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PREVALENCE OF OVERWEIGHT AND OBESITY IN SOUTH ASIAN COUNTRIES: AN ALARMING SITUATION

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Abstract: *Childhood obesity is a global health problem with immediate and long-term health consequences. The increasing trend of childhood overweight & obesity has emerged as a major public health threat. The study reviewed relevant articles on prevalence of childhood overweight and obesity in South Asia during 2008 to 2017. The objective of this study was to assess the prevalence of childhood overweight & obesity in South Asia. Literature search was done in accessible logical open areas, for example, Google Scholar, PubMed, Bio-Med central and Science Hub from the most recent ten years. Extra investigations were likewise recognized through cross-references and sites of authority organizations. Twenty primary studies were included in the final review, of which were conducted in schools settings in the South Asian countries; Bangladesh, India, Pakistan, Nepal, Bhutan, Sri Lanka. The prevalence of overweight and obesity showed wide variations in the included studies. The study showed that the prevalence rate is higher in Bangladesh, India & Pakistan and relatively lower in Bhutan, Nepal & Sri Lanka. This survey indicated expanding patterns in the commonness of overweight and weight rates among children in South Asia. This investigation underlines on the earnest need to advance solid ways of life among children to handle childhood overweight and corpulence.*

Keywords: *childhood, overweight, obesity, prevalence.*

Introduction

Obesity is defined as abnormal or excessive fat accumulation in adipose tissue, to the extent that health may be impaired[1]. Almost all the developing and developed countries are experiencing an epidemic of obesity. Obesity is currently perceived as a noteworthy reason for mortality and grimness around the globe. The prevalence of obesity is increasing at an alarming rate regardless of age and geographical variation. Childhood obesity is one of the most serious public health challenges of the 21st century. Obesity has emerged as one of the global health problems with 200 million school-aged children world-wide categorized as being overweight or obese, of which 40-50 million are obese[2].

In infants and children under 5 years of age obesity is assessed according to the WHO "Child growth standards" (weight-for-length, weight-for-height) and the WHO Reference for 5-19 years (body mass index-for-age)[3]. Other indices, such as waist and hip circumferences, measure different aspects of body composition and fat distribution which have independent and often opposite effects on cardiovascular disease risk factors[4]. Waist circumference is a relatively simple and convenient measure and can be used to assess the quantity of abdominal fat. Hip measurements provide additional valuable information about gluteofemoral muscle mass and bone structure[5] hip circumference is negatively associated with health outcomes in women[6]. The waist-to-hip ratio (WHR) may therefore be a useful measure, since it also includes the accumulation of fat on the hips; such an accumulation may be beneficial for health[4].

As indicated by the WHO, all children falling between the 15th and 85th percentile are characterized as ordinary, between the 85th and 95th percentile as overweight, and more prominent than 95th percentile as obese. On the opposite side of the range, those falling between the 3rd and 15th percentile are characterized as thin though those beneath the 3rd percentile as extremely thin[7,8]. In 2013, 42 million infants and young children were overweight or obese, worldwide and 70 million young children will be overweight or obese by 2025 if current trends continue[8]. The factors attributing to increasing childhood obesity are increased intake of high-calorie foods that are low in vitamins, minerals and micronutrients coupled with decreased physical activity[9]. Urbanization, unfortunate weight control plans and expanded stationary ways of life have added to the expanded pervasiveness of youth corpulence, especially in creating nations[10].

The South-East Asia district has begun to encounter an exceptional danger in youth corpulence with the predominance of overweight quickly ascending as of late and the evaluated pervasiveness of overabundance of bodyweight among school-age 23% (counting corpulent)[11]. In Pakistan, 6% corpulent and 8% overweight kids were found and among them 70% had a place with the higher financial status (SES) amass[12]. In Chennai, India, 4.5% large kids were found and among them over 22% hefty school youngsters had a place with higher SES, 15% to center SES and just 4.5% to low SES bunches[13]. In Thailand[14], the predominance of youth stoutness observed to be 10.8% in

urban well off area, and in Beirut[15], the commonness of overweight was discovered 26%. A pilot contemplate directed on heftiness and over weight in Dhaka in 2010 among wealthy school youngsters and teenagers ported the commonness of obesity 17.9% and overweight 23.6% individually[16]. Studies demonstrated that children from a higher socio-economic group were more vulnerable to develop obesity than other groups [17,18]. In particular, diets are becoming abundant in high fat, high energy foods, poorer in micro-nutrients, soft drink, formula milk, and lifestyles are becoming more sedentary. Financial progress and rising level of corpulence both exist together in a similar populace or even a similar family unit with constant under-nourishment in the creating nations[19].

Childhood overweight has both mental and wellbeing outcomes. Expanding weight is the reason to build the dangers of diabetes, cardiovascular sickness and hypertension and the aversion of corpulence and these incessant infection is covered and particularly for type II diabetes[20]. Hefty individuals are additionally at expanded danger of gout, rest apnoea, obstetric, cardiovascular and careful difficulties[21]. The most essential long haul outcome of childhood stoutness is its industriousness into adulthood, with all the related wellbeing dangers. Stoutness will probably continue when its beginning is in late youth or immaturity and when the heftiness is extreme[22]. Mindfulness about adjusted eating regimen, change in the level of instruction and financial conditions and expanded physical movement could help in diminishing the heftiness in kids[23]. The purpose of this study was to report the prevalence of childhood overweight & obesity in South Asian countries. Limited data are available in these regions on the childhood obesity. Here we attempt to review most of the available articles on childhood overweight & obesity in South Asian countries using WHO/IOTF cut-points.

Material and methods

A review of the studies published in the last ten years between 2008 and 2017 reported on prevalence of childhood overweight and obesity (age 3-17 years) in South-Asian countries India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan was conducted for final review. As the aim was to present the current scenario in this area Literature search was done in available scientific public domains such as Google Scholar, PubMed, Bio-Med central, Science Hub using key words such as childhood overweight, childhood obesity, epidemiology in South Asia, body mass index (BMI), trend and prevalence. Cross references from identified articles were also used to expand the coverage. The websites of official agencies such as IOTF, WHO were accessed for related information. All reported prevalence were taken directly from the study and no recalculations were performed. The year the study was conducted in was considered for analysis; in case, this was not mentioned, only the publication year was included. When multiple cut-offs were used in the same study, only WHO criteria were considered to prevent duplication of study data. The distribution of prevalence of obesity by sex and area of residence was also considered. The results are presented for all 20 studies

combined with a total count of 54,372 participants. Studies were included if they met the inclusion criteria:

Studies on 5-16 years old children; community, school and family interventions or a combination of them and conducted among obese or overweight children and adolescents. Articles were firstly assessed on their abstracts.

The required information that was extracted from all eligible papers was as follow:

I. General characteristics of the study (first author's name, publication year, study year, study design, sampling method, regions).

II. Characteristics of the study population (age and sex of studied participants and sample size).

III. Key findings.

Results

A total of 20 relevant studies were included in the final review. The geographical spread of these studies includes South Asian countries. All of the studies were conducted in schools settings in Bangladesh, India, Pakistan, Nepal, Bhutan, and Sri Lanka. The table shows the prevalence of childhood obesity in these regions. For identifying childhood overweight & obesity, WHO cut-points (15 studies) & IOTF (5 studies) are commonly used in these studies. The prevalence of obesity varied between 1.5 to 24.1 percent. Most of the study designs were cross-sectional study but only one study was cohort study. When verified the scope of the studies were carried out at the municipal level & city corporation level[24-45]. After searching the databases, we noticed that only one study has been undertaken at the national level. All the articles were taken from last 10 years. Taking into account the year of publication, there was an increase in the number of articles published in the last five years[24-45].

Most of the studies showed some basic causes and associated factors of overweight and obesity. Shuhana Sultana et al. reported that eating fast foods & snack types foods play a vital role to the ascending trend of overweight & obesity due to the poor nutritional quality, higher energy intake & unsaturated fat intake from these foods. Overweight & obese children consumed more carbohydrate & protein rich foods than compared to normal & underweight children[24]. M.N. Rahman et al. reported that overweight & obesity children had the tendency to eat more meal per day than healthy child[41]. Vijaynath Itagi et al. reported that childhood obesity is significantly higher in urban schools than rural schools[27]. In another study, M.N. Rahman et al. revealed that overweight & obesity problems were much higher in affluent societies than lower SES[41]. Vijaynath Itagi et al. reported that sedentary lifestyle of children and adolescent i.e. television watching, playing computer games, using internet, over emphasis on

academic excellence ere key contributor to increasing trend of overweight & obesity[27]. Babitha Rexlin et al. reported that children those who were watching TV & playing video games more than 3 hours & sleeping less than 10 hours were statistical significant risk of being obese[26]. Asma Sultana et al. indicated that there was a clear correlation between TV watching, juice intake, fast food intake & obesity[33].

SL	Author	Year	Region	Age Group (year)	Sample Size	Study Design	Cut-points	Overweight Prevalence (%)			Obesity Prevalence (%)			p-value
								Overall	Boys	Girls	Overall	Boys	Girls	
1.	Shuhana Sultana *et al*[21]	2015	Dhaka, Bangladesh	8-10	150	Cross-sectional	WHO	52	-	-	20	-	-	<0.005
2.	Vijay Kumar Sah *et al*[22]	2016	Viratnagar, Nepal	6-16	1900	Cross-sectional	WHO	2.9	-	-	1.8	-	-	<0.005
3.	Babitha Rexlin G. *et al*[23]	2016	Tamilnadu, India	6-12	2519	Cross-sectional	WHO	16.8	-	-	9.3	9.7	8	<0.005
4.	Vijaynath Itagi *et al*[24]	2009	Karnataka	5-16	19263	Cross-sectional	WHO	6.17	7.03	5.07	1.89	2.47	1.39	<0.001
5.	Norbu W. *et al*[25]	2012	Pemagatshel, Bhutan	11-16	392	Cross-sectional	WHO	-	-	-	1.5	1	0.5	_
6.	J. Ahmed *et al*[26]	2013	Hyderabad, Pakistan	11-16	501	Cross-sectional	WHO	8	8	8	12	15	8	<0.005
7.	Sonya Jagadesan *et al*[27]	2014	Chennai, India	6-11	8025	Cross-sectional	IOTF	21	24	17	4.5	5	3.5	<0.001
8.	Adeel Anwar *et al*[28]	2010	Lahore, Pakistan	10-15	293	Cross-sectional	WHO	21.8	24.4	19.8	11.9	10	13	-
9.	Thilakaratne *et al*[29]	2011	Colombo, Srilanka	8-10	423	Cross-sectional	IOTF	4.3	-	-	3.1	-	-	-
10.	Asma Sultana *et al*[30]	2016	Noakhali, Bangladesh	6-16	500	Cohort	WHO	15.6	16.7	14.3	23	25.9	19.3	<0.005
11.	Mohammad Ohid Ullah et al.[35]	2014	Sylhet, Bangladesh.	5-14	300	Cross-sectional	WHO	13.3	8.3	5	5.3	2	3.3	-

12.	G Chaitali et al.[36]	2014	Karnataka, India	3-17	3851	Cross-sectional	IOTF	20.7	-	-	6.8	-	-	<0.001
13.	Tania Bulbul et al.[37]	2014	Bangladesh	6-15	10135	Cross-sectional	WHO	9.5	-	-	3.5	-	-	_
14.	M. N. Rahman et al. [38]	2014	Dhaka, Bangladesh	7-14	112	Cross-sectional	WHO	20.5	16.4	26.7	24.1	26.9	20	<0.001
15.	Haider Jabed Warraich et al.[39]	2009	Karachi, Pakistan	11-17	284	Cross-sectional	WHO	8	_	_	6	-	-	-
16.	Gupta et al.[40]	2013	Bankura, India.	10-17	452	Cross-sectional	WHO	7.7	8.9	6.3	4	4	3.9	-
17.	Muhammad Umair Mushtaq et al.[41]	2011	Lahore, Pakistan	5-12	1860	Cross-sectional	WHO	17	17	16.5	7.5	9	6	<0.001
18.	Ghosh et al.[42]	2011	Kolkata, India	8-12	753	Cross-sectional	IOTF	9.5	-	-	6.1	_	-	-
19.	Dr. Nazeem et al.[43]	2012	India	7-14	2158	Cross-sectional	IOTF	-	-	-	14.97	6.81	8.16	<0.001
20.	Bedowra Zabeen et al.[44]	2015	Bangladesh	9-17	501	Cross-sectional	WHO	-	-	23	-	-	14	<0.001

Table: Epidemiological studies of childhood obesity

Discussion

The study in the capital city of Bangladesh showed high prevalence of overweight & obesity (20%). In that study, the proportions of overweight & obesity were significantly higher in girls compared to boys using WHO cut-points because girls were taller than boys[24]. However, the study in Tamilnadu, India reported that the overall prevalence of overweight & obesity were 16.8 percent and 9.3 percent respectively. This study also showed a relationship with the place of residence and socio-economic status ($p<0.001$). The prevalence of obesity among boys and girls were 9.7 percent and 8 percent respectively and statistically significant[26].The prevalence of overweight & obesity among children aged 6-16 years in Viratnagar, Nepal were 2.9 percent and 1.8 percent severally. The students studied in private school were found to have high prevalence of overweight & obesity[25]. The rate of overweight and obesity was significantly higher in urban regions and in private schools[27]. In Pemagatshel, Bhutan a cross sectional study showed relatively lower prevalence of obesity than other South Asian countries. The prevalence of obesity was 1.5 percent in this study[28]. A study conducted in Hyderabad, Pakistan among children showed prevalence of obesity was higher among boys than girls (15% and 8% respectively) as well as the affluent families mostly in urban societies[29]. A recent study conducted in Noakhali Bangladesh showed the prevalence of overweight & obesity were 15.6 and 23 percent respectively. The study showed that the boys had higher prevalence of overweight & obesity than girls. Household income, television watching juice intake & fast food intake greatly influence the higher rates of obesity among children[33].

South Asian countries are mostly developing countries, currently undergoing major epidemiological nutritional & demographic transitions. Expanding financial advancement in a locale is frequently connected with expanding pervasiveness of stoutness, in industrialized nations as well as in creating nation like Pakistan[34] and India[35].

Natural factors, for example, high-vitality admission, especially fat admission, sex, age, family pay, parent's instruction and way of life are the significant supporters of the advancement of overweight and heftiness[36]. Financial pointers, for example, instructive level, work status and fatherly pay did not essentially vary on youngsters' weight status in present examination however in Pakistan, 70% obese children had a place with the higher financial status (SES) gathering and in India, >22% fat children to higher SES, 15% to center SES and just 4.5% to low SES bunches[34,35]. Be that as it may, access of all the more quick or handled sustenance and absence of physical exercises offices among the urban kids added to the higher extent of overweight and stoutness and additionally nourishing example, sustenance propensities and way of life including physical action formed by large guardians might be the establishment of later eating style and way of life design prompting heftiness. Physical activity plays an important protective role in obesity. A study in Brazil revealed that prevalence of overweight and obese was higher among children who travelled to school in motor vehicle than children who travelled by cycle or who walked to school[44]. Fast foods are a key

contributor to the rising prevalence of obesity among children because of poor nutritional quality of these foods. Fast foods have higher total energy, total fat, and saturated fat, refined carbohydrates and lower fibre and higher energy density[45].

One imperative constraint of this investigation was that the pattern was plotted utilizing detailed predominance rates which thusly were computed utilizing two distinctive shorts (WHO and IOTF). To all the more likely comprehend and analyse youth weight patterns, we require age, sexual orientation and nation or ethnic particular cut-indicates from age six onwards 18 years to consistently characterize youth overweight and heftiness. Additionally, overweight and weight thinks about from vital like Afghanistan, Maldives couldn't be found in writing. Information from these nations could have advanced the rundown perceptions. The viable issue of deciphering the different cut-focuses is a noteworthy hindrance in understanding common patterns in youth stoutness.

Conclusion

The present investigation demonstrates that the rate of overweight and obesity in youngsters are expanding quickly in South Asian nations. The prevalence of obesity has strong association with the place of residence and socio-economic status. The consequence of the current examination may compose the establishment of attention to create arrangements with the end goal to deliver the difficulties to anticipate youth weight and to change their dietary pattern and way of life. This proposes the requirement for a decent and delicate methodology tending to monetary and nourishment advances to adequately handle this circumstance in South Asia.

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