

The Influence of Health on Academic Performance among Secondary School Students: A case study of an Urban Secondary School in Kano State, Nigeria

¹Mukhtar A. Gadanya, ²Kabiru Adamu Ahmad

¹Department of Community Medicine,
Bayero University/Aminu Kano Teaching Hospital,
Kano, Nigeria.

²Federal Medical Centre,
Birnin Kudu, Jigawa State.

Email: magadanya.cmed@buk.edu.ng

Abstract

Parents and teachers often put considerable pressure on children to make the most out of their studies and produce a good result. This resulted in the growing interest in the potential factors that influence educational outcome as poor results may have background health problems that further aggravate ongoing academic problems. It is therefore essential to investigate the influence of these factors in order to timely intervene for better outcomes in both health and academic achievement. This was a descriptive cross-sectional study among 143 students of Day Science College Kano Nigeria to determine the prevalence and influence of asthma, enuresis, haematuria, abnormal visual acuity and body mass index with the students' academic performance. Data on asthma, enuresis, haematuria and vision among the students was obtained using pretested questionnaires. Visual acuity was assessed using Snellen's chart while weight and height were respectively taken using weighing scale and stadiometer after which the BMI was calculated. The data was analysed using SPSS computer software and two sample student t-tests was used to determine the association between the average marks of the students and the prevalent health parameters, level of significance was set at P-values less than 0.05. Academic performance was significantly lower among those who reported difficulty in reading their books or reading from the board due to poor vision as compared to those who did not report similar problems. Overweight was found to be associated with better academic performance ($p = 0.01$), potentially from either excessive mental, without physical activity, or better economic status that may be associated with better access to calories and educational materials. Asthma, enuresis, haematuria, visual problem and abnormal BMI are prevalent among the study group. Early diagnosis and treatment of prevalent health conditions among students will help to improve students' wellbeing and academic performance.

Keywords: Academic performance, development, health, student, urban.

INTRODUCTION

Healthy and well-motivated students are more likely to fully participate in the learning activities in school, excel and live a productive life in the future. As students' health is arguably a significant factor in the learning process. Physically or psychologically unfit students may not be able to fully engage in the school activities with consequent poor academic performance in the long run (Eide *et al.*, 2009; Walid & Christine 2010).

*Author for Correspondence

Educational standard is a common topic of public interest in Nigeria because there is often clear failure of government and parental efforts to yield the desired outcomes. Students' results from various examination bodies usually show massive failure with only few students able to get the required grades. The root cause of this menace needs to be explored and carefully addressed in order shape the future of the educational system, students and the country at large. In particular, it is essential to identify factors that influence both students' health and learning so that appropriate interventions can be put in place at the right time. This will in turn promote better learning and improve academic outcomes that are an important pre-requisite for any true development.

There is a complex relationship between student health and academic performance; (Ickovics *et al.*, 2014) with poor health often negatively affecting students' attendance, ability to learn in school and examination grades. Ill health among students affects their growth, retard mental development, and reduce motivation with consequent reduction in their ability to take advantage of learning opportunities at school (Ickovics *et al.*, 2014; Santanu & Saha 2013).

Previous school-based studies shows that a negative correlation exists between certain health problems and academic performance of students at various levels (Eide *et al.*, 2009). Overweight students often have lower grade point averages, while undernourished students have been shown to experience more health problems with consequent decreased attendance, attention, and their overall academic performance compared to their optimum weight colleagues. (Eide *et al.*, 2009; Santanu and Saha, 2013). Academic performance of students will likely improve when students with health problems are identified and treated effectively (Ickovics *et al.*, 2014; Fagbamiye and Durosaro, 2020)

Despite many studies findings on the relationship between health and academic achievement; to our knowledge there are several gaps regarding how health parameters affect students learning and their academic outcome.

What may account for the gaps may be because earlier studies of "health-promoting profiles of students" did not explore much of relationship between health and academic achievement and conceptual models that could help advance the understanding of such relationships are few (Walid& Christine 2010). Also, geographically speaking, the majority of researches that assessed the associations between health/health programmes and academic achievement were undertaken in the USA with fewer studies from the UK or elsewhere. (Eide, Showalter & Goldhaber 2009).

For these reasons, there is ample support for the critical need to study this area, especially in our environment as today's students are the future professionals and are expected to serve as role models.

This paper hopes find out how asthma, enuresis, abnormal visual acuity and body mass index are related to the performance of college students in their first promotional examination.

Findings of this study will provide educational planners and administrators with information about some medical ailments and their correlates and how they affect performance of the students. It will likewise assist in establishing corrective measures with

respect to the disadvantaged students to ensure carrying everybody along. Where applicable, the affected students would be advised to see further medical advice.

Objectives

1. To determine the prevalence of abnormal visual acuity, abnormal body mass index, enuresis and asthma among students of Day Science College, Kano.
2. To determine the influence of health on the academic performance of the students.

METHODOLOGY

This was a descriptive cross-sectional study among students of Day Science College, Kano, Nigeria; an urban secondary school within Kano metropolis conducted in February 2020.

Study population, inclusion and exclusion criteria

All senior students in the second year of study that agreed to participate in the study and sat for the first promotional examination in the school were included. Apparently, ill students, those in other classes and those that did not participate in the recent promotional examination in the school as well as those who refused to give consent for the study were excluded. One hundred and fifty students were given the questionnaire and their weight, height and visual acuity taken.

Sampling method

Respondents were selected using a multistage sampling technique where a class of senior second year students were randomly selected and individual respondents were selected by systematic sampling from a preformed sampling frame at a predetermined sampling interval.

Data collection and analysis

The students were given self-administered questionnaires to fill in order to obtain information on enuresis, asthma, haematuria and vision. A trained research assistant measures the height and weight of the students by respectively using a Stadiometre from which BMI was calculated.

The students were classified (Table 1) based on their BMI according to WHO body mass classification chart (Datar *et al.*, 2004).

Table 1: Classification of body mass index (BMI)

S/N	BMI (kg/m ²)	Class
1	16.00 - 18.49	Underweight
2	18.50 - 24.00	Normal
3	24.01 - 24.99	Overweight
4	25.00 - 29.99	Pre-obese
5	>30.00	Obese

Snellen's chart placed at 6 metres reading distance was used to obtain students' visual acuity (VA). Students using correction lenses were asked to wear it before their VA was assessed. VA of $\geq 6/18$ was considered normal while that $< 6/60$ taken as visual impairment (American Academy of Ophthalmology Preferred Practice Guidelines, 2020).

Average mark of the students in their immediate past examination was used as a measure of their academic performance.

The data generated was collated and analysed using a computer based statistical package for the social sciences (SPSS) version 16.0. Categorical and quantitative variables were

summarised using frequencies and percentages, mean and standard deviation respectively. Two sample student t-test was used to determine statistical association between the appropriate variables at 95% confidence interval and 0.05 level of significance.

Ethical consideration

This study adheres to the dictates of the Helsinki Declaration, ethical clearance and permission to conduct the study were issued by the Health Research Ethics Committee of Kano State and the authority of Day Science College, Kano respectively with number HMB/GEN/488/Vol.1. Written informed consent was obtained from the individual participating students.

RESULTS AND DISCUSSION

A total of one hundred and forty-three observations were recorded. All the students were males with a mean age of 16.1 ± 1.2 years. Majority of the students were of the Hausa ethnic group, constituting 97.3% (139) of the sample, only 4 students were Fulanis. All were Muslims and indigenes of Kano state.

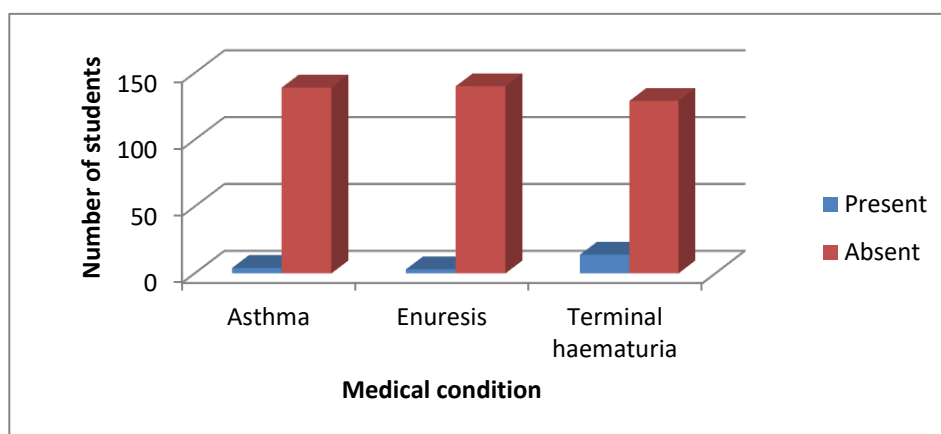


Figure 1: Distribution of students with and without asthma, enuresis and haematuria

Results from the present study revealed that enuresis had a prevalence of 2.1%. This was much lower than (22.2%) and (23.2%) observed from an earlier study carried out among primary school pupils aged 5-16 years in Zaria (Mbibu, 2005) and Port Harcourt (Paulet *et al.*, 2013) respectively. In each of these studies, pupils with enuresis had lower academic performance than their healthy counterparts.

In this study, we also observed that 58% of the subjects were underweight, 1.4% were overweight while 0.7% were obese. The prevalence of abnormal BMI among the study group is 59.8% and that of normal BMI students is 41.1%. A study carried out on weight abnormalities among school children and adolescents in Ota, Ogun state, Nigeria, revealed that weight abnormalities had a much lower prevalence of 22.4% (i.e. 9.0% were underweight, 9.1% overweight, and 4.3% obese) (Asikhia 2010). Both studies indicate that weight excess and deficiency co-exist among school children. However, underweight contribute more to the high prevalence of weight abnormality among the students in this study whereas overweight and obesity together constituted the frequent weight abnormalities observed among the school children and adolescents in Ota.

In this study, students with normal BMI showed significantly lower academic performance than the overweight and obese students (P-values=0.01 and 0.002) respectively. Our study found an unexpected inverse relationship between BMI and academic performance where underweight and obese students significantly performed academically better than those with normal BMI.(Table 2). Similarly, overweight students also performed better than students with normal BMI; however, this relationship was not statistically significant. This finding was in contrast with a similar study in which no significant association or predictive value was found between body mass index and cumulative grade point average (CGPA) among university students in Oyo, Nigeria (Franz and Nkangude, 2014). Likewise, negative correlation between BMI and academic performance was also observed among US high school students (Ickovics *et al.*, 2014).

An inverse relationship between BMI and academic performance may likely be a consequence of other independent factors such as study habit, peer influence, parental support, and students' perception of a course that makes him put in more effort to study (Jaswal 2012). It's also possible there is no association between body-build and school performance.

Table 3: Association between the health parameters and academic performance among the students

Disease condition	n=143	#Mean Mark	Standard deviation	t-value	p-value
Asthma	4	57.2	12.9	0.25	0.8
No Asthma	139	52.8	8.3		
Enuresis	3	54.2	9.56	1.03	0.31
No Enuresis	140	52.9	8.48		
Haematuria	14	49.8	6.94	1.49	1.4
No Haematuria	129	5.3	8.5		
Normal BMI	57	50.3	7.77	2.88¶	0.01*
Underweight	83	54.3	8.07		
Overweight	2	61.5	9.12		
Obese	1	76	0		
Read book	121	53.6	8.17	-2.16	0.03*
Cannot read book well	22	49.4	8.96		
Read board	130	53.4	8.28	-2.07	0.04*
Cannot read board well	13	48.6	8.88		

#Mean mark=average marks of the students in their immediate past examination.* statistically significant¶= ANOVA

The prevalence of students suffering from asthma was found to be 2.8% in this study, and was comparable with 2.4% and 3% observed among school children in Ibadan (Azubuike and Nkanginieme, 2007). No statistically significant association was found between asthma and academic performance. In a related study carried out among school age children with

and without asthma in Enugu, it was found that the performance of asthmatics was comparable to that of their healthy counterparts as. Out of the 128 pupils with asthma and other atopic conditions, (after adjusting for factors such as age and sex) the Intelligent Quotient scores of the atopic children were not found to be statistically different from the non-atopic group (Daramola *et al.*, 2010)

Children with poorly controlled asthma were traditionally believed to have lower school performance likely due to frequent absenteeism at school and low cognitive function from medication side effects (Daramola *et al.*, 2010), this conception was not supported by the findings obtained from this study. This may be due to findings that have shown that children with asthma were mainly known to have limitation in physical activities not their cognitive function. (Ayuk *et al.*, 2013; Daramola *et al.*, 2010).

Asthma, enuresis and haematuria among the students shows no significant effect on their academic performance. However, students who reported difficulty in reading their book or reading from the board due to poor vision were found to have significantly lower academic performance than those that did not report similar problems ($P=0.03$ and $P=0.04$ respectively). On the other hand, overweight and BMI seem to be associated with better academic performance ($p=0.01$), and this may be either due to excessive mental without physical activity, or better economic status that may be associated with better access to calories and educational materials and even private lessons at home.

Haematuria was present among 9.79% of the students and was lower as compared to that obtained from a preliminary study carried out on urinary schistosomiasis among school children in Minna, Nigeria where a prevalence of 52.4% was obtained (Chidozie and Daniyan, 2008). A similar study in Rivers State, Nigeria also found a prevalence of 15.4% (Elele and Ewurun, 2013). The high prevalence of haematuria in the aforementioned studies can be probably explained by the nature of the environments; because these studies were done in riverine areas where urinary schistosomiasis is prevalent. Both macroscopic and microscopic haematuria were included in these studies. No statistically significant association was found between haematuria and academic performance in the present study.

Table 4: visual acuity of the students

S/N	Visual Acuity	Frequency	Percentage%
1	6/60	126	88.1
2	>6/30-6/38	13	9.1
3	>6/24-6/30	3	2.1
4	6/24	1	0.7
Total		143	100

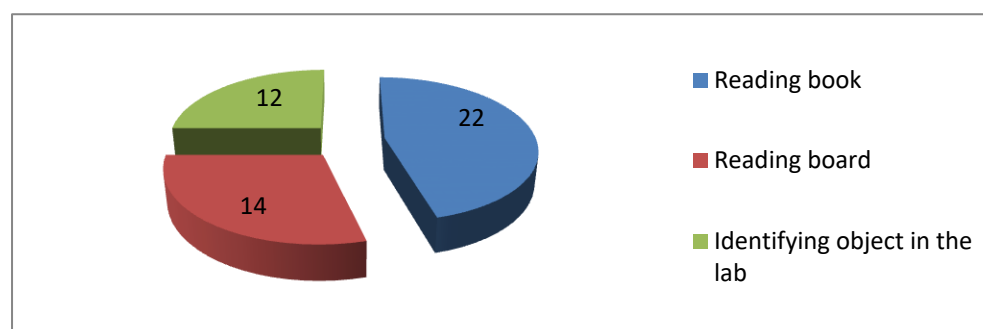


Figure 2: A pie chart showing the number of students with difficulty in reading their book, board or identifying objects in the laboratory due to poor vision.

The prevalence of abnormal visual acuity (VA) among the students was found to be zero percent according to the WHO definition of visual impairment and blindness (Cavalcanti *et al.*, 2012). However, 24% of the students reported having visual difficulties in reading their books and blackboard from their sitting position and had low VA that ranged between 6/24-6/38. Coincidentally, their average mark was significantly lower than that of their classmates who did not reports similar problem.

In a similar study among Singaporean school children, no significant association was found between their average examination marks and VA, (better eye and worst eye, $P=0.27$ and $P=0.16$ respectively) and further analysis yielded no significant predictive effect of VA on academic performance among the students (Adegbehingbe *et al.*, 2005).

CONCLUSION

Good health and education are the foundations upon which we can realise our hopes, make the most of our lives, and explore our true potential.

Asthma, enuresis, weight abnormalities and haematuria were some of the important medical ailments among students of Day Science College, Kano. Each of these medical ailments has an effect on the academic performance of the students to varying degrees. Hence, early diagnosis and treatment of prevalent health conditions among students will help to improve students' wellbeing, academic performance and potentially, life-trajectory.

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