Original Research Article

A cross sectional study to assess the socio-demographic factors and housing conditions influencing the morbidity of primary school children

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Abstract

Background: The School health programme is the only public sector programme specifically focused on school age children. Its main focus is to address the health needs of children, both physical and mental, and in addition, it provides for nutrition interventions, yoga facilities and counselling. Current evidence shows that the home–despite highly developed technologies, materials and construction styles– remains a major cause for ill health through exposure to many factors. **Objective:** study to assess the socio-demographic factors and housing conditions influencing the morbidity of primary school children. **Methodology:** A cross-sectional study was done in rural field practice area of J.J.M Medical College, Davangere during the period from 1st December 2013 to 30th November 2014 by using, pre-designed, semi-structured questionnaire. **Results:** Majority fathers of morbid children (32%) were semi-professional by occupation, whereas maximum number of mothers were housewives (34.5%). Compared to healthy children, 55% of cases had overcrowding, 58.5% had inadequate ventilation, 58.5% had inadequate lighting, 53% did not have separate kitchen, 66% did not have smoke vent and 66% had unclean surroundings and all these variables were significantly associated. **Conclusion:** Educate community on sanitation, water quality and its health linkages. Stress on behavior change for usage of sanitary toilets. Strengthening of Suvarna Arogya Chaithanya by planning biannual periodical health checkups for the school children to identify morbidity and treat if needed.

Key Word: School Health, Primary, Morbidity, Housing, Environment.

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INTRODUCTION

Children morbidity is a major public health concern as this adversely affects their physical and mental growth. There is growing evidence of considerable burden of morbidity and mortality due to infectious diseases and malnutrition in school children.[1] Studies in different countries identified the following in primary school children: respiratory problems, diarrheal disease, nutritional disorders, anemia, parasitic infestations, pediculosis, caries teeth, refractive errors, skin diseases, ear and throat problems, tic disorders, sleeping disorders etc.[2-6] Health and illness concept, classroom climate, poor environmental status, family income, nutrition education and mental health were studied in different parts of the world for health. The School health programme is the only public sector programme specifically focused on school age children. Its main focus is to address the health needs of children, both physical and mental, and in addition, it provides for nutrition interventions, yoga facilities and counselling. It responds to an increased

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need, increases the efficacy of other investments in child development, ensures good current and future health, better educational outcomes and improves social equity and all the services are provided for in a cost-effective manner.[7] Housing and built environments have a profound impact on human health. In developed countries, 80-90% of the day is spent in built environments and most of this is in the home. Therefore, exposures and health risks in this private setting are of crucial relevance. The role of the home for health is enhanced by the fact that the most vulnerable population groups (poor, sick, children and elderly, disable) spend even more of their time in this setting, and are therefore most vulnerable and most in need of healthy living environments. There is a wealth of evidence indicating that housing and construction standards are almost exclusively based on technical norms, engineering knowledge and architectural design aesthetics. Consequently, standards of "adequate housing" or "sustainable housing" in the modern era tend to be informed by technological rather than health rationales, despite the fact that many housing laws have their origins in public health concerns. Similarly, building codes and national regulations governing the production and approval of buildings often tend to be vague, requiring buildings to be "safe", to be equipped with "adequate ventilation options" or "functional heating systems". These requirements provide little information on what the minimum standards of healthy housing are, and what characteristics need to be fulfilled to provide adequate shelter from the perspective of human health.[8,9] Current evidence shows that the home – despite highly developed technologies, materials and construction styles – remains a major cause for ill health through exposure to many factors, including (but not limited to): home injuries, chemical substances, mould and damp, noise, radon, pests and infestations, poor access to water and sanitation, proximity to pollution sources, or flooding, and inadequate protection from extreme weather.

MATERIALS AND METHODS

A cross sectional study was carried out in Anaji PHC which is the Primary rural field practice area of the JJM Medical College, Davanagere from December 2013 to November 2014 for a period of one year. This PHC has 3 sub-centers and covers 9 villages. There were 17 schools in the Anaji PHC area including 13 primary schools. All school children enrolled as students from 1st standard to 5th standard in these 13 primary schools for the academic year 2013-14 were included in the study. Among the 13 primary schools, 9 were government [including primary and higher primary] and 4 were private schools. Total of 981 children from all these schools were screened for assessing the morbidity pattern. All students from the 13 primary schools [9 governments and 4 private] of Anaji PHC studying from 1st to 5th class were included in the study and screened for morbidity. Environment of all the 13 primary schools were assessed. For assessing socio-demographic factors and housing conditions influencing morbidity pattern among affected children. The prevalence of morbidity in primary school children[p] was taken as 50 %.

Sample size was calculated by using the formula for proportion:

$$n=z^2pq/d^2$$

Where,

n= sample size

z= 1.98

p= prevalence of morbidity in primary school children i.e. 50%

q= 100 – p

d= permissible error of 7.5% of p

Substituting the above value, sample size[n] obtained was **178.** Non response rate considered=10 % of n = 17.8 Final sample size [N] for the study was calculated as follows,

Sample size [N] = n + non-response rate

= 178 + 18

= 196

= **200** [Rounded off to the nearest large value]

Among the school children who were found to be morbid, they were considered as **cases.** These cases were randomly selected until the required sample size of 200 was reached. For every case, apparently healthy child in the same class was selected. For choosing apparently healthy child, the very next age and sex matched child was taken for comparison group. Thus our study group consists of 200 Cases and 200 healthy children and their houses were visited.

Inclusion criteria

- All children enrolled in the selected schools from 1st standard to 5th standard
- Students present on the day of examination

Exclusion criteria

- Children who are not willing to participate in the study.
- Children who are suffering from major illness or undergone major surgery
- Children whose houses were locked and could not be checked.

A Pre tested, semi structured questionnaire was used to screen the primary school children for morbidity. Data was collected from each child by Home visits for both morbid children and the comparison group to assess the influence of socio-demographic factors and housing conditions on morbidity. The data was entered onto a

computerized Excel (Microsoft Excel 2007) spreadsheet. Subsequently it was analyzed using SPSS (Statistical Package for Social Sciences) version 20.0. Descriptive Statistics was used to provide an overview of the socio demographic profile and morbidity pattern of study subjects. Chi-Square Test was employed for qualitative discrete data. In this study the test was used to find statistical significance of association between two variables. The statistical significance level was fixed at $p<0.05$.

RESULTS

Table 1: Distribution of school children according to sex and presence of morbidity

Sex	No Morbidity	Morbidity	Total
Girls	271 (62.7%)	161 (37.3%)	432 (100%)
Boys	333 (60.7%)	216 (39.3%)	549 (100%)
Total	604 (61.6%)	377 (38.4%)	981 (100%)

x^2= 0.440, df=1, p>0.05

The prevalence of morbidity was more among boys i.e. 39.3% when compared to girls i.e. 37.3%, which was statistically insignificant. In our study there was no insignificant association between morbidity and sex. Out of 377 morbid children, 200 cases were selected randomly and 200 healthy children were also selected to assess the housing conditions.

Table 2: Distribution of study groups according to Parents' educational status

Characteristic		Healthy Children	Cases	Chi square test
Mother's education	Illiterate	3 (1.5%)	7 (3.5%)	x^2=50.379, df=6, **p=0.000**
	Primary Education	13 (6.5%)	25 (12.5%)	
	Higher Primary Education	35 (17.5%)	44 (22%)	
	Secondary Education	37 (18.5%)	76 (38%)	
	Puc/Diploma	69 (34.5%)	38 (19%)	
	Graduate	34 (17.5%)	6 (3%)	
	Post graduate	9 (4.5%)	4 (2%)	
Father's education	Illiterate	2 (1%)	8 (4%)	x^2=36.536 df=6, **p=0.000**
	Primary Education	7 (3.5%)	16 (8%)	
	Higher Primary Education	12 (6%)	27 (13.5%)	
	Secondary Education	46 (23%)	68 (34%)	
	Puc/Diploma	69 (34.5%)	57 (28.5%)	
	Graduate	55 (27.5%)	20 (10%)	
	Post graduate	9 (4.5%)	4 (2%)	

In our study, 38% mothers of morbid children had completed secondary education followed by higher primary education (22%), whereas 34% fathers of morbid children had completed secondary education followed by PUC/Diploma (28.5%). Thus, association was found between educational status of parents and morbidity.

Table 3: Distribution of study groups according to Parents' occupation

Characteristic		Healthy Children	Cases	Chi square test
Mother's occupation	Unskilled Worker	22 (11%)	19 (9.5%)	X^2=4.749 df=5, p=0.447
	Semi-Skilled Worker	19 (9.5%)	22 (11%)	
	Skilled Worker	31 (15.5%)	22 (11%)	
	Semi-Professional	47 (23.5%)	42 (21%)	
	Professional.	16 (8%)	26 (13%)	
	House wife	65 (32.5%)	69 (34.5%)	
Father's occupation	Unskilled Worker	25 (12.5%)	22 (11%)	X^2=2.900 df=5, p=0.575
	Semi-Skilled Worker	32 (16%)	31 (15.5%)	
	Skilled Worker	43 (21.5%)	40 (20%)	
	Semi-Professional	70 (35%)	64 (32%)	
	Professional.	30 (15%)	43 (21.5%)	

It was observed that in both groups majority of mothers were housewives. Among cases, majority (32%) of fathers were semi-professional by occupation and least was unskilled workers (9.5%) similar pattern observed in control group. Association was statistically insignificant.

Table 4: Distribution of study groups according to type of family and SES

Characteristic		Healthy Children	Cases	Chi square test
Type Of Family	Nuclear	95 (47.5%)	132 (66%)	X^2= 14.198, df=1, **p=0.001**
	Joint	75 (37.5%)	51 (25.5%)	
	Three Generation	30 (15%)	17 (8.5%)	
SES	1	6 (3%)	4 (2%)	X^2= 18.970, df=4, **p=0.001**
	2	39 (19.5%)	18 (9%)	
	3	78 (39%)	61 (30.5%)	
	4	68 (34%)	99 (49.5%)	
	5	9 (4.5%)	18 (9%)	

There was significant association between type of family and morbidity of children. It was observed that 47.5% belongs to nuclear family while 37.5% belongs to Joint family and 15% belongs to three generation family with respect to healthy children and among cases, 66% belong to nuclear type of family while 25.5% belong to Joint family and 8.5% belong to three generation family. Socio economic status of the family was assessed by Modified B.G Prasad's Classification. Out of 200 cases, 49.5% belonged to class IV group followed by 30.5%, 9%, 9% and 2% in class III, class II, class V and class I respectively. In case of healthy children, 39% belonged to class III group followed by 34%, 19.5%, 4.5% and 3% in class IV, class II, class V and class I respectively. Association was found to be statistically significant.

Table 5: Distribution of study groups according to housing conditions

Characteristic		Healthy Children	Cases	Chi square test
Overcrowding	No	120 (60%)	90 (45%)	X^2= 9.023, df=1, **p=0.03**
	Yes	80 (40%)	110 (55%)	
Lighting	Adequate	117 (58.5%)	83 (41.5%)	X^2= 11.560, df=1, **p=**0.001
	Inadequate	83 (41.5%)	117 (58.5%)	
Ventilation	Adequate	121 (60.5%)	83 (41.5%)	X^2= 14.446, df=1, **p=0.000**
	Inadequate	79 (39.5%)	117 (58.5%)	
Kitchen	Separate	130 (65%)	94 (47%)	X^2= 13.149, df=1, **p=0.000**
	Not Separate	70 (35%)	106 (53%)	
Smoke vent	Present	96 (48%)	68 (34%)	X^2= 8.103, df=1, **p=0.004**
	Absent	104 (52%)	132 (66%)	
TOILET	Sanitary latrine	92 (46%)	47 (23.5%)	X^2= 22.327, df=1, **p=0.000**
	Open air Defecation	108 (54%)	153 (76.5%)	
Safe Drinking water Practices	Yes	92 (46%)	37 (18.5%)	X^2= 34.612, df=1, **p=0.000**
	No	108 (54%)	163 (81.5%)	

The housing conditions were analysed separately, among cases 55% had house with overcrowding compared to 40% among healthy children, and 58.5% houses had inadequate lighting compared to 41.5% among controls. Among cases, 58.5% houses had inadequate ventilation when compared to 39.5% of healthy children and 53% did not have separate kitchen compared to 35% of controls. In 32% of cases and 48% of healthy children houses, smoke vent was present. it was observed that among cases 81.5% were not following Safe Drinking Water Practices compared to 54% of healthy children and it was significantly associated. And 33% of cases had unhygienic water storage compared to healthy children (26%)**.** Overcrowding, lighting, ventilation, kitchen, safe drinking water practices and smoke vent were associated with morbidity.

Table 6: Distribution of schools based on School Sanitation

Attribute		Government School	Private School	Total Number of Schools
Drinking water supply	Present	7(77.8)	4(100.0)	11(84.6)
	Absent	2(22.2)	0(0.0)	2(15.4)
Purification	Done	6(85.7)	3(75.0)	9(81.8)
	Not done	1(14.3)	1(25.0)	2(18.2)
Urinals	Present	8(88.9)	4(100.0)	12(92.3)
	Absent	1(11.1)	0(0.0)	1(7.7)
Separate Urinals for boys and girls	Yes	4(50.0)	3(75.0)	7(58.3)
	No	4(50.0)	1(25.0)	5(41.6)
Latrines	Present	4(44.4)	4(100.0)	8(61.5)
	Absent	5(55.6)	0(0.0)	5(38.5)
Separate Latrine for boys and girls	Yes	0(0.0)	2(50.0)	2(25.0)
	No	4(100.0)	2(50.0)	6(75.0)
Eating places	Present	5(55.6)	2(50.0)	7(53.8)
	Absent	4(44.4)	2(50.0)	6(46.2)
Ventilation	Adequate	9(100.0)	4(100.0)	13(100.0)
	Inadequate	0(0.0)	0(0.0)	0(0.0)

Eleven schools had drinking water supply purification done in 80% of schools. Urinals were present in almost all schools but only 7 had separate for boys and girls. 66% were well maintained. Latrines were present in 8 schools and grossly inadequate. The students were using the latrines available in the schools for urination too. There were no separate rooms to serve the midday meals in any of the government schools under study. Either verandas or classrooms were being used for serving meals. Eating places were well maintained. All the government schools had kitchen, possibly because of the presence of the government sponsored mid-day meal program at these schools. Ventilation in terms of floor, door/window area was observed to be adequate for all the schools but only eight (60%) schools were having classrooms with cross ventilation.

DISCUSSION

A total of 200 cases of morbidity identified by clinical examination by the investigator were selected as cases and 200 health children were also selected from the same school and class as the cases for the purpose of comparison of socio-economic condition of the family and the housing conditions. In the study it was the education of the parents both father and mother which had a significant influence on the morbidity status of the children whereas the occupation was not significant association with the morbidity status of the children. 34% of the fathers and 38% mothers of morbid children had completed their secondary education and association was found to be statistically significant. Majority fathers of morbid children (32%) were semi-professional by occupation; followed by professional occupation (19.6%) whereas maximum number of mothers were housewives (34.5%) followed by semi-professional occupation however it was not significant. The education of the parents is more significant in determining the health status of children was also opined in the studies done by Mohd Zulkife *et al* [10] and Amith K *et al.* [11] The education of any person and the occupation is often interdependent factors. Further education of the mother is more important and significant in having a health child not only in the family but in the whole community as well. In the view of this numerous government programme and schemes have also been launched to promote the education of girl child. The association between the family and the morbidity status of the children was having a significant association with the morbidity status of the children in our study , similar findings of our study was also seen in the studies done by NeeluSaluja *et al* [12], Amith K *et al* [11] and Vidya Rani *et al.* [13]The Socio economic status of the study population in our study was also significantly associated with the morbidity status of the children and the results of our study were comparable to the study findings of Neelu Saluja *et al* [12] and J P Singh *et al* .[14] Compared to healthy children, 55% of cases had overcrowding, 58.5% had inadequate ventilation, 58.5% had inadequate lighting, 53% did not have separate kitchen, 66% did not have smoke vent and 66% had unclean surroundings and all these variables were significantly associated. Study done by Sulakshana in Belgaum [15] district found that 22% of schools had inadequate ventilation and illumination in classes. 65% of the schools did not provide desks and in 60% of school's area/student was adequate. In contrast to our study, 40% of schools had inadequate ventilation and lighting in Karkala study. [16] Study done by JP Majra *et al*[17] in rural areas of Mangalore Taluk in Dakashina Kannada District of Karnataka found that one fourth of the schools were located/ sited at inappropriate places, half of the schools had appropriate/ adequate structure. 90% of the schools were overcrowded. Ventilation and day light was adequate for 12(60%) and 14(70%) of the schools respectively. In our study environment and sanitation was better in private schools when compared to government schools. Similar findings were found by Inamdar *et al*[18] al but it was contrast to study conducted by Hegde *et al*[19] (Government schools were better than private schools) Study done by Sulakshana in Belgaum[15] district found that 62% of the schools did not have adequate urinals and 67% schools did not have adequate latrines.11% of schools provided clean area where children can bring and eat house food**.** When compared to schools in Karkala[16] and Madhya Pradesh [18], our results showed better availability of safe drinking water and adequate number of toilets. Government JP Majra,[17] 90% of the schools was having drinking water points and 50% of the schools had adequate latrines for boys and 60% for girls. In contrast to this it was 84% and 25% respectively in our study.

CONCLUSION AND RECOMMENDATIONS

Health education about personal hygiene, sanitation and nutrition may be made as part of the school curriculum apart from the regular educational activities. Teachers should be trained to identify the symptoms of common diseases in school children and take necessary measures for the same. Educate community on sanitation, water quality and its health linkages. Stress on behaviour change for usage of sanitary toilets. Strengthening of Suvarna Arogya Chaithanya by planning biannual periodical health checkups for the school children to identify morbidity and treat if needed. Periodical Health checkup for children in private schools should be made mandatory.

REFERENCES

1. WHO Promoting health through schools. Technical Report Series. No.870. Geneva; 1997; 68-69.
2. Ong SG, Liu J, Wong CM, Lam TH, Tam AYC, Daniel L *Et al*. Studies on the respiratory health of primary school children in urban communities of Hong Kong. Sci. Total Environ. 1991; 106:121-35.
3. Berger IB, Salehe O. Health Status of Primary School. Children in Central Tanzania. J Trop Pediatr. 1986; 32:26-9.
4. Shakya SR, Bhandary S, Pokharel PK. Nutritional status and morbidity pattern among governmental primary school children in the Eastern Nepal**.** Kathmandu Univ Med J. 2004; 2:307-14.
5. Chopdar A, Mishra PK. Health status of rural school in Western Orissa. Indian J Pediatr. 1980; 47:203-6.
6. Gupta BS, Jain TP. A comparative study of the health status of rural and urban primary school children. Indian J Pediatr. 1973; 40:135-41
7. Guidelines of the School Health Programme. Ministry of Health and family Welfare. 2009
8. SuvarnaarogyaChaithanya. Department of public instruction. Government of Karnataka. Available from: URL: http://www.schooleducation.kar.nic.in/mms/suvarna_arogya_chaitanya.html (Accessed on 05/11/2018)
9. SuvarnaarogyaChaithanya Scheme. Available from: URL: http://mdindianetworx.com:91/ (Accessed on 05/11/2018)
10. Mohd. Zulkifle, Abdul Haseeb Ansari, Manchala Ramesh. Relation between socioeconomic status of parents and health of children. International Journal of Advanced Ayurveda, Yoga, Unani, Siddha and Homeopathy 2012; 1(2); 6-12.
11. Amit Kaushik, Richa Raj, Chandra Pati Mishra, Sri Prakash Singh. Nutritional status of Rural Primary School Children and their Socio-Demographic Correlates: A Cross-Sectional Study from Varanasi. Indian Journal of Community Health.2012; 24(4); 310-18
12. NeeluSaluja, Garg SK, Harivansh Chopra, Bhajpai SK, Pandey SM. Socio-demographic factors affecting morbidity in primary school children in urban area of Meerut. The Internet Journal of Epidemiology 2012; 9(2).
13. Vidya Rani, Dhiraj Kumar Srivastava, Pankaj Kumar Jain, Sandeep Kumar, Naresh Pal Singh, Anand Mohan Dixit.Morbidity Pattern Among Primary Schoolchildren in A Rural Area of Uttar Pradesh. National Journal of Community Medicine. 2014; 5 (4); 392-6
14. JP Singh, PeeyushKariwal, SB Gupta, AK Singh, Danish Imtiaz. Nutritional status and morbidity among school going children: A scenario from a rural India. Scholars Journal of Applied Medical Sciences. 2014; 2(11);379-83.
15. Sulakshana s. Baliga. Child Friendly School Initiative at Three Primary Health Centers of Belgaum District, Karnataka. International Journal of Pharma and Bio Sciences. 2013; 4(2);664-8.
16. Hegde A, Shetty A. Child Friendly School Initiative at Karkala Taluk, Karnataka. Indian Pediatrics. 2008 May; 45; 407-09.
17. Majra JP and Gur A. School environment and sanitation in rural India. Journal of Global Infectious Diseases .2010 May-Aug: 2(2); 109- 11.
18. Inamdar S. Child Friendly School Initiative–A deliberation in the plenary session of 41st National Conference of IAP on 10th January 2004 at Chennai.
19. Hegde A, Shetty A. Child Friendly School Initiative at Karkala Taluk, Karnataka. Indian Pediatrics. 2008 May; 45; 407-09.

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