0.12*

**p = 0.01 (2-tailed), *p = 0.05 (2-tailed)

Table 4: Factors associated with the total behavioral scores from the multiple linear regression analysis

Parameters	Unstandardized estimate	Estimate (β)	SE	Confidence interval (95%)	p-value
Age	2.15	0.12	0.86	0.45, 3.85	0.010
Gender	-0.24	-0.01	2.51	-5.17, 4.69	0.920
BMI for age z-score	0.55	0.03	0.79	-1.00, 2.10	0.490
Sweetened beverage intake	5.35	0.16	1.65	2.11, 8.59	0.001
Dessert intake	3.68	0.12	1.52	0.70, 6.67	0.020
Skipping breakfast	3.30	0.05	3.21	-3.00, 9.60	0.300
Frequent eating outside	4.19	0.13	1.57	1.12, 7.27	0.008
Media use during meals	4.73	0.09	2.51	-0.21, 9.67	0.060

SE: Standard error, BMI: Body mass index

survey[31] carried out between 1988-94 and 2013-4 and a national sample of 10-17 years old children and adolescents[20] which found more males than females and younger age with overweight/obesity. Adiposity rebound occurs between

4-7 years of age, hence obesity was frequently found in 7 and 8 years old children in this study as a result of weight gain.

Unhealthy eating behaviors were related to overweight/obesity in previous studies[32-34]. In this study, these eating behaviors were not statistically significantly different among overweight, obesity and normal weight groups. This may be explained by the various etiologies relating to obesity such as genetics, low physical activities, or multifactorial causes. Another possible reason may be the subjectivity and heightened awareness of the participant's caregivers who have been educated regarding eating behaviors and obesity. However, the caregivers of the obesity group reported more behaviors of skipping breakfast and media use during meals in their child than those of the normal weight group without statistical significance. The exercise and physical activities reported by caregivers were significantly lower in the obesity group than the normal weight group. In another study of school children aged from 6-18 years, 95% of the participants reported at least one unhealthy eating behavior but no significant relationship was found with overweight or obesity[32]. The explanations of their finding were the increased calories in homemade food or by responder's bias resulting in a trend toward denying.

Emotional and behavioral factors reported by caregivers among the three groups were not significantly different. The findings were inconsistent with previous studies which have reported a correlation between emotional/behavioral problems and obesity in preschool children and school age girls[18,19]. There were other studies, however, which found no relation between obesity and behavioral problems[22,35]. Possible explanations are that overweight and obese children have low physical activities so that their caregivers view them as having fewer externalizing behavioral problems than those of normal weight children.

There was limited information regarding a correlation between eating behaviors and behavioral problems. One study has found a relationship between unhealthy eating behaviors and internalizing behavioral problems[25]. This study has revealed a minimal correlation between sweetened beverage intake behavior and behavioral problems. However, after adjusting confounding variables, besides the age, some unhealthy eating behaviors including sweetened beverage intake, dessert intake and frequent eating outside were among factors associated with the total behavioral scores from the multiple linear regression analysis.

While, this study provided information regarding eating behaviors and the assessment of behavioral problems using the appropriate tool, CBCL, some limitations need to be addressed. Firstly, the low response rate of the participants may result in the statistical significance of the differences. Secondly, characteristics of the participants may be different from other studies so the findings in this study could not be generalized. Also, as the participants were voluntarily taking part in the study; full randomization was not possible. Lastly, information regarding eating behavior and emotional/behavioral problems were obtained from only caregivers, it is possible school teachers or the children themselves could provide more accurate information.

CONCLUSION

Childhood obesity is a major health problem as its prevalence is increasing. Although the association between overweight/obesity and behavioral problems was not found in this study, some unhealthy eating behaviors were found to be related to behavioral problems. Promoting healthy eating behaviors may be a primary step in the prevention of behavioral problems and obesity.

ACKNOWLEDGMENT

The authors would like to thank the school teachers, caregivers and children for their participation in this study.

REFERENCES

1. Cavadini, C., A.M. Siega-Riz and B.M. Popkin, 2000. US adolescent food intake trends from 1965 to 1996. Arch. Dis. Child., 83: 18-24.
2. Farajian, P., G. Risvas, D.B. Panagiotakos and A. Zampelas, 2016. Food sources of free sugars in children's diet and identification of lifestyle patterns associated with free sugars intake: The GRECO (Greek Childhood Obesity) study. Public Health Nutr., 19: 2326-2335.
3. Ogden, C.L., M.D. Carroll, B.K. Kit and K.M. Flegal, 2014. Prevalence of childhood and adult obesity in the United States, 2011-2012. JAMA, 311: 806-814.
4. Society of Pediatric Nutrition of Thailand, 2014. The royal college of pediatricians of Thailand. Clinical Practice Guidelines of Prevenetion and Management in Childhood Obesity.
5. Rome, E.S., 2011. Obesity prevention and treatment. Pediatr. Rev., 32: 363-372.
6. Freedman, D.S., W.H. Dietz, S.R. Srinivasan and G.S. Berenson, 1999. The relation of overweight to cardiovascular risk factors among children and adolescents: The Bogalusa heart study. Pediatrics, 103: 1175-1182.

7. Reilly, J.J., E. Methven, Z.C. McDowell, B. Hacking, D. Alexander, L. Stewart and C.J. Kelnar, 2003. Health consequences of obesity. Arch. Dis. Child., 88: 748-752.
8. Ottova, V., M. Erhart, L. Rajmil, L. Dettenborn-Betz and U. Ravens-Sieberer, 2012. Overweight and its impact on the health-related quality of life in children and adolescents: Results from the European kidscreen survey. Qual. Life Res., 21: 59-69.
9. Janssen, I., W.M. Craig, W.F. Boyce and W. Pickett, 2004. Associations between overweight and obesity with bullying behaviors in school-aged children. Pediatrics, 113: 1187-1194.
10. Judge, S. and L. Jahns, 2007. Association of overweight with academic performance and social and behavioral problems: An update from the early childhood longitudinal study. J. School Health, 77: 672-678.
11. Lee, H.A., W.K. Lee, K.A. Kong, N. Chang, E.H. Ha, Y.S. Hong and H. Park, 2011. The effect of eating behavior on being overweight or obese during preadolescence. J. Prev. Med. Public Health, 44: 226-233.
12. Azagba, S. and M.F. Sharaf, 2012. Eating behavior and obesity in Canada: Evidence from panel data. J. Prim. Care Commun. Health, 3: 57-64.
13. Bezerra, I.N. and R. Sichieri, 2009. Eating out of home and obesity: A Brazilian nationwide survey. Public Health Nutr., 12: 2037-2043.
14. Lumeng, J.C., K. Gannon, H.J. Cabral, D.A. Frank and B. Zuckerman, 2003. Association between clinically meaningful behavior problems and overweight in children. Pediatrics, 112: 1138-1145.
15. McElroy, S.L., R. Kotwal, S. Malhotra, E.B. Nelson, P.E. Keck and C.B. Nemeroff, 2004. Are mood disorders and obesity related? A review for the mental health professional. J. Clin. Psychiatry, 65: 634-651.
16. Liem, E.T., P.J. Sauer, A.J. Oldehinkel and R.P. Stolk, 2008. Association between depressive symptoms in childhood and adolescence and overweight in later life: Review of the recent literature. Arch. Pediatr. Adolesc. Med., 162: 981-988.
17. Incledon, E., M. Wake and M. Hay, 2011. Psychological predictors of adiposity: Systematic review of longitudinal studies. Int. J. Pediatr. Obes., 6: e1-e11.
18. Griffiths, L.J., C. Dezateux and A. Hill, 2011. Is obesity associated with emotional and behavioural problems in children? Findings from the millennium cohort study. Int. J. Pediatr. Obes., 6: e423-e432.
19. Seyedamini, B., A. Malek, M. Ebrahimi-Mameghani and A. Tajik, 2012. Correlation of obesity and overweight with emotional-behavioral problems in primary school age girls in Tabriz, Iran. Iran J. Pediatr., 22: 15-22.
20. Turer, C.B., H. Lin and G. Flores, 2013. Health status, emotional/behavioral problems, health care use and expenditures in overweight/obese US children/adolescents. Acad. Pediatr., 13: 251-258.
21. Bradley, R.H., R. Houts, P.R. Nader, M. O'Brien, J. Belsky and R. Crosnoe, 2008. The relationship between body mass index and behavior in children. J. Pediatr., 153: 629-634.
22. Mackenbach, J.D., H. Tiemeier, J. van dar Ende, I.M. Nijs and V.W. Jaddoe *et al*., 2012. Relation of emotional and behavioral problems with body mass index in preschool children: The generation R study. J. Dev. Behav. Pediatr., 33: 641-648.
23. Drukker, M., F. Wojciechowski, F.J. Feron, R. Mengelers and J. van Os, 2009. A community study of psychosocial functioning and weight in young children and adolescents. Int. J. Pediatr. Obes., 4: 91-97.
24. Kim, B. and M.J. Park, 2009. The influence of weight and height status on psychological problems of elementary schoolchildren through child behavior checklist analysis. Yonsei Med. J., 50: 340-344.
25. Wu, W.C., D.L. Luh, C.I. Lin, Y.C. Chiang and C.C. Hung *et al*., 2016. Reciprocal relationship between unhealthy eating behaviours and depressive symptoms from childhood to adolescence: 10-year follow-up of the child and adolescent behaviors in long-term evolution study. Public Health Nutr., 19: 1654-1665.
26. WHO., 2009. WHO AnthroPlus for personal computers manual: Software for assessing growth of the world's children and adolescents. World Health Organization, Geneva, pp: 1-45. http://www.who.int/growthref/tools/who_ anthroplus _manual.pdf
27. Achenbach, T.M. and L.A. Rescorla, 2000. Manual for the ASEBA Preschool Forms and Profiles. University of Vermont Department of Psychiatry, Burlington.
28. Achenbach, T.M. and T.M. Ruffle, 2000. The child behavior checklist and related forms for assessing behavioral/ emotional problems and competencies. Pediatr. Rev., 21: 265-271.
29. Anderson, S.E., X. He, S. Schoppe-Sullivan and A. Must, 2010. Externalizing behavior in early childhood and body mass index from age 2 to 12 years: Longitudinal analyses of a prospective cohort study. BMC Pediatr., Vol. 10. 10.1186/1471-2431-10-49.
30. Ministry of Public Health, 2015. Report form of inspection at the provincial level 2015. http://inspection.anamai. moph. go.th/uploads/201511TG10150_11.pdf
31. Ogden, C.L., M.D. Carroll, H.G. Lawman, C.D. Fryar, D. Kruszon-Moran, B.K. Kit and K.M. Flegal, 2016. Trends in obesity prevalence among children and adolescents in the United States, 1988-1994 through 2013-2014. J. Am. Med. Assoc., 315: 2292-2299.
32. Barbu, C.G., M.D. Teleman, A.I. Albu, A.E. Sirbu, S.C. Martin, A. Bancescu and S.V. Fica, 2015. Obesity and eating behaviors in school children and adolescents-data from a cross sectional study from Bucharest, Romania. BMC Public Health, Vol. 15. 10.1186/s12889-015-1569-9.

33. Cavadini, C., B. Decarli, J. Grin, F. Narring and P.A. Michaud, 2000. Food habits and sport activity during adolescence: Differences between athletic and non-athletic teenagers in Switzerland. Eur. J. Clin. Nutr., 54: S16-S20.
34. Veltsista, A., J. Laitinen, U. Sovio, E. Roma, M.R. Jarvelin and C. Bakoula, 2010. Relationship between eating behavior, breakfast consumption and obesity among finnish and Greek adolescents. J. Nutr. Educ. Behav., 42: 417-421.
35. Huang, L., F.B. Tao, Y.H. Wan, C. Xing, J. Hao, P.Y. Su and X.Y. Xing, 2011. Self-reported weight status rather than BMI may be closely related to psychopathological symptoms among Mainland Chinese adolescents. J. Trop. Pediatr., 57: 307-311.