Impact of Health Education on Adolescent Obesity: A Narrative Review

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ABSTRACT

BACKGROUND:

Growing rates of teenage obesity are a major global health concern, with causes including sedentary lifestyles, poor eating habits, and a lack of knowledge about fitness and nutrition. Adolescent health education programs that teach information about physical activity, nutrition, and the value of maintaining a healthy weight have showed potential in tackling this problem. Such programs attempt to prevent or reduce obesity rates, promote lifelong wellness, and lessen the long-term health implications associated with excess weight gain during adolescence by providing teenagers with the knowledge and skills needed to make healthier choices.

OBJECTIVES:

The review aims to examine existing literature on educational programs targeting adolescent obesity and assess their impact on health outcomes.

METHODS:

The study involved searching four databases for peer-reviewed articles up to 2024, focusing on mHealth, overweight or obesity, and adolescents. It included screening titles, abstracts, and full texts against selection criteria.

RESULTS:

According to the review, youth health behaviors were effectively altered, and obesity rates were lowered using educational interventions like apps, surveys, and physical activities. The significance of technology in raising the efficacy of health programs was also mentioned.

CONCLUSION:

The review emphasizes how biological, cultural, and environmental variables all play a role in the complex phenomenon of teenage obesity. It emphasizes how urgent it is to implement initiatives that alter the obesogenic environment by modifying food industry and educational policies. The review suggests novel approaches to treating obesity, such as probiotics, even if pharmacology, clinical research, and multimodal lifestyle programs show potential. In order to address this expanding pandemic, comprehensive public health measures are advocated, with a focus on the effectiveness of health education programs in controlling obesity and changing lifestyle choices.

Keywords: Adolescence, Health, Wellbeing, Obesity, Physical activities, Happiness

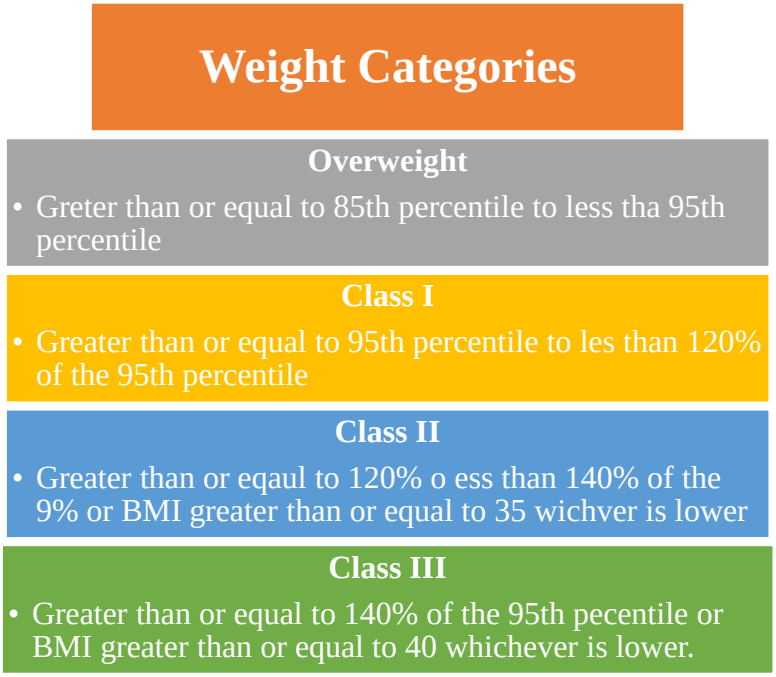
Introduction:

Changing lifestyles and the growing popularity of junk food is expected to lead to a climb in childhood obesity over the coming decade. It is expected to be particularly prevalent in developing countries where traditional diets are becoming westernized and consumption rates of starch, sugar, oil and fat is increasing. That's according to the World Obesity Federation's Atlas of Childhood Obesity which predicts 250 million children and adolescents will be obese by 2030.[1]

More than 1 billion people worldwide are obese – 650 million adults, 340 million adolescents and 39 million children. The number is still increasing. WHO estimates that by 2025, approximately 167 million people – adults and children will become less healthy because of their overweight and obese.[2]

Obesity is defined as body mass index (BMI) equal to or greater than 95th percentile for age and gender and overweight with a BMI between the 85th and 95th percentiles of the 2000 Centers for Disease Control and Prevention (CDC) growth charts.[3]

Adolescents whose BMI is in the top 5% for their age and gender are considered to have obesity. Being in the top 5% means their BMI is higher than 95% of their peers.[4]

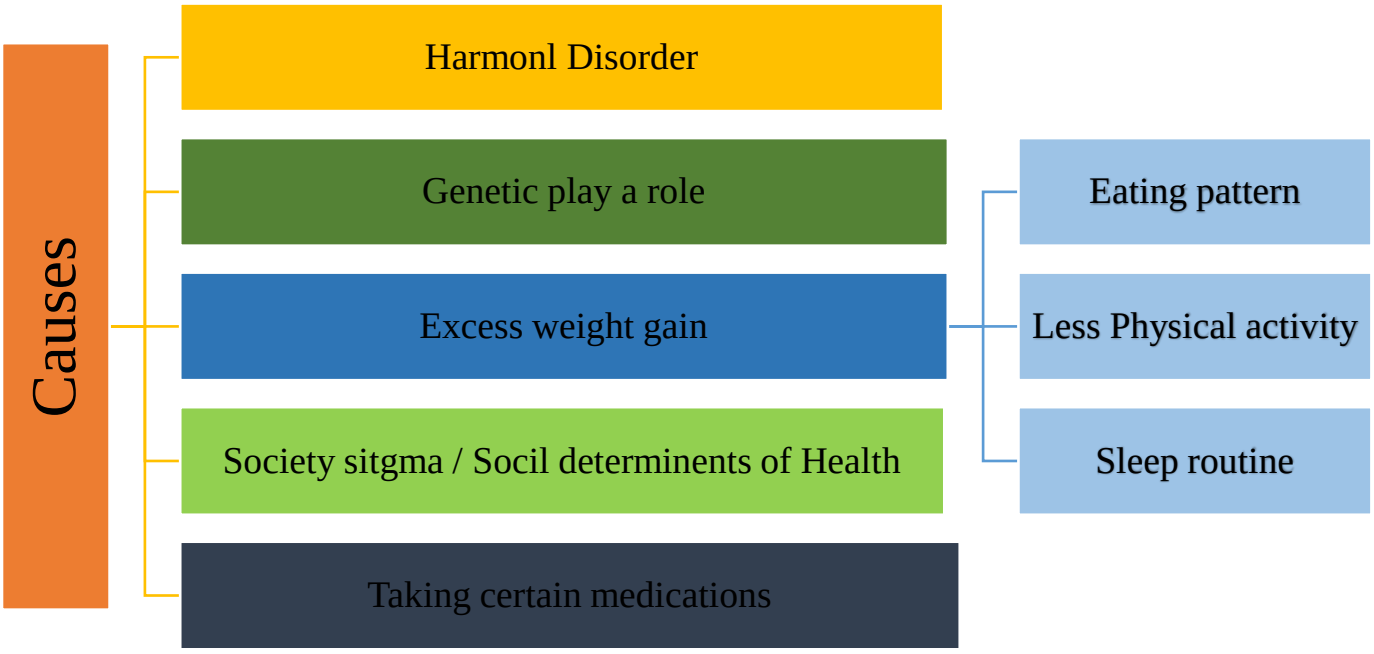


Source: https://www.cdc.gov/obesity/basics/adult-defining.html

The above diagram 1 describes the different types of weight categories.

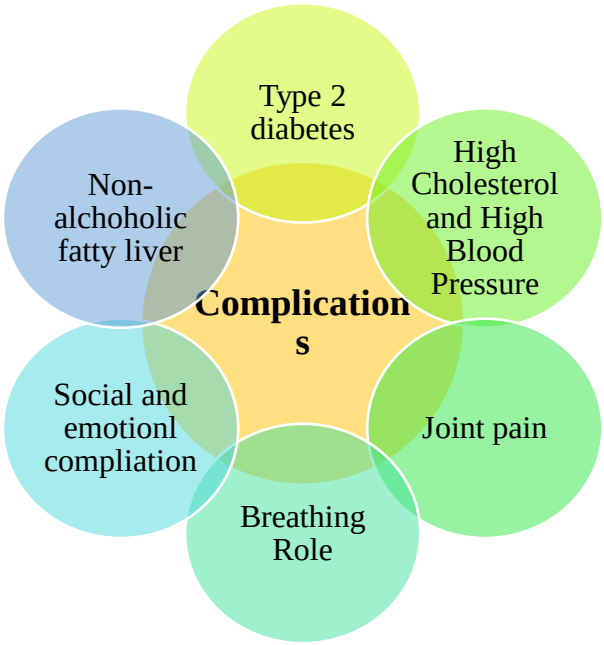
Obesity is twice as common among adolescent as it as 3 years ago. Although most of the complication of obesity occurs in adulthood, adolescent with obesity is more likely than their peer to have high blood pressure and type 2 diabetes.[5]

Although fewer than one third of adults with obesity were obese as adolescents.[6]



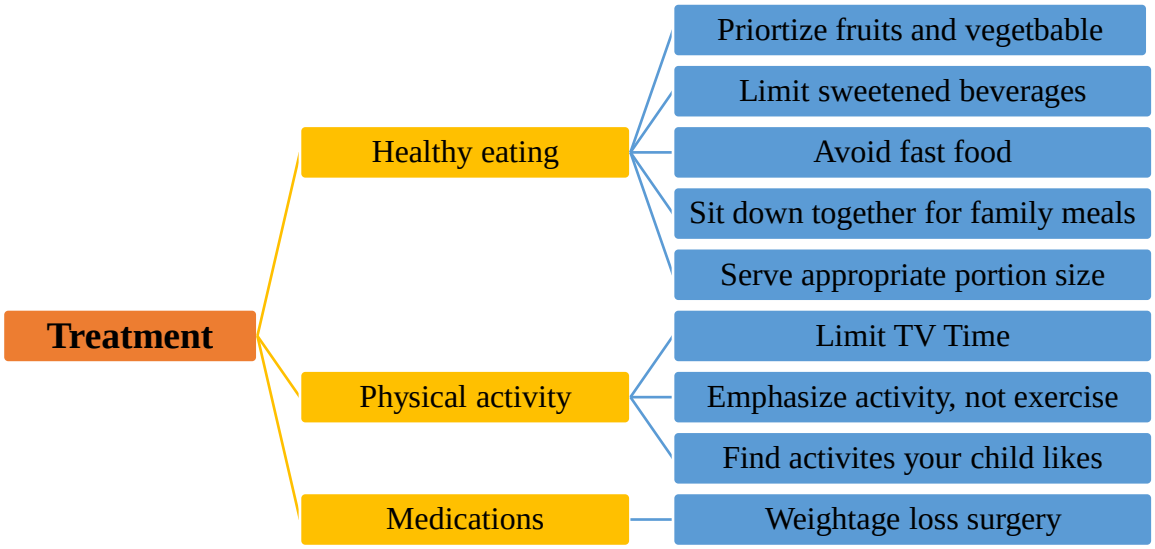
Source: https://www.nhs.uk/conditions/obesity/causes/

The above diagram 2 describes the causes of obesity.



Source: https://www.niddk.nih.gov/health-information/weight-management/adult-overweight-obesity/health-risks

The above diagram 3 describes the complications of obesity.



Source: https://www.nhsinform.scot/illnesses-and-conditions/nutritional/obesity/

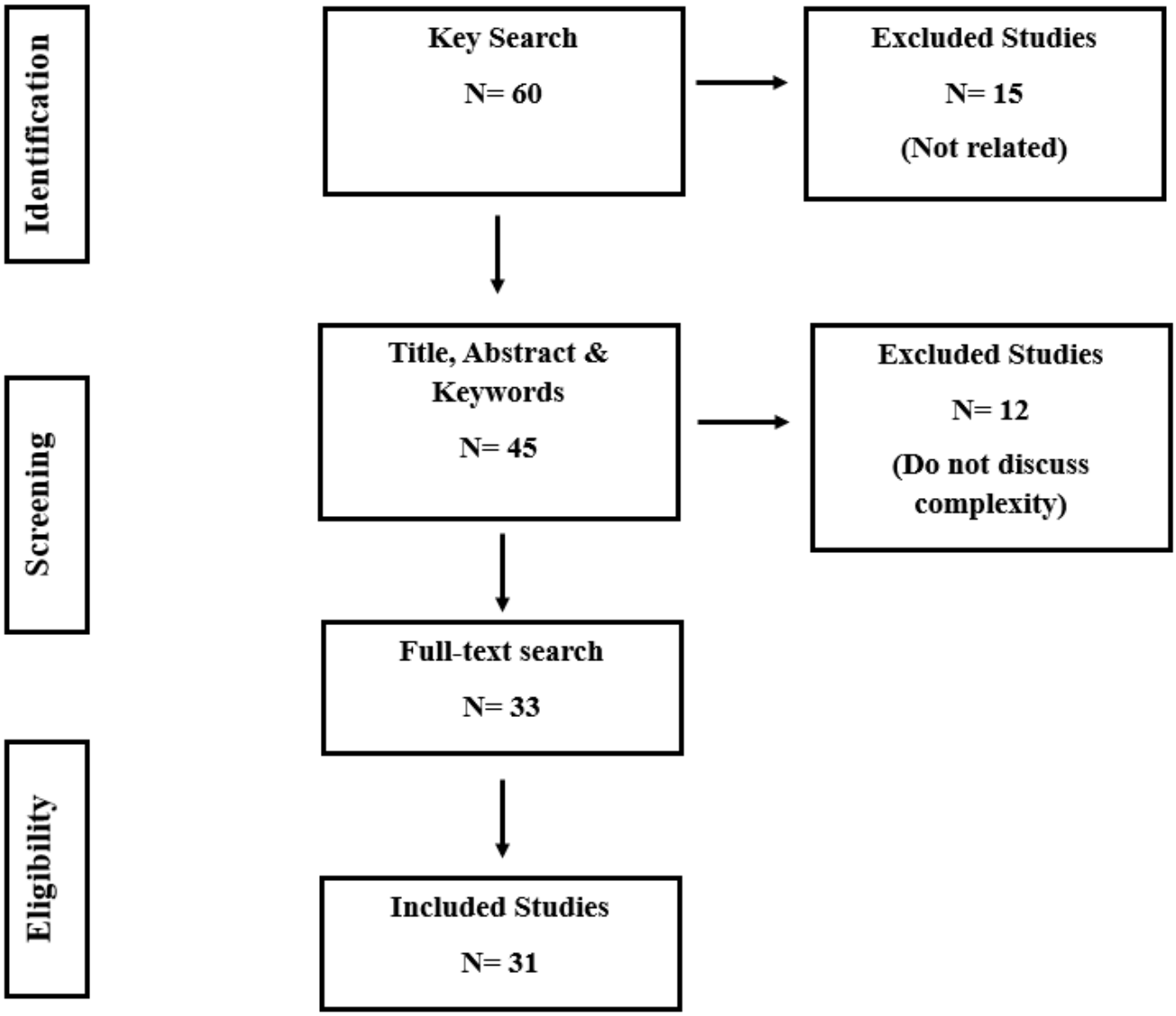
The above diagram 4 describes the treatment given to obese adolescent.

Objectives:

The objective of the current review is to study the existing literature on various educational programs on adolescent obesity and identify their impact on health outcomes.

Methods:

Using four databases-PubMed, ResearchGate, Frontiers in Public Health, and BMC Public Health we looked for peer-reviewed articles. All articles released up to 2024 were included in the search. The search strings included Key phrases for mHealth, overweight or obesity, kids, teens, or young people from many nations. Moreover, reference lists for pertinent reviews were looked through. The screening of titles, abstracts, and complete texts were the first three steps in evaluating the retrieved records against the selection criteria.



Results:

Sl. No	Author/ Year	Number of Subjects	Study Duration	Study Type	Study Location	Study Objective	Technology Used to deliver education	Study Outcomes
1	Marianne et al. 2016	85	2 months	Mixed method implementation study	Melbourne	To investigate whether using codesigned health and lifestyle-screening app, Check Up GP, in general practice influenced young people assessment of the quality of their care and their disclosure of sensitive issues.	App based and survey	There is a high technology improvement in young people's disclosure of sensitive health issues. Integrating health and lifestyle screening app into face-to-face care can enrich young people's experience of seeing their GP, create scope to identify and address unmet health needs and increase patient centred care.
2	Chandrakala p et al. 2016	500	1.6 years	Observational clinical study	Karnataka	To evaluate the prevalence of overweight and obesity in adolescents.	CDC growth chart	Incidence of overweight and obesity in increasing at an alarming rate in children and adolescents. Information, education and communication about healthy lifestyle need to be promoted among children and adolescents.
3	Nayak BS et al. 2016	131	6 months	Randomised control trail	India	To evaluate the effectiveness of multi-component, intervention on improving the lifestyle practices, reducing the body fat and improving the self-esteem of obese children from selected schools of Udupi District, South India	Educational intervention and physical activities	The intervention was effective in reducing BMI, triceps, subscapular skin fold thickness of obese children. The intervention was also effective in improving the lifestyle practices and self-esteem of obese children.
4	Shih et al. 2016	162209	5 years	Descriptive study	Taiwan	The specific aim of the current study was to determine the association between health literacy	Web-based national survey	The sample consisted 48.9% girls, 3.8% were indigenous and the mean BMI was 19.55. About 6% of children self-reported bad and very bad health

						and body weight using data from the Taiwan child health literacy test.		condition. The overall proportion of obese children was 15.2%. Children in the highest health literacy quartile were less likely to be obese. After controlling for gender ethnicity, self-rated health and health behaviour, children with high health literacy were likely to be obese and underweight. Those who did not have regular physical activity or had sugar-sweetened beverage intake were more likely reported being overweight or obese.
5	Thakur et al. 2016	462	5 months	Clustered Randomised	India	To examine the impact of a multi-component lifestyle intervention on weight and BMI of children in a school-based setting.	Questionnaire	Compared with controls and adjusting for age, sex and clustering within classes, children in the intervention group showed decrease in the weight. There was significant reduction in intake of energy, protein and fat but no to minimal reduction in biochemical parameters.
6	Redfern J et al. 2016	352	6 months	Randomised control trail	Sydney	To identify features and factors that explain the effectiveness of a successful text messaging program in terms of user engagement, perceived usefulness, behaviour change and program delivery preferences.	Text message and survey	This process evaluation found that patients with chronic health disease were engaged with and positive about text message program aimed at supporting behaviour change. That the engagement was increased by several factors including the program being initiated close to the time of hospitalisation, the consistency off the message with prior in-hospital education and management, having opportunity for face-to-face contact at program commencement and the personalization of messages.

7	Blasingame et al. 2017	115	1 year	Descriptive study	Florence	To provide education to the adolescent population of age 18-19 years old and that education be used to identify healthy behaviour.	Questionnaire and Educational lecture.	The participant had overall improvement in test scores. It is assumed that an awareness of knowledge was evident based on the scores from the post-test grades. Education may be a tool used to empower and challenge youth to take a stand to live healthier while preventing chronic disease.
8	Mazloomy et al. 2017	100	6 months	Interventional study	Iran	To investigate the effect of TPB (Theory of planned behaviour)-based education on weight loss in obese and overweight adolescent.	Questionnaire and educational session	A significant increase was observed in the mean score for knowledge and TPB constructs six weeks after educational intervention. More significant decrease in body mass index, weight and waist circumference of adolescent were found after the educational intervention. This study showed that TPB can be effectively used in weight reduction programs targeting obese adolescent.
9	Sharareh Haghani et al. 2017	64	3 months	Quasi-experimental study	Iran	Study aimed to determine the effect of tailored education on lifestyle modification in elementary school's students in Isfahan.	Questionnaire and educational session	The average general lifestyle score, one and four months after education, was significantly different between the groups. However, this difference was not significant before nutrition and physical activity one and four months after education showed a significant difference between the groups.
10	Lloyd et al. 2017	1324	1 year	Cluster-randomised control trail	South west England	To investigate the impact of active stakeholder involvement on recruitment, retention and engagement of schools, children and their families the Healthy Lifestyles Programme (HeLP).	Questionnaire	Anthropometric and behavioural measures were taken in 99%, 96% and 94% of children at baseline, 18 and 24 months, respectively, with no differential follow up between the control and intervention groups at each time point. All children participated in the programme and 92% of children and 77% of parents across the socio-

								economic spectrum were considered to have actively engaged with HeLP. The excellent retention and engagement results to the high level of stakeholder involvement in both trial and intervention design, the building of relationships using appropriate personnel and creative delivery methods that are accessible to children and their families across the social spectrum.
11	Shukla et al. 2018	2400	1 year	Cross-sectional study	Uttara Pradesh	To study the factors associated with overweight and obesity among school going adolescent girls.	Questionnaire	The prevalence of overweight and obesity was found to be 5.9% and 2.7%, respectively. Furthermore, on multivariate analysis, those who belonged to general category middle- and upper-socioeconomic status, urban residence, mode of travel to school via bus, absence of outdoor physical activity, non-intake of vegetables every day, and non-vegetarian dietary habits were found to be the independent predictors of obesity and overweight among school going adolescent girls. The study indicates that the increasing proportion of overweight and obesity adolescent females, with their continuously spanning domain in urban areas. To build-up a healthy future generation, the findings stipulate the importance of healthy lifestyle and behavioral changes in context to physical activity inculcation in the daily routine of the children from earlier stages itself.

12	Hoffman et al. 2018	97	6 months	Randomised clinical trail	North Carolina	To describe the implementation of an integrated clinic-community partnership for child obesity treatment and to evaluate the effectiveness of integrated treatment on child BMI and health outcomes.	Community Based programming	An integrated clinic-community model of child obesity treatment is feasible to deliver in a low-income and racially diverse population. As compared with multidisciplinary treatment, the integrated model provides more treatment hours, improves physical activity, and increases quality of life. Parks and recreation departments hold significant promise as a partner agency to deliver child obesity treatment.
13	Jimoh et al. 2018	34	4 months	Randomised control trail	UK	To investigate the use of a smartphone app (FoodWiz2) in supporting healthy life style choices in adolescence. Questionnaire response indicated that the app was generally preferred to the paper dairy, in particular, the app was seen as less boring to use and more acceptable in social setting.	Questionnaire and Educational intervention	Record completion declined throughout the study, possible affected by examination pressure. Food intake data showed increased fruit consumption of chocolate snacks and fizzy drinks among participants using the app.
14	Oyewande et al. 2019	305	6 months	Descriptive Cross-sectional study	Nigeria	To assess the knowledge, attitude, and perception of the secondary school students in Ikeja local government, Lagos state towards the risk factors of overweight and obesity.	Questionnaire	The study showed a low prevalence of overweight and obesity among students of Ikeja local government, low knowledge, poor attitude and negative perception regarding risk factors of overweight and obesity. However, the majority of the students perceived regular exercise as an important means of reducing overweight and obesity.

15	Liu Z, et al. 2019	1200	2 years	Clustered-randomised, parallel-group controlled trail	China	To develop effective lifestyle interventions for the prevention and control of cardiovascular disease in China, Diet, exercise and cardiovascular health (DECIDE)	Questionnaire and educational session	The primary outcome will be the difference between groups in the change in student's body mass index at 9th months after the baseline investigation. The secondary outcomes will include the difference between two groups in the change in anthropometric measures, diet, physical activity levels and other measures at the follow-up activity levels and other measures at the follow-up visit. A variety of process evaluation methods will be used to evaluate the implementation process of the complex intervention.
16	Nisha Narayanan et al. 2019	84	5 years	Interventional study	Columbia and Orange country	Study was to strengthen wellness policy in Title schools by implementing a mentored behaviour-change model that extends the continuum of care from academic to community setting and mobilizes existing public resource in accordance with US Preventive Service task force screening guidelines for childhood obesity management.	Questionnaire and training	KiPOW (Kid Power)! Full, but no KiPOW! Lite, was associated with a modest reduction in BMI percentile compared with control, especially in Orange country. Systolic blood pressure improved in full more than in Lite interventions. Annual renewal of the school and volunteer commitment needed to maintain KiPOW! Was found to be sustainable.
17	M. Vaijayanthimala et al. 2019	50	10 days	Quasi-experimental Study	Chennai	To assess the effectiveness of information, education and communication on prevention of obesity	Questionnaire	The study proved that significant association between the level of knowledge and gender, religion, place of accommodation and skipping breakfast in post-test. The value showed that there

						among young adult and adolescent among nursing student before and after structured teaching programme and to find out the relationship between the level of knowledge regarding prevention of obesity in pre-test and post-test.		was no statistically significant associated between the level of knowledge and all other demographic variables.
18	Chandra et al. 2019	544	1 month	Cross-sectional study	Hyderabad	To study the prevalence of obesity in children in an affluent school in Hyderabad, Telangana, using the recent Indian Academy of Paediatrics (IAP) growth charts and to compare the same with the Centre for Disease Control and Prevention (CDC) charts	CDC growth chart and IAP	The overall prevalence of overweight and obesity in the school children in our study was 35.84% and 24.63%, respectively. Only 38.78% of the students had a normal BMI. The study lies in the fact that we cannot ignore the rising prevalence of obesity in India, which is gradually snowballing into a giant epidemic. Giving due consideration to the secular trends in change in BMI owing to the changing food habits and lifestyle in our country, one cannot overemphasize the need to use country specific and time specific growth charts for assessing the prevalence of this new epidemic. The recent IAP charts prove to be a good tool in quantifying this problem, and hence, country-wide studies on both rural and urban children using these charts are the need of the hour to assess this looming issue.
19	Mastorci et al. 2020	756	2 years	Observational Study	Italy	To identify the principal variables of the different	Questionnaire	KIDSCREEN-52 scores showed poorer autonomy, bullying, psychological well-

						components affecting adolescents' health (i.e. lifestyle habits, social context, emotional status, cognitive abilities), and explore the relationship between the components, assuming that these are not independent to each other, according to a multifactorial and multisectoral perspective		being, and mood compared to the reference group, but greater self-perception. Autonomy was the most significant predictor of LH (p <.0001). The SC found that the most significant elements were the adolescent's connection with parents (p <.0001) and their interactions with peers (p <.0001). Mood variables made the largest impact to ES (p <.0001). The strongest significant predictor for the CA latent variable was school achievement in Language & Literature (p <.0001). LH had a significant positive correlation with SC (p <.0001), ES (p <.0001), and CA. There was a significant positive correlation (p <.0001) between SC and ES and CA. This study highlights the need for an integrated strategy to assess teenagers' health and well-being. This technique highlights the synergistic impact of several components in assessing health and well-being, which may not be recognized in a late approach that focuses solely on individual elements.
20	Seema et al. 2021	385	2 years	Cross-sectional study	Haryana	To identify the prevalence of obesity among adolescent and diverse contributing factors	Questionnaire	A significant association of gender, socioeconomic status, dietary habits, chocolate eating habits, mode of transportation to school, sports participants, physical activity, and screen time. Adolescents who were athletic enthusiasts and those who did physical activity had a good BMI.

								The teens who watched more than 2 h of screen time were more obese, and these were only a few reasons that were responsible for teenage obesity.
21	Ma et al. 2021	8419	14 days	Non-probability sampling	Shanghai	To investigate the direct association between content-based problematic smartphone use and overweight/obesity (as measured by BMI) in Chinese children with school-age and adolescents using a cross-sectional design.	Questionnaire	The result showed that 37.1% of male students were found to be overweight or obese, while 19.4% of females were overweight or obese. Problematic smartphone use may be associated with obesity in children and adolescents. The association differed based on the educational stage and sex, and the difference possessed dimensional specificity.
22	Sofia Strommer et al. 2021	54	2 years	Qualitative study	Southampton UK city	To assess the adolescents' values in relation to diet and physical activity and how these values can inform health intervention design.	Qualitative semi-structured interviews	Adolescents prioritize spending time with friends and pursuing their interests. They prioritize health, but only if it doesn't interfere with other priorities. Adolescents' psychological needs, priorities, and values did not connect with the requirement for physical health.
23	Ramya Ramanathan et al. 2022	220	6 months	Cross-sectional study	Chennai, Tamil Nadu	To assess the Knowledge, Attitude and Practice (KAP) among mothers regarding obesity in children.	Questionnaire	The result showed 52 (23.63%) of children were overweight or obese, with 23 (10.45%) being overweight and 29 (13.18%) being obese. An attitude that a child being obese was not a problem (p=0.03), the practise of mothers who allowed watching television while eating (p=0.001), not restricting media usage (p=0.01), not allowing children to play outdoors every day (p=0.001), and allowed childrearing were all statistically significantly different from mothers' knowledge of

								children with overweight/obesity versus normal weight.
24	Nagy-Pénzes et al. 2022	192	4 years	Randomized controlled trial	East Hungary	To develop an intervention program to improve high school students' health behavior and to evaluate its effectiveness.	Questionnaire	The results imply that school health promotion can be successful in changing knowledge and way of life. Preventive measures must employ a comprehensive strategy during implementation to have a more favourable impact on health behaviour.
25	Balamurugan et al. 2022	120	10 weeks	Randomized Controlled Trial	Bangalore, India	To assess the AHEP's effectiveness in terms of improvement in the mental wellbeing of adolescents.	Questionnaire	The study found that the majority of teenagers enjoy above-average mental wellness. The statistical test indicates a considerable improvement in teenagers' mental health from baseline to the first month, followed by a progressive decline after 6 months. Religion has also been linked to teenagers' mental health.
26	Forster et al. 2023	2350	10 years	Cohort study	Leipzig, Germany	To explore the relationship between body mass index Standard Deviation Score and socio-economic status (SES), health related quality of life, somatoform complaints, and behavioral difficulties in a large study population, with a specific focus on differences in the strengths of associations depending on age, sex, or SES.	Questionnaire	We observed declining HRQoL scores for both bodily and psychological well-being as BMI-SDS rose. Somatoform complaints had no discernible correlation with BMI-SDS. BMI-SDS was positively correlated with conduct issues, peer relationship issues, and emotional issues (the latter only in the adolescent population). They discovered several significant relationships with age and/or SES but no significant interactions with sex.

27	Rizvi et al. 2023	396	2 years	Stratified cluster randomized controlled trial	Udupi, Karnataka, India	To assess the effect of Health education intervention on knowledge, attitude, and practices (KAP) regarding obesity-risk reduction and to estimate the post interventional change in BMI and total body fat(%) among adolescent school children.	Questionnaire	Results showed that KAP improved significantly in both groups, with KAP in the intervention group outperforming the control group at each of the three visits. Thus, the study participants' overall KAP about modifiable risk factors for obesity was found to have improved as a result of the health education. In order to modify knowledge, attitudes, and practises surrounding obesity risk, additional research to screen teenagers for obesity risk must be conducted, as well as subsequent health education programmes.
28	Peuters et a l. 2024	279	3 months	Quasi-randomized controlled trial	Flanders (Belgium)	To assess the effects of LIFEGOALS on mental health and health behaviors, and the insights from users on the working processes of the different intervention components.	Interviews	Results indicated mixed outcomes, with beneficial effects on physical activity, sedentary behavior, sleep quality, and mood, but these were moderated by access to sports and in-school education during the pandemic. The study highlights the importance of contextual factors in mHealth effectiveness for adolescents. HRQoL, mood and peer support worsened in adolescents with pandemic-induced remote-education. Interviewees indicated that the incentive system, self-regulation coaching, and greater health knowledge helped them modify their behavior. The authors emphasized the significance of social aspects, technological quality, and autonomy in mHealth effectiveness.

29.	Ning et al. 2024	11,739	1 year	Prospective cohort study	China	To evaluate the effectiveness of 1year intervention combined with school-based and family involvement education on the risk of overweight and obesity among adolescents in China.	School-based survey	The intervention led to significant reductions in various measures of adiposity and improved awareness of obesity. Short-term, school-based lifestyle education may help lower the risk of obesity in children and adolescents.
30.	Tanveer M, et al. 2024	4108	3 months	Cross-Sectional Study	Pakistan	To evaluate the relationship between physical activity (PA), physical education (PE), and overweight/obesity in school-aged children and adolescents (ages 9–17) in Pakistan and to investigate their impact on obesity within this population.	Questionnaire	The study demonstrates the relationship between physical activity (PA) and body weight status in Pakistani school-age children and adolescents. The incidence of overweight and obesity are higher in girls who participate in less PA and PE. These problems are exacerbated by a lack of possibilities for physical education and community-based activities. It is necessary to take a multisectoral approach that takes into account supportive networks, gender disparities in PA practices, and frequent surveys.
31.	Banati P, et al. 2024	2000	4 months	Prospective intervention study	Africa	To develop and implement in three African cities a potentially sustainable adolescent health check-up programme, and evaluate the acceptability, feasibility, short-term effects and cost-effectiveness of the	Questionnaire	The Y-Check initiative aims to improve adolescent health in three African cities through routine health check-ups. It treats common health conditions and promotes healthy habits. Despite its short four-month follow-up time, the program's ability to improve health through early diagnosis and referral is enhanced by its adaptability to

						programme to improve health and well-being.		local circumstances and stakeholder involvement.

The literature mentioned above shows how effective health education programmes are at treating obesity. The literature demonstrated that patient surveys, Google forms, and instructional sessions are examples of interventions. Better clinical results for obesity as a result of these interventions, as well as improved patient understanding of managing obesity, diet consumption, physical activity, and gradual changes in lifestyle behaviours, attitudes, and practises.

Studies using educational intervention using Google forms, questionnaires, or surveys have revealed improved BMI readings as well as improved awareness of managing obesity among research participants. According to the literature mentioned above, the majority of youngsters are obese.

For children, parents, and teachers, educational sessions on diet, physical activity, and the children's social and economic well-being were held. so that they are knowledgeable about the causes and effects of obesity.

The use of technology in health interventions was investigated by Marianne et al. (2016) and Jimoh et al. (2018), who found that text-based messaging programs and mobile applications can enhance health-related behaviors and boost youth involvement. This implies that technology can improve health programs' efficacy, particularly when used with in-person, conventional healthcare.

Peuters et al. 2024 evaluated how a mHealth program affected teenagers' mental health and health-related activities. The findings revealed conflicting benefits, including increases in physical activity and better sleep, but difficulties because of pandemic-related limitations. This highlights how important contextual elements are and how mHealth programs must be flexible.

According to Chandrakala P et al. (2016) and Seema et al. (2021), food, physical activity, and screen time are important lifestyle variables that contribute to the rising incidence of obesity among teenagers. This emphasizes the necessity of all-encompassing public health initiatives that address obesity risk factors and encourage healthy lifestyle choices.

The focus of studies by Blasingame et al. (2017), Nayak BS et al. (2016), and Rizvi et al. (2023) is on educational interventions meant to encourage children and adolescents to adopt healthier habits. These studies show that focused education can have a favorable effect on lifestyle choices, lower the risk of obesity, and boost self-esteem.

According to Shih et al. (2016), children who have better health literacy are less likely to be obese, indicating that health literacy and education are important factors in encouraging healthy lifestyle choices.

Adolescent health research, as demonstrated by studies such as Hoffman et al. (2018) and Thakur et al. (2016), highlights the importance of community- and school-based initiatives. Studies like this show that encouraging healthy lives and lowering teenage obesity rates may be accomplished through community and school-based interventions.

Forster et al. (2023) and Shukla et al. (2018) draw attention to the ways that socioeconomic position, living in an urban or rural area, and other sociodemographic characteristics affect health outcomes. These results imply that therapies that are specifically designed with these criteria in mind may be more successful in treating obesity and related problems.

The barriers to behavior change are examined by Oyewande et al. (2019) and Mastorci et al. (2020). The findings indicate that although a significant number of teenagers recognize the significance of adopting healthy habits, their capacity to do so is influenced by cultural and social variables. This suggests that in order for health treatments to be effective, these larger contextual elements should be taken into account.

The relevance of continuous support and stakeholder involvement to sustain beneficial effects over time is emphasized in the works of Mazloomy et al. (2017), Nisha Narayanan et al. (2019), and Balamurugan et al. (2022) on sustainability in health initiatives. According to this research, program design maintenance and a wide stakeholder group's participation are essential for long-term effectiveness.

Three studies investigate interventions to combat overweight and obesity in adolescents. Ning et al. (2024) found school-based programs reduced adiposity and improved obesity awareness in China. Tanveer et al. (2024) highlighted the link between low physical activity and higher rates of overweight and obesity in girls in Pakistan. Banati et al. (2024) implemented a 4-month intervention in three African cities, focusing on adolescent health check-ups. Both studies emphasize the need for local involvement and gender-sensitive, community-based approaches.

Conclusion:

Childhood and adolescent obesity cannot be prevented by one simple change. Youth eating habits are influenced by biological, cultural, and environmental variables, such as the availability of high-density food options. For kids and teenagers, physical activity is a less desirable option because of media devices and related screen time. This evaluation serves as a prompt to take immediate action. Clarification is required regarding the necessity of interventions to alter the obesogenic environment through the implementation of policies pertaining to the food sector and in schools. It would be revolutionary to develop probiotic or faecal transplant therapies to alter the gut microbiota in order to treat obesity or overweight. For the time being, multidisciplinary lifestyle regimens, pharmacotherapy, and ongoing clinical research show promise.

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