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A Study on the Domestic Environmental Conditions and Its Impact on the Prevalent Morbidities

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ABSTRACT

Background: Man is responsible for the pollution of his environment through urbanization, industrialization and other human activities. The success of any health policy or health care intervention depends upon a correct understanding of socio-economic, environmental and cultural factors which determine the occurrence of diseases and deaths.

Objectives: the study was conducted to study the Environmental Conditions of the population residing in the given settings and also to study the impact of these environmental condition on the Morbidities prevailing in the Population.

Methods: A community based cross sectional study was done in Sankheda Taluka of Chhotaudaipur district. A total of 250 families in the village including 1452 subjects were enrolled in the study.

Results: The housing and environmental conditions were assessed and given scores and categorized as Good, Average and Poor. These scores were then associated with the presence of morbidities like Respiratory Disease ,Vector borne Disease, Skin Disease , Ophthalmic Disease, Gastrointestinal Disease, ENT Disease and it was seen that they were significantly associated with prevailing environmental risk factors in the population.

Conclusion: The housing and environmental conditions play a significant role and are associated with occurrence of diseases involving various systems, hence these conditions must be given due attention so that it shall significantly lower the disease burden in any community.

Key words: Environment & Housing condition, Scores, Morbidities, Association, Domestic Environment

INTRODUCTION

The environment affects human health in a different ways. The relation between human health system and the environment risk factors were extensively studied and environmental risks factors have been proven to significantly impact on human health system, either directly by exposing people to harmful agents, or indirectly, by disturbing life-sustaining ecosystems. It has been estimated by World Health Organization (WHO) that nearly 13 million deaths annually can be prevented by checking environmental factors most of which are preventable. It is also estimated that 24% of global disease burden and 23% of deaths are related to environmental factors. Most of these are in developing world (nearly 15 times higher) than developed as the exposure to risks and hazards are higher and the accesses to healthcare are poorer.[1]

The Human-Environment interaction has shown a direct relationship with Quality of Human life, Years of Healthy life lived and Health disparities. From all over the world about 25% of all death and the total burden of diseases can be because of the environmental factors. [1] The key to mans' healthy

life depend upon surrounding environment and man is often involved in polluting surrounding environment which has also accentuated by continuous urbanization, industrialization and other hazardous environmental activities. Socioeconomic, environmental and cultural factors play pivotal role in influencing morbidities, mortalities and also largely influence success of any health policy and any health care intervention.[2] Both short term and long term exposures of environmental conditions are responsible for several health events and it has been explained by many epidemiological studies.[3]

Morbidity and Mortality can be reduced and several health issues can be addressed if the environmental factors are brought in favour and if its complexities are well understood and this must be done in a comprehensive manner. Our four basic components of environment like Air, water, food and shelter which are a key for maintaining health can alter human system [4].Inadequate housing conditions have been found responsible for environmental burden of diseases. Therefore improving housing conditions shall minimize negative impact and is beneficial for the residents and society.[5]

Prime focus of Environmental epidemiology has been on health effects brought about by polluted air, water and food[6]. A wide range of health conditions like respiratory tract infections, asthma, lead poisoning, injuries, and mental health problems occur due to poor Housing conditions.[7] This study was conducted to understand the prevailing conditions of environment among the study population and its impact on several morbidities prevailing in the given community settings.

MARTIALS&METHODS

It was a community based cross sectional study. The study was started after permission of institutional ethics committee. Study was conducted in tribal district of Gujarat, Chhotaudepur. The multistage sampling method was used to select sample house. In the 1st stage, out of all Talukas of Chhotaudaipur district, one Taluka (Sankheda) was selected. There are total 4 PHCs in Sankheda; of these, one (Bahadarpur PHC) and in the next stage, one sub centre (out of the total 6 sub centres) was selected (Anandpura). Out of all the villages in Anadpura, the most populous i.e. Gola Gamdi was selected for surveying the population. The entire village was surveyed for the study of environmental conditions and its impact over the health of its inhabitants. A total of 250 families in the village were enrolled in the study. The population of 250 families was 1452; thus family size is 5.8.

The study was carried out using a pre-designed and pre-tested questionnaire. The basic information about family demographic information like age, sex, education and socio-economic class in addition to morbidity was collected in addition to domestic environmental condition like housing condition, ventilation, overcrowding, use of toilet, type of cooking fuel use and sewage disposal. The data was collected from November to December 2014 as a part of the large study Village Adoption Programme initiated by department. The environmental conditions of the families were categorized as Good, Average and Poor on the basis of the individual scores given to each environmental variable (Good: 17-24, Average: 9-16 and Poor <8)and the total of the scores computed by adding them up. Each individual family was categorized as "Good, Average or poor" and the morbidities of the individual family members were associated with the environmental scores using chi squared test.

The data collection was done by trained investigator by moving from house to house. After taking consent of head of the family or senior member of family, the data collection was done. The basic socio demographic information and related questions were asked to head of family members and morbidity in last one month was asked and reported. The domestic environmental condition was assessed by observation. It was scored as reported in table-3.

Thus collected data was validated and compiled using MS Excel 2007 at 5% level of significance.

RESULTS

A total of 1452 population was surveyed in 250 families. Majority of the subjects were in the age group of 19-60 years, followed by those in 0 -18 years of age group whereas about 9%of the subjects were Geriatric. Of the total participants, almost equal numbers were males and females with a sex ratio of 1002. Majority of the studied subjects were educated up to primary followed by those educated up to secondary. Nearly 27% of them were illiterates whereas only 2% were educated up to or beyond Graduation. Among the families, most of those surveyed were from social class 4 and 5 whereas a very small proportion of them were form Social class 1 and 2 (Social classification was as per the criteria of Modified Prasad's classification, 2012).

To assess the housing and environmental conditions, several variables were taken into consideration. In each of the variable, score was assigned as good (3), average (2) and poor (1) depending on the type of environmental condition in each variable. A final score was computed by adding up each individual score for every variable.

Table 1: Socio Demography Profile of subjects

Socio demographic Variables	Subjects (%)
Total Families Surveyed	**250**
Total Population Surveyed	**1452**
Age group distribution	
0-18 years	595 (41)
19-60 years	732 (50.4)
60 years and above	125 (8.6)
Sex Distribution	
Female	727 (50.1)
Male	725 (49.9)
Sex ratio	1002
Education	
Illiterate	391 (26.9)
Primary	647 (44.5)
Secondary	179 (12.32)
Higher secondary	76 (5.2)
Diploma	6 (0.41)
Graduate	25 (1.72)
Post graduate and above	1 (0.06)
Not applicable*	127 (8.74)
Social Class (n=250)**	
Class 1	19 (7.6)
Class2	17 (6.8)
Class3	45 (18)
Class 4	83 (33.2)
Class5	86 (34.4)

*Not applicable indicates children 0 to 5 years of age
** Social class as per Modified Prasad`s Classification of 2012 (AICPI= Rs. 741/-)

Table 2: Housing and Environmental Conditions

Variables	Total (n=1452)	Score
Type of House		
Pakka	548 (37.7)	3
Semipakka	81 (5.6)	2
Kaccha	823 (56.7)	1
Overcrowding (as per no. of rooms)		
No	441 (30.4)	3
Yes	1011 (69.6)	1
Cross ventilation		
Yes	848 (58.4)	3
No	604 (41.6)	1
Lighting		
Adequate	634 (43.7)	3
Inadequate	818 (56.3)	1
Toilet		
Own & Separate	245 (16.9)	3
Common	7 (0.5)	2
Open air defecation	1200 (82.6)	1
Type of fuel use for cooking		
LPG	101 (7)	3
Kerosene	141 (9.7)	2
Chula	1210 (83.3)	1
Liquid waste		
Sewage line	75 (5.2)	3
Open	1377 (94.8)	1
Scoring System		
Good	17-24	
Average	9-16	
Poor	< 8	

Table 3: Environmental Scores

Score	Frequency (%)
Good Condition (17-24)	204 (14)
Average Condition (9-16)	392 (27)
Poor Condition (<8)	856 (59)
Total	1452 (100)

Table 4: Morbidities Prevalent in study Subjects

Morbidities	Subjects	Prevalence*
Respiratory Disease	38	2.6
Vector Born Disease	16	1.1
Skin Disease	47	3.2
Ophthalmic Disease	75	5.2
Gastrointestinal Disease	45	3.1
ENT disease	38	2.6

*Point Prevalence of the morbidities in percentage

On the basis of the final score, subjects were categorized as (overall) living in good, average or poor environmental conditions. The family scores were taken as individuals' environmental scores to associate them with the morbid conditions of subject.

As the sample was from rural area, the quality of the housing and environment conditions among the population was predominantly poor with a majority of them showing poor condition (59%) whereas 27% showed average and only 14% showed as living in good conditions.

The point prevalence of morbidities showed that the highest morbidities were ophthalmic diseases followed by skin disease. The prevalence of respiratory disease was about 3 %.

To assess the impact of housing and environment condition on prevalent morbidities, all of the above environmental factors were analyzed & association was sought using chi squared test at 5% level of significance. It was seen that these scores were significantly associated with the presence of morbidities like Respiratory Disease ($p<0.001$); Vector born Disease (p 0.01149); Skin Disease (p 0.004198); Ophthalmic Disease ($p <0.001$); Gastrointestinal Disease ($p < 0.001$); and ENT Disease (p 0.005).

DISCUSSION

A community based cross sectional study was carried out in order to study the socio-demographic profile, housing and environment conditions and the association of these housing and environment conditions with different morbidities. Out of total population, about 27 % were illiterates and nearly 34 % of the subjects were each in social class IV & V. This was one of the probable reasons why a large proportion of them had poor housing and environment conditions, like Kaccha house, presence of overcrowding, inadequate lighting, prevalent practice of open air defecation, usage of Chula for cooking and inappropriate disposal of waste.

Table 5: Association of Housing & Environmental Condition & Its impact on Morbidities

Morbidities	Housing Score (Percentage)			Chi-square	*P value*
	Good (n=204)	Average (n=392)	Poor (n=856)		
Respiratory Disease					
Yes	15 (39.5)	2 (5.3)	21 (55.2)	24.87	0.00000398
No	189 (13.4)	390 (27.6)	835 (59)		
Vector Born Disease					
Yes	6 (37.5)	1 (6.3)	9 (56.2)	8.932	0.0114932
No	198 (13.8)	391 (27.2)	847 (59)		
Skin Disease					
Yes	3 (6.4)	5 (10.6)	39 (83)	10.946	0.00419862
No	198 (14.1)	379 (27)	828 (58.9)		
Ophthalmic Disease					
Yes	23 (30.7)	10 (13.3)	42 (58.3)	23.186	0.00000923
No	173 (12.6)	390 (28.3)	814 (59.1)		
Gastrointestinal Disease					
Yes	7 (15.5)	1 (2.2)	37 (82.2)	14.898	0.00058202
No	197 (14)	391 (27.8)	819 (58.2)		
ENT disease					
Yes	2 (5.3)	4 (10.5)	32 (84.2)	10.288	0.00583431
No	202 (14.3)	388 (27.4)	824 (58.3)		

These environmental practices are largely influenced by the socio-economic conditions of the community and the impact is pretty much apparent.

It was seen in the present study that, Kaccha house, presence of overcrowding and usage of Chula for cooking were associated with occurrence of respiratory diseases, similar result was noted in a comparative study byP McCarthy[8] et al where the people in areas of 'bad' housing were found to report more respiratory symptoms than those in 'good' housing areas. A study by Wanyeki I et al [9-12]also explained that overcrowding, poor air quality within houses as a result of inadequate ventilation, and the presence of mould and smoke contribute to poor respiratory health in general and have been implicated in the spread and/or outcome of tuberculosis (TB).

Present study showed that poor Environmental conditions were associated with the prevalent skin diseases. A study by Gustafson CJ [13] et al showed similar findings in which the quality of housing conditions, particularly hot, dry indoor thermal environment, demonstrated significant associations with pruritus, rash, and scaling like skin conditions.

Similar findings in the present study showed positive associations of the environment with ENT disease, as found by Arup Sen Gupta[14] et al who showed occurrence of CSOM associated with poor housing conditions.

Present study showed that wrong practices like open air defecation and disposal of waste in open were associated with occurrence of vector born disease. Similar results were found by T Nkuo-Akenji et al[15] in Bolifamba.

CONCLUSION

The housing and environmental conditions play a significant role and are associated with occurrence of disease. Therefore if these conditions are given a due attention and improved upon, it shall significantly lower the disease burden in any given community. An assessment of health practices, health seeking behaviour and awareness can be carried out in first stage after which the necessary interventions can be implemented in the next stage according to the findings. Training of the health staff including medical officer and health workers for the importance of ideal environmental practices necessary for improving the health of the community may be first assessed and then carried out as per requirements.

REFERENCES

1. World Health Organization Certified [Internet]. A Prüss-Üstün (IL) Preventing disease through healthy environments: A global assessment of the burden of disease from environmental risks. c2016- [cited 2018 January 21]. Available from: http://www.who.int/quantifying_eh impacts/publications/preventing-disease/en/.
2. K.Park. Environment And Health. Text Book of Preventive and Social Medicine, 23rd edition. Jabalpur: M/s Banarsidas Bhanot Publishers; 2015. p. 705.
3. World Health Organization Report [Internet]. Environment and health risks: a review of the influence and effects of social inequalities. c2012- [cited 2017 December 03]. Available from: http://www.euro.who.int/__data/assets/pdf_file/0003/78069/E93670.pdf.html.
4. Portier CJ. Comprehensive Environmental Public Health: Public Health Rep [Internet]. 2011[cited 2018 Feb 8];126 (Suppl 1): 3–6. Available from:http://www.ncbi .nlm.nih.gov/pmc/articles/PMC3072897/
5. World Health Organization Report [Internet]. Braubach M (IL): Environmental burden of disease associated with

inadequate housing - methods for quantifying health impacts of selected housing risks in the WHO European Region. c2011- [cited 2018 Mar 18] Available from: http://www.euro.who.int/__data/assets/pdf_file/0003/142077/e95004.pdf

6. H.Feriis R. Environmental Epidemioligy. In : R Riegelman, editor. Essentials of Environmental Health,3rd edition. Burlington: Jones & Bartlett Learning Publications; 2001.p. 479-81.
7. Krieger J, Higgins DL. Housing and Health: Time Again for Public Health Action. Am J Public Health 2002;92 (5):758–68.
8. Evans J, Hyndman S, Stewart-Brown S, Smith D, Petersen S. An epidemiological study of the relative importance of damp housing in relation to adult health. J Epidemiol Community Health 2000;54 (9):677–86.
9. Wanyeki I, Olson S, Brassard P, Menzies D, Ross N, Behr M, et al. Dwellings, crowding, and tuberculosis in Montreal. Soc Sci Med 2006;63 (2):501–11.
10. Jaakkola JJK, Hwang B-F, Jaakkola N. Home Dampness and Molds, Parental Atopy, and Asthma in Childhood: A Six-Year Population-Based Cohort Study. Environ Health Perspect 2005;113 (3):357–61.
11. Beggs CB, Noakes CJ, Sleigh PA, Fletcher LA, Siddiqi K. The transmission of tuberculosis in confined spaces: an analytical review of alternative epidemiological models. Int J Tuberc Lung Dis 2003;7 (11):1015–26.
12. Clark M, Riben P, Nowgesic E. The association of housing density, isolation and tuberculosis in Canadian First Nations communities. Int J Epidemiol 2002;31 (5):940–5.
13. Gustafson CJ, Feldman SR, Quandt SA, Isom S, Chen H, Spears CR, et al. The association of skin conditions with housing conditions among North Carolina Latino migrant farm workers. Int J Dermatol 2014;53 (9):1091–7.
14. Arup Sen Gupta, Rama Ram, Farzana Islam SM, Ram AK, Bhattacharyya SK. A study on clinico-epidemiological profile of ear, nose and throat diseases among patients aged 6 to 14 years attending the E.N.T. OPD at M.G.M. Medical College, Kishanganj, Bihar, India. Glob J Med Public Heal 2012;Vol 1 (4):13–7.
15. Nkuo-Akenji T, Ntonifor NN, Ndukum MB, Abongwa EL, Nkwescheu A, Anong DN, et al. Environmental factors affecting malaria parasite prevalence in rural Bolifamba, South West Cameroon. Afr J Health Sci 2006;13 (1–2):40–6.