Original Article

A Study On Adolescent Obesity And Over Weight : Risk Factors Associated, Vitamin D Status,Covid 19 Impact

Dr.NAYEEMUL REHAMAN SHAIK , Dr. Dr.VYSHNAVI KAKARLA , M. BALA GOPAL ,PROFESSOR & HOD , Dr. MONIKA.R , Dr.MOGULLA PRAVALIKA

* Department of Paediatrics , MEENAKSHI MEDICAL COLLEGE HOSPITAL AND RESEARCH INSTITUTE MAHER DEEMED TO BE UNIVERSITY U/S 3 OF UGC 1956, Enathur,Kanchipuram, Tamilnadu.
*Corresponding author:
Dr Nayeemul Rehaman shaik
Department of Paediatrics, MMCHRI,Tamilnadu,India
DOI: 10.47750/pnr.2022.13.S01.263

Abstract

Background: Adolescent obesity has become alarming health problem reaching epidemic levels world wide,Covid 19 further worsened this scenario. Adolescent obesity is a multifaceted disease with serious immediate, intermediate and long-term consequences on both physical and mental health. So, if not intervened, It could transform into major health problem,there by posing economic challenges for future generations. So, its important to know the risk factors associated .There is limited research relating risk factors, vitamin d status and covid 19 impact.so our study is aimed at this.

Methodology: This is a Cross-sectional Observational study conducted in the department of pediatrics MMCHRI, among 100 children included by convenience sampling method, aged 10 to18 years for a period of 1 year during April 2021-april 2022.

Results: In our study of 100 study participants 75 were aged 10 to 14 years and 25 in 15 to 18 years . Our studies showed that high screen time contributed 76 % ,sedentary life style 72 % along with fatty food 70 % consumptions are the major risk factors contributing to obesity. 62 % had vitamin deficiency.

Conclusion: Our study showed high screen time, sedentary life style along with fatty food consumption are the most important risk factors. COVID-19 pandemic evoked major lifestyle changes including indoor stay reducing out door activity. Schools closed increased online classes further increasing screen time. There was vitamin D deficiency in majority of adolescents in our study. So primary prevention methods should be aimed at educating the child and family and encouraging appropriate diet and exercise from young age. Secondary prevention is by preventing the child from unhealthy habits.Due to the serious implications,effective treatments are urgently needed. Lifestyle interventions represent the recommended therapy.

Key words: Life style,fast foods,fatty foods,Obesity,risk factors.

Introduction: The World Health Organization (WHO) defines 'Adolescents' as individuals in the 10-19 years age group. Its a important phase of life in which there is a rapid physical growth, with changes of body composition, sexual and psychologic maturation. Childhood obesity has reached epidemic levels in developed as well as in developing countries.The dramatic increase in overweight and obesity among children and adolescents has become a major public health problem. Obesity during adolescence represents a strong predictor of obesity and higher mortality in adulthood. Due to the serious implications of obesity in adolescents, effective treatments are urgently needed. A study of 432,302 children ages 2 to 19 years found the rate of body mass index (BMI) increase nearly doubled during the COVID-19 pandemic compared to a pre-pandemic period. This faster increase was most pronounced in children with overweight or obesity and younger school-aged children.

Adiposity is measured using body mass index (BMI), BMI percentiles for age and sex are defined by the Center for Disease Control and Prevention,these are used to estimate overweight & Obesity, defined as 85th to less than 95th percentile, obesity 95th percentile or greater, and extreme obesity, 120% of the 95th percentile or at least 35 $kg/m^{2.}$

Adolescence obesity is a strong predictor of adulthood obesity and higher mortality. Investing in adolescent health ensures triple dividends in terms of health during adolescence, health during later adulthood (by preventing risk factors for chronic health disorders like non-communicable diseases) as well as health of the future generation (by ensuring health of the offspring of women who themselves remained healthy).

Due to the serious implications of obesity in adolescents, effective treatments are required .Lifestyle interventions represent the recommended therapy.

Aims & Objectives of the study: To asses the risk factors associated, vitamin D status and covid 19 impact on adolescent obesity & over weight.

Methods: This study was conducted as a Cross-sectional Observational study in the pediatric Out-patient block ,in department of pediatrics of MMCHRI, among children aged 10 to 18 years for a period of 1 year , during April 2021-april 2022. A total of 100 children by convenience sampling method were included in this study. **Inclusion Criteria :** Children in the aged group 10 to 18 years with overweight BMI ≥ 85th percentile and obesity BMI 95th percentile are taken into the study.**Exclusion Criteria** : Children with endocrine disorders, calcium metabolism disorders, syndromal obesity, premature adrenarche, diabetes or on medications for various unlabelled disorders. **Data Collection -** Study participants were explained about the purpose of the study. After taking the informed & written consent, detailed information of the study was taken. General Physical Examination and anthropometric measurements were measured. Vitamin D levels were measured using the form of 25-hydroxycholecalciferol (25OHD) by chemilumnescencemethod.**Studytools:**Pre-designed, semi-structured interview schedule, non stretchable measuring tape, Calibrated standard adult weighing scale, stethoscope, etc.**Statistical analysis:** Data entered in MS Excel and analyzed by using using SPSS software.. P value < 0.05 is considered as statistical significance at 95% confidence interval.

Results:

Table 1:Distribution of study participants based on AGE,GENDER, BMI

Age (years)	No Of Study Participants	Percentage (%)
10 -14 (yrs)	75	75%

15 - 18 (yrs)	**25**	**25%**
Total	**100**	**100%**
Gender	**No Of Study Participants**	**Percentage (%)**
Male	**65**	**65%**
Female	**35**	**35%**
Total	**100**	**100%**
Obesity-Over weight	**No Of Study Participants**	**Percentage (%)**
Obesity	**58**	**58%**
Weight	**42**	**42%**
Total	**100**	**100%**

From the table 1,Out of 100 study participants 65% of the adolescents were male and 35% of the adolescents were female.75% were in the age group 10 to 14 years and remaining 25% were in the age group 15 to 18 years age group 58 were obese and 42 were overweight.

Table 2: Risk factors ,Dietary and lifestyle factors

Variable	**Sub category**	**Number of study participants (n)**	**Percentage (%)**
Region	**Rural**	32	32
	Urban	68	68

Parental obesity	**Yes**	12	12
	No	78	78
Sibling obesity	**Yes**	16	16
	No	84	84
Diet	**Veg**	35	35
	Non veg	65	65
Fatty food	**Yes**	70	70
	No	30	30
Fast food	**Yes**	62	62
	No	48	48
Screen Time/ viewing	**Yes**	76	376
	No	24	24
Physical activity	**Yes**	73	73
	No	37	37

From the table 2, 32% belonged to rural,68% to urban.12% of overweight and obese adolescents had parental obesity and 16% had sibling obesity. 35% are vegetarians and 65% are non vegetarians.70% adolescents were fatty food consumers and 62% of overweight and obese adolescents were fast food consumers. Screen time/viewing was found in 76% of adolescents 73% of adolescents have limited physical activity.

Graph 1:Risk factor distribution

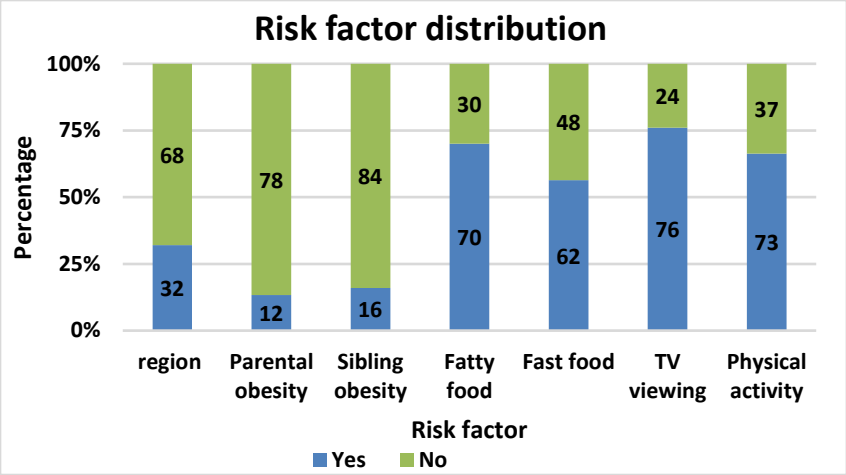
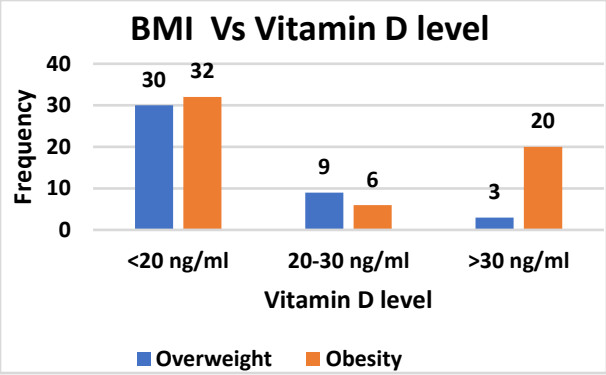


Table 3: BMI Vs Vitamin D levels

BMI	Vitamin D level			Total
	<20 ng/ml	20-30 ng/ml	>30 ng/ml	
Overweight	30 (48.4%)	9 (69.2%)	3(13.1%)	42 (43%)
Obesity	32 (51.6%)	6 (30.7%)	20 (86.9%)	58 (57%)
Total	62 (100%)	15 (100%)	23 (100%)	100 (100%)

From the table 3, Among the overweight 30 had vitamin D <20ng/ml, 9had in the range 21-30ng/ml and 3 had >30ng/ml.Among the obese adolescents, 32 of them had vitamin D <20ng/ml, 6 had in the range 21-30ng/ml and 20 of them had >30ng/ml.

Graph 2: BMI VS VITAMIN D LEVEL



Discussion: An observational cross sectional study done among obese and overweight adolescents to identify the risk factors, assess the vitamin D levels,impact of covid 19. Our study included a total of 100 study participants. In the present study 65% of the adolescents were male and 32% were female. 75% were in the age group 10 to 14 years and remaining 25% were in the age group 15 to 19 years These findings were consistent with study done by Reddy TP et al.,[4]who reported that majority 66.6% were male 33.4% were female,76.6% were in the age group 10-14 years & 23.4 % were 15 to 19. Obese&Overweight: In this study 58% of the adolescents were obese and 42% were overweight. Similar findings were seen in study done by Reddy TP et al.,[4]who stated that 46.7% of adolescents were overweight and 53.3% were obese.Risk factors :76%have increased screen time ,73% have sedentary life, 70 % have fatty food consumption.Were more than in a study done by Reddy TP et al.,[4]who stated Physical activity is seen in 65% and 35% did not have physical activity. TV viewing was found in 30% and 70% were not. 70% were fatty food consumers and 50% were fast food consumers. Vitamin D levels: In the present study 62% of obese and overweight adolescents had vitamin D levels <20 ng/ml (deficient), 15% had vitamin D level 20-30 ng/ml (insufficient range) and 23% had vitamin D level >30 ng/ml. Similar findings were observed in a study done by Saneifard et al.,who found that vitamin D deficiency was found in 49% of the total children and was significantly more prevalent in females (33.1%) than males (15.9%) and Saurabh K et al.,who reported that of the total 25 study participants 14 (56%) had Vitamin D levels <20 ng/ml that is in the deficiency range, 7(28%) had in the insufficiency range and 4 (16%) had in the sufficient range.

Conclusion: our study showed high screen time, sedentary life style along with fatty food consumption are the most important risk factors contributing to adolescent obesity and overweight.COVID-19 pandemic evoked major lifestyle changes including indoor stay reducing out door activity. Schools closed, increased online classes further increasing screen time. There was vitamin d deficiency in majority of adolescents in our study group. So primary prevention methods should be aimed at educating the child and family and encouraging appropriate diet and exercise from young age through adulthood while secondary prevention should be targeted at lessening the effect of childhood obesity by preventing the child from continuing unhealthy habits and obesity into adulthood. Due to the serious implications of obesity in adolescents, effective treatments are urgently needed. Lifestyle interventions represent the recommended therapy.

Declaration of conflicting interests: The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

References

1. J PediatrNurs. 2021 January-February; 56: 90–98.When Pandemics Collide: The Impact of COVID-19 on Childhood ObesityPublished online 2020 Nov 11. doi: 10.1016/j.pedn.2020.11.004

2. HedyehSaneifard, MarjanShakiba, Ali Sheikhy,LeilaBaniadam, FatemehAbdollahGorji and Aida Fallahzadeh. Vitamin D Deficiency in Children and Adolescents: Role of Puberty and Obesity on Vitamin D Status. Nutrition and Metabolic Insights.2021;14:1-7.

3. Garrido-Miguel M, Cavero-Redondo I, Álvarez-Bueno C, Rodríguez-Artalejo F, Moreno LA, Ruiz JR, et al. Prevalence and trends of overweight and obesity in European children from 1999 to 2016: a systematic review and Metaanalysis. JAMA Pediatr. 2019;173(10):e192430. https://doi.org/10.1001/jama pediatrics.2019.2430.

4. Reddy TP, Reddy K, Reddy MS, Manjunath GA. Levels of vitamin D among overweight and obese adolescents: an observational study. Int J ContempPediatr2017;4:1934-9.

5. Gurnani M, Birken C, Hamilton. J. Childhood obesity: causes, consequences, and management. Pediatr Clin North Am. (2015) 62:821–40. 10.1016/j.pcl.2015.04.001 [PubMed] [CrossRef] [Google Scholar]

6. Sahoo K, Sahoo B, Choudhury AK, Sofi NY, Kumar R, Bhadoria. AS. Childhood obesity: causes and consequences. J Family Med Prim Care. (2015) 4:187–92. 10.4103/2249-4863.154628 [PMC free article] [PubMed] [CrossRef] [Google Scholar]

7. Brown CL, Halvorson EE, Cohen GM, Lazorick S, Skelton JA. Addressing childhood obesity: opportunities for prevention. Pediatr Clin North Am. (2015) 62:1241–61. 10.1016/j.pcl.2015.05.013 [PMC free article] [PubMed] [CrossRef] [Google Scholar]

8. Qasim A, Turcotte M, de Souza RJ, Samaan MC, Champredon D, Dushoff J, et al.. On the origin of obesity: identifying the biological, environmental, and cultural drivers of genetic risk among human populations. Obes Rev. (2018) 19:121–49. 10.1111/obr.12625 [PubMed] [CrossRef] [Google Scholar]NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128·9 million children, adolescents, and adults. Lancet. 2017;390(10113):2627–42. https:// doi.org/10.1016/S0140-6736(17)32129-3.

9. https://www.euro.who.int/__data/assets/pdf_file/0006/372426/WH14_COSI_ factsheets_v2.pdf

10. https://www.epicentro.iss.it/okkioallasalute/indagine-2019-dati

11. Weiss R, Dziura J, Burgert TS, Tamborlane WV, Taksali SE, Yeckel CW, et al. Obesity and the metabolic syndrome in children and adolescents. N Engl J Med. 2004;350(23):2362–74. https://doi.org/10.1056/NEJMoa031049.

12. Skinner AC, Perrin EM, Moss LA, Skelton JA. Cardiometabolic risks and severity of obesity in children and young adults. N Engl J Med. 2015;373(14): 1307–17. https://doi.org/10.1056/NEJMoa1502821.