Prevalence of Childhood Obesity and its Prevention- Systematic Review

Ranjana Chavan[1], Mangesh Jabade[2], Dipali Dumbre[2]

[1]Assistant Professor, [2]Tutor, Department of Community Health Nursing, Symbiosis College of Nursing, Symbiosis International (Deemed University), Senapati Bapat, Road Pune, Maharashtra

Abstract

Introduction: Childhood obesity is one of the most serious public health challenges of the 21st century and prevalent global public health issue as children. The number of overweight or obese infants and young children (aged 0 to 5 years) increased from 32 million globally in 1990 to 41 million in 2016. Overweight and obese children are likely to stay obese into adulthood and more likely to develop non communicable diseases like diabetes and cardiovascular diseases at a younger age. Therefore Prevention of childhood needs high priority. **Material & Methods:** 125 citations in PubMed & ISI Web of science found by electronic search and finally 19 articles were selected for writing systemic review. The search strategy consisted of search strings composed of terms targeting: prevalence, childhood obesity, prevention we restricted the search to articles published since 2012 to appropriate balances feasibility of implementation and the validity of the resulting information. **Result:** The prevalence of overweight and obesity among children and adolescents aged 5-19 has risen dramatically from just 4% in 1975 to just over 18% in 2016. (WHO, 2017). Somewhere between 5.74 percent and 8.82 percent of school children in India are obese. In China, the overweight and obesity rate in children aged 7 and over was 12.2% and 7.3%, respectively. Four different studies were screened which was focused on at least one components like physical activity, physical fitness, fruit consumption. Significant changes observed on sedentary time (Watching TV and studying), active play time and fruit consumption but there was no effect on BMI or the prevalence of Overweight/ Obesity. A family Based Obesity prevention programme is effective strategy to prevent childhood obesity by providing physical activity classes to improve behavior and skills of the children. **Conclusion**: The strength of evidence is stated that family based intervention plays pivotal role in preventing Childhood obesity

Key words- *Childhood Obesity, prevention, prevalence, family based intervention*

Introduction

Childhood obesity is one of the most serious public health challenges of the 21st century and prevalent global public health issue as children. The problem is global and it has been seen in both developed and developing countries, with recent prevalence estimates of 23 and 13%, respectively. It is steadily affecting many low and middle-income countries, particularly in urban settings. (1)

The World Health Organization (WHO) has stated that the child population is more in developing countries, so childhood obesity rapidly increasing in developing countries than in developed countries.(2) The number of overweight or obese infants and young children (aged 0 to 5 years) increased from 32 million globally in 1990 to 41 million in 2016. In the WHO African Region alone the number of overweight or obese children increased from 4 to 9 million over the same period. (3)

An estimated 170 million children under 18 years of age were overweight or obese in 2008, and it has been projected that approximately 30% of all children will be affected by these conditions by 2030 (4, 5)

Childhood obesity has reached epidemic levels in the republic of India. India has the second-largest number of childhood obesity patients in the world, next to China. It has been estimated that 14.4 million children in India are affected by obesity, and its occurrence is increasing rapidly. (6)

Overweight and obese children are likely to stay obese into adulthood and more likely to develop non communicable diseases like diabetes and cardiovascular diseases at a younger age. Therefore Prevention of childhood needs high priority

Childhood Obesity prevention training is the strategy to halt obesity problem in childhood. A WHO (World Health Organization) classification distinguishes between general, selective and targeted intervention. Prevention programs can be classified as behavior-oriented (individual-based intervention) or community-/ environment-based (context-related intervention). Families have the ability to influence and shape child behaviors on a daily basis. Therefore, experts suggest that family involvement in the prevention of childhood obesity may provide greater behavior changes and sustainable weight loss over time compared to interventions without parental involvement. (7, 8)

Family-based interventions have grown considerably in recent years to prevent childhood obesity. Parents are described as integral targets in interventions, given their highly influential role in supporting and managing the four behaviors that affect children's energy balance (diet, physical activity, media use, and sleep). (9, 10, 11)

School based interventions include actions taken in schools to assist children in the prevention or treatment of obesity independent from family. Family based interventions include actions taken with the child's parents or caregiver in the home to help prevent or treat obesity. The purpose of this review is to identify, review, and critically appraise the evidence from studies examining the effect of family based intervention and school-based interventions on childhood obesity. (12)

A less active childhood is one of the most important factors contributing to childhood obesity. It has been reported that childhood obesity tracks into adulthood and is associated with an increased risk of mortality& morbidity, independent of weight loss later in life. Various health hazards may arise as complications of obesity like Coronary heart disease, Stroke, Type 2 diabetes, Hypertension, Hyperlipidemia etc.(2)

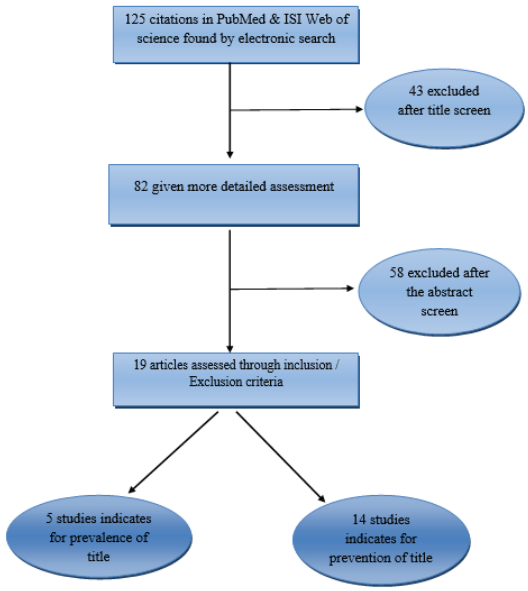
Objectives

This study systematically reviewed the prevalence of developing and developed nation and preventive strategies for Childhood obesity.

Search strategy and initial screening

With the help of a research librarian, most common databases used (PubMed, PsycINFO, and CINAHL) in recent systematic reviews and using individually tailored search strategies most appropriate for each database. The search strategy consisted of search strings composed of terms targeting: prevalence, childhood obesity, prevention we restricted the search to articles published since 2012 to appropriate balances feasibility of implementation and the validity of the resulting information.

Material & Methods



Result

The prevalence of overweight and obesity among children and adolescents aged 5-19 has risen dramatically from just 4% in 1975 to just over 18% in 2016. (WHO, 2017). The vast majority of overweight or obese children live in developing countries, where the rate of increase has been more than 30% higher than that of developed countries. (13)

Prevalence

Childhood obesity is highly prevalence in the United States and it is risk for poor health in children and adolescents. 18.5 % (13.7 million) children and

adolescents were obese and it is higher in Non hispanic blacks (22%) than non-Hispanic whites (14.1%).[14] In developing countries, the prevalence of Childhood Obesity is rapidly changing due to dietary practices and sedentary lifestyle. Somewhere between 5.74 percent and 8.82 percent of school children in India are obese. In urban south India, 21.4 percent boys and 18.5 percent girls aged 13-18 are either overweight or obese.[15] The study was conducted in Nepal where 575 students were included, 107 (18.6%) were overweight and 41 (7.1%) were obese. Out of that 328 male children, 62 (19.0%) were overweight and 35 (10.6%) were obese. Likewise, among 247 female children, 45 (18.2%) were overweight and 6 (2.4%) were obese.[16] In China, the overweight and obesity rate in children aged 7 and over was 12.2% and 7.3%, respectively. The corresponding number of overweight and obesity increased to 34.96 million.[17]

Prevention

School based interventions include actions taken in schools to assist children in the prevention or treatment of obesity independent from family. Family based interventions include actions taken with the child's parents or caregiver in home to help prevent or treat obesity.

The 3 studies focused on lifestyle i.e. incorporated nutrition, physical activity and behavioral components. Many parents stated that they did not want their child to '*be put on a diet* 'whereas more interested on holistic approach for weight management of the child. Motivating factors about parents that they had opportunities to adopt new skills and improve their knowledge on lifestyle related behaviors.[18, 19, 20] A family Based Obesity prevention programme is effective strategy to prevent childhood obesity by providing physical activity classes to improve behavior and skills of the children.[21]

Parents plays important role in childhood obesity prevention programs, to make them engage in weight loss management because they help their children to adopt healthy behavior.[22] Most of the parents do not understand the importance of Obesity prevention as they do not accept that their child has excess weight and adverse effect would happen due to diet consumed by child. Families are able to construct children's lifestyle habits, perhaps through their "parenting style" and management of "family functioning."[23] After attending of Parents in this prevention programmes, their children have to have more fiber diet and reduce sedentary lifestyle. Most of these programs were successful in decreasing body mass index (BMI) z-score and some health consequences of overweight In some cases, significant decrease in fat mass is documented, as well. [24]

School-based interventions programme plays an important role on promoting physical activity as well as preventing obesity. Four different studies were screened which was focused on at least one components like physical activity, physical fitness, fruit consumption. Significant changes observed on sedentary time (Watching TV and studying), active play time and fruit consumption but there was no effect on BMI or the prevalence of Overweight/ Obesity. [25, 26]

BMI z-score decreased with statistical significance for the students who received School-based intervention as compare to who did not receive the intervention.[27, 28, 29] Also decrease in their percentage of body fat with statistically significant for children who received school based interventions. [28, 30, 31]

Conclusion

The strength of evidence is stated that family based intervention plays pivotal role in preventing Childhood obesity. Nutrition, physical activity, reduce screen time intervention with behavioral modification are more effective strategies to maintain children's weight. Parental lifestyle influences the dietary pattern and behavioral changes in the child. More research and consistent methods are needed to understand the comparative effectiveness of childhood obesity prevention programs in the community setting.

Conflict of Interest – Nil

Source of Funding- self

Ethical Clearance – Ethical clearance taken from Institutional Research Committee of Symbiosis College of Nursing

References

1. Ng M, Fleming T, Robinson M, Thomas B, Graetz N, Margono C, et al. Global, regional, and national prevalence of overweight and obesity in children

and adults during 1980-2013: a systematic analysis for the global burden of disease study 2013. Lancet. 2014; 384(9945):766–81.

2. WHO. Commission on Ending Childhood Obesity: Facts and figures on childhood obesity. 2016.
3. Dr Manish Arora1, DrSwapnil Shinde2, Dr R P Patwardhan3 Prevalence of Overweight or Obesity in Adolescent School Children from Pune, India (2017) Imperial Journal of Interdisciplinary Research (IJIR) Vol-3, Issue-3, 2017 ISSN: 2454-1362, http://www.onlinejournal.in
4. Mistry SK, Puthussery S. Risk factors of overweight and obesity in childhood and adolescence in South Asian countries: a systematic review of the evidence. Public Health. 2015;129:200–9.
5. Swinburn BA, Sacks G, Hall KD, et al. The global obesity pandemic: shaped by global drivers and local environments. Lancet. 2011;378:804–14.
6. Risk Factors, Consequences and Prevention Strategies of Childhood Overweight and Obesity: An Indian Context Sumit Nayek1, Abhishek Thakur2, Pabitra Ghosh3 International Journal of Science and Healthcare Research Vol.4; Issue: 4; Oct.-Dec. 2019 Website: www.ijshr.com ISSN: 2455-7587
7. LangeD, WahrendorfM, SiegristJ, etal: Associations between neighbourhood characteristics, body mass index and health-related behaviours of adolescents in the Kiel Obesity Prevention Study: a multilevel analysis. Eur J ClinNutr 2011;65:711-719.
8. Ludwig J, Sanbonmatsu L, Gennetian L, et al: Neighborhoods, obesity, and diabetes-a randomized social experiment. N Engl J Med 2011;365:1509-1519.
9. Birch LL, Davison KK. Family environmental factors influencing the developing behavioral controls of food intake and childhood overweight. PediatrClin N Am. 2001;48(4):893–907.
10. Jago R, Edwards MJ, Urbanski CR, Sebire SJ. General and specific approaches to media parenting: a systematic review of current measures, associations with screen-viewing, and measurement implications. Child Obes. 2013;9(Suppl):S51–72.
11. Loprinzi PD, Trost SG. Parental influences on physical activity behavior in preschool children. Prev Med. 2010;50(3):129–33.
12. Capestrain, Ashley; Montague, Emily; and Frantz, Meghan, "Effectiveness of School-based Interventions versus Family-based Interventions in the Prevention and Treatment of Childhood Obesity" (2017). Honors Research Projects. 439.
13. World Health Organization. Obesity and overweight. [updated 2018-02-16; cited 2018-03-20]. http://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight
14. AdekunleSanyaolu, PhD,[1] ChukuOkorie, MBBS, MPH,[2] Xiaohua Qi, MD, PhD,[3] Jennifer Locke, MD,[3] and SaifRehman, MD[3] Childhood and Adolescent Obesity in the United States: A Public Health Concern Prevalence of Childhood Obesity in the United States Glob Pediatr Health. 2019; 6: 2333794X19891305.
15. Childhood Obesity: The Indian Scenario Compared with World Wide Michael AnjelloJothi Rajan1*, R Srinivasan1 and Arockiam Thaddeus2 1 Tamil Nadu State Council for Science and Technology, India 2 Jayaraj Annapackiam College for Women, Periyakulam, India Submission: January 16, 2018; Published: February 08, 2018.
16. Asmita Karki et al (2019) Prevalence and associated factors of childhood overweight /obesity among primary school children in urban Nepal. BMC Public Health volume 19, Article number: 1055 (2019).
17. Wang S, Dong YH, Wang ZH, Zhou ZY, Ma J.Trends in overweight and obesity among Chinese children of 7-18 years old during 1985-2014 Chin J Prev Med, 51 (4) (2017), pp. 300-305
18. Grow H, Hsu C, Liu L *et al.* Understanding family motivations and barriers to participation in community-based programs for overweight youth: one program model does not fit all. *J Public Health Manag Pract* 2013; 19(4): E1–e10.
19. Newson L, Povey R, Casson A, Grogan S. The experiences and understandings of obesity: families' decisions to attend a childhood obesity intervention. *Psychol Health* 2013; 28(11): 1287–305.
20. Stockton M, McClanahan B, Lanctot J, Klesges R, Beech B. Identification of facilitators and barriers to participation in weight gain prevention research by African American girls. *Contemp Clin Trials* 2012; 33(1): 38–45.
21. Farias Edos, S.; Goncalves, E.M.; Morcillo, A.M.; Guerra-Junior, G.; Amancio, O.M. Effects of programmed physical activity on body composition

in post-pubertal school children. J.Pediatr. 2015,91,122–129.

22. Parents as agents of change (PAC) in pediatric weight management: the protocol for the PAC randomized clinical trial. *Ball GD, Ambler KA, Keaschuk RA, Rosychuk RJ, Holt NL, Spence JC, Jetha MM, Sharma AM, Newton AS BMC Pediatr. 2012 Aug 6; 12():114.*

23. "Childhood overweight and obesity: maternal perceptions of the time for engaging in child weight management". *Warschburger P, Kröller K BMC Public Health. 2012 Apr 20; 12():295.*

24. Impact of childhood obesity treatment on body composition and metabolic profile. *Kalavainen M, Utriainen P, Vanninen E, Korppi M, Nuutinen O World J Pediatr. 2012 Feb; 8(1):31-7.*

25. Brown, E.C.; Buchan, D.S.; Cavana, J.; Baker, J.S.; Wyatt, F.B.; Kilgore, J.L. Fit for school: Results of a 10-week school-based child healthy weight pilot intervention for primary school students. *Int. J. Health Promot. Educ.* **2016**, *54*, 229–244.

26. Hollis, J.L.; Sutherland, R.; Campbell, L.; Morgan, P.J.; Lubans, D.R.; Nathan, N.; Wolfenden, L.; Okely, A.D.; Davies, L.; Williams, A.; et al. Effects of a 'school-based' physical activity intervention on adiposity in adolescents from economically disadvantaged communities: Secondary outcomes of the 'Physical Activity 4 Everyone' RCT. *Int. J. Obes.* **2016**, *40*, 1486–1493.

27. Cadzow, R. B., Chambers, M. K., & Sandell, A. D. (2015). School-based obesity intervention associated with three year decrease in student weight status in a low-income school district. Journal Of Community Health, 40(4), 709-713. doi:10.1007/s10900-015-9989-0 Calculate your body mass index. (2016).

28. Lee, A., Ho, M., Keung, V. W., & Kwong, A. M. (2014). Childhood obesity management shifting from health care system to school system: intervention study of school-based weight management programme. BMC Public Health, 14. doi:10.1186/1471-2458-14- 1128

29. Schwartz, A. E., Leardo, M., Aneja, S., & Elbel, B. (2016). Effect of a School-Based Water Intervention on Child Body Mass Index and Obesity. JAMA Pediatrics, 170(3), 220-226 7p. doi:10.1001/jamapediatrics.2015.3778

30. Elizondo-Montemayor, L., Gutierrez, N. G., Moreno, D. M., Martínez, U., Tamargo, D., & Treviño, M. (2013). School-based individualized lifestyle intervention decreases obesity and the metabolic syndrome in Mexican children. Journal Of Human Nutrition & Dietetics, 2682-289. doi:10.1111/jhn.12070

31. Ling, J., King, K. M., Speck, B. J., Kim, S., & Wu, D. (2014). Preliminary assessment of a school-based healthy lifestyle intervention among rural elementary school children. Journal Of School Health, 84(4), 247-255.