



Bioscene

Bioscene

Volume- 21 Number- 03

ISSN: 1539-2422 (P) 2055-1583 (O)

www.explorebioscene.com

Snacking and Pica Behavior Prevalence among School Children with and Without Behavior Problems

Sushma B V* & Khyrunnisa Begum**

*Assistant Professor, Department of Nutrition and Dietetics; JSS Academy of Higher Education & Research, Mysuru, India

** Professor and Chairperson, Department of Food science and Nutrition, University of Mysore, Mysore, India

Corresponding Author: **Dr. Sushma B. V**

Abstract: Snacking behaviour and preferential eating of fast foods are the characteristic eating pattern among school age children. However, the present scenario about the child health indicates a rise in behaviour problems among children globally. In this context, the influence of behaviour problems on snacking behaviour among children aged 9-14years is investigated. The study revealed that, 28% boys and 21% girls with behaviour problem exhibited preference to fast foods compared to their normal counterparts. Boys (24.4-35.1%) with behaviour problems preferred chocolates and had craving for sugar, 30.6% boys preferred homemade sweets. Other than this, licking walls (12.6-34.2; 10.0-34%), eating mud (10.0-42.3; 12.0-32.0%) and chewing chalk piece (10.0-38.7; 12.0-38.0%) was also prevalent among boys and girls with behaviour problems. Evidently children with behavior problems exhibited an increased preference for snack foods as well as pica habit for non food materials.

Keywords: Behaviour Problems, Snacking Pattern, Food Preferences, School age children, Pica hyperpalatable foods, obesity, addiction, eating disorders

Introduction

Snacking is a common eating practice worldwide ¹; it is the extra eating occasion beyond the normal meal times. However, it is still ambiguous whether to consider snacking as an extra eating time or an additional meal². Snacks are variously defined, one of the definitions denotes the food categories that are preferred and the time of the day when consumed ^{2,5}. Snacking is common in all age groups; eating behaviours in general and snacking in particular are influenced by parents, friends, school and digital environment^{6,7}. Children particularly during their developmental transition exhibit strong snacking behaviours, this has been a common observation by investigators worldwide. It is recognised that the sight, smell or thought of food

causes urge to eat in humans, if food is available may lead to eating episode⁸. The present-day food environment exerts pervasive influence for snacking⁷.

Snacking plays a significant role in children's diet with multiple snacking occasions occurring throughout a child's day. The average number of daily snacks is reported by various investigators to be 3 with 92.9 – 100% of children consuming snacks^{3,4}. Snacks frequently consumed are reported as 'fruits and vegetables', 'baked desserts', 'sweets, candy and confectionery', and 'dairy products'⁴.

Research reports presents alarming connotations related to weight gain and snacking behaviour^{3,4}. In humans, stress and emotional status alter normal eating behaviours and cause skipping meals. Meal skipping has been found to correlate with snacking behaviours. Epidemiological studies related to eating patterns and unhealthy eating behaviours in all categories of people of different gender, age, socio economic grades and health status endorse similar results⁵.

Recently there is an upsurge in behaviour problems among school age children; in India the prevalence rates are reported to be 2.6% to 35.6%⁵⁻⁷. While in developed countries the occurrence rate is still higher⁷. Aetiology for behaviour problem in children are not completely elucidated however, lifestyle factors and environmental stress are indicated as correlating factors⁷. More over certain food constituents such as salicylic acid, artificial colours and flavours are known to exert pharmacologic reactions in the body specifically by stimulating neurons⁸. Reports indicate that these constituents cause symptoms like headache, irritability, agitation, mental confusion and hyperactivity in sensitive children, it is speculated that foods containing such substances could induce abnormal behaviours in children⁸. Observational studies have also proven a positive linkage between diet and behaviour pattern⁸. Interventional experiments showed that sugar or food additives to be the major causative factors for occurrence and severity of problematic behaviours. It was therefore, considered important to investigate snacking behaviour as well as the preferred food items among children between 8-12 years, and the differences in snacking behaviour due to behaviour problems.

Methodology

Study Population –

This was a cross sectional study carried out in one of the major cities of Karnataka from South India. 587 children both girls (N= 258; 44.0 %) and boys (N=329; 56.0%) aged between 9 to 14 years were selected from the mainstream schools. A total of three schools, one each of private, government and government aided schools having English and the vernacular language (Kannada) as medium of instruction formed the loci for conducting the study. All children studying in 4th to 9th standards were the participants.

Tools Used: Self reporting questionnaires were prepared in simple English language for children to understand and respond easily. Behaviour problem was assessed using 'Abbaris Child and Adolescent Self Report' (ACASRQ) schedule as modified by Sushma et.al , to assess children with non-pathological behaviour issues in Indian children (16). The response sheets in all the questionnaires so prepared required ticking the right option. All the questionnaires were translated into Kannada language, with the help of a language expert from Kuvempu Institute of Kannada Studies; University of Mysore. Questionnaires so prepared were standardized before conducting the study.

While conducting the study, children were given choice to use questionnaires in the language they preferred (Kanada or English) according to their comfort level. Children from 4th and 5th standards were assisted in making entries. Information about parent's occupation and income was confirmed from school records.

Demographic information elicited was related to religion, family type, parents' education, occupation. Socioeconomic status was assessed based on the possession of house hold articles (two and four wheelers, TV, computer, fridge and washing machine). Occupation of mothers and fathers were graded as low, lower middle, middle, upper middle and high according to Desai et al; 2010 ¹⁷.

Socio economic status was calculated using information regarding parent's education, occupation, type of house and possession of household articles. Each item was scored, and the sum of total score so obtained ranged between 5 – 28; this was distributed as 'low SES- with scores < 9; Middle SES: 10 -18 and High SES > 19.

Snacking behaviour questionnaire elicited information about various foods such as fast foods, sweets, bakery items. The questionnaire had four-point assessment scales, i.e Always, Sometimes, Rarely and Never.

Statistical analysis:

Data obtained was analysed using XL SAT -752 pro version for descriptive analysis. Mean scores, standard deviation and percentage were calculated for interpreting eating pattern. Chi Sq analysis was used compared the means at $p \leq 0.05$ significance level.

Results

Subjective details of the participants are presented in table.1, it is evident that majority of the selected children both girls & boys belonged to Hindu religion (70.5, 68.7%), a small percentage practiced Christianity and Islam. Nuclear families predominated (56.2 and 61.4% girls and boys) while 27.9 and 28.0 percent of

children were from joint families. Only 15.9 and 10.6% girls and boys were from extended families. Ninety seven percent fathers and mothers were literates, among these 37 to 32 % were graduates and 30 to 25% respectively had completed diploma courses.

Majority of (87 %) mothers and (98%) fathers were employed, 48 to 51% fathers and 36 to 38% mothers were engaged in 'upper and high' grade jobs. A small proportion of mothers were housewives. A greater proportion (49.6; 61.7 %) of girls & boys belonged to middle SES while 21.3 to 12.2 and 29 to 26% were from low and high SES were respectively.

Table 1: Demographic characteristics of the study population.

Variables	Total study population N=587	
	Girls (N =258) %(n)	Boys (N=329) %(n)
Age		
9-11 yrs	33.9(85)	42.6(140)
12-14 yrs	67.1(173)	57.4 (189)
Total(%)	43.9	56.1
Religion		
Hindu	70.5(182)	68.7 (226)
Christian	12.4(32)	14.3 (47)
Muslim	17.1(44)	17.0 (56)
Family type		
Joint	27.9(72)	28.0 (92)
Nuclear	56.2(145)	61.4 (202)
Extended	15.9(41)	10.6 (35)
Diet type - Veg		
Normal Behavior	57.2(56)	66.4(85)
Behavior problem	42.8(42)	33.6(43)
Diet type - Non Veg		
Normal Behavior	63.7(102)	66.2(133)
Behavior problem	36.3(58)	33.8(68)
Father education		

Illiterates	1.2 (3)	-
School	2.7(7)	3.3(11)
SSLC	8.5(22)	8.8(29)
Diploma/ Puc	30.6 (79)	28.0(92)
Graduation	36.8 (95)	36.2(119)
Higher Education	20.2(52)	23.7(78)
Mother education		
Illiterates	1.9(5)	0.9(3)
School	7.4(19)	8.2(27)
SSLC	14.3(37)	14.9(49)
Diploma/ Puc	25.6(66)	31.0(102)
Graduation	33.7(87)	32.2(106)
Higher Education	17.1(44)	12.8(42)

Father occupation		
Home makers	2.3(6)	0.9(3)
Working		
Low grade	5.4(14)	6.3(21)
Lower Middle grade	13.6(35)	13.1(43)
Middle grade	29.8(77)	27.7(91)
Upper middle grade	32.2(83)	32.5(107)
High grade	16.7(43)	19.5(64)
Mother occupation		
Home makers	10.9(28)	7.6(25)
Working		
Low grade	12.0(31)	11.9(39)
Lower middle grade	16.3(42)	17.3(57)
Middle grade	22.2(58)	24.0(79)
Upper middle grade	25.5(66)	27.0(89)
High grade	12.8(33)	12.2(40)
Socio-economic status		
Low SES	21.3 (55)	12.2 (40)
Middle SES	49.6 (128)	61.7 (203)

High SES	29.1 (75)	26.1 (86)
----------	-----------	-----------

Table .2: Percent occurrence of Behaviour Problems among the Selected Children

Child participants	N	Normal	Behavior problems	Behavior problems	
				mild	moderate
Boys	329	66.3(218)	33.7 (111)	86.5 (96)	13.5 (15)
Girls	258	61.2(158)	38.8 (100)	87.0 (87)	13.0 (13)
Chi. Sq P value	0.1207 ^{NS}			0.5382 ^{NS}	

Table 2 presents the prevalence of behaviour problem among the participants. More than 30% of children both boys and girls were found to be inflicted with behaviour problems of mild and moderate type (33.7 and 38.8 % boys and girls). Although prevalence of behaviour problem was seen more among girls as compared to boys, the differences were small and statistically not significant. In clinical practice, behaviour problems are found to vary from mild to severe form; in the severe state, behaviour characteristics are more intense and difficult to handle. Nevertheless, there was not a single child with severe grade of behaviour problem. Majority (87 %) of the affected children were found in the mild grade and the rest exhibited moderate form of behaviour problem. The occurrence rate of mild and moderate form of behaviour problem was essentially similar among boys and girls.

Table.3: Snacking Pattern Among Selected Children: Comparison Between Normal Children And Those With Behavior Problems

Girls (%)					Boys (%)		
Behavior status	Frequency of consuming	Prefer more snacks than meals	Prefer More bakery foods	Preference for fast foods	Prefer More snacks than meals	Prefer More bakery foods	Preference for fast foods
Normal	Always	17.7	21.0	24.1	17.0	15.1	14.7
	Sometimes	24.7	26.0	37.3	35.3	39.0	40.8
	Rarely	33.5	29.8	20.9	37.2	34.4	32.5
	Never	24.1	22.2	17.7	10.5	12.4	11.0
Behavior Problem	Always	21.0	15.0	17.0	13.5	15.3	14.4
	Sometimes	29.0	44.0	37.0	42.3	45.0	39.6

	Rarely	35.0	23.0	29.0	27.9	22.6	30.6
	Never	15.0	18.0	17.0	17.1	17.1	15.4

Preferences for snacks among the selected children is presented table 3, The scenario of the food market in the present day is very wide, in order to understand their preferences, for various types of snacks, it was decided to broadly categorise snack items as bakery items, fast foods and traditional home-based snacks. It was important to do so because snacks vary in their calorie content. Also, according to the definition, snacks are categorised based on the quality and composition of food². Recently the term ‘Treat food’ is introduced to categorize snack foods with high fat, sugar and salt content, consumed either at meal time or in between meals⁴.

Table 4: Preference Towards Fast Foods

Preference Towards Fast FOODS by children									
Normal children N (%)									
Type of Diet	Girls				Boys				Chi Sq.
	Always	Sometimes	Rarely	Never	Always	Sometimes	Rarely	Never	
Veg	23.2(13)	59.0(33)	10.7(6)	7.1(4)	16.5(14)	68.2(58)	9.4(8)	5.9(5)	2.73; Df:3 P=0.43 5
Non Veg	22.5(23)	58.8(60)	11.8(12)	6.9(7)	17.3(23)	65.4(87)	10.5(14)	6.8(9)	
Total	22.78(36)	58.8(93)	11.4(18)	7.0(11)	17.0(37)	66.5(145)	10.1(22)	6.4(14)	
Children with Behavior Problems									
Veg	21.4(9)	59.5(25)	12.0(5)	7.1(3)	27.9(12)	41.9(18)	18.6(8)	11.6(5)	3.71; df: 3 P=0.29 4
Non Veg	25.8(15)	55.2(32)	10.4(6)	8.6(5)	29.4(20)	42.6(29)	16.2(11)	11.8(8)	
Total % (N)	24.0(24)	56.0(57)	12.0(11)	8.0(8)	27.9(31)	43.2(48)	17.1(19)	11.8(13)	
Comparing between normal and behavior problem children									
Boys: chi sq =16.7; df= 3; P=0.001 - significant									
Girls: chi sq = 0.235; df= 3;P= 0.972 - NS									

In this investigation, children were enquired about the type of snack preferred, preference for snacks over meals and frequency of eating their preferred snack. Carmen P et. Al. mentioned that snacking incidence in all age groups including children has increased over the last 25 years whereas percentage of the population reporting consumption of three or more snacks per day has increased fourfold⁹.

Girls (%)						Boys (%)			
Preference	Behavior status	Always	Sometimes	Rarely	Never	Always	Sometimes	Rarely	Never
Eat sweets most of the time	Normal	7.6	65.2	15.2	12.0	10.0	63.7	15.1	11.0
	Behavior Problem	10.0	58.0	20.0	12.0	18.0	51.3	19.0	11.7
Eat sweet at every meal	Normal	5.1	29.7	26.6	38.6	5.0	24.7	32.6	37.6
	Behavior Problem	9.0	27.0	39.0	25.0	7.3	20.7	40.5	31.5
Eat chocolates daily	Normal	15.8	53.7	19.6	10.7	16.9	64.6	12.8	5.5
	Behavior Problem	16.0	60.0	14.0	10.0	24.4	44.1	18.0	13.5
Homemade vs other sweets	Normal	13.2	65.8	12.0	8.7	20.6	60.1	14.2	5.0
	Behavior Problem	20.0	54.0	15.0	11.0	30.6	37.8	19.8	11.8
To eat sugar	Normal	20.2	56.9	13.2	9.4	26.1	55.9	12.3	5.5
	Behavior Problem	22.0	53.0	12.0	13.0	35.1	34.2	20.7	9.9
Carry sweets in lunch box	Normal	7.6	22.2	32.3	37.9	7.3	19.3	34.9	38.5
	Behavior Problem	10.0	15.0	27.0	48.0	11.7	19.0	42.3	27.0

Table 5: Preference For Sweets: Comparison Between Normal

Essentially small differences were found in the preferences for snacks among the normal children and those with behaviour problems. Response from nearly 40% children was 'Rarely' and 'Never' for snack preferences. In general girls exhibited higher preference for snacks than their male counterparts, 17.7 and 17% normal girls and boys preferred snacks over family meals 'Always', while 21% girls with behaviour problem mentioned to prefer snack over meals 'Always'. Majority of children mentioned to prefer snacks 'Sometimes'. Higher percentage of normal girls preferred fast foods as well as bakery products. Similar results are reported by

Kandukuri V et.al³ from India that 30 to 40% of adolescent boys and girls preferred snacks over meals. Further, they reported that on an average children consumed snacks 3 times a day that preferably included chips, biscuits⁴. Boys with behaviour problems exhibited low preference for snacks. Devash et. al. are of the opinion that primary reason for snack food consumption may be for hunger particularly among adolescent children⁷.

It was considered imperative to investigate influence of diet pattern on snacking pattern. It can be noted from table 5, that normal children practicing vegetarianism and those non vegetarians did not exhibit differences in snacking pattern. It is evident therefore diet pattern exerts least influence on snacking. Among girls with behaviour problems, there were no differences seen in the attitudes for snacking between those practicing two diet patterns. However, a small but statistically significant differences were seen for snacking behaviour among boys, those who practiced non-vegetarianism preferred fast foods in higher percentages against those of vegetarians, the differences were however, statistically significant at $P < 0.001$.

Liking for sweets and frequency of eating sweets is presented in table 5, it is interesting to note that except for chocolate, all types of sweets including sugar was liked by children in general. Preferences to consume sweets 'Always' and 'Sometimes' between the two groups of children were similar except that a small but higher percentage of children with behaviour problem mentioned to prefer to eat sweets 'Always'. 10 to 22 % of children with behaviour problem mentioned to consume sweets always. Although liking for chocolates were less among all the groups, however boys with behaviour problem 24.4% mentioned to prefer chocolates and 30.6% preferred homemade sweets. Other than this, marked differences were not found in percentage of responses for 'Sometimes' and gender differences were found to be small. It is worthwhile to mention that Interrelationship between stress, behaviour problem and dietary patterns are rarely been examined in young children. Positive associations were observed between problems and both sweet and fatty foods consumption. Negative associations were observed between events and fruits and vegetable consumptions. Overall, stress was associated with emotional eating¹⁰. Sweet foods are known to have a moderator effect for emotional eating subjects¹¹.

Table.6: Cravings For Non Food Material By Children: Comparison Between Normal And With Behavior Problems

Girls (%)						Boys (%)				Chi Sq. Value
Cravings		Always	Sometimes	Rarely	Never	Always	Sometimes	Rarely	Never	Chi Sq=0.320 df: 2 P=0.82
Lick wall (enjoys)	Normal	-	3.8	27.8	68.4	-	4.6	25.7	69.7	0.395 df: 2 P=0.821
	BP	-	10.0	34.0	56.0	-	12.6	34.2	53.2	
Comparing between normal and behavior problem children Boys: chi sq =11.5; df= 2; P=0.003 } significant Girls: chi sq = 6.04; df= 2; P= 0.04										
Eat mud (Likes the taste)	Normal	-	5.7	23.4	70.9	-	6.0	36.2	57.8	Chi Sq =7.37; df: 2 P=0.02
	BP	-	12.0	38.0	50.0	-	10.0	42.3	47.7	Chi Sq =0.512; df: 2 P=0.714
Comparing between normal and behavior problem children Boys: chi sq =3.65; df= 2; P=0.161 - NS Girls: chi sq = 11.7; df= 2; P= 0.03 - significant										
Chew chalk piece	Normal	-	7.0	37.3	55.7	-	4.1	24.3	71.6	Chi Sq =10.2; df: 2 P=0.006
	BP	-	12.0	32.0	56.0	-	10.0	38.7	51.3	Chi Sq. 1.10 df: 2 P=0.578
Comparing between normal and behavior problem children Boys: chi sq =13.9; df= 2; P=0.001 - significant Girls: chi sq = 2.24; df= 2; P= 0.326 - NS										

Pica is defined as craving for a food item or its constituents or for substances not commonly regarded as food. DSM-III emphasizes repeated nonnutritive ingestion for a period of time as habitual mode of response. Factors affecting the incidence of pica- psychological state, ethnicity, nutritional deficiency, dietary habits, lead intoxication and paristosis. Pica is a pathological craving for and eating of a nonnutritive item eg: clay, coal, paper or food ingredients like flour, raw potatoes etc. it is a complex behaviour^{13,14}. Since the target group in this study were children aged 8 -14 years and also those who exhibited behaviour problem it was considered essential to understand their eating behaviours in general. Geophagia was found common and included licking wall, eating mud and chewing chalk pieces.

Data revealed that pica was common among both normal children as well as those with behaviour problem. However, higher percentage of children with behaviour problem exhibited pica. Highly prevalent pica was mud eating, wherein 12 to 32% girls and 10 to 42% boys with behaviour problem exhibited mud eating. The second most prevalent pica were licking wall and eating chalk, 10.0 to 34.2% girls and 12.6 and 34.2% boys mentioned to lick walls while 12 to 32% girls and 10 to 38.7% boys with behaviour problem chewed chalk. Normal children were also found to be inflicted with pica, the occurrence rates were however, markedly less. The percentage of girls with mud eating was 5.7 and 23.4 while that for boys was 6.0 and 36.2. This was followed by chewing chalk (girls:7.0 and 37.3%; boys: 4.1 and 24.3%) and licking walls (girls: 3.8 and 27.8; boys: 4.6 and 25.7%). The frequency of occurrence of the episodes as mentioned by children was 'sometimes' and 'rarely', there were no reports of daily episodes. The reason for geophagia among humans in general and children in particular is reported to be mineral deficiencies. According to Reid RM, geophagia offers an adaptive value of its antidiarrheal, detoxification and mineral supplementation potentials¹⁵.

Conclusion

Noticeably nutrition known to exhibit profound effects on behavior and mental health. From the findings the increased preference towards sweets, snacks and pica behaviors among children with behavior problems were observed. It has been noticed that the inappropriate behavior characteristics are indicative of increased snacking and pica behaviors often resulting to the nutritional risks and undesirable health outcomes.

References:

1. Njike, V Y, Smith, T M, Shuval O, Shuval K, Edshteyn, I, Kalantari, V, & Yaroch A L. Snack food, satiety, and weight. *Adv. In Nutri. An Intl. Rev. J.* 2016, 7: 866-78.

2. Gregori, D, Foltran, F, Ghidina, M. and Berchilla, P. 2011. Understanding the influence of the snack definition on the association between snacking and obesity: A review. *Intl. J of Fd.Sci & Nutr*, 62(3), 270- 275..
3. Vasanthi Kandukuri, and Varsha Peram. Comparison of snacking behaviour pattern between government school and private school going children ages (10 to 17 years old) and assessment of their nutritional status. *Intl. J of Sci. and Healthcare Res.* 4,(4)2019. Website:www:ijshr.com. ISSN:2455-7587
4. Niamh O Kane, Sinead Watson, Laura Kehoe, Emma O Sullivan Aine Muldoon, Jayne Woodside, Janette Walton and Ann Nugent. The patterns and position of snacking in children aged 2-12 years: A scoping review. *Appetite.* 188 (2023) 106974. www.elsevier.com.
5. Pratap S, Sagar R. The need for National data on Epidemiology of child and adolescent mental disorders. *J. Indian Assoc. Child Adolesc. Ment. Health*, 2008;4(2):22-27.
6. Nandi DN, Banerjee G, Mukherjee SP, Ghosh A, Nandi PS, Nandi S. Psychiatric morbidity of a rural Indian community: Changes over a 20-year interval. *Br J Psychiatry*, 2000; 121:303-310.
7. Merikangas KR, Nakamura EF, Kessler RC. Epidemiology of mental disorders in children and adolescents. *Dialogues Cli Neurosci*, 2009; 11:7-20.
8. McCann D, Barrett A, Cooper A, Crumpler D, Dalen L, Grimshaw K, Kitchin E, Lok K, Porteous L, Prince E, Sonuga-Barke E, Warner JO, Stevenson J, 2007. Food additives and hyperactive behaviour in 3-year-old and 8/9-year-old children in the community: a randomised, doubleblinded, placebo-controlled trial. *Lancet*, 370 (9598): 1560-1567
9. Hess J M, Jonnalagadda S S & Slavin J I. what is snack, why do we snack, and how can we choose better snacks? A review of the definitions of snacking, motivations to snack, contributions to dietary intake, and recommendations for improvement. *Advances in Nutrition* 7(3) 466-475.
10. Mei Jun Chan, Gabrielle Wann Nii Tay, Gayatri Kembhavi, Jubilee Lim, Salome A nRebello, Hazyl Ng, Congren Lin, May C Wang, Falk Muller-Riemenschneider and Mary Foong-Fong Chong. Understanding children's perspectives of the influences of their dietary behaviour. *Publ. Health Nutri.* 25(8), 2156- 2166, 2021.
11. Devesh Roy, Ruchira Boss, Sunil Saroj, Bhushana Karandikar and Mamata Pradhan. Snack food consumption across Pune Transect in India: A comparison of dietary behaviours based on consumer characteristics and locations. *Nutrients*: 2021, 13, 4325.
12. Schuz, B, Schuz, N & Ferguson, S G. it is the power of food: Individual differences in food cue responsiveness and snacking in everyday life. *Intl. J of Behavioural nutr. & physical activity*, 12 (1), 1-8, 2015,

13. Carmen P and Barry M. Popkin Piernas C, Popkin BM. Trends In Snacking Among U.S. Children. *Health Affairs*. 2010;29(3):398-404.3. Sebastian RS, Cleveland LE, Goldman JD. Effect of Snacking Frequency on Adolescents' Dietary Intakes and Meeting National Recommendations. *J Adolescent Health*. 2008;42:503
14. Nathalie Michels, Isabelle Sioen, Caroline Braet, Gabriele Eiben, Antje Hebestreit, Inge Huybrechts, Barbara Vanaelst, Krishna Vyncke and Stefaan De Henauw. Stress, emotional eating behaviour and dietary patterns in children. *Appetite*. 59, 762-769, 2012.
15. Van Strien T, Cebolla A, Etchemendy E, Gutierrez- Maldonado J, Ferrer- Garcia M, Botella C and Banos R. emotional eating and food intake after sadness and joy. *Appetite* 66, 2013, 20-25.)
16. Sushma B V, Venkateshan S and Khyrunnisa Begum (2013). Prevalence of Behavior Problems among School Children and their Demographic Correlates. *Journal of Behavioral and social sciences*; 1(4):P.203-212
17. Barton J Blinder, Stanley I, Goodman and Phyllis Henderson. Pica: A critical review of diagnosis and treatment. Chapter 30. *The eating disorders*. (Eds: Blinder BJ, Chaitin BF, and Goldstein R), PMA Publishing Corp. 1988. 331- 344.
18. Barton J Blinder and Christina Salama. An Update on pica- prevalence, contributing causes and treatment. *Psychiatric times*: 66, www.psychiatrictimes.com. 0805PT203360BLTlay, 4/24/2008. P:66.
19. Russell M Reid. Cultural and medical perspectives on geophagia. *Medical Anthropology*, 13, 2014, 337-351.
20. Martha J Nepper and Weiwen Chai. Associations of the home environment with eating behaviours and weight status among children and adolescents. *J of Nutrition and Food Science* 2015, S12.
21. Hasanuddin Nuru and, Fardiana Mamang Association between snacking and obesity in children: a review. *Int J Community Med Public Health*. 2015 Aug;2(3)