Original Research Article

Assessing Knowledge on Asthma Self-Care Among School-Aged Children in Bangladesh: A Study of Demographic Influences

ABSTRACT

Background: Asthma is a common respiratory illness in children that causes episodes of bronchial spasm and makes it difficult to breathe. Common triggers include allergens, respiratory infections, irritants, physical activity, and family history. Children with asthma often exhibit symptoms such as nighttime coughing, wheezing, and fatigue during activities. India and the US have high incidence rates of childhood asthma, with the US reporting 6.8 million children with asthma in 2012. Proper self-care management, including allergen control, medication use, exercise, and healthy habits can help prevent worsening of symptoms.

Objective: This study aims to assess the level of knowledge on asthma self-care among school-aged children with asthma in certain schools and to determine the relationship between their knowledge score and demographic factors. The ultimate goal is to create a self-management information pamphlet for asthma.

Methods: The study aimed to evaluate the knowledge of self-care management for schoolchildren with asthma in selected schools in Bogra, Bangladesh. A quantitative research approach with a descriptive design was used to collect and analyze data from 105 schoolchildren with asthma between the ages of 10-16 years. The study consisted of two variables, knowledge of self-care management of asthma and demographic variables such as age, sex, religion, etc. The data was collected using a structured questionnaire with 42 items, which was given a score based on the correctness of answers. The validity and reliability of the tool was assessed. The collected data was analyzed using descriptive and inferential statistics to meet the objectives of the study. An information booklet on self-care management of asthma was also distributed to the participants.

Result: A study of 105 school children on their self-care management of asthma was conducted. The respondents were categorized based on age, sex, and class. The data was analyzed using chi-square test and showed that age, sex, and class had an effect on the children's knowledge. The highest percentage of moderate knowledge was found in 11-12 year-olds (51.35%), female respondents (18.18%), and 6-7th standard students (49.12%). The results were not statistically significant (p-value > 0.05). The data also showed a relationship between some socio-demographic characteristics (age group, class studying, area of residence, and marital status of parents) and knowledge level, while other characteristics (sex, religion, family income, education of parents, occupation of parents) did not have a significant relationship. The study showed that some socio-demographic characteristics have an effect on children's knowledge of self-care management of asthma, while others do not.

Conclusion: This study provides insights into characteristics of asthmatic school children and their families. Most respondents had moderate knowledge about asthma. The marital status, education, occupation, duration of asthma, and health problems in the family did not significantly impact the knowledge level. Further research is needed to understand the determinants of knowledge about asthma in these populations.

Keywords: Asthma, Family history, Self-care management, Bangladesh

1. INTRODUCTION

Acute illnesses in babies and children are often brought on by respiratory tract infections. Asthma is one of the most prevalent pediatric infections in children. [1] A breathing disorder called asthma is characterized by episodes of bronchial spasm that make it difficult to breathe. [2] Asthma affects over 5 million children under the age of 18. Children with asthma are limited from engaging in everyday activities like going to school and playing, for example, every year. [3]

Dust mites, chalk dust, animals, chemicals, strong odors, airborne allergens like pollen, animal dander, mold, cockroaches, and dust mites, respiratory infections like the common cold, physical activity (exercise-induced asthma), cold air, air pollutants and irritants, such as smoke, and family history are all common asthma triggers that can be found in schools. [4] Poverty, black race, maternal smoking, big families, severe allergy exposure, and respiratory illness in infancy are significant risk factors for the development of asthma in children. [5]

Children who have asthma often exhibit nighttime coughing or wheezing that worsens with exercise, fatigue during activities, and other signs and symptoms. [6] Bronchitis, emphysema, symptoms that interfere with sleep, work, or leisure activities, and a persistent constriction of the bronchial tubes (airway remodeling) that affects breathing are some of the typical consequences of asthma. [7] The Indian subcontinent, Asia-Pacific, Eastern Mediterranean, and Northern and Eastern Europe all had the lowest incidence rates (5%). [8]

Although asthma may develop at any age, 80% to 90% of kids have their first symptoms between the ages of 4 and 8 years old. In the USA, children had a greater frequency of asthma than adults during 2008 to 2010. In 2010, one or more asthma episodes were experienced by three out of every five youngsters who had the condition[9]. In the United States in 2012, 6.8 million children have asthma, according to Asthma Surveillance Data. In the USA, 8.3% of children had asthma in 2013. 9 In Bangalore, 30% of youngsters had asthma in 2007, according to Times of India. In Bangalore, we discovered that 25.5% of children were affected in 2009. [10] About one out of every twelve children in India had asthma in 2014, according to a budgetary report from the Union Health Minister. India has 20–28 million instances of asthma, with a 10-15% incidence rate among children (5–11 years old). 30 percent of Bangalore's youngsters had asthma in 2014. In Delhi, children with asthma accounted for 11% of all cases in 2015. [11]

It is a comprehensive term that includes lifestyle (sporting activities, recreation, etc.), general and personal cleanliness, nutrition (kind and quality of food ingested), and environmental influences (living conditions, social habits, etc.) self-medication and socioeconomic variables (such as income level and cultural views). [12] Asthma patients and their families are given care and encouragement as part of self-management support in order to assist them recognize their essential role in controlling their condition, make educated choices about their treatment, and adopt healthy behaviors. [13]

Allergen control, correct medication usage, exercise, a balanced diet, enough oral fluid, enough sleep, right posture, proper inhaler use, personal cleanliness, good breathing practices, and self emotional control are only a few ways to maintain the basic self-care management of asthma.[14] Chronic bronchial inflammation may result from untreated asthma. Damage will result from this. In the end, it will lower people's quality of life. [15] Schoolchildren with asthma may be at danger from physical education since episodes are likely to happen all the time. [16] To address the escalating asthma issue in the US, the

National Asthma Education and Prevention Program (NAEPP) was launched in March 1989. [17]

2. METHODS

2.1 Research approach: The study adopted a quantitative research approach in view of the nature of the problem and the objectives to be accomplished. This approach helps to collect and analyze data effectively, accurately and economically.

2.2 Research design: The study employed a Descriptive design to assess knowledge regarding self-care management of asthma. The design provides a backbone structure to the study and helps to obtain answers to the research questions.

2.3 Variables under study: Two types of variables were identified in the study: the research variable (knowledge regarding self-care management of asthma) and demographic variables (age, sex, religion, class, type of family, parents' educational status and occupation, number of siblings, monthly income, presence of asthma, management at home, previous knowledge about asthma, source of information, type of house, number of windows, pet animals and plants, and sports).

2.4 Setting of the study: The study was conducted in 11 selected schools in Bogra, Bangladesh, including Angels High School, Florence High School, Sarvodaya National Public School, and others. The setting was selected due to the availability of samples, feasibility of conducting the study, and ethical clearance.

2.5 Study population: The target population of the study was school children with asthma in the selected 11 schools in Bogra, Bangladesh, with a total population of 4661. The accessible population for the study was school children with asthma who were available and willing to participate in the study.

2.6 Sample and sample size: The sample size of the study was 105 school children with asthma in the age group of 10 to 16 years who fulfilled the inclusion criteria and were studying in the selected 11 schools in Bogra, Bangladesh.

2.7 Sampling technique: The study employed a purposive sampling technique to select the most appropriate school children with asthma as study participants. This technique was considered appropriate for the study.

2.8 Criteria for sample selection: Inclusion criteria for the sample selection were children who were available at the time of data collection, could understand Kannada or English, and were willing to participate in the study. Exclusion criteria were children with asthma who were not willing to participate in the study or had already attended an awareness program.

2.9 Data Collection Process: The study was conducted in three phases. In Phase 1, the investigator obtained permission to conduct the study in selected schools at Bogra, Bangladesh. In Phase 2, the investigator established rapport with the subjects and explained the nature of the study, confidentiality, and cooperation required. The main study was conducted by selecting 105 samples from 11 schools at Bogra, Bangladesh. In Phase 3, after obtaining consent, the investigator administered the structured questionnaire. The data collected was processed daily.

2.10 Description of Tool: The researcher used a structured questionnaire to assess school children's knowledge on self-care management of asthma. The tool consisted of two parts,

with a total of 42 items. Part 1 consisted of 9 questions on general information on asthma and Part 2 consisted of 33 questions on self-care management. The items were constructed in consultation with experts and reviewed literature, and each item had four alternative responses.

2.11 Scoring Procedure: The items were given one score for a correct answer and zero for a wrong answer. The total score was 42, and it was classified as Inadequate knowledge (≤ 50%), Moderate knowledge (51% - 75%), and Adequate knowledge (≥ 75%).

2.12 Validity of the Tool: The validity of the tool was assessed using a four-point rating system: very relevant, relevant, not relevant, and needs modification.

2.13 Reliability of the Tool: The reliability of the tool was assessed by the degree of consistency with which it measured the attribute it was supposed to measure.

2.14 Data Collection Process: The investigator introduced themselves to the subjects and explained the purpose of the study. The structured questionnaire was administered, and time was given to fill it out. After collecting the filled forms, the answers were recorded and the respondents were thanked. An information booklet on self-care management of asthma was also distributed.

2.15 Plan for Data Analysis: The data collected was analyzed using descriptive and inferential statistics to meet the objectives of the study.

3. RESULTS

This is a data analysis of the knowledge level of school children on self care management of asthma. The data was collected from 105 respondents, who were classified based on their age group, sex, and class studying. The data was analyzed using chi-square test and the p-value was calculated to determine the level of significance.

The results of the Table 1 analysis show that the age group, sex, and class studying have an effect on the knowledge level of school children on self care management of asthma. For the age group 11 to 12, the percentage of respondents with inadequate knowledge was 48.65% and the percentage of respondents with moderate knowledge was 51.35%. For the age group 13 to 14, the percentage of respondents with inadequate knowledge was 37.5% and the percentage of respondents with moderate knowledge was 62.5%. For the age group 15 to 16, the percentage of respondents with inadequate knowledge was 80% and the percentage of respondents with moderate knowledge was 20%.

In terms of sex, the percentage of male respondents with inadequate knowledge was 49.18% and the percentage of male respondents with moderate knowledge was 50.82%. The percentage of female respondents with inadequate knowledge was 81.82% and the percentage of female respondents with moderate knowledge was 18.18%.

In terms of class studying, the percentage of respondents from 6th to 7th standard with inadequate knowledge was 50.88% and the percentage of respondents with moderate knowledge was 49.12%. The percentage of respondents from 8th to 9th standard with inadequate knowledge was 76.32% and the percentage of respondents with moderate knowledge was 23.68%. The percentage of respondents from 10th standard with inadequate knowledge was 70% and the percentage of respondents with moderate knowledge was 30%.

The chi-square test showed that the age group, sex, and class studying had a significant effect on the knowledge level of school children on self care management of asthma. However, the p-value was greater than 0.05, indicating that the results were not statistically significant.

Table 1: Association between Selected demographic variables

Characteristics	Category	Respondents Number	Knowledge level				χ^2 Value	P Value
			Inadequate		Moderate			
			n	%	n	%		
Age group (years)	11 to 12	37	18	48.65	19	51.35	6.43*	>0.056 df=2
	13 to 14	48	18	37.50	30	62.50		
	15 to 16	20	16	80.00	4	20.00		
Sex	Male	61	30	49.18	31	50.82	4.46*	>0.054 df=1
	Female	44	36	81.82	8	18.18		
Class studying	6-7th Std	57	29	50.88	28	49.12	7.17*	>0.056 df=2
	8-9 Std	38	29	76.32	9	23.68		
	10th Std	10	7	70.00	3	30.00		
Type of family	Nuclear	83	50	60.24	33	39.76	5.77*	>0.053 df=1
	Joint	22	18	81.82	4	18.18		
Area of Residence	Urban	94	65	69.15	29	30.85	6.52*	>0.053 df=1
	Rural	11	3	27.27	8	72.73		
Religion	Muslim	87	60	68.97	27	31.03	0.74 NS	>0.052 df=3
	Hindu	15	3	20.00	12	80.00		
	Others	3	2	66.67	1	33.33		
Family income/month	Below BDT. 5,000	11	5	45.45	6	54.55	3.06 NS	>0.052 df=3
	Rs.5,001-10,000	43	30	69.77	13	30.23		
	Rs.10,001-20,000	34	21	61.76	13	38.24		
	Above BDT.20,000	17	13	76.47	4	23.53		
Marital status of parents	Living separately	7	2	28.57	5	71.43	6.93*	>0.053 df=1
	Living together	98	66	67.35	32	32.65		
Education of Father	Illiterate	4	2	50.00	2	50.00	2.03 NS	>0.058 df=3
	Primary	24	15	62.50	9	37.50		
	Secondary	41	29	70.73	12	29.27		
	Graduate	37	24	64.86	13	35.14		
Education of Mother	Illiterate	5	2	40.00	3	60.00	5.38 NS	>0.057 df=3
	Primary	28	22	78.57	6	21.43		
	Secondary	44	27	61.36	17	38.64		
	Graduate	27	19	70.37	8	29.63		
Occupation of Father	Government	23	14	60.87	9	39.13	1.08 NS	>0.056 df=2

	Private	34	25	73.53	9	26.47		
	Self employed	48	30	62.50	18	37.50		
Occupation of Mother	Government	8	5	62.50	3	37.50	0.74 NS	>0.053 df=3
	Private	10	8	80.00	2	20.00		
	Self employed	11	7	63.64	4	36.36		
	Housewife	76	50	65.79	26	34.21		
School children suffering from Asthma (years)	From Childhood	18	12	66.67	6	33.33	2.46 NS	>0.059 df=4
	01 to 02	42	29	69.05	13	30.95		
	03 to 04	22	12	54.55	10	45.45		
	5	11	9	81.82	2	18.18		
	Above 5	12	9	75.00	3	25.00		
Family members suffering from Asthma	Yes	41	26	63.41	15	36.59	0.02 NS	>0.053 df=1
	No	64	42	65.63	22	34.38		
Relationship	Parents	39	21	53.85	18	46.15	2.47 NS	>0.057 df=3
	Siblings	14	5	35.71	9	64.29		
	Others	4	2	50.00	2	50.00		
	No	48	42	87.50	6	12.50		
Health problems in family	Yes	57	42	73.68	15	26.32	5.16	>0.053 df=1
	No	48	26	54.17	22	45.83		

*** Significant at 5% Level, NS : Non-significant**

4. DISCUSSION

The results show that different characteristics of the respondents are associated with different levels of knowledge. For example, among the age groups, the 11 to 12 year-olds had a higher percentage (51.35%) of moderate knowledge compared to the 15 to 16 year-olds (20%). Additionally, female respondents had a higher percentage (81.82%) of moderate knowledge compared to the males (50.82%).

When considering the type of family, the respondents from nuclear families had a higher percentage (60.24%) of moderate knowledge compared to those from joint families (18.18%). Similar results were found when considering the area of residence, religion, and family income.

The $\chi 2$ value and p value are also provided for each characteristic, which represents the level of statistical significance between the knowledge level and the characteristic. A low p value (usually <0.05) indicates a significant association, while a high p value (>0.05) indicates no significant association. For example, the p value for the type of family was >0.053, which means that there is no significant association between the type of family and the knowledge level of the respondents.

These data show the relationship between various socio-demographic characteristics (age group, sex, class studying, type of family, area of residence, religion, family income, marital status of parents, education of parents, and occupation of parents) and the knowledge level of respondents (inadequate and moderate). The data is presented in a tabular format, where

each row represents one characteristic and each column provides the number and percentage of respondents who fall into each category (inadequate or moderate) within each characteristic. The final two columns present the chi-squared test statistic ($\chi 2$ value) and the p-value, which indicates the level of statistical significance of the relationship between the characteristic and the knowledge level of the respondents. A p-value of <0.05 is considered significant.

The data shows that there is a significant relationship between the socio-demographic characteristics and the knowledge level of the respondents for some of the characteristics, such as age group (11-12 years), class studying (6-7th std), area of residence (urban), and marital status of parents (living separately). For other characteristics, such as sex, religion, family income, education of parents, and occupation of parents, there is no significant relationship between the characteristics and the knowledge level of the respondents (p-value > 0.05).

The data reflects the relationship between the characteristics of school children suffering from asthma and their knowledge level about the disease. The number of respondents who have moderate knowledge about asthma is higher compared to those who have inadequate knowledge. The marital status of parents and the health problems in the family do not have a significant impact on the knowledge level of children with asthma. The education of both father and mother and the occupation of parents also show non-significant results with regards to the knowledge level. The family history of asthma and relationship with family members also do not show any significant impact on the children's knowledge level. The length of time a child has suffered from asthma also shows no significant difference in their knowledge level.

4. CONCLUSION

The data analyzed in this study provides some insight into the characteristics of school children suffering from asthma and their families. The majority of the respondents had moderate knowledge about asthma, and the data showed no significant impact of the marital status of parents, education of parents, occupation of parents, duration of children suffering from asthma, family members suffering from asthma, and health problems in the family on the knowledge level of the respondents regarding asthma (P value > 0.05). This suggests that other factors may play a more significant role in determining the knowledge level of the respondents regarding asthma. Further research is needed to fully understand the determinants of knowledge about asthma in school-aged children and their families.

ETHICAL APPROVAL

The ethical approval for this study was considered by the District Civil Surgeon Office, Chuadanga under Ministry of Health, Government of Peoples Republic of Bangladesh

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