DOI: 10.7860/JCDR/2018/36790.12375

Original Article

Paediatrics Section

Relationship between Attachment Style and Body Mass Index of Children using Ex-Post Facto Research Design

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ABSTRACT

Introduction: 'Attachment' refers to a child's relationship with and the need for its parent, which sets the base for all future relationship patterns and interactions. Underweight and obesity are recognised as complex problems emerging from genetics, poor nutrition, developmental processes, life experiences and lifestyle. Higher and lower than normal Body Mass Index (BMI) at an early age is associated with many negative health outcomes, concurrent as well as later in life. Few studies place BMI within the framework of the Internal Working Model of attachment theory due to its power in regulating feeding and emotions in caregiver/parents relationships with their children, to the best of authors knowledge none compare the attachment style of the contrast group of obese, normal and underweight children within the Indian setting in the same study.

Aim: To investigate the effect of attachment style on BMI of children.

Materials and Methods: Information on attachment style (Ricky Finzi-Dottan, 2012) and BMI (Omron model-HBF212) was collected from 217 early adolescents (10-14-year-old, in Grade IV-IX) from three private schools of Jaipur. The sample was divided into three groups as per BMI specifications of Indian Academy of Paediatrics. Further, contrast group comparison of underweight, overweight and normal weight adolescents was identified and computed with the chi-square analysis.

Results: Results confirmed that insecure attachment style is associated with higher than normal BMI (overweight/obesity), whereas, children with normal BMI showed secure attachment style. However, no specific trend of attachment style could be identified among children with below normal BMI (underweight). The result was found to be significant (χ^2=35.787, df=2, p<0.01).

Conclusion: Findings suggest that attachment style with parents/caregiver during the early years are of vital importance in contributing towards shaping the future course of eating, feeding pattern, developmental trajectory leading to a healthy or unhealthy style of life and accumulation of specific experiences, modus operandi to face challenges leading to problems like obesity or overweight.

Keywords: Anxious, Obesity, Underweight

INTRODUCTION

Childhood and adolescence are generally considered the healthy period of life. However, the developmental transition of children makes them vulnerable, particularly to environmental surroundings [1]. Much important health and social behaviours and problems either start or peak during the early years [2]. Evidence indicates that children are prone to underweight and overweight problems due to lifestyle changes [1,2].

India is facing a double burden of underweight and overweight during early adolescence [3]. Nutrition surveys 2002 and 2006 show that more than half the Indian population aged 9-18 years were undernourished [4-6]. It is important to recognise that whether underweight is only a medical problem or a psychosocial concern that requires investigation [7,8]. Moreover, childhood obesity could be another form of malnutrition, which is increasing steeply among children in India in the past decade [9].

India is a fast-growing economy, undergoing major epidemiological, nutritional and demographic transitions resulting in a high prevalence of obesity [9]. The prevalence of overweight increased from 9.7% prior to 2001 to 13.9% in studies reported after 2010 [10]. An obese or underweight individual has to face the weight stigma of being 'too fat' or 'too thin' and this discrimination hurts the individual on an emotional as well as on the psychological bases (i.e., Risk of depression, low self-esteem) [11]. Several studies show that overweight children are more likely to become obese adults [12]. Furthermore, obesity and underweight at an early period of life impact negatively on the child's life, in the long run [12].

Attachment theory suggests that babies are born with a variety of innate behaviours to maximise their chance of survival, which, while explorative behaviour, permit them to explore their social world. Attachment behaviours draw others towards them in a very time of 'want' or 'distress' [13]. The secure attachment style encourages certain emotional and social consistent behaviour patterns and other positive behaviours, whereas, insecure attachment styles result in behaviours like denying, do not like giving affection to the child or showing negative behaviour and arrogance [13]. These behaviours remain consistent and overt for a long time [14] and correspond the attachment style later during adulthood [14]. These secure or insecure attachment styles are shown to be closely connected with emotional regulation, specifically, with the use of emotional eating behaviours as a coping mechanism [15]. Particularly, when caregiver at an early age is unreliable and unresponsive, children, possibly turn to food as a coping mechanism deficit ways to manage their emotions [15].

Few researchers have indicated the impact of family dynamics with a specific role of attachment styles on body weight [16]. Neglectful parenting, resulting in specific life experiences has been documented to be associated with childhood obesity [17]. Few studies have reported that poor quality of the early mother-child relationship is associated with higher prevalence of adolescent obesity [17]. Some characteristic of the dysfunctional pattern of interaction is found in families with obese children [18], e.g., adolescents with uncaring and unsympathetic mothers were found to have a significantly greater risk of developing higher BMI during their school age [19]. Similarly, anxious attachments

are associated with underweight of children [20]. Attachment insecurity is an established risk factor for eating disorders in children, more specifically, for anorexia disorder [20]. Therefore, parent-child attachment is of great significance in shaping the child's health later in life.

The past studies focus on either underweight or overweight in the developmental stage from infancy to childhood. In addition, most of the studies [17-20], on attachment style are from the western world. Therefore, present study would like to investigate the link between attachment style and different levels of BMI (contrast group comparison of underweight, overweight and normal weight) of Indian adolescents in the age group of 10-14 years in Indian adolescents.

MATERIALS AND METHODS

A school-based ex-post facto study of contrast group comparison of underweight, overweight and normal children was conducted over a short period of three months from August to October 2017 of Jaipur city (Rajasthan) to avoid the examination related stress issues with children, parents and school administration. This is not an intervention based research and no clinical trials on samples were conducted.

Adolescents of 10-14 years of age (Grade V to IX) constitute a homogeneous group with similar characteristics [21]. They are not hassled by board exams, competitions, and future career issues compounding to stress compensatory behaviours like over or under eating. Therefore, the present study included 250 students, with an equal number of males and females in the age range of 10 to 14 years (enrolled in Class V to IX) attending regular school. Sample of underweight, normal weight and overweight were based on similar academic difficulty level. The selection of three private schools was from different location of the city, but who had similar fee structure, syllabus, facility and teacher profile. Three schools targeted had 1000 of (10-14 years), adolescents V-IX classes and two sections of each class were contacted for identifying adolescent with different body mass index. There were 10-12% overweight/obese and 4 to 6% underweight adolescent in each class. Therefore, all obese adolescents (100), all underweight (50) and randomly selected adolescent with normal weight (100) were included in the study (total sample=250) since, this study was conducted in Jaipur city (Urban area) the obese and normal children were more than underweight. Thus, the sample of underweight children is relatively small. To equate the number in all three categories of BMI, taking underweight children from other schools would have allowed different confounding and intervening variables to contaminate the results of this study. School Principal, Class Teacher's and Parental consents were obtained through a circular explaining the purpose and procedure of the study. Informed consent of the participants (school children) was also obtained before conducting this study. A complete enumeration of students was done and those present at the time of study and consented to participate were included in the study.

The socio-demographic characteristics of the sample included a note of religion, diet pattern, academic records (as per the class teacher description good academic performance children scoring above 75% and average below it) and number of siblings. Out of the 250 student's sample contacted, consent of a total of 217 students and their parents to participate in this study (response rate of 86.8% with a dropout rate of 13.2% due to nonavailability of written consent).

Those students and parents who did not give the written consent to participate in the study and those who were taking treatment for certain alignments were excluded from the study.

Procedure

The standardised self-report questionnaire for attachment style for latency age children developed by Ricky Finzi-Dottan R, (2012) was administered [22]. The questionnaire contains 15 items, divided into three factors, which taped the Ainsworth's three attachment patterns: secure (e.g., "I usually believe that others who are close to me will not leave me"), anxious/ambivalent (e.g., "I'm sometimes afraid that no one really loves me"), and avoidant (e.g., "I find it uncomfortable and get annoyed when someone tries to get too close to me"). The children were asked to read each item and to rate the extent to which the item described themselves on a 5-point scale, with scores ranging from 1 (not at all) to 5 (very much). Internal consistency of 'a'=.69-.81, test-retest reliability was 'r'=.87-.95. The school selected for the study was an English-medium school. Therefore, they could read and understand the English language of the test well. This test is freely available on the net in the PDF version and the permission of the concerned author through e-mail was granted prior to the study.

BMI of children was measured by BMI machine (Model-HBF-212). Criteria for measuring BMI was taken according to the Indian standards [23]. Criteria of BMI-Underweight- a percentile range of <5, Normal weight-a percentile range of 5 to <85, Overweight-a percentile range of 85 to <95 and Obese-a percentile range ≥95 [23].

Ethical concern: The Permission to conduct this study was taken from the authors institute as well as from the School Principal, Class Teacher's and Parental consents were obtained through a circular explaining the purpose and procedure of the study. Informed consent of the participants (school children) was also obtained before conducting this study.

STATISTICAL ANALYSIS

Statistical Package for Social Sciences, Version 22.0 for Windows (SPSS 22.0) was used to analyse the quantitative data. Chi-square was computed and 0.05 level of confidence was used to interpret the results of the present study.

RESULTS

Demographic characteristics: Equal participation of gender was seen in the present study (50.23% male and 49.76% female). Higher percentage of Hindu religion was there in comparison of non-Hindu (85.25% Hindu and 14.74% Non-Hindu). Diet Pattern of the families included (92.16% Vegetarian and 7.83% Non-vegetarian). Two categories were taken in academics performance good and average (57.60% average and 42.39% good). Moreover, trend of two children in the family was seen as compared to single child and more than two children (45.62% two children, 44.70% single child and 9.67% three children) [Table/Fig-1].

Socio demographic variables		N (%)
Gender	Male	109 (50.23)
	Female	108 (49.76)
Religion	Hindu	185 (85.25)
	Non-Hindu	32 (14.74)
Diet pattern	Vegetarian	200 (92.16%)
	Non-Vegetarian	17 (7.83%)
Academic performance	Good	92 (42.39)
	Average	125 (57.60)
Number of children in the family	One	97 (44.70)
	Two	99 (45.62)
	Three	21 (9.67)

[Table/Fig-1]: Demographic characteristics of present sample.

Attachment style and BMI: Out of 217 participants in the study. Adolescents with higher BMI significantly showed insecure attachment style (54 insecure, p<0.01, in comparison to adolescents with normal BMI, showed secure attachment style (74 secure, p<0.01). Significantly, equal trend was found in adolescent with below than normal BMI (20 secure and 21 insecure, p<0.01) [Table/Fig-2,3].

Body mass index	Secure	Insecure	Total
Normal	74	23	97
Underweight	20	21	41
Obese	25	54	79
Total	119	98	217

[Table/Fig-2]: Comparison of attachment style and body mass index of children.

Varibles	Value	"df"	p-value
Pearson chi-square	35.787	2	<0.001*
Likelihood ratio	37.099	2	<0.001*
Linear-by-linear association	35.264	1	<0.001*

[Table/Fig-3]: Chi-square value, df, and significance level of attachment style and body mass index of children.
*Statistically significant (p<0.01)

BMI and academic performance: Significantly higher percentage of obese and underweight adolescents were found in average academic performance as compared to normal weight children (57.60% average and 42.39% good, p<0.01) [Table/Fig-4].

Varibles	Value	"df"	p-value
Pearson chi-square	24.749	4	<0.001*
Likelihood ratio	33.248	4	<0.001*
Linear-by-linear association	18.073	1	<0.001*

[Table/Fig-4]: Chi-square, df, significant value of body mass index and academic record.
*Significant at (p<0.01)

BMI and number of children in the family: Significantly higher percentage of obese children were found with single child in the family. Underweight had more than two children in the family in comparison to normal weight children (45.62% two children, 44.70% single child and 9.67% three children, p<0.01) [Table/Fig-5].

	Value	"df"	p-value
Pearson chi-square	181.633	4	<0.001*
Likelihood ratio	178.225	4	<0.001*
Linear-by-linear association	22.930	1	<0.001*

[Table/Fig-5]: Chi-square, df, and significance value of number of children in the family and their body mass index.
*Significant at (p<0.01)

DISCUSSION

The concept of attachment theory has made important contributions to early experiences. Bowlby, in a beautiful statement, puts "intimate attachments to human beings are the hub around which a person's life revolves, not only when he is an infant or a toddler, but through his adolescence and years of maturity to old age" [24]. Attachment styles developed early in life impacts health gradually and subtly. These impacts may be physical, social, emotional and mental depending on the quality of life experiences an individual has. A study conducted on 3,043 Canadian youth reported that insecure attachment was significantly associated with higher BMI. The disordered and restrained eating has emerged as one of the strongest mediators in attachment and BMI association [25]. It has been argued in several studies that attachment styles play a role in the development of emotional eating, eating disorders and management of body weight [26-28], whereas, some studies do not report any such differences [29]. The reasons for such differences need to be explored in the sample of early adolescents because they have a fair knowledge of health-promoting/hindering agents. They start taking independent decisions about themselves, their lifestyle and food choices, unlike younger children who are more dependent on their parents for their choices and decisions.

Exploring Indian studies on attachment style and BMI of children, a limited range of studies is found. A correlation study conducted in Vishakhapatnam city of Southern India and Jammu city of Northern India explored the association between BMI, anxiety and depression in school children and reported positive correlations of BMI with anxiety and depression of boys of 10-14 years of age [30,31]. Psycho-social concerns related to body shape and body image, insecurity, low self-esteem was found among obese children [32]. Very few Indian studies have focused on BMI of children (mostly focusing on the prevalence and trends of childhood obesity) e.g., a review article focused on data taken from 52 studies conducted in 16 states of India during 1981 to 2013 [33]. To date, many of the Indian researches have explored links between BMI and factors such as socio-economic status, depression, body image etc., [34], however, none have explored the link of attachment style with wide range of BMI during early adolescence in the Indian setting.

The results of the study are very promising and conclusive with clear trends. Obese participant of the present study reported insecure attachment style in comparison to children with normal weight who reported secure attachment style. The chi-square analysis of the present study revealed a significant association between attachment style and BMI of children. Anxious and avoidant (insecure style) children have poor emotional control, are hyperactive and distressed, indulge in uninhibited eating or emotional eating, feel frightened, nervous and disorganised, have negative-self-image etc., which could mediate the connection between insecure attachment style and BMI of adolescents [35]. The association of eating behaviour and attachment style can be further explained by the tendency to seek pleasure through overeating (high positive energy balance resulting in high BMI) resulting in obesity among children who develop insecure attachment style. Apart from psychological causes, children who develop insecure attachments also have higher physiological reactivity higher cortisol levels leading to the risk of obesity [36]. Therefore, insecure attachment style could be a predictor of obesity in children as well as later in life. Further, children with normal BMI showed secure attachment style. This further strengthens the above said association in the present research. As reported in a study [37], secure attachment style promotes behaviours like curious, competent, empathic, resilient, self-confident, positive self-image, etc., Which may further reinforce that secure attachments with parents and caregivers could contribute to foster health and well-being throughout lifetime. It is noteworthy that such trend of attachment style and BMI was not observed among underweight children (participants) of this study, where secure and insecure attachment style was observed in a comparable number of children. Hence, the reason for underweight cannot be explained on the basis of their attachment style, but, overweight can be explained. There can be a number of confounding variables, other than attachment style to explain underweight e.g., Malnutrition diet, poor lifestyle, prior chronic sickness, poor metabolism, genetical conditions, socioeconomic conditions or medical conditions to mention a few [38].

Regarding the role of socio-demographic variables associated with the attachment style of the child and his BMI, present study checked the association diet pattern (vegetarian/non-vegetarian) with

attachment style and found no significant association (χ^2=3.281, df=2, p=>.05). However, significantly greater number of children having normal BMI were well in their academic performance in comparison to obese/overweight or underweight children. Moreover, single child in the family was found to be obese or overweight as compared to two or three children in the family. Conversely, children with three siblings were found to be underweight as compared to normal and obese/overweight children. These findings are similar to the earlier empirical research [39,40]. Further, considering the purpose and future scope of the study, it is noteworthy that childhood obesity is one of the most common, yet neglected, public health problem in both developed and developing countries. In India too, it is rampant and neglected. The disease burden and economic burden of it are very high due to associated diseases, lower productivity, longevity, concurrently as well as later. It is extremely complex to understand as well as difficult to deal with it. Obesity, if grows during childhood, is a slow and non-cognizant disease, if unnoticed or untalented at early age and stage, it gradually gets settled have drastic adverse effects on health, wealth and productivity of individual, family, society and nation. Therefore, it is an important issue to study in-depth and at length as children of today are tomorrow's citizen, thus it is extremely important to ensure good health for children.

LIMITATION

Obesity is a complex problem there are so many factors which could be responsible for the increase and decrease of BMI of children. A similar study with much larger sample from diverse locations of the country with varied demographic specifications enhances the general ability. Multiple regression analysis could further fix the proportion of the variance of individual variables.

CONCLUSION

The findings of the present study have suggested that the early years (infant-childhood) are very crucial and associated with positive or negative transactional experiences (secure and insecure attachment style) with resultant BMI related health outcomes. If a child is raised with secure attachment, forming healthy relationships with the parents/caregiver and peers the child's developmental trajectory is expected to be good and healthy. Conversely, if it is insecure attachment it might lead to unhealthy development like obesity/overeating as compensatory adaptive behaviours of the child in the long run. Future research could explore the long-term impact of attachment styles on a wide range of BMI.

ACKNOWLEDGEMENTS

The authors wish to express sincere gratitude to Professor Jagdish Prasad, Former Professor and Head, Department of Statistics University of Rajasthan, Jaipur. Presently working as Professor of Statistics and Business Analytics, Amity University, Rajasthan. In providing his valuable suggestions for statistical analysis and interpretation of data for the present study.

REFERENCES

[1] Mulye T, Park M, Nelson C, Adams S, Irwin C, Brindis C. Trends in adolescent and young adult health in the United States. Journal of Adolescent Health. 2009;45(1):8-24.
[2] Healthy People 2020 [Internet]. Healthypeople.gov. 2018 [cited 1 August 2018]. Available from: https://www.healthypeople.gov/.
[3] Singh S, Gopalkrishna G. Health behaviours & problems among young people in India: Cause for concern & call for action. Indian Journal of Medical Research. 2014;140:185-208.
[4] National Nutrition Monitoring Bureau. Diet & nutritional status of the rural population. Hyderabad: National Institute of Nutrition; 2002. p. 158. NNMB Technical Report No. 21. Available from: http://www.nnmbindia.org/NNMBREPORT2001-web.pdf, accessed July 12, 2012. 16.
[5] National Nutrition Monitoring Bureau. Diet & nutritional status of population and prevalence of hypertension among adults in rural areas. Hyderabad: National Institute of Nutrition; 2006. p. 166. NNMB Technical Report No: 24. Available 204 Indian J Med Res, August 2014 from http://www.nnmbindia.org/NNMBReport06Nov20.pdf, accessed July 12, 2012.
[6] Wasnik V, Rao BS, Rao D. A study of the health status of early adolescent girls residing in social welfare hostels in Vizianagaram district of Andhra Pradesh state, India. Inter J Collabor Res Intern Med Public Health [serial on the Internet] 2012. Available from: http://iomcworld.com/ijcrimph/ ijcrimph-v04-n01-07.html, accessed on July 18, 2012. 18.
[7] Rao VG, Aggrawal MC, Yadav R, Das SK, Sahare LK, Bondley MK, et al. Intestinal parasitic infections, anaemia and undernutrition among tribal adolescents of Madhya Pradesh. Indian J Community Med. 2003;28(1):26-29.
[8] Kathleen M, Teresa D. Poor weight gain in infants and children [Internet]. Uptodate.com. 2018 [cited 17 January 2018]. Available from: https://www.uptodate.com/contents/poor-weight-gain-in-infants-and-children-beyond-the-basics
[9] Pareek A, Joshi U, Rathore B. Why it is important to address childhood obesity. International Journal of Indian Psychology. 2017;5(1):18-31.
[10] Gomez F, Galvan R, Frenk S, Munoz J, Chavez R, Vazquez J. Mortality in second and third degree malnutrition. Journal of Tropical Pediatrics. 1956;2(2):77-83.
[11] Allison M, Lee C. Too fat, too thin: Understanding bias against overweight and underweight in an Australian female university student sample. Psychology & Health. 2014;30(2):189-202.
[12] Serdula M, Ivery D, Coates R, Freedman D, Williamson D, Byers T. Do obese children become obese adults? a review of the literature. Preventive Medicine. 1993; 22(2):167-77.
[13] Bowlby J. A secure base: Parent-child attachment and healthy human development. London: Basic books; 2008.
[14] Sroufe L. The coherence of individual development: Early care, attachment, and subsequent developmental issues. American Psychologist. 1979;34(10):834-41.
[15] Pierrehumbert B, Bader M, Miljkovitch R, Mazet P, Amar M, Halfon O. Strategies of emotion regulation in adolescents and young adults with substance dependence or eating disorders. Clinical Psychology & Psychotherapy. 2002;9(6):384-94.
[16] Kaitz M, Bar-Haim Y, Lehrer M, Grossman E. Adult attachment style and interpersonal distance. Attachment & Human Development. 2004;6(3):285-304.
[17] Brodsgaard A, Wagner L, Poulsen I. Childhood overweight dependence on the mother-child relationship. Health Psychology Research. 2014;2(2):1583.
[18] Butcher J, Mineka S, Hooley J. Abnormal Psychology. 13th ed. Delhi: Pearson Education India; 2013:351-352.
[19] Wu T, Dixon W, Dalton W, Tudiver F, Liu X. Joint effects of child temperament and maternal sensitivity on the development of childhood obesity. Maternal and Child Health Journal. 2010;15(4):469-77.
[20] Valenzuela M. Attachment in Chronically Underweight Young Children. Child Development. 1990;61(6):1984-1996.
[21] Agarwal K, Saxena A, Bansal A, Agarwal D. Physical growth assessment in adolescence. Indian Pediatr. 2001; 38(11):1217-35. Available from: https://www.ncbi.nlm.nih.gov/pubmed/11721062.
[22] Finzi-Dottoan R. Attachment style classification questionnaire for latency age children [Internet]. Midss.org. 2012 [cited 4 March 2018]. Available from: https://www.midss.org/sites/default/files/ascq-eng-my.pdf.
[23] Khadilkar V, Khadilkar A. Revised indian academy of pediatrics 2015 growth charts for height, weight, and body mass index for 5-18-year-old Indian children. Indian Journal of Endocrinology and Metabolism. 2015;19(4):470-76.
[24] Bowlby J. Attachment and loss. 3rd ed. New York: Basic Books; 1980.
[25] Maras D, Obeid N, Flament M, Buchholz A, Henderson K, Gick M, et al. Attachment style and obesity. Journal of Developmental & Behavioural Pediatrics. 2016;37(9):762-70.
[26] Jurist E, Fonagy P, Target M, Gergely G. Affect regulation, mentalization, and the development of the self. New York: Other Press Professional; 2005.
[27] Black C, Wilson G. Assessment of eating disorders: Interview versus questionnaire. International Journal of Eating Disorders. 1996;20(1):43-50.
[28] Mikulincer M, Shaver P, Pereg D. Journal search results-Cite This For Me. Motivation and Emotion. 2003;27(2):77-102.
[29] Amianto F, Northoff G, Abbate Daga G, Fassino S, Tasca G. Is anorexia nervosa a disorder of the self? a psychological approach. Frontiers in Psychology. 2016;(7):849.
[30] Premasudhakar D, Dharani B. Association of body mass index, anxiety and depression among the school children of Visakhapatnam District, Andhra Pradesh. International Journal of Scientific Research & Development. 2017;5(2):185-88. Available from: http://www.ijsrd.com/articles/IJSRDV5I20394.pdf.
[31] Fareed M, Afzal M. Evidence of inbreeding depression on height, weight, and Body Mass Index: A population-based child cohort study. American Journal of Human Biology. 2014;26(6):784-95.
[32] Puder J, Munsch S. Psychological correlates of childhood obesity. International Journal of Obesity. 2010;34(S2):S37-S43.
[33] Mohan V, Ranjani H, Mehreen T, Pradeepa R, Anjana R, Garg R, et al. Epidemiology of childhood overweight & obesity in India: A systematic review. Indian Journal of Medical Research 2016;143(2):160-74.
[34] Rohilla R, Rajput M, Rohilla J, Malik M, Garg D, Verma M. Prevalence and correlates of overweight/obesity among adolescents in an Urban City of North India. Journal of Family Medicine and Primary Care. 2014;3(4):404-08.
[35] Cyril S, Halliday J, Green J, Renzaho A. Relationship between body mass index and family functioning, family communication, family type and parenting style among African migrant parents and children in Victoria, Australia: a parent-child dyad study. BMC Public Health. 2016;16:707.

[36] Singh Chahar P. Physiological basis of Growth and Development among Children and Adolescent in Relation to Physical Activity. American Journal of Sports Science and Medicine. 2014;2(5A):17-22.
[37] Devi R. Childhood obesity. Hyderabad, India: Icfai University Press; 2009:55-56.
[38] Sahu S, Kumar S, Bhat B, Premarajan K, Sarkar S, Roy G, et al. Malnutrition among under-five children in India and strategies for control. Journal of Natural Science, Biology and Medicine. 2015;6(1):18-23.
[39] Oketayo o, Ojo J, Inyang E, Adewodi R, Akinluyi F. The effect of dietary pattern and body mass indexon the academic performance of in-school adolescents. International Education Studies. 2012;5(6):66-70.
[40] Tonetti L, Fabbri M, Filardi M, Martoni M, Natale V. The association between higher body mass indexand poor school performance in high school students. Pediatric Obesity. 2015;11(6):e27-e29.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Apr 14, 2018**
Date of Peer Review: **Jul 12, 2018**
Date of Acceptance: **Oct 03, 2018**
Date of Publishing: **Dec 01, 2018**