

THE PATTERN OF COMMONER HEALTH PROBLEMS AMONG BASIC SCHOOL CHILDREN, GEZIRA STATE, SUDAN

Salwa E. Hussein, FCM, SMSB

Department of Community Medicine, Faculty of Medicine, Gezira University, Wad Medani, Sudan

خلفية: قلة المعلومات عن حجم المشاكل الصحية وسط أطفال المدارس تعتبر من أهم العوامل لعدم الرضا عن حالة الصحة المدرسية في السودان. إيجاد معلومات صحية من المدارس عن صحة أطفال المدارس سيساعد في ترقية وتعزيز صحة الأطفال بالمدارس.

هدف الدراسة: هدفت الدراسة إلى تحديد نسب الأمراض الشائعة والمشاكل الصحية وسط تلاميذ مرحلة الأساس بمدينة ودمدني والعوامل المؤثرة لحدوثها ومقارنة توزيعها بالمحليتين فيها.

طريقة الدراسة: هذه دراسة مقطعية أجريت على 3862 تلميذاً وتلميذة في نهاية العام الدراسي 2000 – 2001. تم اختيارهم عن طريق العينة العشوائية الطباقية المتعددة المراحل حسب توزيعهم النسبي بالمحليتين وذلك باستخدام استبيان تم تصميمه واختباره وتعديله لجمع المعلومات عن الأمراض وسط أطفال المدارس والعوامل المؤثرة فيها. واستخدمت الأساليب الإحصائية المناسبة للتحليل.

نتائج الدراسة: أوضحت الدراسة أن 77.9% من مجموعة الدراسة أصيبوا بالمalaria 33.3% بالتهاب الزور و26.4% منهم أصيبوا بالمشاكل النفسية والاجتماعية التي أثرت على أدائهم المدرسي و24.5% منهم مصابين بتسوس الأسنان 17.3% أصيبوا بنوبات الإسهال 16.8% أصيبوا بالديدان الدبوسية 12.49% أصيبوا بالخصبة 11.5% أصيبوا بالالتهاب الرئوي 9.2% أصيبوا بالربو و8.9% مصابين بقصور البصر.

الخلاصة: ارتبطت بعض هذه الأمراض والمشاكل الصحية بتدني صحة البيئة المدرسية وخدمات التغذية بها. هذه النتائج ينبغي أن توضع في الاعتبار في التخطيط لبرامج الصحة المدرسية وذلك يمكن تحقيقه بالتدخلات المناسبة لتقليل هذه المشاكل من خلال تحسين البيئة المدرسية ورفع الوعي الصحي للمجتمع المدرسي تجاه هذه المشاكل.

الكلمات المرجعية: الأمراض الشائعة وسط أطفال المدارس ، الجزيرة – السودان

Background: The lack of baseline information on the magnitude of health problems among school children is considered one of the factors of the unsatisfactory status of school health in Sudan. Availability of such data from schools will help in the health promotion of school children.

Objective: To determine the proportions of the commoner diseases or health problems among Wad Medani basic school children (males and females) at the end of the school year 2000-2001.

Method: This is a cross-sectional study conducted on 3862 basic school children (males and females). They were selected by multi-stage stratified proportional random sampling according to their sex and localities. A pre-designed pre-tested questionnaire was used to collect data which were then tabulated and statistically analyzed.

Results: The study revealed that 77.9% of the study group had malaria, 33% of them had sore throat, 26.4% suffered from psychosocial problems that affected their school performance. Dental carries 24.5%, diarrhea attacks 17.5%, oxyuris worm 16.8%, pneumonia 11.5, measles infection 12.4%, asthma 9.2% and visual defects 8.9%. Some of these problems were related to the poor quality of school environment including sanitation and poor nutritional services. These findings should be considered in planning school health programmes. Appropriate interventions to reduce these problems through improving school environment and raising the awareness of the school community towards such problems is recommended.

Key Words: Common health problems among school children in Gezira State-Sudan

Correspondence to:

Dr. Salwa E. Hussein, Department of Community Medicine, Faculty of Medicine, Gezira University, P.O. Box 20, Wad Medani, Sudan E-mail: salwasanousi@yahoo.com

INTRODUCTION

School age children (5-14 years) constitute about 30% of the total population in Sudan.¹ As future parents they need to be acquainted with knowledge and skills necessary for developing healthy attitudes for themselves and their families.² In order to achieve this, we need to know their common health problems, the socioeconomic factors associated with the problems, and the community health issues related to hygiene and school sanitation.³

By determining epidemiological pattern of the disease and health problems among school children, this study will fill an important gap in the school health literature at the state level, and would hopefully provide new facts to help planners to improve the situation. It would also fulfill the recommendation of WHO expert committee on comprehensive school health education and promotion (1997).⁴

It is equally important to improve the use of data by establishing simple school health records to help in the setting up of an efficient school health information system. This would prevent wastage of school health research investment and secure it from the 'data graveyard'.⁴

Indicators of children's health are necessary for planning, implementation and monitoring of school health programmes.⁵ Infectious diseases once expected to be eliminated from significant public health problems, remain the leading cause of death in the world.⁶ Many factors such as social changes, level of health care, food production, human behavior, and environmental changes in public health infrastructure and microbial adaptation have contributed to their persistence and increased occurrence.⁷ Of the non-communicable diseases, asthma is increasing where there is rapid urbanization and industrialization.⁸

In the Gezira state, as in other states in Sudan, school health is meant to be an integral part of the primary health care package. The training of the school teachers as health guides in schools is one of the important strategies to promote school health. These teachers should be oriented towards the commoner diseases among the school children. The overall objective of this study was to survey the epidemiology of common diseases and health problems among basic school children to improve their health status. It aims specifically:

(1) To determine the proportion of basic school children who contracted some infectious diseases and those who had non-infectious disease or chronic illnesses, during school years 2000 – 2001. (2) To determine the factors affecting the occurrence of these diseases. (3) To compare the differences in the distribution of these diseases between the two geographical localities (Medani East and West).

METHODS

This is a cross-sectional study which correlates diseases to some socio-economical and demographic factors in selected school children. The study was conducted in Wad Medani town, the second biggest town in Sudan. It is the capital of Gezira. It consisted of two municipalities (east and west) at the time of the study. The total number of the basic schools were 85. The school children, both males and females, from east and west Medani municipalities (localities) including private schools constituted the target group for this study. Review of the directorates of education in both municipalities have shown that the total number of basic school children was 38620 at the time of the study. The age range of the pupils from the first class to 8th class was 6-15 years. 3862 (t 10%) of basic schools' pupils of Wad Medani were selected by multi-stage stratified random sampling according to their proportional allocations. Two equations to determine sample size for some disease were utilized.^{12,13} The sampling technique was as follows:

Stage One: the proportion of school children in each locality was determined. Accordingly, the sample size of the school children of both sexes for each locality was determined.

Stage Two: the proportion of school children of each school (boys/girls) in each locality was determined, and the sample size for each school (boys/girls) in each locality was calculated.

Stage Three: the proportional representation of school children in each class was determined, the sample size of the school children from each class was calculated, and the sample of school children were selected by simple random sampling. Following the American "Student health history form",³ a questionnaire was designed. It was discussed with the staff of community medicine, Faculty of Medicine Gezira University, the school health coordinators in the Ministry of Health

Gezira State. It was pre-tested and revised before the conduct of the study. The questionnaire addressed the history of some chronic illnesses and some common diseases, contracted by each child during the school year 2000–2001. Emphasis was on age, gender identification and some socio-demographic data. A pilot study was conducted two months prior to data collection for validation. It was modified and finalized before conduct of the study. The case definition of each disease was determined. Any basic school child who had been diagnosed clinically or by laboratory tests, treated and seen by a doctor or medical assistants as a case for the given disease was part of this study. Case definition of malaria was as follows: any basic school child selected for this study, who was diagnosed clinically as malaria or by blood film, proved and treated by a doctor or medical assistant was a case of malaria. For the case definition of asthma, any basic school child from the study group proved by the doctor or the medical assistant to have an intermittent wheezy chest, tightness, or attacks of wheeze or cough was considered a case of asthma.

The researcher trained five health workers to collect the data by interviewing the parents of the young children and the older school children. The school clinical records were consulted to minimize the recall problem. In this study, although locally used terminology was considered, any basic school child selected should fulfill the locally adapted scientific definitions of the diseases and the case definitions provided for the study. The questionnaires from each school were collected in a coded envelope and each selected child was given a code number. An observation checklist was used to determine school environmental factors associated with some of the health problems.

Data were analyzed by using the Statistical Package for Social Sciences version 10 (SPSS). Hypothesis testing and Chi-square test were used to determine the association of socio-demographic factors to some diseases. The level of significance was set at <0.05 throughout the study.

RESULTS

Three Thousand Eight Hundred Sixty Two (about 10%) of Medani Basic School were randomly selected by multistage stratified sampling i.e. 3862 students who responded to the questionnaire

(the younger ones responded through their parents and with the help of their school health guide teachers). However, some respondents did not answer all questions.

The analysis of the questionnaire revealed multi-tribal community; 32 tribes. 9.9% of the mothers and 4.8% of the fathers respectively were illiterate. 34.5% of mothers were housewives. The average size of family members was six. The majority of families were below the poverty level if we consider the annual income per capita around 300 US Dollars (Sudan UNFPA report).

Table 1 shows the top ten most frequent of diseases the school children had during the year 2000-2001. The diseases were listed according to their frequency in a descending order. Malaria headed the list with 77.9% followed by sore throat, which affected 33.1%. 26.4% had psychosocial problems such as having to miss school and problems relating to poverty. 24.5% of the study sample had dental caries. 17.3% had attacks of diarrhea. Oxyuris worm was reported in 16.8% of the school children. 12.4% reported they had measles. There had been pneumonia in 11.3% in the studied population, 9.2 % of the study group had asthma, and in 8.6% there were visual defects.

Table 2 shows the variations in the frequency of some of the diseases in the different geographic locations i.e., east & west Medani. The results reveal that malaria, diarrhea, measles and asthma were reported more frequently by the school children from Medani east, and their results were statistically significant. Oxyuris worm and sore throat appeared to be more among basic school

Table 1: Frequency of the top 10 diseases and health problems among Medani basic school children (sample size, 3862) during 2000-2001

Health problem	Affected Frequency (%)
Malaria	3009 (77.9)
Sore throat repeated	1287 (33.3)
Psycho-social problems affecting school performance	740 (26.4)
Dental caries	947 (24.5)
Diarrhea	667 (17.3)
Oxyuris worm (Entrobiasis)	650 (16.8)
Measles	478 (12.4)
Pneumonia	443 (11.5)
Asthma	355 (9.2)
Visual defect	342 (8.9)

Table 2: Distribution of some diseases among the study group by locality (east and west of Medani) during the year 2000-2001 (sample 3862)

Disease	East		West		Total	Test of significance	
	Yes	No	Yes	No		X ²	p-value*
Malaria	2316	57	693	276	3862	30.751	0.000
Sore throat	985	1908	302	667	3862	2.713	0.100
Asthma	550	1570	143	617	2880	15.554	0.000
Diarrhea	525	2368	142	827	3862	6.198	0.013
Oxyuris	498	2.395	152	817	3862	1.210	0.271
Measles	380	2513	98	871	3862	6.11	0.013

*p<0.05 is significant

Table 3: The association of diarrhea and family income

Family consumption of food per day	Diarrhea		Total
	Yes Freq. (%)	No Freq. (%)	
Insufficient	551 (18.2)	2475 (81.8)	3026
Just sufficient	95 (14.2)	576 (85.8)	671
Average	20 (12.8)	136 (87.2)	156
More than sufficient	1 (1.1)	8 (88.9)	9
Total	667(100)	3195(100)	3862

X²=8.815, p=0.031

children of Medani east than west, but the results were not statistically significant.

Table 3 shows the association of diarrhea to family income. There was a negative association between occurrence of diarrhea and family income. The number of cases decreased with increasing income and the results was statistically significant (p<0.05).

Other diseases were reported in this study as follows: chicken pox (8.6%), ear diseases (7.4%), rheumatic arthritis (7.4%), nocturnal enuresis (7.3%), skin diseases (7.1%), bilharzias in stool or urine (5.3%), whooping cough (4.6%), speech difficulty (2.9%), hearing impairment (2.9%), bone fractures (2.8%), urinary tract disease (2.4%), epilepsy (1.3%), congenital heart disease (1.1%), diabetes (0.8%) and physical disability (0.8%).

DISCUSSION

Malaria headed the list of diseases (77.9% reported cases) in this study. It is the most common disease among the school children in Sudan, as stated by Ageeb.¹⁴ It also headed the list of diseases in the annual reports from Medani health areas in 2000. Malaria was the lead disease reported among children aged 5-14 years in the annual report for admission in Medani pediatrics hospital. The results for malaria in this study

seem very high when considered alongside the prevalence from the blood film surveys conducted by the malaria control programme in Gezira. In 2000, it was 10% in Medani, and 4% in 2001, 1.81% in 2001. This means that malaria was overestimated and over diagnosed by doctors and health workers, thus creating the problem of drug resistance as shown in the study (Blue Nile Project documents). In this study, the cases of malaria reported from Medani east were more than those reported from Medani west. The difference was found to be statistically significant (Table 2). This result could be explained by the fact that 10% of the schools were situated in the area irrigated by the canals of Gezira Project. This is also where most of the school children in these schools lived.

Sore throat is the second most frequent ailment among the studied school children (33.1%). This result is similar to the cases reported on and those in the pediatric hospital. It is however, higher than what was reported by the school health team in Khartoum where 900 in every 10000 school children had sore throat (9%).¹⁴

In this study, dental problems amounted to 24.5%. This could be even higher if a proper dental screening was conducted. It is nonetheless higher than the result of the survey carried out by the school health team in Khartoum.¹⁴

Asthma is a chronic disabling disease. The prevalence of childhood asthma has been reported as varying between 1% and 30% in different populations.⁹ Childhood asthma is underestimated and under-diagnosed particularly in tropical countries.^{10,11} In this study, the prevalence of asthma was 9.3%. Two surveys done in Sudan among Khartoum school children showed a prevalence of 13% and 16%.¹⁰ This indicates that prevalence of asthma was less than the previous

studies done in Khartoum by Ibrahim,¹⁰ in the 1980s (13-16%) and suggests that asthma is as common as it is in developed countries. Our findings are almost similar to those got in the United States (9.2 to 15%) between the years 1983 -85 and 1992-1994,¹⁷ are higher than the prevalence in such countries as Nigeria 2.4%, Zimbabwe 1.4%, Barbados 1.1%¹⁵ and Saudi Arabia 6.6%,¹⁶ but lower than in Saudi Arabia (Riyadh 11.9%, Jeddah 12.6%) and the latest figure of 13% in the United Kingdom.¹⁸

The age, sex and family history were important risk factors for childhood asthma. The commonest age group for asthma in this study was 10 to 14 years with male predominance (Figure 1). It differs from a hospital-based study in which half of the asthmatic children were under five.¹⁹ It is also different from studies conducted during 1980s where the commonest age group was 7-10 years.¹⁰ In this study, the males reported were nearly twice the number of females, indicating that male gender is one of the important risk factors for childhood asthma. This result is similar to a study done in Medani Pediatrics hospital in 1999. In the current study, family history of asthma was an important risk factor just as in the hospital-based study.¹⁹

The higher prevalence of diarrhea 17.3% and oxyuris worm (16.8%) in this study is an important indicator of the school children health status. It is also an indicator of the existing environmental conditions of Wad Medani basic schools. These results are important for the planning of school health programmes in this town as recommended by the expert committee in the report of WHO on comprehensive school health education and promotion (1997).⁴ The findings are similar to those from studies in Egypt which revealed that oxyuris was frequent with high prevalence rates in rural schools.²⁰

Measles in one of the preventable highly infectious diseases, which seems to affect older school children nowadays. In this study, measles was reported from 12.4% of the studied group. The study revealed that measles affected females more than males and the cases increased with age (Figure 2). These results could be due to vaccine failure or the fact that children were vaccinated too early. However, this needs further investigation.

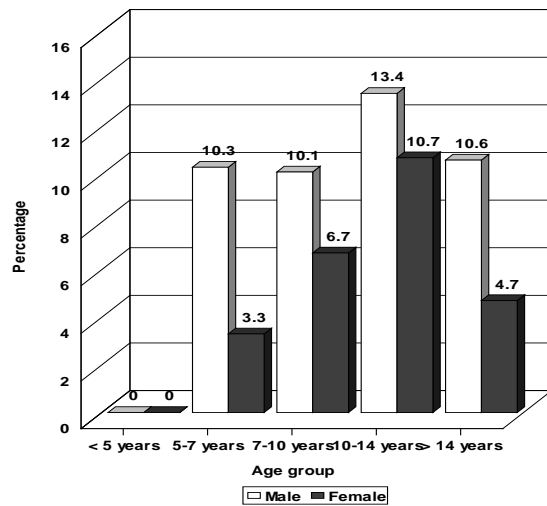


Figure 1: Age and gender distribution of asthma cases among Medani basic school children during 2000-2001

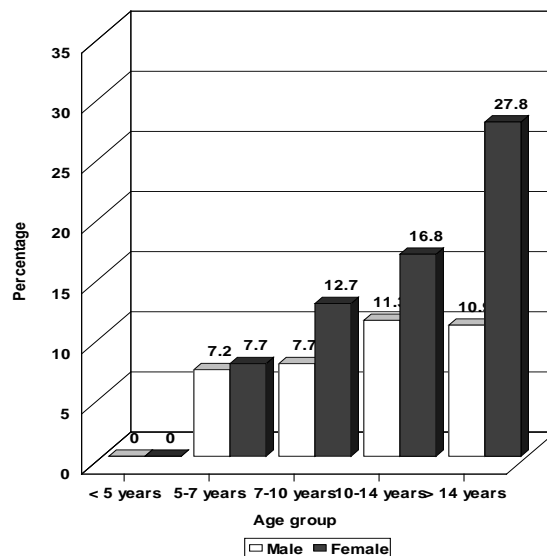


Figure 2: Age and gender distribution of measles cases among Medani basic school children during 2000-2001

The results on measles in this study were similar to those reported in America during the first 26 weeks of 1994, with same pattern of shift in age incidence from preschool age to older age group. The occurrence of measles among vaccinated school children in this study is 12.4% from the studied group, while in the study in Egypt, Tayil revealed that measles appeared in 80% of cases who had been vaccinated and showed seropositivity rate of 86.1% but with no significant variation with age. Accordingly, in Egypt a second dose of measles vaccine was

recommended.²¹ The explanation for the results of this study could be the same as given by Ornstein and Hannman who postulated that such a change in pattern may be due to the failure of the primary vaccine or waning immunity, the presence of unimmunized persons, the children being too young for vaccination or that the immunized children had not been given second dose of measles vaccine.²²

Through incidence density measures Marks, Haplin and Ornstein obtained results that showed that the measles vaccine lost its protective ability gradually during the first 6 years, but the relative risk of getting measles had almost tripled by 10-12 years after immunization. This is the evidence that led to the recommendation that children should be revaccinated at the age of 5 or 6 years.²³ Our results is similar to their findings, hence we recommend a second dose of vaccine in Sudan.

Other diseases were not uncommon, but the lower proportion of skin diseases (7.1%) and Bilharzias found in this study could be explained by the following: The skin disease might be undermined by the pupils, their parents or their teachers.

The lower proportion of bilharzias may be due to the fact that most of the pupils in Wad Medani lived in the town. The few (5.5%) who lived near the Gezira canal had the disease.

CONCLUSION

This study showed that basic school children had many health problems relating to their socioeconomic status, and poor school environment, a condition which should be taken into account in planning school health programmes in Gezira State.

RECOMMENDATION

The school health forms should be revised to include history of common diseases and kept health records of the school children. This should be simple and easy to analyze.

Availability of these forms will help in determining the magnitude of health problems among school children, and will also help in planning health programme to solve these problems. A second dose of measles vaccine when a child starts school is recommended in Sudan.

REFERENCES

1. UNFPA, Sudan documents (1998).
2. Haglund BJA, Pattersson B. Finer D. Tillgren P. Education, issues and problem, creating supportive environment for health. Public health in action 3 WHO, Geneva, WHO publication, 1996, P. 33.
3. Frank H, Walter H. Place of health in today's schools, school health and learning, classic objectives of general education. Turner's school health and health education 7th edition, Sanit Louis, USA, CU Mosby Company, 1976, P.3 & 129.
4. Assessing available infrastructure and situation analysis in WHO, technical report series, report of WHO expert committee on comprehensive school health education and promotion, WHO publication 1997; Geneva:70-2.
5. Indicators for planning and monitoring school health programme in WHO technical report series, report of WHO expert committee on comprehensive school health education and promotion, WHO publication, Geneva, 1997. P. 67.
6. Global health situation and projection estimates. Geneva, World Health Organization, 1992.
7. Bryan RT, Pinner RW, Berkelman RI. Emerging infectious disease in the United States In: Wilson ME Levins R. Spilman A, eds. Disease involution: global changes and emergence of infectious diseases. Annals of the New York Academy of Science 1994: 303-11.
8. Khaled NA, Wnarson DA. Asthma is a common problem, establishing the diagnosis of asthma. In: Management of asthma in adults, a guide for low income countries. Paris, France. International Union Against Tuberculosis and Lung Disease, 1996, P. 3 , 8.
9. Partidge MR, Alwan A. Prevention of asthma and approaches for enhanced care in Eastern Mediterranean Region. East Med Health J 1997; 133-41.
10. Ibrahim SA. Management of childhood asthma in the tropics. Sudan Med J 1990; 80.
11. Speight AWP, Lee DA, Heye EN. Under diagnosis and under treatment of asthma in childhood. BMJ 1983; 286:1253-6.
12. Cochran W. Sampling techniques by John Wiley and Sons. Inc. Canada, 1977.
13. Elnouri AA. Sample size determination, an equation for more than one disease "Unpublished paper".
14. Ageeb A. School Health Programme, policies and strategies of school health at national on state level, some health. Problems of school children. Sudan National school health workshop 1998; P. 7 – 8.
15. Ehrlich RI, Du-ToitD, Jordan E, Volmink JA, Weinberg EG, Zwanestein M. Prevalence and reliability of asthma symptoms in primary school children in Cape Town (abstract). Int J Epidemiol 1995;24(6):1138-45.
16. Frayh A, Abdulbari B. Prevalence of asthma among Saudi school children. Saudi Med J 1992;13(6):521-4.
17. Farber HJ, Wattigney W, Berension G. Trends in asthma prevalence; the Boggalusa Heart study (abstract). Ann Allergy asthma Immunol 1997;78(3):265-9.
18. Strachan DP, Anderson HR, Limb ES, O'Neill A, Wells NA. National survey of asthma prevalence, severity and treatment in Great Britain. Arch Dis Child 1994;70:174-8.
19. Ahmed EA, Habour AB, Musa AA. Childhood asthma risk and Triggering factors. Chest Journal 1999;116(4 suppl2):250S.
20. The state of child health in eastern Mediterranean region by Harfoche JK and Verhostrate; revised by AI Shazili H. 2nd Rev. ed. X, 213P (EMRO Technical Publication Series, 9); Alexandria 1995: p. 157-8
21. Tayil SE, El-Shazyl MK, ElAmrawy SM. Seroepidemiological studies of measles after 15 years of compulsory vaccination in Alexandria, Egypt. East Med J 1998;4(3):437-8.
22. Orestein WA, Hannman AR. Measles elimination. Paediatrics 1986; 77(5):790-1.

23. Jekel JF. In collaboration with Elmore JG and Katz DL.
Method of primary prevention: specific protection.
Epidemiology Biostatistics and preventive medicine. USA
Saunders Text and review series, Saunders Company 1996 pp 208-209