

ORIGINAL ARTICLE

RELATIONSHIP BETWEEN OBESITY AND PHYSICAL ACTIVITY IN CHILDREN

¹Dr. Nimra Mustafa, ¹Dr. Mahwish Shamim¹Baqai Institute of Physical Therapy and Rehabilitation Medicine, Baqai Medical University

ABSTRACT

Background: Physical activity (PA) plays an important role in prevention of obesity in children and adolescents. Current evidence provides useful visions to better understand how they just rely on each other. The aim of this study was to determine the relationships between obesity and PA in children.

Material & Methods: This study was conducted on 100 children, fourth to eight class, and aged between 9- 14 years. Body Mass Index and PA were measured in 49 females and 51 males. Physical activity was measured using the Physical Activity Questionnaire for Children and for BMI, height was measured by inch tape and weight was measured by weight machine. Pearson's correlation co-efficient was used to determine the correlation between PA and obesity.

Results: This study showed that out of 100 participants only 12 were participated in low physical active. Mostly children 45 participate in low-moderate level of physical activity, 32 children participated in moderate, 11 were high-moderate and 0% participated in high level of physical activity on a weekly basis and BMI interpretation was only 9 were underweight, 53 were normal, 7 were overweight, 31 were obese. Results showed a moderate negative correlation between BMI and physical activity ($r = -0.3325$, $P = 0.3173$).

Conclusion: It has become a combined social responsibility of parents, caregivers, educators and health professionals to aware children about the negative effects of obesity and helps them in implementing strategies to prevent its development.

Keywords: Physical activity, Obesity, Children.

1. INTRODUCTION:

World-wide, progressing development has great effect on children living in metropolitan areas. Children of nowadays have media-dominated free time activities which lead to a reduced level of physical activity. In addition, due to unhealthy lifestyle of children, or they are surrounded by a food-toxic surroundings, which encourages the consumption of high calorie, convenient, and unhealthy foods. Many studies indicated that the generally poor health of children all over the world can be mainly associated to the modern way of life, characterised by high-calorie diets and low physical activity rates.⁽¹⁾

Obesity is the immoderate build-up of adipose

tissue in the body due to consume more food than is required for energy. Body mass index used to classify the obesity and if you have a weight of $30\text{kg}/\text{m}^2$ over you are obese⁽²⁾. According to a grade of the arena's "fattest state" issued on Forbes, Pakistan is graded one hundred sixty five (out of 194 international locations or states) in phrases of its overweight inhabitants⁽³⁾. A study conducted in 2006 suggested that a mostly of the Pakistani population falls in the overweight or obese class⁽⁴⁾. Childhood weight problems are one of the critical community health tasks of the 21st century. Obesity is the mother of all problems. Higher body mass index is a key threat issue for non-communicable diseases (NCD) such as: cardiovascular diseases,

diabetes, musculoskeletal issues, and some cancers (consisting of endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon. Risk for these non-communicable diseases will increase with accelerated BMI⁽⁵⁾. Causes of obesity increases with the intake of high caloric food and decreased physical activity which is the result of sedentary lifestyle that includes spending time on using gadgets in sitting and lying positions⁽⁶⁾. Management of obesity includes pharmaceutical, non-pharmaceutical and physiotherapy treatments. Optimal nutrition and exercise and physical activity are two major interventions which are used in physiotherapy management to prevent and manage obesity⁽⁷⁾. There are recommendations which prevent and manage obesity one is general recommendation and other is societal recommendation. In general recommendations increases intake of fruits and vegetables, limit high intake of cholesterol food and sugar intake and be physically active at least doing moderate to vigorous intensity activities for 60 minute each day. In societal recommendation government and health professional aware children about the negative effects of obesity⁽⁸⁾.

Physical activity (PA) is described as any bodily motion cause by means of skeletal muscle that need energy expenditure. The benefits of physical active include: maintain health and prevent illness, improve quality of life and mental health, improve factors that effect on health⁽⁹⁾. Moderate activities increases heart rate and increase sweat rate examples in children are: cycling on flat ground, playing in ground, riding a scoter. Vigorous intensity enhances bone and muscle strength and improves overall health and increase self-confidence. If a child does one minute of vigorous activity the benefit is same as they do two minute moderate activity. Examples of vigorous activities in children are swimming, running, football, and rugby. Children should also do bone and muscle strengthening activities at least 3 days in a week. Examples of bone and muscle strengthening activities are: sit up and press up, gymnastic, hopscotch⁽¹⁰⁾. There are many recommendations for physical activity in children. WHO endorsed

levels of physical activity for kids aged 5 – 17 years include: Children have to do at least 60 minutes of slight- to full of life-depth bodily interest daily, Physical activity greater than 60 minutes deliver extra fitness advantages, aerobic vigorous activity and bone and muscle strengthening exercise have to be executed at least 3 times per week. Increase childhood obesity related to decrease level of physical activity⁽¹¹⁾.

The motive of this study is to evaluate the relationship between obesity and physical activity in children. Now a days sedentary lifestyle increase in children that causes obesity in children so this study will provide awareness to parents, educators and health care givers how to prevent obesity.

2. MATERIALS AND METHODS:

2.1 Study design and participants selection: This observational study was conducted on 100 children, fourth to eight class, and aged 9- 14 years. All 100 children both girls and boys are selected for study no children will be excluded because all students meet the inclusion criteria. (FIGURE 1).

Total No. Of students N=100 Aged 9-14yrs
Male=51 Female=49
Assesment through Questionnaire
Analyzed N=100 M=51, F=49

3.1 Correlation:

The Pearson's correlation coefficient shows that moderate negative ($r = -0.3325$; $P = 0.3173$)

correlation exists between BMI and physical activity. (TABLE 3, GRAPH 1).

	Overall (n=100) Mean \pm S.D	Male (n=51) Mean \pm S.D	Female (n=49) Mean \pm S.D	p-value	Result at P<0.05
Height(m)	4.34 \pm 0.6	4.29 \pm 0.64	4.406 \pm 0.62	0.3681	Not-significant
Weight (kg)	35.6 \pm 7.8	36 \pm 7.89	35.28 \pm 7.7	0.3173	Not-significant
BMI (kg/m ²)	21.6 \pm 7.0	21.9 \pm 6.735	21 \pm 7.35	0.42371	Not-significant

TABLE : DEMOGRAPHIC CHARACTERISTICS

BMI	No of Participants
Underweight	9
Normal	53
Overweight	7
Obese	31
Total	100

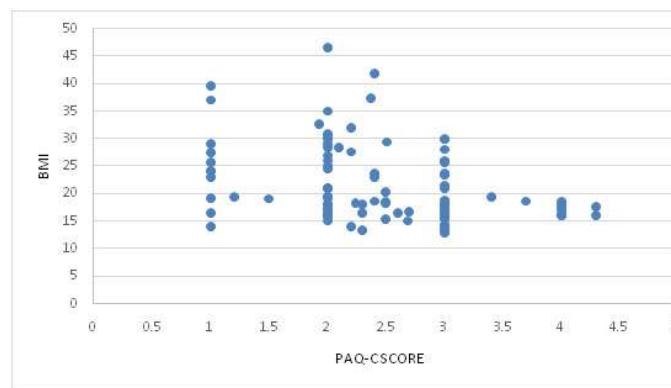
Physical Activity	No of Participants
Low	12
Low-moderate	45
Moderate	32
High-moderate	11
High	0
Total	100

TABLE : BMI AND PHYSICAL ACTIVITY SCORING FOR ALL PARTICIPANTS

Correlation between physical activity and BMI	Pearson's correlation (r)	p-Value	Result at P<0.05
	-0.3325	0.3173	Not-significant

TABLE : RELATIONSHIP BETWEEN OBESITY AND PHYSICAL ACTIVITY

PAQ-C= Physical Activity Questionnaire for Children
BMI= Body Mass Index



4. DISCUSSION:

The purpose of study was to investigate the relationship between obesity and physical activity in children. 100 participants were randomly selected for the study.

The result of study is supported by Tang A, Zhang Y, Zou J et. Al (2012). The study finds the relationship between Obesity, Sleep and Physical Activity in Chinese Preschool Children. This study deduced that children who are vigorously involved in physical activities ($p = 0.002$), spent considerable time (more than 2 hours) in front of digital screens ($p < 0.001$) have no or negligible with obesity. Children who sleeps longer on weekends showed better relationship with obesity ($p = 0.037$), moreover, monthly income does not directly impact the child and parent BMI. ⁽¹²⁾.

The study is supported by Meimei Ji, Amber Tang, et.al (2018). The purpose of this study is to understand obese and weight problems in preschool youngsters in Changsha City inside the context in their sleep and physical activity. These effects offer feasible proposals to lower tiers of obese and weight problems amongst preschool children. The prevalence of early life overweight and weight problems were 15.2% and 9.8% respectively. Preschool-elderly youngsters travelled 11,111 – 3357 and 10,350 – 2973 steps in step with day on weekdays and weekends respectively. The number of daily steps became not statistically extraordinary among weekdays and weekends. The amount of time spent every day doing energetic pastime on weekdays and weekends

become appreciably different, with a mean time of 20.5 – 31.6 min and 10. Three – 15. Three min respectively ($p = 0.002$). Furthermore, 10.7% and 50.9% of youngsters used monitors for extra than hours on weekdays and weekends respectively ($p < 0.001$). Children slept for drastically longer on weekends (eight. Three – zero.9 h) than on weekdays (8.1 – 0.7 h) ($p = 0.037$). A considerably better proportion of college students additionally fell asleep earlier than 10:00 p.m. On weekends (26.8%) in comparison to weekdays (15.2%) ($P < 0.001$). Parent's BMI values were definitely linked with baby BMI, the month-to-month household income became negatively associated with infant BMI. Male children had been more likely to have a better BMI than female children. Children who were obese were additionally greater likely to have shorter sleep instances in comparison to youngsters of everyday weight ($p = \text{zero.047}$). There turned into an excessive occurrence of overweight and weight problems the various Chinese preschool kids on this study. Students also demonstrated terrible sleep and bodily pastime habits ⁽¹³⁾.

The result of study was supported by Haris Pojskic and Bahareh Eslami (2018). The examine observe the (i) the intensity of physical hobby (PA), obesity indices and cardiorespiratory fitness (CRF) among boys and ladies in number one college, and (ii) to determine the relationship of obesity indices and PA with CRF for the whole quantity of candidates, after which separately for boys and girls. The outcomes acquired confirmed the incidence of preferred obese and weight problems became 25. Five% in our sample which was lower than that in the regional estimate (e.g., – 28%) for Eastern Europe. PA level significantly decreased across age groups in girls ($p = 0.010$), but not in boys ($p = 0.086$). Post hoc test did not reveal any significant pairwise differences among age groups in girls. Boys showed to be significantly more physically active than girls in age 12 and 13 ($p = 0.00$ and $p = 0.01$, respectively). Boys who were classified in normal body weight group showed to have higher level of PA comparing to those who were in underweight, overweight and obese group, $\$2(3) = 9.29$, $p = 0.026$. Girls did not

showed significant changes in PA level across the body weight categories, $\$2(3) = 1.97$, $p = 0.579$. Boys from normal and overweight category were physically more active comparing to girls ($p < 0.01$), while there were no significant differences between them in obese and underweight group ($p > 0.05$)⁽¹⁴⁾.

The result of study is supported by Peter T. Katzmarzyk, Tiago V. Barreira, Stephanie T. Broyles et.al (2015). The odds ratios (ninety five% confidence periods) for weight problems from multilevel, multivariable fashions have been 0.79 (zero. Seventy one–0.Ninety) for nocturnal sleep period, 0.52 (0.Forty five–zero.60) for MVPA, 1.15 (1.05–1.27) for TV time, 1.08 (0.Ninety six–1.20) for healthful weight-reduction plan rating, and zero.Ninety three (0.83–1.04) for unhealthy diet score in boys and 0.71 (zero.63–zero.80) for nocturnal sleep length, 0.Forty three (zero.35–0.Fifty three) for MVPA, 1.07 (zero.96–1.19) for TV time, 1.05 (zero.93–1.19) for healthful food plan rating, and zero.96 (0.82–1.11) for dangerous weight loss plan score in ladies. Behavioural hazard factors are vital correlates of obesity in youngsters, in particular low, moderate to full of life physical activity (MVPA), small sleep length, and excessive TV looking⁽¹⁵⁾.

The result of this study is supported by Alma D. Guerrero, Flores M et al. (2017). Approximately 22% of young population ages between 10 to 17 years engaged themselves in physical workout for at least 20 minutes. Daily physical activity of any sort like walking, running or physically intense sports reduces the likelihood of being obese or overweight (odds ratio = 0.79; 95% confidence interval = 0.68–0.91). In a stratified analysis of the major racial and ethnic groups, it is evident that white children are shows better results than other minority children (odds ratio = 0.70; 95% confidence interval = 0.60–0.82)⁽¹⁶⁾.

5. CONCLUSION:

There is inverse relationship between obesity and physical activity. As physical activity decreases, risk of obesity increases. Obesity is the roots of various problems so it is important to maintain healthy

weight. It has become a combined social responsibility of parents, caregivers, educators and health professionals to aware children about the negative effects of obesity and helps them in implementing strategies to prevent its development. Future Recommendation; research can be conducted on a large sample size. Unfortunately, few schools participated in research. More participants from many schools will be needed in future studies to conclude findings beyond a few schools.

6. CONFLICT OF INTEREST

The author certifies no conflict of interest in conducting this research whatsoever directly or indirectly. The collection of data is purely unbiased and sampled in true sense. The result drawn is according to statistical tools employed with no alteration in numbers and formulae at all. Therefore, this research is free from any sort of conflict of interest.

7. ACKNOWLEDGMENT

I would like to express my special thanks of gratitude to my teacher and mentor Dr. Mahwish Shamim who gave me the golden opportunity to do this wonderful research work on this topic, which also helped me in doing a lot of research and I came to know about so many new things I am really thankful to them.

REFERENCES:

1. Lombard M. Relationship between Posture, Obesity and Physical Activity levels in children aged 10-13. MSc thesis. Johannesburg, South Africa: University of the Witwatersrand, Health sciences; 2016.
2. Rhule V, White L, Lowe T. Physiopedia. [Online].; 2019 [cited 2019 December 25. Available from: <https://www.physiopedia.com/Obesity>.
3. Wikipedia. Wikipedia. [Online].; 2018 [cited 2020 December 5. Available from: https://en.wikipedia.org/wiki/Obesity_in_Pakistan.
4. Hasan F, Hasab B. Is obesity endemic to Pakistan? Journal of the Pakistan Medical

Association. 2017 October; 67(10): 1641-1641.

5. Organization WH. World Health Organization. [Online].; 2017 [cited 2019 December 25. Available from: https://www.who.int/dietphysicalactivity/childhood_consequences/en/.
6. Wikipedia. Wikipedia. [Online].; 2018 [cited 2019 December 25. Available from: <https://en.wikipedia.org/wiki/Obesity>.
7. Carter B, Amhlaoibh MN, McCormack N. Physiopedia. [Online].; 2019 [cited 2019 December 25. Available from: https://www.physio-pedia.com/Management_of_Obesity.
8. Organization WH. World Health Organization. [Online].; 2016 [cited 2019 December 25. Available from: <https://www.who.int/dietphysicalactivity/childhood/en/>.
9. Gates A, Lee M, Lowe A, Hashe M. Physiopedia. [Online].; 2019 [cited 2019 December 25. Available from: https://www.physio-pedia.com/Physical_Activity
10. Dow A, Civitarese A, Al LT. Physiopedia. [Online].; 2019 [cited 2019 December 25. Available from: https://www.physio-pedia.com/Childhood_Obesity.
11. Organization WH. World Health Organization. [Online].; 2015 [cited 2019 December 25. Available from: https://www.who.int/dietphysicalactivity/factsheet_youth_people/en/. Ji M,
12. Tang A, Zhang Y, Zou J. The Relationship between Obesity, Sleep and Physical Activity in Chinese Preschool Children. International Journal of Environmental Research and Public Health. 2018 March; 15(3):527.
13. Ji M, Tang A, Zhang Y, Zou J. The Relationship between Obesity, Sleep and Physical Activity in Chinese Preschool Children. International Journal of Environmental Research and Public Health. 2018 March; 15(3): 527.
14. Pojiskic H, Eslami H. Relationship between Obesity, Physical Activity and Cardiorespiratory fitness level in children and Adolescence in Bosnia and Herzegovina Public Assess 2018 November. Front physiol 9:
15. Katzmarzyk PT, Barreira TV, Broyles S, Champagne CM, Chaput P, Fogelholm M. Relationship between lifestyle behaviors and obesity in children ages 9–11: Results from a 12 country study. Obesity A Research Journal. 2015 July.
16. Guerrero AD, Flores M, Vangala S, Chung PJ. Differences in the Association of Physical Activity and Children's Overweight and Obesity Status Among the Major Racial and Ethnic Groups of U.S. Children. HSS Public Access. 2017 July; 44(3): 411-420.