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PHYSICAL INACTIVITY AND OBESITY IN SCHOOL-AGED CHILDREN OF SINDH, PAKISTAN: A PREVALENCE STUDY

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Abstract

This study investigates the prevalence of physical inactivity and obesity among school-going children in Sindh, Pakistan, focusing on the role of limited physical education in contributing to these issues. A cross-sectional analysis was conducted among 400 randomly selected students from grades 7 to 10 in Tando Muhammad Khan and Nawabshah. Data on physical activity, participation in physical education, and BMI were collected to classify students as normal weight, overweight, or obese. Results showed low levels of physical activity across the sample, with 2.5% classified as obese and 10.3% as overweight. Most students reported no regular physical education classes, indicating a strong link between school-based inactivity and rising obesity. The study underscores the urgent need to integrate structured physical education into school curricula to curb childhood obesity and promote healthier habits in the student population.

INTRODUCTION

The most important stages in our life are childhood and puberty.[1] These stages may carry a number of diseases to adulthood or may become risk factors for adult disease.[1] Low level of physical activity and unhealthy dietary behavior leads to unhealthy life styles.[2] Same as obesity, malnutrition is also a major concern because its occurrence during childhood may lead to major health problems e-g; protein energy malnutrition and anemia that impede the physical and mental development.[1] Mental disorders such as attention deficit hyperactivity disorder (ADHD), disruptive behavior disorder (DBD), mood disorders, Tic disorder (TD) and anxiety powerfully affect a child's learning process.[3]Heavy backpacks may contribute to high risk of back pain among school going children.[4] Approximately one out of three adults are either overweight or obese in United States.[5]In United States around 17% of children aging 2-19 years are thought to be obese because they have reached epidemic proportions.[6]It has been shown by many studies all around the world that low level of physical activity including lack of participation in sports at school or at home and less active mode of transport to and from school, accompany the higher risk of overweight and obesity, among children.[7] It has become a global concern to think about rising ratio of overweight and obese children.[8] Globally in 2013, 12.9 and 13.4% of boys and girls in developing countries were discovered overweight or obese and almost 23.8 and 22.6% were found in developed countries respectively.[9] Worldwide, about 10% of school-aged children are overweight and one quarter of these are estimated as obese.[10, 11] The risk of type II diabetes has been increased in middle aged population of Pakistan due to other lower rate of involvement in PA and their unhealthy food and eating habits.[12] Overweight and obesity during childhood and adolescence are increasing their risk at

a greater pace in developing nations than in developed ones.[13] Like other developing countries obesity and under nutrition are also highly rising in Pakistan. It also has been discovered in corresponding developing countries such as Egypt and India.[14] Major health and financial challenges have been presented by obesity and its co-morbidities in South Asia with Pakistan being the ninth highest ranking of country in terms of obesity.[15] Obesity among children has a competent prevalence between 15 to 20% in Pakistan.[16] Obesity during childhood has many negative health outcomes and higher risk of cardiovascular diseases, diabetes, common bone and joint problems, sleep apnea and social and psychological problems.[17] For the adult population, it is being commencing to be thought that physical inactivity and sedentary behaviors, particularly watching TV and surfing the internet have been found to be related to their increased BMI.[12]Watching television for a longer period of time not only increases the risk of obesity but it also affects eyesight, raise cholesterol and ultimately leads to poor health.[18] Increased sitting time may lead to unfavorable changes in cardiovascular function and glucose tolerance.[19] Physical activity intervention programmers aim to offer many opportunities to PA among children through school environments.[8] With the potential occasions, the healthy lifestyles and habits among children can be developed within the schools, as they spend their considerable time in schools.[8] Physical activity among children can be advanced in school setting as it is thought to be a perfect place for this activity, children can have various chances to be physically fit during school week including break times, sports, physical education classes and active travel to and from school.[20] There is a sudden fall in physical activity engagement among the teenage, emphasizing an immediate attention to understand the effect of physical activity among young people.[21] The childhood stage shows a critical period for the advancement of a free, un integrated play as well as participation in well-developed and integrated activities such as sports.[21] In U.S in the past decades childhood obesity has increased its rate mainly due to physical inactivity.[22] Risk of obesity during childhood as well as adulthood can be diminished by physical activity. Physical Activity has direct effect on blood pressure and is related with emotional health.[18] Physical activity lowers the risk of some major diseases e: g coronary heart disease, stroke, and type II diabetes as well as colon and breast cancer. [18]Regular physical activity is thought to be very important for a desirable growth and development of a child.[19] Physical activity has an essential role in children's physical and mental health, with specific advantage for preschool children's social, gross motor and skills development.[23] Moderate to vigorous physical activity is a recognized part of a healthy lifestyle.[24] Physical activity is a changeable behavior that can be practiced to make our weight status better as well as give other health advantages.[17]The health and quality of life can be improved by regular physical activity and even the small amount of physical activity can lead to positive health outcomes.[5]Parents, schools, education departments, urban planners and other organizations are required to take step to advance the physical activity and healthy eating such as fruits that protects against obesity, in school going children in Pakistan.[25] Policy makers communities and schools are provided with guidelines and based practice to increase physical activity in schools by World Health Organization.[18]

1.1 Significance of the study

The main gap of this study is that, this kind of study has yet not been conducted in Sindh except a few schools and the main reason to conduct this study is to determine prevalence of Physical inactivity and Obesity among school going children, because children spend a good part of time in their schools, we thought the lack of physical education classes and increased sedentary time during study classes may lead to many health problems among children such as obesity.

1.2 Objective of the study

The purpose of this study is to determine the prevalence of physical inactivity and obesity among school going children.

2. Method

2.1 Study Design

This cross-sectional study was conducted to determine the prevalence of physical inactivity and obesity among school-going children in Sindh, Pakistan. The study was carried out over a six-month period from

August 2018 to January 2019. A total of 400 students from grades 7 to 10 were included, while students outside these grades were excluded. Convenience sampling was used to select the participants from both government and private schools in Tando Muhammad Khan and Nawabshah.

2.2 Data Collection Instruments

Data were collected using two primary instruments. The Physical Activity Questionnaire for Children (PAQ-C) was used to assess physical activity levels. This self-administered, 7-day recall questionnaire includes 10 items, which evaluate physical activity during various periods of the day. Body Mass Index (BMI) was measured using standard height and weight measurements, with BMI calculated as weight in kilograms divided by height in meters squared.

2.3 Statistical Analysis

Data were analyzed using SPSS version 25. Descriptive statistics were employed to summarize the data, with categorical variables reported as frequencies and percentages, and continuous variables reported as means. The classification of physical activity levels was based on Kowalski scores, and the prevalence of obesity and overweight was determined using standard BMI thresholds.

2.4 Ethical Considerations

Ethical approval was obtained from the Ethical Review Committee of the Institute of Physiotherapy and Rehabilitation Sciences, Peoples University of Medical and Health Sciences for Women. Informed consent was secured from the school principals, and parental consent was obtained for each participant. Assent was also obtained from the students. All data were kept confidential and anonymous, and participants had the option to withdraw from the study at any time without providing a reason.

3. Results

3.1 Demographic:

The mean age of the participants was 13.79 ± 1.522, the mean of physical activity level among participants was 2.04± 0.59 that indicates moderate level of physical activity. The mean BMI of the participants was 25.05 ± 119 which falls into the category of overweight, 328 participants were females and 72 were males.

3.2 Physical Activity Questionnaire for children:

The questionnaire consists of 9 items, The 1st item further divided into 14 sub items, including Cricket, Skipping Rope, Tag, walking for exercise, Bicycling, Jogging or Running, Swimming, Dance, Football, Badminton, Volleyball, Hockey, Basketball and Ice skating. The mean for physical activity, during the past 7days was 1.52±0.40. The mean of "the activity level during physical education classes was 1.33±0.91. The mean of "the activity level during recess during recess during the past 7days was 2.27±1.23. The mean of "the activity beside lunch during the past 7days was 1.71±0.91. The mean of "the activity in the evening time during the past 7days was 2.30±1.26. The mean of "the activity on the last weekend was 2.43±1.34. The mean of "which one of the following describes you best for the last days" was 2.66±1.39. The 9th item was physical activity for each day last week and that item was divided into 7 sub items including Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday. The mean for "physical activity for each day last week" was 2.34±0.84. The total physical activity of the participants was found to be mean± SD of 2.04±0.59. The results showed that the 51.8% (207N) of participants involved in Light, 48% (19N) in Moderate and 0.3% (1N) in Vigorous level of physical activity.

BMI values were found as, 41.5% of children with Normal weight, 2.5% obese, 10.3% overweight and 45.8% found underweight.

Activity during the last 7 days

S. No	Activities	No Activity	1-2 times	3-4 times	5-6 times	7 times or more	Mean± SD
1	Cricket	63.5%	23.8%	6.5%	3.5%	2.7%	1.58±0.95
2	Skipping Rope	74%	15.8%	6.2%	1%	3%	1.43±0.89
3	Tag	56.5%	21.8%	8.8%	5%	8%	1.86±1.24

4	Walking for exercise	34.8%	27.7%	14%	8.5%	15%	2.41±1.41
5	Bicycling	71.3%	16.2%	5.3%	3%	4.2%	1.53±1.02
6	Jogging or running	51.5%	17.8%	13.5%	8%	9.2%	2.06±1.34
7	Swimming	91.3%	5.3%	2.5%	0.3%	0.6%	1.14±0.52
8	Dance	56.5%	21.8%	9.3%	5%	7.4%	1.85±1.23
9	Football	67%	20.3%	8%	2.5%	2.2%	1.53±0.91
10	Badminton	85%	7.2%	5%	1.8%	1%	1.27±0.72
11	Volleyball	91.8%	6%	0.8%	0.2%	1.2%	1.13±0.54
12	Hockey	90%	7.8%	2%	0%	0.2%	1.13±0.42
13	Basketball	81%	12.2%	4.8%	1.2%	0.8%	1.29±0.68
14	Ice skating	94.5%	2.5%	1.2%	1.8%	0%	1.10±0.47

Activity level during physical education classes during the last 7days.

I don't do PE	Hardly ever	Sometimes	Quite often	Always	Mean± SD
87.3%	0.8%	6.2%	3.2%	2.5%	1.33±0.91

Activity level during recess and beside lunch

Activity	Sat down(talking, reading, doing school work)	Stood around or walked around	Ran or played a little bit	Ran around and played quite a bit	Ran and played hard most of the time	Mean± SD
During recess	28.7%	42.8%	12%	5.8%	10.7%	2.27±1.23
Beside lunch	49.5%	38.5%	6%	3.5%	2.5%	1.71±0.91

Activity level right after school, sports in the evening, activity level on the last weekend.

Activity	None	1 time last week	2-3 times last week	4 times last week	5 times last week	Mean± SD
Right after school	56.3%	20.5%	11.7%	3.5%	8%	1.86±1.23
Sports in the evening	33.5%	28.2%	22.8%	5.5%	10%	2.30±1.26
Activity on the last weekend	34%	21.3%	23%	10.3%	11.4%	2.43±1.34

What suits you the best for the last 7 days?

All or most of my free time was spent doing things that involve little physical effort	I sometimes(1-2 times last week)did physical things in my free time	I often (3-4 times last week)did physical things in my free time	I quite often (5-6 times last week)did physical things in my free time	I very often (7times or more times last week)did physical things in my free time	Mean± SD
23.8%	31.8%	17.2%	9.7%	17.5%	2.66±1.39

Activity level for each day last week.

Days	None	Little bit	Medium	Often	Very often	Mean± SD
Monday	42.5%	29%	19%	0.8%	8.7%	2.04±1.19
Tuesday	38.8%	28.2%	24%	4.8%	4.2%	2.08±1.09
Wednesday	46.8%	22%	23%	5.7%	2.5%	1.95±1.07
Thursday	36.5%	24%	25.3%	9%	5.2%	2.23±1.18
Friday	38.5%	19.3%	21.3%	7.7%	13.2%	2.38±1.40
Saturday	32.8%	19%	24.5%	9.2%	14.5%	2.54±1.40
Sunday	29.3%	9.5%	18%	12%	31.2%	3.07±1.62

4. Discussion

The purpose of the study was to determine prevalence of physical inactivity and obesity among school going children in Sindh, Pakistan. We measured physical activity level by the use of PAQ-C Questionnaire and obesity by calculating Body Mass Index (BMI). In this study the mean PAQ-C was 2.04±0.59 and the prevalence of obesity and overweight were found to be 2.5% and 10.3% respectively. By the use of Kowalski scoring protocol the study of Dakar (Senegal) reported mean score of PAQ-C 2.42±0.85 and Italy reported mean score 3.05±0.67 which were higher than the mean we found in our study. We found 41.5% children with normal weight, 2.5% obese, 10.3% overweight and 45.8% underweight. The study of Dakar (Senegal) reported 50% children with normal weight,21.4% overweight/obese and 28.6% underweight as compared to study of Dakar we have found more children underweight and less percentage of normal weight and overweight/obese. The prevalence of overweight reported by some African countries such as Tanzania (15%), Kenya (19%) and Egypt (31.4%) and 12.2% reported by Nepal, which are higher than that of our study. The study reported prevalence of overweight same as ours' was by China which was 10.4%. The study of Kerala state of India found the prevalence of overweight (7.56%) that was lower than our findings and obesity (3.10%) which was higher than our study.

4.1 Strengths of the study:

A major strength of this study are the measured heights and weights for BMI rather than self-reported were used for assessment, physical activity level was reported by children there-self (Self- report) which is more accurate than reported by parents or teachers (Proxy report). Another strength of this study is the high response rate from all participants.

4.2 Limitations of the study:

The limitations of this study include, we have not reported the relation of physical activity and obesity with socioeconomic status, nutrition and sedentary behavior. And we have not directly/objectively (use of objective tool such as Accelerometer) observed PA level of participants but we have indirectly/subjectively (through a Questionnaire) assessed their PA level that relies on participants' recall of their perception of intensity of movement. Another weak point of our study is low sample size.

Conclusion

We simply used PAQ-C Questionnaire to measure PA level and BMI to determine the prevalence of obesity among children. The PAQ-C appears to be an easy to use and alternative tool for PA surveillance and monitoring. We found light level of PA among school going children. Most children reported that due to lack of PE classes in their schools they don't do PE classes. They play only on the weekend or on Sunday but not on the regular basis with the proper recommendations. About 2.5% of children were found obese and 10.3% overweight. The practice of moderate to vigorous exercise at least one hour a day should be followed to prevent overweight/obesity and related chronic diseases risk among school going children.

Future Recommendations:

Such kind of studies should be conducted in other cities of Sindh to give basic knowledge about the level of PA among children and its recommendations to the school organizations and the knowledge about risks and complications develop from PIA and obesity or being underweight (children face many physical and mental problems).

We recommend future researchers to fill the gap/limitations we faced such as use of an objective tool with questionnaire for validity. As we found low level of PA and high prevalence of underweight children, studies should be conducted on prevalence of PA and obesity associated with socioeconomic status and nutrition or diet behaviors of children. Through this study we also found that most of the children were not doing PE, classes because of lack of PE classes in their schools, so we suggest all this school organizations and principals to create such kind of systems in the schools to enhance PA among school children for their physical and mental healt.

List of Abbreviations

Symbols/Abbreviations	Full Form
ADHD	Attention deficit hyperactivity disorder
DBD	Disruptive behavior disorder
MD	Mood disorder
TD	Tic disorder
DPT	Doctor Of Physical Therapy
PA	Physical Activity
WHO	World Health Organization
BMI	Body Mass Index
PIA	Physical Inactivity

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