Morbidity Profile of School Children in Rural and Urban Areas of Visakhapatnam – A Comparative Study

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ABSTRACT

BACKGROUND

Children from rural areas and urban slums suffer from poor quality of life. In spite of several health programmes in existence, conditions such as infections, malnutrition etc. continue to be major threats leading to morbidities among school children. This study was conducted to evaluate the various morbid conditions prevailing among school going children and compare the urban and rural scenarios in Visakhapatnam district.

METHODS

A cross sectional study was conducted between November 2018 and October 2019 (1 year) among secondary school children studying in classes 6th to 10th (age between 11 and 15 years) of three randomly selected government schools in urban and rural areas. A total of 800 school going children was considered (400 from three rural and 400 from three urban schools) for the study. Prior approval from the Institutional Ethics Committee was taken for the study. Data was collected by using a pre-tested questionnaire. Clinical examination was conducted to detect any morbidity.

RESULTS

The most common morbid condition was found to be anaemia. The prevalence of anaemia was 47.12 %, followed by nose, throat, and eye conditions (33.87 %, 22.5 % and 30.75 % respectively) and morbidity of oral cavity (30.62 %). The prevalence of skin infections such as pediculosis and tinea and other fungal infections was 24.87 %.

CONCLUSIONS

Children in urban schools were found to be suffering more from skin, nose and throat abnormalities and anaemia as compared to children from rural schools who had ocular problems especially signs of Vitamin A deficiency along with anaemia.

KEYWORDS

Morbidity, School Children, Rural and Urban Areas

BACKGROUND

According to 2011 census, children aged between 5 and 16 years account for 25 % of population in India.[1] Children in this age group are on the threshold of adulthood. Protecting and promoting the health of our children would yield in rich dividends. This age group also involves the early adolescence, where children experience the physiological and psychological changes.[2] They are vulnerable by virtue of their physical, mental, emotional and social status. They are susceptible to various conditions such as infections, malnutrition, stress etc.

School age is a critical time in the development of a human being and the school setting provides a strategic point for improving children's health, self-esteem, life skills and behaviour. Health is a key factor in effective learning and performance in school.[3] Over 2.3 billion school age children spend one third of their time in schools. Schools therefore constitute a unique setting to help children and adolescents to develop a positive outlook on life and help them establish healthy lifestyles.[4]

The changing social and political conditions, also affect the ability of these young children to achieve their full potential, complete school and become economically productive.[5] Especially the children from rural areas and urban slums are found to suffer from poor quality of life.

Schools also provide a site where health promotion and preventive interventions can be implemented and introduce health information and technologies to the community. WHO's Global School Health Initiative, launched in 1995, seeks to mobilise and strengthen health promotion and educational activities at the local, national, regional and global levels. The Initiative is designed to improve the health of students, school personnel, families and other members of the community through schools.[6]

School health programs that coordinate delivery of health education and health services and that provide a healthy environment could become one of the most efficient means for improving wellbeing of the children. Unfortunately, such programs are underdeveloped in most of the nations.[6] In India under National health mission (NHM), the Rastriya Bal Swasthya Karyakram was launched in 2013 with objectives to screen school children for identified diseases and provide early intervention and thus improve quality of life.

Rationale

In spite of several heath programmes in existence, conditions such as infections and malnutrition continues to be a major threat leading to morbidities among school children. Research indicates that malnutrition and poor health are among the most common causes of low school enrolment, high absenteeism, early dropout and poor classroom performance. There are 6.3 lakh schools in India. However, only 8 % the schools have sanitation facilities in school premises, 44 % have water supply facilities, 19 % have urinals and 8 % lavatory facilities. Under these conditions, schools become unsafe places where diseases can be transmitted.[7]

Various studies have been conducted across the country in both rural and urban settings. The important morbid conditions as reported are malnourishment, communicable diseases, skin diseases, eye, ear and dental problems such as refractive errors, otitis, dental caries etc.

Objectives

- To evaluate the various morbid conditions prevailing among school going children and compare the urban and rural scenarios in Visakhapatnam district.
- To understand the morbidity pattern among school children and compare rural and urban scenarios.

METHODS

A descriptive cross sectional study was conducted from November 2018 to October 2019 (1 year) among secondary school children studying in classes 6th to 10th (age between 11 and 15 yrs.) Three govt schools were selected in urban as well as rural areas of Visakhapatnam. 50 % prevalence was considered as per the study quoted.[8] The sample size was calculated as 400 using the formula

$$N = \frac{Z^2(1 - a/2)\, p\, q}{d^2}$$

Where P = 0.5, q = 0.5, & d (L) = 10 % of P.

Therefore, a sample of 400 secondary school children were included in the study in each group i.e. 400 from three urban schools similarly 400 from three schools of rural area making a total of 800.

In sampling technique, multistage random sampling method was followed. First, the list of all coeducational government secondary schools in rural and urban areas functioning under District Education Officer and the Commissioner of Greater Visakhapatnam Municipal Corporation was obtained. Three secondary schools were selected randomly from the urban and rural areas of Visakhapatnam respectively. To include 140 students in each school, one section from each class, i.e. from 6th to 10th, was randomly selected. As per their roll numbers, first twenty - eight students from each of the selected section were interviewed and examined.

Inclusion Criteria

Students studying in classes 6th to 10th in the age group of 11 - 15 years and present on the day of study and consented to participate.

Exclusion Criteria

Students absent on the day of the study or seriously ill. Study tools include pretested semi structured interview schedule, weighing scales, stadiometer and Snellen's eye testing chart for visual acuity. Study variables - age, sex, religion, type of

family, anthropometric measurements (height, weight, BMI), Anaemia based on Palmar Pallor (based on IMNCI Guidelines) clinical signs and symptoms.

Operational Definition

Vitamin A deficiency[9] / Xerophthalmia is the clinical spectrum of ocular manifestations of vitamin A deficiency ranging from the milder stages of night blindness and Bitot spots to potentially blinding stages of corneal xerosis, ulceration and necrosis (keratomalacia). Night blindness (in which it is difficult or impossible to see in relatively low light) and Bitot spots were considered as having vitamin A deficiency in the present study.

Statistical Analysis

Data entry was done using Microsoft EXCEL - 2010. Data analysis was done using SPSS version 21. Test of significance in the form of chi-square test was applied for finding the statistical difference between categorical variables. P value < 0.05 was considered as statistically significant.

IEC Approval and Other Permissions

Prior approval from the Institutional Ethics Committee was taken for the study. Prior permissions from District Education Officer and school Head master was taken to conduct the study. The study was conducted in presence of class teacher consent was obtained from the school children after informing their parents.

RESULTS

This study was conducted among secondary school students studying in classes 6th to 10th and aged between 11 and 15 years.

	Age (in Completed Years)	Rural (400)	Urban (400)	Total
	11	36 (4.50)	57 (7.12)	93 (11.62)
	12	103 (12.87)	99 (12.37)	202 (25.23)
	13	100 (12.50)	86 (10.75)	186 (23.24)
	14	83 (10.37)	104 (13.0)	187 (23.36)
	15	78 (9.75)	54 (6.75)	132 (16.50)
Gender	Female	233 (29.12)	175 (21.87)	408 (50.99)
	Male	167 (20.87)	225 (28.12)	392 (48.99)
Religion	Hindu	370 (46.26)	363 (45.38)	733 (91.64)
	Christian	29 (3.62)	33 (4.12)	62 (7.74)
	Muslim	1 (0.12)	4 (0.5)	5 (0.62)
Type of family	Nuclear	394 (49.25)	383 (47.87)	777 (97.12)
	Joint	6 (0.75)	17 (2.12)	23 (2.87)

Table 1. Distribution of Socio-Demographic Characteristics of the Study Population (N = 800)

The mean age was found to be 12.9 yrs. ± 1.4 SD. Table no 1 shows that there is equal distribution of male and female children in the study. However rural urban distribution shows a greater number of female children in schools of rural areas as compared to urban schools. Majority of them were Hindus. Majority were from nuclear families both in rural and urban areas. (49.25 % & 47.87 % respectively).

Sl. No.	Condition	Frequency (%)
1	Anaemia	377 (47.12)
2	Skin condition (pediculosis, tinea and other fungal infections)	199 (24.87)
3	Ocular morbidity (Refractive Error and Vit. A deficiency)	243 (30.75)
4	Morbidity of Ear (Otitis media and wax)	19 (2.3)
5	Morbidity of Nose (Rhinitis and DNS)	271 (33.87)
7	Morbidity related to throat (upper respiratory tract infections and tonsillitis)	180 (22.7)
8	Morbidity related to oral cavity (mouth ulcers, dental caries, fluorosis)	245 (30.62)

Table 2. Morbidity Profile of Study Population (N = 800)

Table: 2 shows that the most common morbid condition was found to be anaemia. The prevalence of anaemia was 47.12 %, followed by ear and eye conditions (33.87 % and 30.75 %) and morbidity of oral cavity (30.62 %). The prevalence of skin infections such as Pediculosis and tinea and other fungal infections was 24.87 %.

Sl. No.	Organ / System	Frequency (%)
1	Respiratory system	
	NAD	796 (99.6)
	Bronchitis	2 (0.2)
	Asthma	2 (0.2)
2	Gastrointestinal system	
	NAD	632 (79)
	Worm infestation	143 (17.9)
	Gastroenteritis	25 (3.1)
3	Genitourinary system	
	NAD	736 (92)
	Dysmenorrhoea	60 (7.5)
	Menorrhagia	4 (0.5)

Table 3. System-Wise Conditions among the Study Population (N = 800)

The above Table 3 shows the prevalence of various systemic morbid conditions. Among all the conditions, the prevalence of worm infestations was reported in 17.9 % followed by dysmenorrhea (7.5 %) and gastroenteritis among 3.1 % of the children. Asthma and Bronchitis was reported among 0.2 % of the children.

Morbidity Profile		Rural (%) (N = 400)	Urban (%) (N = 400)	Total	P -Value	Odds Ratio (CI)
Anaemia	Present	146 (36.5)	231 (57.75)	377 (47.12)	0.0001	OR = 0.42 (0.316 - 0.55)
	Absent	254 (63.5)	169 (42.25)	423 (52.87)		
Skin related Abnormality	Absent	319 (79.75)	282(70.5)	601 (75.12)	0.0001	OR - 1.64 (1.19 - 2.28)
	Present	81 (20.25)	118 (29.5)	199 (24.87)		
Ocular morbidity	Absent	276 (69)	281 (70.25)	557 (69.62)	0.459	OR = 0.94 (0.06 - 1.27)
	Present	124 (31)	119 (29.75)	243 (30.75)		
Ear Morbidity	Absent	392 (49)	389(48.62)	781(97.62)	0.477	OR = 1.38 (0.55 - 3.48)
	Present	8 (2)	11 (2.75)	19 (2.3)		
Morbidity related to Nose	Absent	331 (82.75)	197 (49.25)	528 (65.99)	0.005	OR = 4.94 (3.57 - 6.84)
	Present	69 (17)	203 (50.75)	271 (33.87)		
Morbidity related to Throat	Absent	352 (88)	268 (67.25)	620 (77.5)	0.0001	OR = 3.61 (2.50 - 5.21)
	Present	48 (12)	132 (32.75)	180 (22.5)		
Morbidity related to Oral Cavity	Absent	289 (72.25)	266 (66.5)	555 (69.37)	0.0001	OR = 1.31 (0.97 - 1.77)
	Present	111 (27.75)	134 (33.5)	245 (30.62)		

Table 4. Morbidity Profile among Rural and Urban School Children (N = 800)

The prevalence of anaemia among the study population was 47.12 %. It was found that 57.75 % children in urban schools were anaemic as compared to (36.5 %) in rural. This difference was highly significant. The overall prevalence of skin infections among secondary school students was found to be 24.87 %. The prevalence was significantly higher among urban students (29.5 %) compared to 20.25 % in rural students. Pediculosis was found to be common skin condition (12 %), followed by tinea (5 %) and other fungal infections (5 %).

The overall prevalence of ocular morbidity was found to be 30.75 %. It was 31 % in rural children as compared to 29.75 % in urban. The most common ocular condition was refractive error (17 %) followed by vitamin A deficiency (13 %). The prevalence of refractive error was 18.5 % in urban as compared to 16 % among rural school students. Vitamin A deficiency was more among rural school children (14.75 %) as compared to 11 % of urban children.

Morbidity related to ear was seen among 2.3 % of study population. It was found to be 2.75 % among urban as compared to rural (2 %). The prevalence of chronic otitis media was higher in urban students (1.5 %) as compared to rural (0.5 %). Thirty-three percent of children were suffering from morbidity related to Nose. Fifty percent of urban school children were suffering from nasal conditions as compared to 17 % of rural children. The two common conditions related to nose identified was DNS (Deviated Nasal Septum) and Rhinitis. Around 20 % of school children in urban areas had rhinitis as compared to 10.25 % of students from rural. Similarly, 30.75 % of students from urban areas had DNS as compared to 6.75 % of rural school children.

Tonsillitis and upper respiratory tract infections were high among urban students (16.7 % and 16 % respectively) as compared to rural students (6.5 % and 5.75 % respectively). The overall prevalence of throat infections was found to be 22.5 %.

The overall prevalence of morbid conditions related to oral cavity was found to be 30.62 %. Prevalence was significantly higher among urban school children (33.5 %) as compared to those studying in rural schools (27.75 %). Around 17 %, 10 %, 4 % children were suffering with mouth ulcers, Dental caries and fluorosis respectively. Prevalence of dental caries was similar in both rural and urban (10 % and 10.25 %), but fluorosis was more among rural children (5.75 %).

DISCUSSION

The total number of children surveyed in this study were 800, [400 each in rural and urban government schools studying in 6th to 10th classes]. The age distribution ranged from 11 to 15 years with mean age of 12.9 years.

The gender distribution shows more number of females being enrolled in rural schools in contrast to urban schools depicting that adolescent girls in urban schools probably are choosing work over schooling to support their families financially, similarly less number of boys are observed to be attending schools in rural areas as compared to urban. Most of the families were nuclear both in rural and urban areas reflecting the transformation in the family and societal structure.

Regarding morbidity pattern, the most common morbid condition was found to be anaemia followed by conditions associated with Nose & Throat and others.

Children in urban schools were found to be suffering more from Skin, Nose and Throat abnormalities and Anaemia as compared to children from rural schools who had ocular problems especially signs of Vita A deficiency along with Anaemia. The prevalence of skin infections such as Pediculosis and tinea and other fungal infections was 24.87 %. Urban environmental pollution may be one of the possible reasons for the suffering of children in urban areas.

Among all the systemic conditions, the prevalence of worm infestations was reported to be high, similar to as reported by Ganapathy Kalaiselvan et al.[10] Asthma and Bronchitis were reported among 0.2 % of the children.

It is observed that almost half of the children were suffering from anaemia. Prevalence was found to be significantly higher among children of urban schools compared to rural children similar to other studies.[11,12,13,14,15,16,17] It was found that not only the rural urban difference exists but also more number of boys especially in urban areas were anaemic as compared to rural areas which needs urgent attention and implementation of Anaemia prevention control strategies addressing school children such as weekly iron and folic acid supplementation (WIFS) in urban areas. Contributing factors such as worm infestation, nutritional deficiencies, dietary habits have to be focussed upon. The prevalence of worm infestations was found to be 17 % in this study.

For many school age children school health services are the first and the most accessible point of contact with health services, with a potential to regularly reach most school-age children with preventive, curative and supportive health interventions.[4]

Rashtriya Bal Swasthya Karyakram (RBSK) is an important initiative by Government of India aiming at early identification and early intervention for children from birth to 18 years to cover 4 'D's including diseases and deficiency along with birth defects and developmental delays. It includes screening of all children studying in Government and Government aided schools for 30 diseases. There is need to strengthen these services especially in urban areas.[18]

Children of school going age are susceptible for skin infections due to various factors such as lack of personal hygiene, hand washing facilities and overcrowding etc. In this study, one fourth of the children were suffering from skin infections., similar to as reported by other studies.[15,19,20] Fungal infections were most common. It was found to be high among the urban students as compared to rural. Use of mobiles and addiction to smart phones has increased in past few years. Children too are having access which is affecting their sight. It is observed in this study that almost one third of the children were suffering from ocular conditions most commonly refractive errors and Vit A deficiency. Especially children of urban areas were suffering more from refractive error. Other investigators too have reported similarly.[13,19,20] Vitamin A deficiency is an important

condition to be studied in children as most of these children are undernourished. Prevalence of Vitamin A deficiency in this study was 12.87 %, which was higher as compared to other studies.[21,22]

In the present study the rural - urban distribution of nose & throat infections show that the prevalence of upper respiratory tract infections (URTI) is higher among students in urban schools as compared to rural. This may be attributed to the 1) urban environmental pollution, 2) school environment and ventilation in the classrooms as schools in urban areas are located in congested areas with less space to accommodate large number of pupils, 3) also it can be attributed to the living conditions in the slums and overcrowding as majority of the students have their residence in slums. Investigators have also reported higher proportion of ear infections among school children.[23,24]

In this study, nearly one third of the study population were suffering with one or other conditions related to oral cavity. It was significantly higher among students in urban schools as compared to those studying in rural schools. Presence of mouth ulcers was found to be the most common ailment seen among urban students and may be attributed to their nutritional status.

CONCLUSIONS

Children in urban schools were found to be suffering more from skin, nose and throat abnormalities and anaemia as compared to children from rural schools who had ocular problems especially signs of vitamin A deficiency along with anaemia. More emphasis needs to be given to primordial and primary preventive measures for prevention of childhood morbidities. School based health education programme may be a useful effort in this regard.

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