

Physical Activity in Children with Asthma in Bangladesh

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Being an important public health issue, childhood asthma affects physical activity and daily sports of the children. The objective of the study was to measure the physical activity of children with bronchial asthma. A descriptive, cross-sectional study was conducted from January to December 2014 at the Outpatient Department of National Asthma Centre, Mohakhali, Dhaka among school children of class 12 and below. Hundred forty-eight purposively selected children of both sexes with age range from 8 to 18 years were included in the study. Data were collected through interview with children or their parents using an interview schedule based on “Physical Activity Questionnaire for Older Children” (PAQ-C) and “Physical Activity Questionnaire for Adolescents” (PAQ-A). Data analysis was carried out by SPSS software, version 16.0. The mean age was 12.2 years with a standard deviation (SD) of 2.9 years. Male and female were almost equal with a ratio of 1: 1.1. As many as 73 (49.3%) were students of primary level, while 58 (39.2%) were of secondary level. Thirty-two (21.6%) children had monthly family income less than Tk 15,000, while most of the children 81 (54.7%) had monthly family income from Tk. 15,001 to 30,000. At least 70 (47.3%) children had positive family history of asthma. Physical activity score decreases with age ($r = -0.4$) with more prominence in female ($r = -0.5$). Significant difference in PAQ scores was found between primary and secondary students group ($p < 0.001$). Children from nuclear family had lower physical activity ($p < 0.001$). Physical activity decreases with age with more prominence among females. Moreover, physical activity questionnaire score has sex differential.

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Introduction

Estimated 235 million people are currently suffering from bronchial asthma according to the World Health Organization (WHO) which has made the disease an important public health problem globally.¹ It is a important cause of morbidity specially among children, non-communicable diseases in particular. It poses a serious obstacle on children’s day to day activities in spite of availability of safe and effective treatment.²⁻⁵

Though asthma has worldwide prevalence, most asthma-related death ascribes to developing countries.¹ The prevalence of asthma among Bangladeshi children like India and Pakistan remains lower than the developed countries.⁶ However, mortality among Bangladeshi children is significantly higher (7.3%) than the adults (5.3%).⁶

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There seems to be a common perception that children with asthma have a reduced capacity for exercise. Surprisingly, there is contradictory evidence in relation to this position, and it remains unclear whether significant differences exist between children with asthma and their non-asthmatic counterparts.⁷ Physical activity or exercise tolerance and potential reduced work capacity in children with asthma are still a debatable issue. Results from trials with regard to the possible benefits and risks of physical activity or exercise in asthmatic children and adolescents have shown contradictory results because physical activity may trigger allergic systemic, cutaneous and respiratory symptoms such as exercise-induced asthma. Though exercise or physical activity seems to be a common trigger for asthma in children,⁸ but the consequence of this for exercise patterns has been poorly researched. Children with asthma are physically less active is not substantiated by different study findings,⁹ while some studies revealed that children with asthma are significantly less likely to engage in vigorous physical activity and are with less physical fitness.¹⁰ Furthermore, it has been observed in a study that 74 percent children restricted their running in the previous week because of attack with asthma.¹¹ Many parents worried about their children in taking part in physical exercise and often restricted their activities as a result of lack in knowledge or misinterpretation of medical advice.¹² However, regular exercise and participation in sports are considered useful in the management of asthma, since physical training improves cardiopulmonary fitness, neuromuscular coordination, self-confidence and health-related quality of life.^{13,14} Regular physical activity appears to induce beneficial immunological changes, thereby reducing allergic inflammation.¹⁵ In addition, physical activity leads to significant reductions in the use of both inhaled and oral steroids.¹⁶ The study was conducted with an aim to measure

physical activity score of children with asthma as well to find out their socio-demographic differentials.

Methods

A descriptive, cross sectional study was carried among 148 purposively selected children with bronchial asthma diagnosed by registered physician attending higher secondary level or below with age range from 8 to 18 years to measure the physical activity of children with asthma. The study was conducted from January to December 2014 at Out-patient department, National Asthma Centre, National Institute of Chest Disease and Hospital, Mohakhali, Dhaka. Both male and female children were included in the study. However, asthmatic children with comorbidities like heart disease, physical or psychological disability or acute exacerbation of asthma, and who were unwilling to participate were not included. Data were collected by face to face interview of the children, or their attendant like parents of too young children or unable to answer properly. A semi-structured questionnaire based on the Physical Activity Questionnaire for Children (PAQ-C) and Physical Activity Questionnaire for Adolescents (PAQ-A) which was first developed and administered by Kowalski, Crocker, and Kowalski in 1997 to measure general levels of physical activity of students of class 12 and below within above-mentioned age range. Physical, mental or socio-economic risk or harm was no more than minimum to the children or their parents included in the study. Data processing and analysis were carried out by using Statistical Package for the Social Sciences (SPSS) software version 16.0. Student's t-test, ANOVA, Pearson's correlation and partial correlation were conducted.

Results

A descriptive, cross-sectional study was carried out among 148 purposively selected children with asthma of both sexes with age range from 8 to 18 years at National Asthma Center, Mohakhali, Dhaka with a view to assess the physical activity of the children. The mean age was 12.2 years with a standard deviation (SD) of 2.9 years. Of 148, as many as 73 (49.3%) were male, while 75 (50.7%) were female. At least 73 (49.3%) children were students of primary level, whereas 58 (39.2%) were secondary level and 17 (11.5%) were higher secondary level students. Parents of 138 (93.2%) children were currently married, while 6 (4.1%) children had either father or mother alive and parents of 4 (2.7%) children were divorced or separated. As many as 32 (21.6%) children had monthly family income less than Tk.15,000, while most of the children 81 (54.7%) had monthly family income from Tk. 15,001 to 30,000 (Table I).

Not less than 70 (47.3%) children had positive family history of asthma (Fig. 1). Maximum duration of suffering from asthma was 10 years with a mean of 4.4 years and a standard deviation of 2.3 years. Duration of each asthmatic episode was ranged from 1 to 7 days with a mean of 1.4 days and a standard deviation of 0.8 days. On the contrary, absence from day to day activities during each attack of asthma was ranged from 0 to 6 days with an average of 1.9 days and a standard deviation of 1.1 days (Table II). Highest number of children remained absent from work for 2 days. Mean physical activity score was 2.7 with a standard deviation of 0.6. Scores were ranging from 1.4 to 4.2. Physical activity score was ranged from 1 to 5, where score 1 indicate lower physical activity and 5 indicate higher one.

Age had negative moderate correlation with physical activity score ($r = -0.401$) that is physical activity score was likely to decrease

with increasing age. Correlation was found weaker among male children ($r = -0.3$), however, stronger correlation was found among females ($r = -0.53$). Physical activity score was higher among male (2.9 ± 0.5) than in female (2.44 ± 0.58), with high statistical significance ($p < 0.001$). Physical activity was found higher, both in male (3.1 ± 0.5) and female (2.8 ± 0.5) when only primary students were in account, though significant difference between male and female was still present ($p = 0.002$). With respect to educational level, primary students had highest physical activity score (2.9 ± 0.5), whereas it was found lowest among high school children (2.4 ± 0.6). The differences among various educational level had high statistical significance ($p < 0.001$). However in post-hoc test, the significant difference was observed only between primary and secondary students ($p < 0.001$). Children from nuclear family had lower physical activity (2.6 ± 0.6) than children from combined family (3.1 ± 0.4) and the difference was high statistical significance ($p < 0.001$, Table-IV).

Table I: Background characteristics of children

Characteristics	Frequency	Percentage
Gender of Children		
Male	73	49.3
Female	75	50.7
Educational Status		
Primary	73	49.3
Secondary	58	39.2
Higher secondary	17	11.5
Marital Status of Parents		
Married	138	93.2
Widow/widower	6	4.1
Divorced/separated	4	2.7
Monthly Family Income in Taka		
Upto 15000	32	21.6
15001 to 30000	81	54.7
30001 to 50000	34	23.0
More than 50,000	1	0.7

Table II: Asthma characteristics of children

Characteristics	Mean±SD	Range
Duration of suffering in years	4.42±2.33	0.17 10.00
Attacks per year	2.55±0.72	1.20 6.00
Duration of each attack (days)	1.41±0.75	1 7
Absent from work (days)	1.90±1.05	0 6

Table III: Children's characteristics by Physical Activity

Characteristics	Mean	SD	p value
Sex			
Male	2.98	0.49	<0.001
Female	2.44	0.58	
Educational Status			
Primary	2.94	0.51	<0.001
Secondary	2.42	0.59	
H.S.C	2.81	0.87	
Religion			
Muslim	2.70	0.64	NS
Non-Muslim	2.68	0.42	
Marital Status of Parents			
Married	2.69	0.60	NS
Single	2.81	0.72	
Family Type			
Nuclear	2.58	0.60	<0.001
Combined	3.09	0.43	
Monthly Family Income (BDT)			
Up to 15,000	2.67	0.63	NS
15,001 to 30,000	2.74	0.62	
>30,000	2.62	0.55	

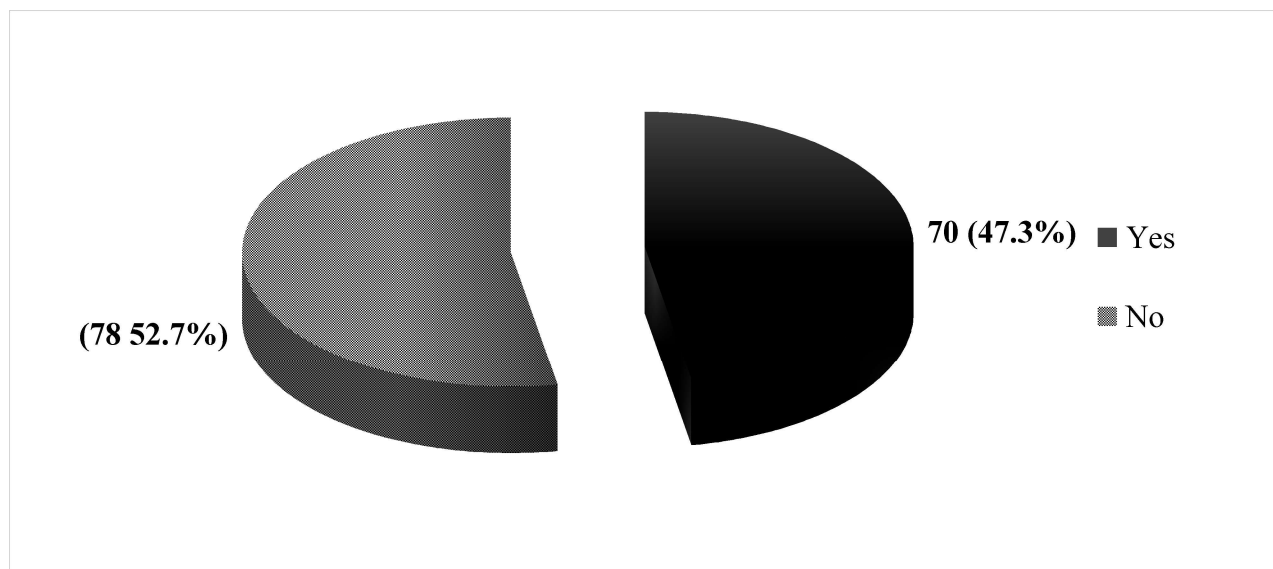


Figure 1. Pie diagram showing family history of asthma

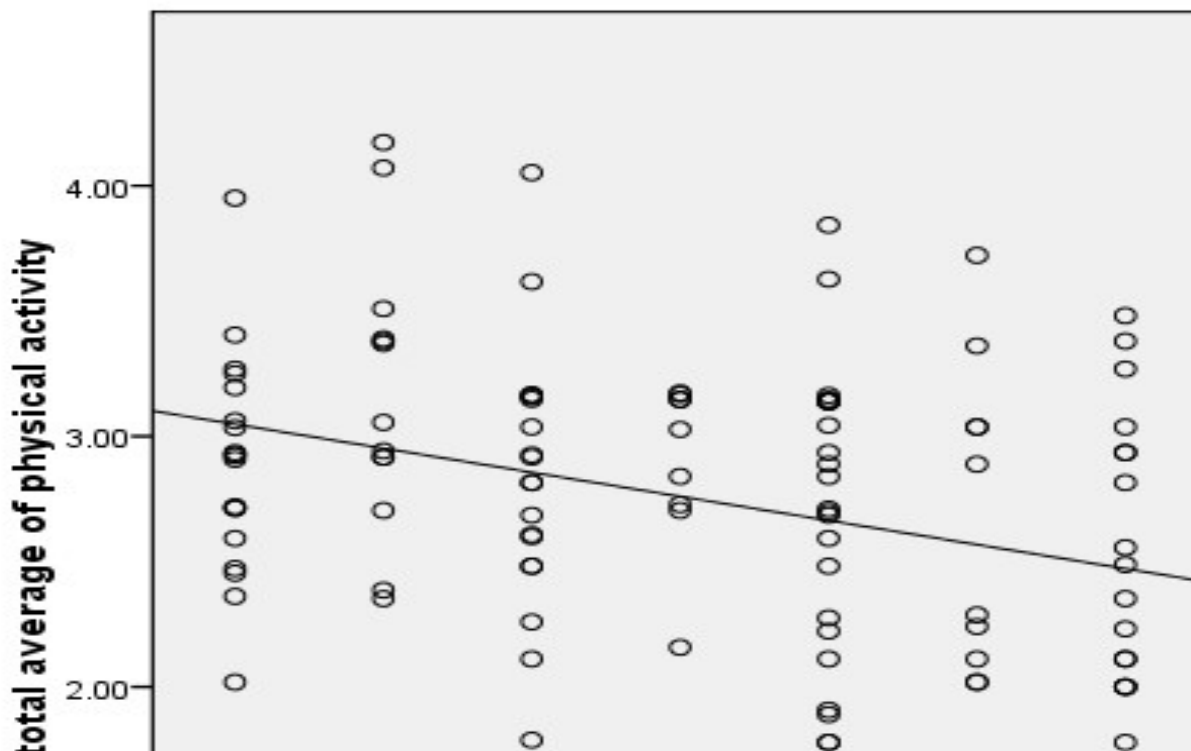


Figure 2. Correlation between age and physical activity score

Discussion

A descriptive, cross-sectional study was conducted among 148 children with asthma with age range from 8 to 18 years attended at outpatient department, National Asthma Centre, Mohakhali, Dhaka with an aim to assess the physical activity of the children. Male female ratio was 1:1.1. This is not vindicated by the findings of study conducted by Sarkar et al. in 2012¹⁷ among school children of Dhaka city with male predominance which might be due to purposive type of sampling used for selection of respondents. Religion of 123 (83.1%) children was Islam, while 23 (15.5%) was Hinduism and 2 (1.4%) was Christianity which is more or less in agreement with the findings of census conducted in 2011.¹⁸ At least 70 (47.3%) children had family history of asthma. This is in line with findings of the study conducted by Mahdi et al., in 2010 in India where nearly 45 percent patient had a family history.¹⁹

Physical activity score was ranged from 1.4 to 4.2 with a mean of 2.7 and standard deviation 0.6. This has similarity with the findings of the study conducted by Santos-Silva et al., 2014 in Portugal where the observed average score was 2.4 with a standard deviation of 0.7.²⁰ PAQ score had negative correlation ($r=-0.4$) with age, whereas correlation ($r=-0.5$) was stronger in female children. Physical Activity Questionnaire (PAQ) score was revealed higher in male (3.0 ± 0.5) than in female (2.4 ± 0.6). The difference was with high statistical significance ($p<0.001$). Primary students had higher physical activity score (2.9 ± 0.5) compared to high school children (2.4 ± 0.6) with high statistical significance ($p<0.001$). These findings have concurrence with findings of Ph.D thesis work conducted in Australia by Liam Welsh where PAQ score was clearly ahead in males (3.00 ± 0.6) than in females (2.7 ± 0.6), whereas PAQ score was 3.9 ± 0.7 in grade 5 students and 3.0 ± 0.6 in grade 8 students.²¹

Conclusion

It can be concluded that in children with asthma physical activity decreases with age which is more prominent among females. Moreover, physical activity questionnaire score has revealed sex differential with females having lower score than males. Children from nuclear families has significantly lower physical activity score. Primary students has higher PAQ score than the others.

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