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Role of Technology and School based Interventions in Obesity

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ABSTRACT: Technology has played a vital role in the prevention of different diseases and has been implemented in many parts of the world as a tool to fight obesity. Computer, television, mobile phones has influenced and caused great impact on the health of people. Small amounts of weight loss can improve an individual's life span and since obesity has reached epidemic proportions it is our goal to understand obesity and develop new ways to combat or prevent it. Lack of sleep, genetics, medication, etc is the reasons for the rise in overweight and obesity in most of the cases. An increase in exposure to technology goes hand in hand with a decrease in physical activity. As children spend more time sitting in front of the TV or computer, they spend less time outside running around and burning off calories and energy. Over time, combined with an increase in snacking, this can lead to significant weight gain. The aim of the present study identifies the impact caused by technology in obesity and the effectiveness of school intervention programs to reduce the burden among school children.

Keywords: Obesity, technology, overweight, physical activity

INTRODUCTION

Multi-media multitasking have been on the rise over the years in our country and causes disruptive negative behaviour that changes in snacking behaviour and overall energy intake in adolescents and adults that has caused obesity in people. Obesity has become a growing public health concern over the past four decades afflicting people of all ages and all socioeconomic groups. The constant use of technology has forced people to consume more food while watching television and multitasking (chatting) or while watching television without multitasking. Nine out of 10 food advertisements shown on TV during Saturday morning children's programming are for low-nutrient foods that are high in fat, sodium and added sugars as per the report in the Journal of the American Dietetic Association in 2008,. This food marketing largely influences a child's food preferences and, ultimately, his health. This is partly because, unlike adults, children have a hard time distinguishing between regular programming and advertisements. A lack of sleep due to engagement with technology will release hormones ghrelin, a hormone that initiates hunger and decrease in leptin hormone which acts vice versa. On average, a sleep-deprived person will consume 300 extra calories per day, usually from high-fat foods, and snack more frequently than someone who is well-rested that will expose to obesity. Implementing school-based programs to establish healthy habits in youth have been found to have a positive impact.

Further, benefits have been shown when supplementing classroom education with 1:1 health coaching provided by nursing students.

Childhood obesity school interventions must be geared toward physical activity and nutrition of the children. Previously, in other parts of the world, programs such as Coordinated Approach to Child Health (CATCH) and SWITCH are school-based interventions that have aimed to modify physical activity and diet of elementary students. The CATCH program focus was on changing the behaviour of elementary school students' physical activity and healthy eating through curriculum provided by classroom teachers. The aim of the present study identify the impact caused by technology in prevention of obesity and the effectiveness of school intervention programs to reduce the burden among school children. Some suggested strategies for childhood obesity prevention and management include increasing physical activity, reducing sedentary time including television viewing, personalized nutrition plans for very obese kids, co-curriculum health education which should be implemented in schools and counseling for children and their parents (Ranjani *et al.*, 2014). Globally, children in particular are gaining weight, which tracks into adulthood thus increasing the risk of adult diseases such as type 2 diabetes, cardiovascular disease (CVD), hypertension and polycystic ovarian syndrome (PCOS) later in life (WHO, 2005, Singh *et al.*, 2008). Aggarwal *et al.* (2004) showed that among obese adolescents in Punjab a significant percentage (82.3%) were non-vegetarians.

Goyal *et al*. (2010) reporting on adolescents from Gujarat did not find a difference in the prevalence of overweight and obesity among vegetarians and non-vegetarians but did find a correlation with frequency of eating out as well as with junk food consumption. Shah *et al*. (2010) aimed to evaluate the impact of a school-based health and nutrition education program on knowledge and behavior on 3128 school children (8-18 years), 2241 parents and 841 teachers from three different cities representing North India. Low baseline knowledge and behavior scores were reported in 75-94% of the government and 48-78% of the private school children, across all age groups. A significant improvement was observed in younger children (aged 8-11 years) compared with those aged 12-18 years; in females compared to males and in government schools compared to private schools ($P < 0.05$ for all).

The same group also reported the effectiveness of a more focused multi-component intervention model of nutrition and lifestyle education on behavior modification, anthropometry and metabolic risk profile in urban Indian adolescents. Two schools matched for student strength and socioeconomic strata were randomly allocated as intervention and control group. Changes in nutrition-related knowledge, attitude, lifestyle practices, food frequency and body image of eleventh-grade students (15-17 years) were tested in both schools. At 6 months follow-up, significant improvement in several domains of knowledge and lower consumption of aerated drinks and energy-dense unhealthy foods was observed in the intervention school children (n = 99) as compared to the control school children (n = 102). Another significant observation was that higher proportion of intervened children brought packed lunch and carried fruit to school compared to the control group. Additional measurements in relation to insulin resistance, β-cell function, disposition index, and subclinical inflammation were reported in another paper on the same cohort of adolescents which predictably showed marked improvements in these measures among the intervened children compared to the control group

A recent study from southern India revealed that a significant increase in the level of knowledge among normal and overweight children can be achieved by a mass education program (Singhal *et al.,* 2010, 2011).

KEY FACTORS OF CHILDHOOD OBESITY

Overweight and obesity are caused by numerous social and environmental factors that influence people's energy intake and physical activity.

Reversing the energy balance to restore a healthy weight is a significant challenge once an individual is overweight or obese, predominantly for adolescent people who can have little control over food and activity choices.

Key determinants of childhood obesity are however, unhealthy dietary habits, and reduced physical activity remain significant problems.

A. Lack of physical activity

Lack of physical activity is a prime cause of obesity. television viewing, internet, and computer games alone or in combination with factors like outdoor activities, lack of open spaces and playgrounds in schools and communities along with increasing pressure on children to perform in academics and reduced emphasis on sports, contribute to childhood obesity. The association between obesity and use of other media is somewhat weaker. Combining a clinical assessment of baseline activity levels and modifying environment to promote physical activity should be part of any preventive strategies.

B. Overindulgence caloric intake

The practice of overfeeding of low-birth-weight babies for catch up growth, if continued, also contributes to obesity. Due to the unrestricted access to energy-dense foods at various platforms like school cafeteria and school neighborhood combined with low knowledge about dietary components in school children, there is often increased caloric intake per body weight per day.

C. Changes in Lifestyle

Due to fast life in urban India people do not have time to go for walking and purchase things just by walking to the store or other shops. They usually take vehicles even for shorter distances that has exposed them to obesity at large.

D. Peer influence and affluence

Peer influence and affluence is again causing risks among children as they want to show superiorty over the others in terms of food. Again limited availability of open spaces and parks due to population expansion and illegal settlements with abundance of fast-food outlets and eating points increase the chance of the child becoming obese.

TECHNOLOGY AND OBESITY

With the advent of cell phones, television sets, computers the long-term health effects in India are taking an ugly turn. The everyday household devices in homes that are easily available and affordable to low-income people have made the situation worse as it is linked to a growing pandemic of chronic diseases, especially obesity due to too much sitting, less physical activity and increased consumption of calories.

The study subjects 154,000 people around the world were studied from 17 different nations for up to 12 years were asked about their medical history, physical activity, their daily eating habits and their height and weight were recorded.

Results showed that there seemed to be no correlation between the number of devices in a home and the rate of diabetes, obesity and other conditions like heart disease in high-income countries. Obesity, for example, raised from a 3.4 per cent prevalence if there were no devices in the home, to 14.5 per cent for three devices. Similar findings were documented in diabetes in low-income countries.

The possession of three devices was associated with a 31 per cent decrease in time spent doing physical activity, a 21 per cent increase in time spent sitting and a nine-centimetre increase in waist size compared to their peers who didn't have TV, computers or cars. Although, it is said that the devices themselves don't cause obesity and diabetes, it's how it most likely affects behaviour - less physical activity, sitting more and eating more, and it also affects diet.

Children spend an average of 7 hours per day watching TV, playing video games and using the Internet in India. The maximum recommended time per day is one or two hours. A YMCA survey concluded that over half of children between the ages of 5 and 10 spend less than four days per week playing outside. The study also showed that almost 75% of parents made the decision to spend family time watching television with their kids instead of doing other activities.

The presence of a TV set in a child's bedroom seems to exacerbate the impact of TV-viewing on children's weight status. A study of 2343 children aged 9 to 12 years revealed that having a bedroom TV set was a significant risk factor for obesity, independent of physical activity (Adachi *et al.* 2007). A cross-sectional study of 2761 parents with young children in New York found that 40% of the 1- to 5-year-olds had a bedroom TV, and those who did were more likely to be overweight or obese. Teenagers with a bedroom TV spent more time watching TV, less time being physically active, ate fewer family meals, had greater consumption of sweetened beverages, and ate fewer vegetables than did teenagers without a bedroom TV.

Granted, economic factors also play a part in the struggle of technology vs. physical activities. Moreover, parents are working over 40 hours per week to make ends meet while coordinating their schedules with their kids schedules, and they find it difficult to make time for physical activities. Also, families with economic challenges have to choose between afterschool activities like sports and paying rent or the mortgage.

SCHOOL-BASED OBESITY PREVENTION STRATEGIES

The following strategies may be used in the prevention of obesity among school children in India:

(i) Coordination: Many state government agencies and nongovernmental organizations develop and implement school based programs to promote physical activity and healthy eating. States can maximize the effectiveness and efficiency of these efforts by:

(a) Reinforcement of program coordination, integration, and partnership.

(b) Line up program outcomes and priorities across departments.

(c) Political interagency workgroups and budget planning.

(d) Encouraging agencies to work together to develop and implement state standards and policies.

(ii) Decision-making and policy formulation: School health programs and policies need to be modified to make the right choices and allocate resources to address childhood obesity. States need accurate data about young people's health-related behaviors by encouraging schools to participate in data collection surveys.

(iii) Health planning: A key task of a school health council is to assess the school's health policies and programs to determine goals for school health programs and facilitate collaboration on health-related programs. Require school districts to create a school health council and designate a school health coordinator who provides leadership for health-related programs. Provide training for school health councils, administrators, and school health coordinators on using research-based self-assessment and planning tools.

(iv) Wellness policies: Wellness policies can command physical education requirements, health education requirements, the types of foods and beverages sold on campus, and many other important practices that promote physical activity and healthy eating

(v) Professional development: Qualified staff is essential to implement effective school physical activity and nutrition programs. Qualified physical education teachers must be in elementary schools.

Effective policies and tools apart from school based interventions may include:

Supervision

a. Initiate community-based research to document burden of obesity and associated risk factor and monitor these trends over time.

b. Maintain a nationwide database on secular trends in obesity and associated commodities.

c. Periodic examination of nutritional and obesity status of children including adults:

d. To create a database for childhood obesity at various regions to start with and then may be at state level

Education

a) Clinical counseling interventions in the primary care setting is suggested and health care should include obesity-focused education

b) Educational materials are available from a variety of sources to facilitate the counseling. These materials have much in common and have not been directly compared; it is reasonable for providers to select materials with messaging that is best suited to their community.

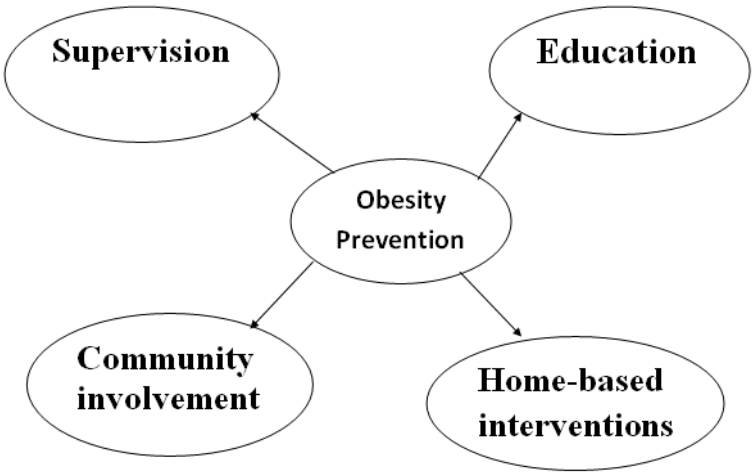

Fig 1: Interventions to prevent obesity.

c) Nutrition and physical advice through electronic media.
d) Support of healthy lifestyle by well-known people and local champions.

Community involvement

a) Children-specific nutrition information and workshops for illiterate women.
b) Promotion of bicycles and walking.
c) Family-centered and child focused involvement.
d) Organization and contribution in health walks and healthy food festivals.
e) Information about diet that is healthy (Balanced diet).
f) Long-term changes in behaviors that are related to obesity risk should be emphasized, rather than diets and exercise prescriptions, which tend to set short-term goals.

Early infancy and perinatal period

a) Balanced nutrition to expecting mothers
b) Promote exclusive breastfeeding
c) Prevention of catch-up obesity in children
d) Preservation of correct growth velocity under supervision of physicians

Keep away from excess nutrition to stunted children.

Home-based interventions

a) Key goals to address are the common diet-related problems encountered in children.
b) TV/computer time to be restricted.
c) Compulsory 60 min of physical activity.
d) Curb on eating out at weekends and restricting availability of junk foods at home.

CONCLUSION

Obesity has become a national epidemic and a disease of global magnitude. The numbers of patients with obesity have grown exponentially in the last 10 years to the degree that the Centers for Disease Control and Prevention reports that one third of the population is obese. Technology clearly plays an important role in the current epidemic of childhood and adolescent obesity. The sheer number of advertisements that children and adolescents see for junk food and fast food have an effect. So, too, does the shift away from good nutritional practices that increased media screen time seems to create.

Unfortunately, the traditional therapies of diets, exercise, behavioral modification and medications have had little effect, especially in the severely obese. Operative approaches now provide the most effective treatment of obesity but carry with them possible risks. It is concluded that electronic technology has increased the obesity problems in the world and school intervention may be very useful to reduce obesity in children in the long run.

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