ORIGINAL ARTICLE

Morbidity pattern and their socio-demographic co-relates among rural primary school children in eastern Uttar Pradesh: A cross-sectional study

Amit Kaushik[1], Akash Bansal[2], Pankaj Kumar Jain[3], Sandip Kumar[4], Rajesh Kumar Yadav[5], Sri Prakash Singh[6]

[1]Assistant Professor, [3]Additional Professor, [4]Associate Professor, Department of Community Medicine, [5]Associate Professor, Department of Paediatrics, UP RIMS&R, Saifai, Etawah, UP, [2]Assistant Professor, Department of Biochemistry, Late Shri Baliram Kashyap Memorial Government Medical College, Jagdalpur, Chattisgarh, [6]Professor, Department of Community Medicine, IMS, BHU, Varanasi, UP.

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Corresponding Author

Address for Correspondence: Amit Kaushik, Assistant Professor, Community Medicine, UP RIMS&R, Saiafi, Etawah, UP-206130
E Mail ID: dramitkaushik@gmail.com

Citation

Abstract

Research question: What is the morbidity pattern among primary school children in rural area of Varanasi and what their socio-demographic co-relates are? Objective: To study the morbidity pattern among of primary school children in rural Varanasi and to find out various socio-demographic correlates associated with morbidity. **Study Design**: Descriptive cross sectional study. Setting**:** Four primary schools from Chiraigaon Community Development Block of Varanasi were selected for study purpose. Participants**:** Eight hundred and sixteen students from four schools were included in the study by total enumeration of the students present on the day of survey. **Results:** The present cross-sectional study revealed overall more prevalence of morbidity among female students (86.1%) as compared to their male counterparts (84.4%). Children belonging to scheduled caste, socio-economic status class IV, those whose parents were illiterate and those belonging to joint family had higher prevalence of any morbidity. Caste, socio-economic status, parents' education and type of family were significantly associated with morbidity among school children. **Conclusion:** Prevalence of morbidities was found to be 2.3 morbidities per child (prevalence) and 2.8 morbidities per sick child. Female students suffered more in comparison to their male counterparts. Nutritional deficiencies were most prevalent. Socio-economic status, caste, literacy of parents and type of family had significant association with morbidity.

Key Words

Morbidity; School Children; Uttar Pradesh

Introduction

The health and well-being of children is a fundamental issue in education. Indeed, active promotion of health is now seen as a priority for schools. The level of concern is illustrated by the fact that WHO has set up a Global School Health Initiative. Beginning of school health services in our country dates back to 1909, when for the first time medical examination of school children was carried out in Baroda city (1). Though so many years have elapsed since independence, status of health of school children has not improved a lot. Health services for school children are a must for building a Healthy Young India. Out of total 136229962 enrolled primary children, Uttar Pradesh constitutes almost nineteen percent of them (2). Mortality in school age children is low but morbidity and physical defects constitute major problems. Extensive surveys have been carried out in different parts of the country and the findings show that sickness and morbidity rates in India are among the highest in the world (3-10). With this background the present study was conducted to explore the prevalence morbidity patterns for example acute respiratory infections, skin disorders, eye problems, ear problems, different vitamin deficiencies etc. and their socio-demographic co-relates among the primary school children.

Aims & Objectives

1. To study the morbidity pattern among of primary school children in rural Varanasi.
2. To identify various socio-demographic correlates associated with morbidity.

Material and Methods

The present study was conducted in Chiraigaon Community Development Block of Varanasi, the field practice area of Rural Health and Training Centre, Institute of Medical Sciences, Banaras Hindu University, Varanasi. A list of all 106 government primary schools of chiraigaon community development block was prepared. Out of these 106 schools; four schools Primary School Barain, Bariyasanpur, Rustampur and Umraha were selected by purposive sampling for the study. All the students present in the school on the days of survey were included in the study, thus a total of 816 students were examined from four schools. The principals of the schools were approached for the present study. The purpose of study was explained to them and their written consent was obtained for conducting the study in their respective schools. The participating students were also explained about the study. Ethical approval was also obtained from Institutional Review Board of Institute of Medical Sciences, Banaras Hindu University. For students suffering from minor illnesses necessary treatment was given by our Rural Health Centre, Chiraigaon situated in the village. If needed necessary arrangements were made by linking them with Primary Health Centre, Chiraigaon.

Tools of study: For study purpose semi-structured and pre-tested interview schedule was used, which had three parts. The first section consisted of information related to socio-demographic profile of the study subjects like age, sex, caste, family income, type of family, education of mother, education of father, occupation of father, occupation of mother etc. The date of birth of the student was taken from the school records and the actual age of the child was recorded in years. The question about the caste was asked directly and they were stratified into General (Others), Backward (OBC) and Schedule caste (SC) groups. For monthly income of the family, statements were taken from parents through school authorities. The social class of the sample group was determined by modified B G Prasad classification. For the purpose of present study, a family was a unit comprising two or more persons related by blood, marriage or adoption and residing together in the same dwelling unit with a common kitchen. A family was considered nuclear when it consisted of husband, wife and their dependent children, and joint family if it included close relatives like sons, daughters who are not dependent, father, uncle, brother etc.

Health Appraisal: Health check-up of children was done for presence of various morbidities like skin diseases, eye problems, respiratory tract infections etc. The examinations were carried out at school premises in one room which was made available for this purpose. **Physical Examination:** A thorough clinical examination was done. Lips, gums and tongue of the children were examined for the presence of angular lesions, cheilosis, gum swelling and bleeding, glossitis, papillary atrophy and other signs of deficiency. The skeletal system was examined for the presence of any deformity and signs of rickets like costochondral beading, bowing of legs, knock knee. Dental inspection was carried out and dental caries, malocclusion, periodontal diseases (diseases of the gums and supporting structure of teeth), dental fluorosis or mottled enamel was taken note of. Examination was carried out for signs of adenitis, adenoids, chronic otitis media, mastoiditis and tonsillitis. Thyroid Gland and Lymph nodes examination was carried out to find out any abnormality. A thorough systemic examination was done to detect any abnormality in the respiratory system, gastro-intestinal system, circulatory system, central nervous system and skeletal system. Eyes and eyelids were examined for any signs of conjunctivitis, stye, xerophthalmia and blepharitis. **Definitions of terms used in the study:** Night **blindness:** A child with a history of hesitation to go out of the house at night or preference to sit in a corner of the room after dark or colliding with wall or other objects in the dark, with no difficulty in vision in day time, was taken as a case of night blindness (11).

Conjunctivitis: An individual with red eye/ eyes with symptoms of painless itching and watering was taken as a case of conjunctivitis (12).

Conjunctival Xerosis: Dryness, thickening, pigmentation and lack of lustre and transparency of the bulbar conjunctiva of the exposed part of the eyeball (13). **Bitot's Spots:** Well-demarcated, superficial, dry, grayish, silvery or chalky-white, foamy plaques, often triangular or irregularly circular in shape, more often confined to the regions lateral to the cornea or rarely overlying it (13). **Corneal Xerosis:** Hazy or opaque, frequently with a bluish milky appearance, usually most marked in the lower central area (13). **Keratomalacia:** Softening of the entire thickness of part or more often the whole of the cornea (13).

Angular Stomatitis: Sodden and excoriated lesions associated with fissuring at the angles of the mouth13. **Cheilosis:** Vertical fissuring, later complicated by redness, swelling and ulceration of lips other than the angles (13). **Caries:** Decayed, missing or filled teeth tooth was termed as caries tooth (13).**Knock Knees:** A child with the knees abnormally approximated and the ankles abnormally divergent was taken as a case of knock knees (14). **Bow legs:** A child with the knees abnormally divergent and ankles abnormally approximated was taken as a case of bow legs (14).

The data were entered on to excel sheet, coding was done and analyzed with SPSS 16.0. Tables were

prepared and chi-square test was applied to detect association wherever necessary.

Results

Total eight hundred sixteen students were included in the present study; out of which there were three hundred eighty four were boys and four hundred thirty two were girls. The mean age of the boys and girls was 8.40±1.87 and 8.37±1.78 years respectively (Table: 1). Looking at the caste distribution of the study subjects 44.9% belonged to scheduled caste, 41.5% to other backward classes while the least were from others caste category i.e. 13.6%. Maximum (45.9%) belonged to socio-economic class four. Regarding the educational status of parents maximum were illiterate; father (36.4%) and mother (59.6%). By occupation fathers of maximum study participants were unskilled labourers and mothers housewives. As many as 54.8% children were from joint family (Table: 2).

Nutritional deficiencies were found to be most prevalent (56.9%) among study participants, followed by diseases of oral cavity (46.0%). Only 4.4% students were having enlarged lymph nodes (Table: 3).

Overall eighty five percent of the school children were found to have one or the other morbidity. Prevalence of morbidities among boys and girls was revealed to be almost equal in our study (Table: 4).

Prevalence of Bitot's spots, conjunctivitis, conjunctival xerosis and blepharitis was 4.0%, 3.2%, 2.3% and 2.3% respectively among boys, while the corresponding figure among their female counterparts was found to be 2.1%, 4.8%, 2.1% and 2.8% respectively. Among boys as much as 21.0% had angular stomatitis and 6.3% had cheilosis, while among girls the prevalence of angular stomatitis and cheilosis was 16.0% and 11.8% respectively. Looking at distribution of disorders of gums 18.0% boys and 16.7% girls were found to have bleeding and spongy gums. Prevalence of dental caries was more among the boys (46.5%) as compared to girls (45.3%). Among skin disorders prevalence of fungal disorders was maximum (12.9%) followed by scabies (9.2%). Signs of vitamin D deficiency were more prevalent among girls in comparison to boys. Ear discharge was present among 12.5% boys and 14.6% girls. Twenty eight percent of boys and twenty seven percent of girls suffered from upper respiratory tract infection. Prevalence of lymphadenopathy, hepatomegaly and splenomegaly was found to be 4.4%, 2.9% and 1.1% respectively (Table: 5).

Looking at the caste wise distribution of morbidity, children belonging to scheduled caste were having maximum prevalence (44.9%) of any morbidity followed by other backward class (41.5%), minimum was among those who belonged to others caste category (13.6%) and this association between caste and prevalence of any morbidity was found to

statistically significant. Children belonging to class IV socio economic status were maximum (46.1%) to suffer from any morbidity while those belonging to class II were least sufferers (5.1) and the association with socio economic status was statistically significant. With increasing educational level of parents the prevalence of any morbidity was found to be decreasing and the association with either parent's educational status was revealed to be statistically significant. Association of father's education with prevalence of morbidity among children was not statistically significant. Approximately fifty percent of the children belonging to joint family suffered from any morbidity while the figure for their nuclear family counterparts was forty five percent and the association between morbidity and type of family was statistically significant (Table: 6).

Multivariate regression was applied using variables that were found significant in univariate analysis. The results of multivariate analysis revealed caste, socio-economic status, type of family and father's education as significant factors associated with morbidity (Table: 7).

Discussion

In our study we found that 85.3% of children (84.4% in boys and 86.1% in girls) were found to be suffering from one or more morbid conditions accounting for 2.3 morbidities per child (prevalence) and 2.8 morbidities per sick child. Prevalence of morbidity reported in our study is less than that reported by Ananthakrishnan et al[3] who reported that 97.0% children were having morbidity, while it is more than reported by Panda et al (4) (2000, Ludhiana) and Hassan et al (5) (2002, Aligarh) who reported it to be 72.4% and 82.0% respectively. The higher morbidity in our study may be attributed to two factors first one being maximum study subjects belonged to lower middle or lower class of society and second being high illiteracy among parents of children. The present study revealed that girls were having more morbid conditions in comparison to boys which is similar to that reported by Panda P et al. The prevalence of morbidity was maximum due to nutrient deficiencies (56.9%), followed diseases of oral cavity (45.9%), skin diseases (29.4%), respiratory infections (27.5%), ear disorders (13.6%) and eye disorders (6.6%). Ananthakrishnan et al[3] reported riboflavin deficiency in (32.9%), while the signs of vitamin B deficiency in the form of angular stomatitis and cheilosis in our study were present in 27.5% study subjects, higher prevalence in our study may again attributed to poverty. The prevalence of dental caries was 46.0%, which is higher than those reported by Ananthakrishnan et al[3] and Hassan et al[5] who reported it as 27.9% and 25.0% respectively but it is lower to that reported by Saravanan S et al (6) and N Joshi et al (7) in Tamil Nadu. Prevalence of

conjunctivitis and signs of vitamin A deficiency was found higher (4.0% and 5.1%) in our study as compared to that reported by Gupta M et al in Shimla, Himachal Pradesh, the higher prevalence in our study may be due the fact that our study was conducted in rural area where people have low levels of awareness and lesser access to the health care facilities. Among skin disorders infection of skin was the commonest finding (11.4%) in our study which similar to the findings reported by Dogra S and Kumar B (9) in their study in North India. Finings of our study revealed that morbid conditions were more prevalent among scheduled caste students in comparison to those from other groups and among those who belonged to lower middle and lower class of the society. Gupta et al (1976) (10) studied the relationship of morbidity pattern with family income and found that morbidity was high among children belonging to low socio-economic group. Children whose parents were illiterate or had lesser educational qualification had higher prevalence of morbidities in our study. This finding may be attributed to the fact that those illiterate persons may be having less awareness about the disease conditions and also the availability of treatment services. Morbidities in our study were found to be more prevalent among those students who belonged to joint families as compared to their counterparts who belonged to nuclear families which may be due to lesser availability of food and other nutritious food items to the children of joint families both in terms of quantity and quality due to larger family size.

Conclusion

Prevalence of morbidities was found to be 2.3 morbidities per child (prevalence) and 2.8 morbidities per sick child. Female students suffered more in comparison to their male counterparts. Nutritional deficiencies were most prevalent. Socio-economic status, caste, literacy of parents and type of family had significant association with morbidity.

Authors Contribution

Author 1: Designing the study, data collection, analysis & drafting: Author 2, 3, 4, 5 in drafting the manuscript and Author 6: Designing the study, analysis & drafting.

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Tables

TABLE NO. 1 AGE & SEX-WISE DISTRIBUTION OF STUDY SUBJECTS:

Age (completed Years)	BOYS		GIRLS		TOTAL	
	NO.	%	No.	%	No.	%
5	12	3.1	12	2.8	24	2.9
6	57	14.8	66	15.3	123	15.1
7	69	18.0	78	18.1	147	18.0
8	72	18.8	60	13.9	132	16.2
9	63	16.4	99	22.9	162	19.9
10	51	13.3	69	16.0	120	14.7
11	33	8.6	24	5.6	57	7.0
12	27	7.0	24	5.6	51	6.3
Total	384	100	432	100	816	100

TABLE NO. 2 SOCIO-DEMOGRAPHIC PROFILE OF STUDY SUBJECTS: (N=816)

Specifications	No.	%
Caste		
SC	366	44.9
OBC	339	41.5
Others	111	13.6
Socio-economic Class		
Class II	42	5.2
Class III	159	19.5
Class IV	375	45.9
Class V	240	29.4
Father's Education		
Illiterate	297	36.4
Primary & Middle	270	33.1
High School	117	14.3
Intermediate & Above	132	16.2
Mother's Education		
Illiterate	486	59.6
Primary & Middle	309	37.8
High School	21	2.6
Father's Occupation		
Agriculture	84	10.3
Business	42	5.2
Service	27	3.3
Skilled Labourer	285	34.9
Unskilled Labourer	378	46.3
Mother's Occupation		
ASHA	3	0.4
House Wife	585	71.7
Skilled Labourer	195	23.9
Unskilled Labourer	33	4.0
Type of Family		
Joint	447	54.8
Nuclear	369	45.2

TABLE NO. 3 PREVALENCE OF MORBIDITIES

S. No.	ICD Code	Disease	No. (%)
1	E50-E64	Nutritional Deficiencies	465 (56.9)
2	H00-H59	Eye Disorders (Excluding Xerophthalmia)	54 (6.6)
3	H60-H95	Ear Disorders	111 (13.6)
4	J00-J99	Respiratory infections	225 (27.6)
5	K00-K14	Diseases of oral cavity (Excluding signs of vitamin B & C deficiency)	375 (46.0)

6	L00-L99	Disorders of skin and subcutaneous tissue	240 (29.4)
7	R59	Enlarged lymph nodes	36 (4.4)
Total			**696 (85.3)**

TABLE NO. 4 SEX-WISE PREVALENCE OF ANY MORBIDITY

Morbidity	Boys		Girls		Total	
	No.	Percent	No.	Percent	No.	Percent
Present	324	84.4	372	86.1	696	85.3
Absent	60	15.6	60	13.9	120	14.7
Total	384	100.0	432	100.0	816	100.0

$\chi2=0.49$; $df=1$; $P=0.48$

TABLE NO. 5 DISTRIBUTION OF CHILDREN ACCORDING TO TYPES OF MORBIDITIES

S. No.	Diseases	Boys	Girls	Total	Test of significance
1	**Disorders of eye:** Bitot's Spots Conjunctivitis Conjunctival Xerosis Normal	15 (3.9) 12 (3.2) 09 (2.3) 348 (90.6)	09 (2.1) 21 (4.8) 09 (2.1) 393 (91.0)	24 (2.9) 33 (4.0) 18 (2.3) 741 (90.8)	x^2=3.87; df=3; p=0.27
2	**Blepharitis** Present Absent	09 (2.3) 375 (97.7)	12 (2.8) 420 (97.2)	21 (2.6) 795 (97.4)	x^2=0.15; df=1; p=0.69
3	**Lips** Angular Stomatitis Cheilosis Normal	81 (21.1) 24 (6.3) 279 (72.7)	69 (16.0) 51 (11.8) 312 (72.2)	150 (18.4) 75 (9.2) 591 (72.4)	x^2=9.7; df=2; p=0.007
4	**Gums** Bleeding & Spongy Gums Normal	69 (18.0) 315 (82.0)	72 (16.7) 360 (83.3)	141 (17.3) 675 (82.7)	x^2=0.24; df=1; p=0.62
5	**Dental Caries** Present Absent	174 (45.3) 210 (54.7)	201 (46.5) 232 (53.5)	375 (46.0) 441 (54.0)	x^2=0.12; df=1; p=0.72
6	**Skin** Fungal Infection Pyoderma Scabies Normal	51 (13.3) 21 (5.5) 45 (11.7) 267 (69.5)	54 (12.5) 39 (9.0) 30 (6.9) 309 (71.5)	105 (12.9) 60 (7.4) 75 (9.2) 576 (70.6)	x^2=8.75; df=3; p=0.03
7	**Vit D deficiency signs** Present Absent	18 (4.7) 366 (95.3)	39 (9.0) 393 (91.0)	57 (7.0) 759 (93.0)	x^2=5.89; df=1; p=0.01
8	**Ear Discharge** Present Absent	48 (12.5) 336 (87.5)	63 (14.6) 369 (85.4)	111 (13.6) 705 (86.4)	x^2=0.75; df=1; p=0.38
9	**URTI** Present Absent	108 (28.1) 276 (71.9)	117 (27.1) 315 (72.9)	225 (27.6) 591 (72.4)	x^2=0.11; df=1; p=0.73
10	**Lymphadenopathy** Present Absent	24 (6.2) 360 (93.8)	12 (2.8) 420 (97.2)	36 (4.4) 780 (95.6)	x^2=5.8; df=1; p=0.01
11	**Hepatomegaly** Present Absent	15 (3.9) 369 (96.1)	9 (2.1) 423 (97.9)	24 (2.9) 792 (97.1)	x^2=2.3; df=1; p=0.12
12	**Splenomegaly** Present Absent	3 (0.8) 381 (99.2)	6 (1.4) 426 (98.6)	9 (1.1) 807 (98.9)	x^2=0.68; df=1; p=0.40

TABLE NO. 6 SOCIO-DEMOGRAPHIC CO-RELATES OF MORBIDITY

S. No.	Specification	Morbidity any type		Total (n= 816)	Test of significance
		Present	Absent		
1	**Caste** SC OBC Others	333 (91.0) 300 (88.5) 63 (56.8)	33 (9.0) 39 (11.5) 48 (43.2)	366 (44.9) 339 (41.5) 111 (13.6)	x^2=84.28; df=2; P<0.001
2	**SES** Class II Class III Class IV Class V	18 (42.9) 120 (75.5) 339 (90.4) 219 (91.3)	24 (57.1) 39 (24.5) 36 (9.6) 21 (8.7)	42 (5.1) 159 (19.5) 375 (46.0) 240 (29.4)	x^2=87.11; df=3; P<0.001
3	**Father's Education** Illiterate Primary & Middle High School Intermediate & Above	285 (96.0) 213 (78.9) 87 (74.4) 111 (84.1)	12 (4.0) 57 (21.1) 30 (25.6) 21 (15.9)	297 (36.4) 270 (33.1) 117 (14.3) 132 (16.2)	x^2=47.07; df=3; P<0.001
4	**Mother's Education** Illiterate Literate	435 (89.5) 261 (79.1)	51 (10.5) 69 (20.9)	486 (59.6) 330 (40.4)	x^2=16.99; df=1; P<0.001
5	**Father's Occupation** Agriculture Business Service Skilled Labourer Unskilled Labourer	75 (89.3) 36 (85.7) 21 (77.8) 231 (81.1) 333 (88.1)	9 (10.7) 6 (14.3) 6 (22.2) 54 (18.9) 45 (11.9)	84 (10.3) 42 (5.1) 27 (3.3) 285 (34.9) 378 (46.4)	x^2=8.7; df=4; P=0.06
6	**Type of family** Nuclear Joint	297 (80.5) 399 (89.3)	72 (19.5) 48 (10.7)	369 (45.2) 447 (54.8)	x^2=12.40; df=1; P<0.001

TABLE NO. 7 MULTIVARIATE REGRESSION MODEL

Specification	Morbidity		Odds Ratio (OR)	p Value	Confidence Interval (CI)
	Present No. (%)	Absent No. (%)			
Caste SC OBC Others	333 (91.0) 300 (88.5) 63 (56.8)	33 (9.0) 39 (11.5) 48 (43.2)	1 Referent 0.73 0.10	 0.26 <0.001	 0.42-1.26 0.05-0.18
Father's Education Illiterate Primary & Middle High School Intermediate & Above	285 (96.0) 213 (78.9) 87 (74.4) 111 (84.1)	12 (4.0) 57 (21.1) 30 (25.6) 21 (15.9)	4.89 0.98 0.61 1 Referent	<0.01 0.95 0.16	2.06-11.62 0.52-1.85 0.30-1.21
Mother's Education Illiterate Literate	435 (89.5) 261 (79.1)	51 (10.5) 69 (20.9)	1.56 1 Referent	0.09	0.93-2.62
Socio-economic Status Class II Class III Class IV Class V	18 (42.9) 120 (75.5) 339 (90.4) 219 (91.3)	24 (57.1) 39 (24.5) 36 (9.6) 21 (8.7)	0.10 0.22 0.75 1 Referent	<0.001 <0.001 >0.39	0.04-0.25 0.12-0.43 0.39-1.44
Type of family Nuclear Joint	297 (80.5) 399 (89.3)	72 (19.5) 48 (10.7)	1 Referent 2.08	0.002	1.31-3.3