

IMPACT OF SCHOOL ABSENCE ON ACADEMIC PERFORMANCE OF SCHOOL CHILDREN WITH ASTHMA IN ENUGU, NIGERIA

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Abstract

A number of factors are thought to influence the academic performance of children with asthma and absence from school is one. Reports on the impact of school absences on the academic performance of children with asthma are limited and the findings are inconsistent. The impact of school absences on the academic performance of children with asthma in Enugu, Nigeria is determined in this study. Children with Asthma (Subjects) aged 5–11 years were recruited consecutively at the weekly asthma clinic of the University of Nigeria Teaching Hospital (UNTH) Enugu, Nigeria. Their age-, sex- and socio-economic class - matched non- asthmatic classmates (Controls) were recruited from the school. The total number of days of school absence for 2012/2013 academic session was obtained for each pair of pupils from the class attendance register. Academic performance was assessed using the average of the overall scores in the three term examinations of same session. The median number (range) of days of absence from school for the entire study population was 6 (1 - 41) days. The median number (range) of days absent from school was 9 (1 - 29) days for the subjects and 3 (1 - 41) days for the controls. The difference was highly statistically significant ($U = 5103$, $p < 0.001$). The number of controls who had average and good academic performance was higher than that of subjects. However there was no significant association between academic performance and school absence in both subjects ($\chi^2 = 3.92$, $d.f = 2$, $p = 0.141$) and controls ($\chi^2 = 0.59$, $d.f = 1$, $p = 0.444$). We concluded that although children with asthma miss more school days than their non -asthmatic classmates, this does not significantly affect their academic performance.

Keywords: Asthma, School absence, Academic performance, Children

Introduction

Asthma is one of the most common chronic illnesses among children, affecting over six million children globally (Masoli et al. 2004). Children with asthma, similar to children with other chronic illnesses, are at the intersect of the health and education systems and are expected to compete with non-asthmatic counterparts in the same classroom under the same learning conditions (Bateman et al. 2008).

Asthma has been reported to be one of the most common causes of school absenteeism among chronic health conditions in childhood and increased absenteeism by school children with asthma has been well documented (Taras and Potts–Datema, 2005; Krenitsky- Korn, 2011; Gutstadt et al. 1989; Bender, 1995; Baxter et al. 2011). Frequent attacks in children could lead to a significant number of days of absence from school and this can affect their academic performance (Taras and Potts–Datema, 2005;

Diette et al. 2000). However, although school absence in children with asthma has been studied, reports on the relationship between school absence and academic performance in children with asthma are inconsistent (Taras and Potts–Datema, 2005; Moonie et al. 2008; Silverstein et al. 2001; Krenitsky-Korn, 2011; Gutstadt et al. 1989). While some studies have documented an inverse relationship between school absence and academic performance in children with asthma, others reported that there was no relationship or even the reverse. Baxter and colleagues (2011) in their study similar to that of Moonie and Co (2008) observed an inverse relationship between absenteeism and academic attainment among children with asthma. However, Gutstadt and colleagues (1989) reported that school absenteeism was not associated with academic performance among children with asthma. They argued that although children with asthma tend to miss more school

days than their non- asthmatic colleagues; it did not significantly affect their academic performance.

This study compared days of absence from school between children with asthma (Subjects) and those of their classmates without asthma (Controls) who are of the same age, sex and socio-economic class and assessed the impact if any of school absences on the academic performance of these children.

MATERIALS AND METHODS

Primary school-aged children with asthma attending the weekly asthma clinic of the University of Nigeria Teaching Hospital (UNTH), Enugu were the study population. Consecutive children with asthma aged 5–11 years who had been in the same primary school for over one academic session during the study period (September 2012 – August 2013) were recruited. Before enrollment, in order to ascertain eligibility, necessary data (including age, sex, school, class, medical history, occupation and education of both parents) were obtained from the accompanying parent/caregiver of the asthmatic child and the child subsequently assessed clinically for chronic and debilitating medical conditions such as heart disease, seizure disorders and cerebral palsy that are known to affect academic performance independently (Perrin, 1996). The control group consisted of normal classmates of the children with asthma as proposed by Richard and Burlew (1997). The minimum sample size was estimated at 117, based on the estimated prevalence of 50% when prevalence is not known (Araoye, 2003). One hundred and twenty children with asthma who satisfied the inclusion criteria were recruited after informed consent were obtained from their parents/caregivers.

At the schools, the non-asthmatic children who were of the same age, sex and socio-economic class as the children with asthma were selected as controls from their school register. A total of one hundred and twenty pupils were selected as control group. The home of each of the selected controls was visited for informed consent and for the completion of the study questionnaire. They were also assessed clinically for chronic and debilitating medical conditions such as heart

disease, seizure disorders and cerebral palsy that are known to affect academic performance independently before enrollment (Perrin, 1996). The total number of days of school absence for the academic session was obtained for each pair of pupils from the class attendance register. High absence was taken as > 12 school days' absence in the session while low absence was \leq 12 school days' absence as recommended by Weitzman and colleagues (1982). There was no validated academic achievement measure in Nigeria; hence this study, similar to earlier related studies (Ezenwosu et al. 2013; Ibekwe et al. 2008), employed the use of school examination report. The average overall score in percentage for each child in each of the three term examinations for 2012/2013 academic session was calculated as a measure of the overall score academic performance of the child. Also the average of the scores for the academic session for each of the children in each of the four key subjects (English, Mathematics, Social Studies and Sciences) expressed in percentage, was used as a measure of their specific academic performance. These represented the academic performances (Overall and specific) and were further graded as high (\geq 75%), average (50 – 74%) and low (< 50%). Those with low scores were considered as having poor academic performance. This measure has been used previously for the assessment of academic performance of school children (Akpan et al. 2010; Ibekwe et al. 2008; Ogunfowora et al. 2005; Ezenwosu et al. 2013). However, varying standards between individual teachers may affect this measurement approach.

Socio-economic status was determined using the occupation and educational attainment of both parents and their substitutes as proposed by Oyedeji (1985). Class I represented the highest social class and class V the lowest. Each parent was scored separately by finding the average score of the two factors (occupation and educational level). The mean of the scores for the father and mother approximated to the nearest whole number was chosen as the social class of the child.

Health Research Ethics Committee of UNTH, Enugu approved the study and the Enugu State Ministry of Education gave

clearance before the study was commenced. Means of academic performance and socio-economic class that were not normally distributed were compared using the Mann-Whitney U test. The significance of association between categorical variables was determined using chi-square. The level of significance was taken as $p < 0.05$.

RESULTS

A total of 240 children comprising 120 subjects and 120 controls were enrolled in the study. They were selected from 105 primary schools within Enugu metropolis. Out of the 105

primary schools, 60 were public schools from where 77 subjects and controls each were enrolled while 45 were private schools from where 43 subjects and controls were enrolled.

Table 1 show the age and sex distribution of the subjects and controls. There were 81 (67.5%) males and 39 (32.5%) females (male: female ratio 2.1:1) in each group. The age range was 5 to 11 years while the mean age \pm standard deviation (SD) was 8.20 ± 1.92 years. Seventy-Five percent (75%) of the children (subjects and controls) in this study were from the higher socioeconomic classes I and II.

Table I: Age and sex distribution of the subjects and controls.

Age (years)	Subjects		Controls	
	Male (%)	Female (%)	Male (%)	Female (%)
5 – 8	45 (55.6)	24 (61.5)	45 (55.6)	24 (61.5)
9 – 11	36 (44.4)	15 (38.5)	36 (44.4)	15 (38.5)
Total	81 (100.0)	39 (100.0)	81 (100.0)	39 (100.0)

$\chi^2 = 0.39, d.f = 1, p < 0.535$

During the academic session under study, the median number (range) of days of absence from school for the entire study population was 6 (1 - 41) days. The median number (range) of days absent from school was 9 (1 - 29) days for the subjects and 3 (1 - 41) days for the controls. The difference was highly statistically significant ($U = 5103, p < 0.001$). The median number (range) of days of school absence of the subjects with poor asthma control (8 (1 - 29) days) was not significantly different from that of those with good control (7 (1 - 41) days) ($U = 1259.50, p = 0.581$). Out of the 120 subjects and controls studied, only 18 subjects (15%) did not miss any school day compared to 42 (35%) of controls. Among the 102 subjects who missed school days, 36 (35.3%) had high school absence while 66 (64.7%) had low school absence. Among the 78 controls who missed school days, twenty-one (26.9%) had high school absence and 57 (73.1%) had low school absence. The prevalence of high school absence was significantly higher in subjects compared to controls ($\chi^2 = 5.18, p = 0.023$).

Out of the 69 male subjects that missed school, 21(30.4%) had high absence and 48 (69.6%) had low absence while out of the 51 male controls that missed school, 21(41.2%) had

high absence and 30 (58.8 %) had low absence. The difference in the prevalence of high school absence in male subjects compared to male controls was not statistically significant ($\chi^2 = 1.49, p = 0.223$). Out of the 33 females subjects that missed school, 15 (45.5%) had high absence and 18 (54.5%) had low school absence while all the 27 (100.0%) female controls that missed school had low absence. The difference in the prevalence of high school absence in female subjects compared to female controls was statistically significant ($\chi^2 = 16.36, p < 0.001$).

Forty eight subjects (40%) had a history of hospital admission which ranged from 1 to 5 days and 48 (40%) had emergency room visits of 1-5 times in the previous one year. Thirty-five percent of all the subjects had acute asthma attacks as the only reason for hospital admission. Majority (77.8%) of the asthmatics who had hospital admissions had an average hospital stay of one to three days before discharge. High school absence in the subjects was significantly associated with hospital admissions and emergency room visits ($c^2 = 16.08; d.f = 1; p < 0.001$).

The comparison of academic performance and school absence in subjects and controls is as shown on Table II. Six (5%) subjects had poor academic performance while

performance. These six subjects with poor academic performance however had low school absence and none of the subjects or controls with high school absence had poor academic performance. The number of controls who had average and good academic performance was higher than that of subjects. However there was no significant association between academic performance and school absence in both subjects

($\chi^2 = 3.92$, d.f = 2, $p = 0.141$) and controls ($\chi^2 = 0.59$, d.f = 1, $p = 0.444$).

Table III compared the age specific differences in median number of days of absence from school between subjects and control. The subjects at ages 5, 6 10 and 11 years had more days of absence from school compared to controls (ages 5 ($p < 0.001$), 6 and 10 ($p = 0.025$) and 11 ($p < 0.001$)).

Table II: Association between academic performance and number of days absent of subjects and controls

School Absence	Academic performance of subjects			Academic performance of controls		
	Poor n (%)	Average n (%)	Good n (%)	Poor n (%)	Average n (%)	Good n (%)
Low	6 (9.1)	21 (31.8)	39 (59.1)	0 (0.0)	27 (47.4)	30 (52.6)
High	0 (0.0)	15 (41.7)	21 (58.3)	0 (0.0)	12 (57.1)	9 (42.9)
Total	6 (5.9)	36 (35.3)	60 (58.8)	0 (0.0)	39 (50.0)	39 (50.0)
χ^2 /d.f/ p value	3.92/2/0.141			0.59/1/0.444		

Table III: Age specific comparison of school absence between subjects and controls.

Age (years)	Number of days of Absence		Mann-Whitney U	p -value
	subjects Median (Mean rank)	controls Median (Mean rank)		
5	12.00 (24.75)	5.500 (12.25)	49.50	< 0.001
6	6.00 (5.00)	0.00 (2.00)	0.01	0.025
7	6.50 (20.00)	2.00 (17.00)	135.00	0.372
8	6.50 (27.95)	10.00 (33.05)	373.50	0.255
9	8.00 (25.81)	6.500 (23.19)	256.50	0.512
10	3.00 (5.00)	0.00 (2.00)	0.02	0.025
11	12.50 (32.00)	0.000 (17.00)	108.00	< 0.001

DISCUSSION

In this study, school absence was significantly higher among the subjects. This finding is similar to previous reports on asthma (Krenitsky- Korn 2011; Gutstadt et al. 1989; Fowler et al. 1992; Le Louarn and Schweitzer, 2004; Bender, 1995; Wang et al. 2005; Doull et al. 1996) and other chronic ill-health (Taras and Potts–Datema, 2005; Javad et al. 2014). The reason could be the frequent routine follow-up visits and recurrent attacks resulting in frequent hospitalization found among the subjects in this study which is also in keeping with the reports from some earlier studies (Liu et al, 2007; Taras and Potts–Datema, 2005; Moonie et al. 2008; Shohat et al.

2005; Silverstein et al. 2001; Sundberg et al. 2007; Moonie et al. 2006; Halbert et al. 2009).

Although there was higher school absence among the subjects, this did not affect their academic performance. This finding aligns with that of Moonie and colleagues (2008). The reason for the lack of significant effect of school absence on academic performance of the subjects could be because a greater percentage of them were from the higher socio-economic class as children in the higher socio- economic class are known to perform better academically compared to those in lower socio-economic class who are faced with poor motivation, unsatisfactory home environment and neglect, poor class

housing and nutrition (Karadel and Kulkarni, 2005; Ong et al. 2010; Ozmert et al. 2005). Therefore the subjects in this study who are largely from the higher socio-economic class could have enjoyed good parental motivation coupled with extra lessons at home and school which enabled them to make up academically. In addition, these subjects may have channeled their energy and time away from exercises and other activities that could trigger asthma attacks towards reading and other academic work.

Weitzman and colleagues (1982) in their study noted a negative impact of school absence on academic performance which differs from the finding in this study. Differences in study design and environment between this study and that of Weitzman and colleagues may have accounted for this. While the work by the later was a community-based study in which they studied school absence and its impact on their academic performance of children in the United State of America, this study looked specifically at school absence and academic performance amongst Nigerian children with asthma and compared them with matched classmates without asthma. Similar finding to this study was also reported among children with epilepsy (Ibekwe et al. 2008) and SCA (Ezenwosu et al. 2013) in the same setting with this study.

CONCLUSIONS

Although the mean number of days of school absence was higher in children with asthma, this had no significant impact on their academic performance.

Competing interests

The authors declare that they have no competing interests.

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