Abstract: Trailing trot of life in urban slum in Kolkata

Dr. J Mukhopadhyay, Professor

Department of Community Medicine, Jagannath Gupta Institute of Medical Science & Hospital, Budge-Budge, Kolkata – 700137

Background: Human sustenance in metro-slums is not only associated with social, civic & economic burden but often with the myriad of chronic illnesses. Thinking through this trend, it was decided to study the quality of life of residents of a slum in Kolkata in terms of socio-civic facilities and chronic health problems during Feb-Apr 2022.

Methods: A descriptive, cross-sectional study, conducted by data collection through questionnaire that included socio-demographic, environmental and medical data. Diagnosis of chronic diseases was ascertained by review of subject's recent medical documents along with basic physical &clinical examination.

Result: Age-sex, gender quotient and family-size of the community are comparable to Indian statistics. 88% were literate, 48.3% employed and 92% belonged to lower socio-economic status. Rented houses, inadequate water, unhygienic toilets, improper waste disposal, over-shooting drains and unhealthy surroundings reflected poor municipal services. 31.4% had single chronic disease & 14.8% had multi-morbidity. Hypertension, Tuberculosis, Alcohol disorder, Hypercholesterolemia and Diabetes were common. Clustering of Hypertension, Alcohol disorder & Hypercholesterolemia found common. Illiterate, smoker, alcoholic men of 50 years & above from lower socio-economic group were significantly affected by chronic diseases.

Conclusion: Improvement in civic services, upliftment of support for income generation with medical care for affected, are recommended.
Key Words: Chronic disease, Disease clustering, Multi-morbidity, Urban slum.

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Urbanisation refers to the process of transformation of communities from rural dominance in economy, life style and culture, to one that is preponderantly urban. It is envisaged that future urbanisation at the global level would be intense in the Asian cities. It is predicted that by the year 2030, almost 2.6 billion out of the total urbanites of 4.9 billion would be in Asia. [1] Asia has also seen the emergence of metropolises like Seoul, Mumbai and Bangalore promoting regional disparities in the city limit. [2] The problem of disparity that exists between city and surrounding regions would be further accentuated on account of migration of population in India. Urbanisation in India is characterised by asymmetric provision of civic facilities concentrated in salubrious areas compounded by rural influx and settlements in the outskirts.[3]

An improvement in the quality of life in urban areas would warrant upgrade in the general well-being in urban slums. The urban slums are characterised by unhygienic conditions, poverty, lacking basic health care, socio-pathological issues and social exclusion as a result of extension of rural poverty, inequality and disparity. India is experiencing epidemiological transition ensuing rising burden of non-communicable diseases besides infectious illness. [4]
There have been consistent endeavours to improve the condition of the slums through various government programmes. In the backdrop of these social issues, it was thought prudent to study the quality of life among the residents of a slum in terms of civic facilities and chronic health problems in Kolkata during Feb-Apr 2022.

Material & Method

The study was conducted during Feb to Apr 2022 among the residents of a urban slums located in Tollygang area, South Kolkata having around 108 families with about 400 member. Access to this slum was facilitated through local administrative body and sanction was obtained from the authorities to carry out the study.
The members were interacted at the outset to explain the intent of the study in Feb 2022 and informed individual consents were collected following necessary pandemic precautions. Formal list of all members along with address and mobile no. was made. A relevant data collection instrument was arranged after revisiting the current literature integrating required modifications due local factors and issues.
The instrument comprised of three segments; first part contained details of personal attributes besides socio-demographic characteristics with job engagement status of the subjects and the second part had details of housing, water supply, garbage disposal, wash-room facilities and availability of medical services. Standard of living was calculated on the basis of possessing gadgets like fan, cooler, television, computer, fridge, motor cycle, bicycle, mobile phone, smart phone, metered electricity, internet connection and LPG. Each facility was given a score of 2. A total score of 8 or less was taken as low while a score of 18 or more as high. Third section housed information on commonly occurring diseases in various age groups. Socio-economic status (SES) was ascertained as per the current scale. [5]

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Existing medical conditions were documented on self-statement supported by recent medical consultation and investigation not older than 12 months. Chronic diseases are medical conditions that are long lasting, need periodic medical attention and may limit daily activities. [6]

Preliminary medical examination for each subject was done including height, weight, general medical check & BP. Medical diagnosis was ascertained according to the following criteria:

Sl No.	Disease	Diagnostic criteria
1	Tuberculosis	Self-stated under-treatment with medical documents
2	HIV	Self-stated with hospital report
3	Diabetes	Self-stated with medical documents
4	Hypertension	Self-stated with documents & measured BP>140/90 or on Rx
5	Congestive heart failure (CHF)	Self-stated with medical document
6	Arthritis	Self-stated with medical document
7	High cholesterol	Self-stated with medical document
8	Thyroid disease	Self-stated with medical documents
9	Cancer	Medical & hospital document
10	Asthma/Bronchitis	Self-stated with medical documents
11	Alcohol disorder	Reported by self & family members/ Any related document
12	Underweight	Measured: By BMI, Weight for age & height

Name, address and mobile no. of residents were codified for discretion, but the record was preserved to avoid duplication. Name of head of the family and house no. were maintained as primary distinctive identity of the family. New-norm measures like utilization of mask, hand sanitizer and social distancing were followed during the interactions. Institutional ethical clearance was not contemplated since the work involved direct review medical documents and basic medical examination without any active intervention. The data acquired was assimilated, tabulated and statistically validated to infer the outcome.

Results

The community is located on the southern flank of a main road connecting south Kolkata further down to south 24-parganas district of West Bengal. Houses are by and large single room brickwork accommodation with asbestos/tin roof, while few of them are completely make-shift improvised type. Public toilets, municipal piped water supply point, water hand-pumps and street lights are available but not sufficient to make common life at ease. Drainage is open, littered with undue drop-offs making the surrounding dirty and disorganized added with irregular garbage disposal. Govt. hospital and dispensary facilities are available near-by. The locality is over-populated and crowded with lack of space and privacy for the residents.
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54% of the households found shabby with 72% residents complained of poor ventilation. The houses are old and worn out, has not been subjected to repair for long. All the houses are hired on rental basis and monthly levy varied between Rs. 50 to Rs. 300. 55% identified nearby tube well as the source of drinking water, however there are 3 municipal water points.

Municipal taps generally provide intermittent supply of water. None of the houses had separate toilets. There are 8 toilets to cater for 108 families; conditions of toilets are unhygienic. However a set of 4 toilets has been marked for females. No separate covered washroom is available for the ladies. Although solid waste is being collected and disposed off daily yet, littering was seen all around the area. Underground drainage system existed but connected with surface drain from the houses. There are points of overflowing and blockage with foul smell. Nearly 32% residents complained of ill-maintained drains and toilets. 68% of the families contacted nearby state hospital on medical issues as compared to 32% consulted local doctors. Unemployment existed among 29% of population between 20-59 years. 60% of families had moderate score for standard of living. All members stated taking 3 principal meals everyday apart from tea & coffee. The habitation portrayed a picture of semi-urban slum in a metro city having many unattended socio-graphics left to its own arrangement.

Table-1 reveals majority (50.3%) belonged to 21-40 year age group while subjects above 51 years only comprised of 12.3%. 91.6% were Hindu. A total of 108 families with 430 members constituted a family size of 3.9 with a sex ratio of 945.7.

Table 1: Age, sex & religion of the subjects

Age group in yrs.	Gender		Religion		Total No. (%)
	Male	Female	Hindu	Muslim	
1 - 10	24	26	47	3	50(11.6)
11-20	26	23	45	4	49(11.4)
21-30	56	54	105	5	110(25.6)

31-40	55	51	98	8	106(24.7)
41-50	30	32	56	6	62(14.4)
51-60	19	17	30	6	36(8.4)
61 +	11	6	13	4	17(3.9)
Total (%)	221 (51.4)	209 (48.6)	394 (91.6)	36 (8.4)	430 (100.0)

38.9% families migrated and settled to the present locality during 1971 conflict while 14.8% moved in after 1971 (Table-2). In-home migration from neighbouring areas constituted 27% rural and 10% urban. Non-conflict migration mostly took place for search of employment and work engagement.

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Table 2: Migration Pattern

No. of families	Non-conflict Migration (40)		Post-conflict migration (68)		
	Origin		Year of migration		
	Rural	Urban	Prior to 1971	During 1971	After 1971
108	29 (26.9)	11 (10.2)	10 (9.2)	42 (38.9)	16 (14.8)

Fig. in the percentage parenthesis indicate

Most of the respondents (38.5%) were educated up to the primary standard as against 34.2% completed middle school. Majority of the families belonged to lower (47.6%) followed by lower middle class (44.7%) of the SES. 48% had per capita income less than Rs. 985 per month (Table-3).

Table 3: Education, SES & per capita monthly income of the subjects

Education		Socio-economic status		Per Capita monthly income	
Qualification	No.(%)	Grade	No.(%)	Income(INR)	Total (%)
Graduate	8(1.9)	Upper	--	6574 or more	
Secondary	58(13.5)	Upper middle	--	3287 – 6573	
Middle School - VIII Std	147(34.2)	Middle	33(7.7)	1972 – 3286	26(6.0)
Primary	166(38.5)	Lower middle	192(44.7)	986 – 1971	196(45.6)
Illiterate	*51(11.9)	Lower	205(47.6)	985 or less	208(48.4)
Total	430(100.0)		430(100.0)		430(100.00)

* Including 24 children of 01-04 year age group not attending school

Table- 4 & 5 reflects that 104 (31.4%) adults had single chronic diseases, 43(13%) had two and 6(1.8%) had 3 or more diseases. There were 209 detected instances of chronic diseases among the 153 subjects of which most prevalent was Hypertension (18.4%) followed by Tuberculosis (9.9%). Significant gender differential was seen in Hypertension and under-weight. Alcohol disorder, Diabetes and Hypercholesterolemia were also important chronic diseases. Prevalence of Under-weight children was quite high (24.2%), however no frank case of PEM found. Males significantly bore the brunt of chronic diseases more with a 2.3 times higher risk when compared to females (Table-6).

Table-7 shows correlation between chronic disease and demographic profile of the subjects.
Illiterate men in their 5th decade of life belonging to lower-most SES status with lowest per-capita income were significantly affected. Out of the 07 socio-demographic attributes of age, sex, education, SES, income, smoking & drinking habits, correlation with ascending chronological age stood out most significant.

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Table 4: Prevalence of chronic diseases

Prevalence of Chronic diseases in 21 to 60+ yrs.(n-331)			Chi sq Sig- (p<0.05)	Prevalence of Chronic diseases in 1 to 20 yrs. (n-99)		Chi sq Sig- (p<0.05)
Disease	Male(171) No. & %	Total(209) No. & %		Male(50) No.& %	Total No & %	
Tuberculosis	19(11.11)	33(9.96)	0.51, NS	1	1(1.01)	-
HIV	02(1.16)	02(0.6)	-	-	-	-
Diabetes	14(8.19)	24(7.25)	0.46, NS	3	3(3.03)	-

Hypertension	41(23.98)	61(18.42)	7.2, Sig	5	5(5.05)	
Congestive heart failure	-	01(0.3)	-	-	-	-
Arthritis	-	1(0.3)				
High cholesterol	15(8.77)	25(7.55)	0.75, NS	-	-	-
Thyroid disease	-	02(0.6)	-	-	-	-
Cancer	-	02(0.6)	-	-	-	-
Asthma/ Bronchitis	06(3.5)	08(2.42)	0.45, NS	3	5(5.05)	-
Alcohol disorder	28(16.37)	28(8.45)	-	-	-	
Underweight	07((4.09)	22(6.64)	9.64, Sig	9	24(24.24)	2.14, NS

Table-5: No. of Chronic diseases as per no. of subjects

Diseases	Stag (104)	Dyads (43)	Triads (5)	Tetrads (1)	Total
Tuberculosis	24	5	4		33
HIV		2			02
Diabetes	19	4	1		24
Hypertension	29	28	4		61
Congestive heart failure	1				01
High cholesterol	-	21	3	1	25
Thyroid disease	2				02
Cancer	3				03
Asthma/Bronchitis	7		-	1	08
Alcohol disorder	2	24	1	1	28
Underweight	17	2	2	1	22
Total instances	104	86	15	4	209

Table-6: Chronic diseases according to gender among adults

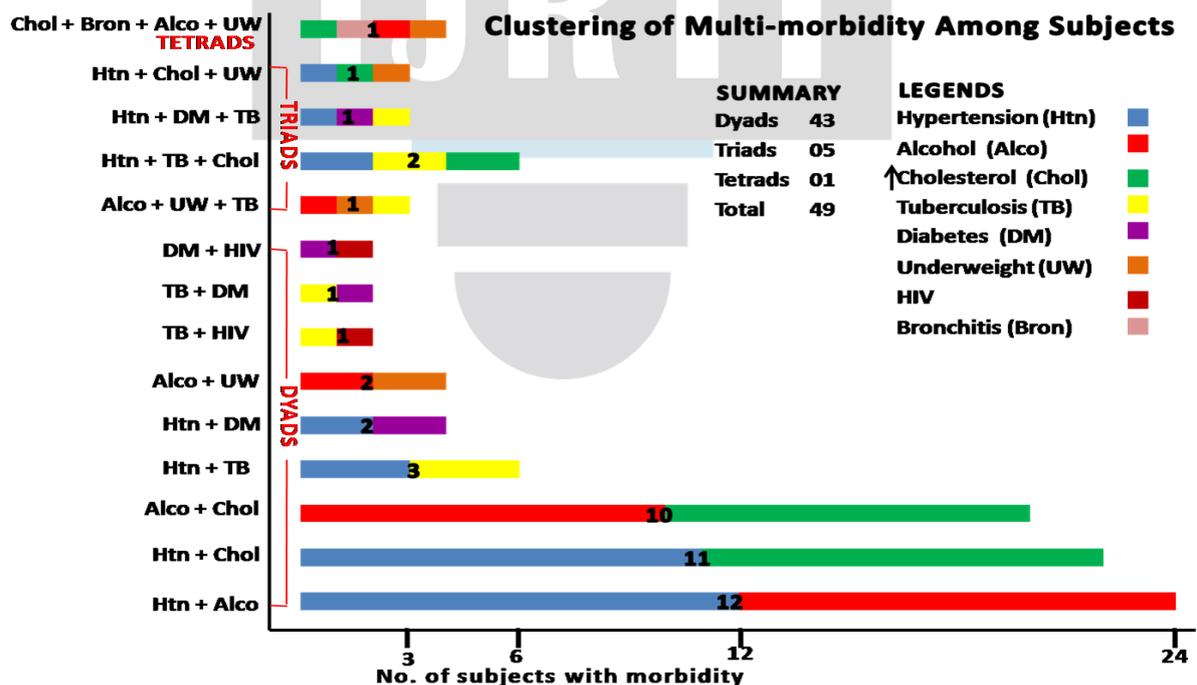| Category	Affected with disease (%)	Not affected with disease (%)	Total (%)	Significance
Male	98 (30.6)	73(22.7)	171(53.3)	OR 2.32, Chi Sq 13.6, p - 0.0002
Female	55 (17.1)	95(29.6)	150(46.7)	
Total	153(47.7)	168(52.3)	321(100.0)	

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Fig-1: Clustering characteristics of multi-morbidity among the affected

Table-7 shows correlation between chronic disease and demographic profile of the subjects.

Illiterate men in their 5th decade of life belonging to lower-most SES status with lowest per-capita income were significantly affected. Out of the 07 socio-demographic attributes of age, sex, education, SES, income, smoking & drinking habits, correlation with ascending chronological age stood out most significant. Male gender, smoking, alcohol consumption and poor literacy were also recounted correlated to prevalence of chronic diseases.Fig-1 depicts the clustering of diseases among 49 multi-morbidity patients i.e. the subjects affected with multiple chronic diseases. Hypertension-Alcohol disorder (24.5%), Hypertension-Hypercholesterolemia (22.4%) and Alcohol disorder-Hypercholesterolemia (20.4%) were found to be frequently clustering among residents afflicted with dual diseases. Co-existence of Hypertension, Hypercholesterolemia and alcoholism in variable combination is understandably mutually complimentary and correlative. Among the triads, Hypertension-Tuberculosis-Hypercholesterolemia got clubbed together among 4% of the multi-morbid subjects. Men were apparently more affected with Hypertension (24%), Alcohol disorder (16.4%) and Hypercholesterolemia (8.8%) that got manifested in variety of permutation and combination among the multi-morbid individuals.

Table-7: Disease prevalence according to socio-demographic profile

Categories		Have exactly one chronic condition (n-331)	Significance p value	No. of subjects as per attributes	Total no. of subjects & (Diseased)	Trait specific prevalence rate
Age	21-30	12(3.62)	Chi Sq 65.9, p=0.00001 p<0.05	110		10.9
	31-40	25(7.55)		106		23.6
	41-50	33(9.96)		62	331(104)	53.2
	51-60	25(7.55)		36		69.4
	61 +	9(2.72)		17		52.9
Gender	Men	66(19.9)	Chi sq 8.45, p=0.003, p<0.05	171	331(104)	36.8
	Women	38(11.5)		160		25.6
Education	Graduate	2(0.61)		8		25.0
	Secondary	14(4.23)	Chi sq 11.4 p= 0.022 p<0.05	48		29.2
	Middle school	34(10.27)		117	331(104)	29.1
	Primary	40(12.08)		136		29.4
	Illiterate	14(4.23)		22		63.6
SES	Middle	4(1.21)	Chi sq 8.31 p=0.015, p<0.05	25		16.0
	Lower middle	39(11.8)		148	331(104)	26.4
	Lower	61(18.4)		158		38.6
Per capita monthly income	1972 – 3286	3(0.9)	Chi sq 7.54, p=0.023, p<0.05	20		15.0
	986 – 1971	40(12.4)		151	331(104)	26.4
	985 or less	61(18.4)		160		38.1
Tobacco in men 15-60 yrs. (n-186)	Current smokers (56)	28	Chi sq 7.4 p = 0.006 p<0.05	56	186(66)	50
	Non-smokers (130)	38		130		29.2
Alcohol user men 15-60 yrs. (n-186)	Current drinking (48)	26	Chi sq 9.86 p = 0.001 p<0.05	48	186 (66)	54.2
	Non-drinkers (138)	40		138		29.0

Discussion

The age-sex composition, gender quotient and family-size of the community studied reflects comparable features akin to national statistics.[7] 112 male (26%) & 96 female (22.3%) members of the community were engaged in income generation activities and the support from the fairer gender is noticeable. 11% men and 17% women in 20-59 years age group were unemployed due to various reasons. Men mostly worked as vendors, shop runners, hotel attendants, stall workers & security personnel; while females worked as domestic help, hospital ayah/sweeper. 379(88.1%) subjects were literate; that's comparatively higher than documented literacy rate of West Bengal (77%).[8] Nearly 92% respondents belonged to lower-middle & lower-most class of SES with per capita monthly income less than Rs. 985 to 1971.

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Basic minimum education favoured with small family, trying financial endeavour & meagre social subsistence depicts hardship in human sustenance in Kolkata slums in the face of poor civic facilities.

Space crunch, lack of privacy, crowded toilets and insufficient indoor found inappropriately trying for adolescent girls and ladies. Old rented houses, inadequacy of water supply, unhygienic public toilets, improper waste clearance, over-shooting drains, unhealthy surrounding with moderate unemployment depicts a picture of one of the many forsaken Kolkata slums commensurate with findings of a study from the recent past. [9] Taking in to stride the breathing insufficiencies, many families (92.5%) tried best to upgrade economically by dual engagement of spouses and grown-up children gainfully to meet the ever-escalating expenses. People do consider life in a slum as a possible prospect to transition to middle class group in the long run; however many adjudge it actually as a poverty trap. Satisfaction & dissatisfaction among slum dwellers could be affected by many economic, social and environmental constraints as well as the initial reasons for settling in; existing evidence implies that most slum dwellers in low-middle-income-countries (LMIC) unwillingly stay in slums because of compelling reasons. [10]

104 (31.4%) adults had solitary chronic disease compared to 49(14.8%) had multi-morbidity in the present study. The prevalence of single (31.4%) as well as multi-morbidity (14.8%) in this study is disturbing particularly because it is among an economically marginalized population. Coexistence of two or more chronic conditions is usually defined as multi-morbidity. [11, 12] Centers for Disease Control and Prevention, US documented that 21% of Americans aged 45–64 and 45% of citizens aged 65 & above had been diagnosed with two or more chronic conditions in 2010. [13] Pefoyo et al reported 51% having one, 24% with two coexisting illness & further found proportion reached 81% among 75 years aged or more. [14] Improvements in survival and an aging population are two key reasons that the prevalence of chronic disease and the likelihood of living with more than one condition are expected to continue to rise for the foreseeable future. In addition, several lifestyle factors have been identified as important contributors to the incidence of chronic diseases and multi-morbidity. [15] A recent study documented prevalence of chronic diseases as 48.3% among less than 45 years group, 59% in 45-60 years and 70% in 61-75 years among Indian national. [16] Comparatively the prevalence found in the present study is lower than most of the reported prevalence.

Overall, most prevalent condition was Hypertension (18.4%) followed by Tuberculosis (9.9%). Significant gender differential was seen among adults being hypertensive and under-weight. Alcohol disorder, Diabetes and Hypercholesterolemia were also important chronic diseases. In general, the prevalence of hypertension in India is 29.8% with noteworthy rural urban differential & significant higher occurrence among lesser educated group of subjects. [17] 9Lower prevalence of hypertension in the present intent among urban slum-dwellers could be due to the reason of 10.5% adults being underweight and 92% engaged in moderate to high grade of physical activity due to day-long employment need. Prevalence of under-weight children was quite high (24.2%), however no frank case of PEM found. A study has documented prevalence of underweight in India among 18 years age group is 39.8%. [18] The rate of stunting among under-five in India has declined from 48% to 38.4%, wasting has increased slightly from 19.8% to 21%, and underweight has decreased from 42.5% to 35.8% between the two time-periods of NFHS-3 & 4. [19] Health of urban slum children and adolescents indexed with underweight in the present work as upshot of urbanization appears an important issue in India. [20] Malnutrition among children is of paramount public health concern in many developing countries and India is no exception. [21] 168(52.3%) adults didn't have any diseases. Men significantly bore the brunt of chronic diseases with 2.3 time higher risk than the women. While most scholars documented higher affinity of the fair gender to multi-morbidity, contrastingly present work unveils the co-existence of multi-morbidity more among the males in consonance with findings of Almagro et al in 2020. [22] It is possible that with a longer survival, the so-called 'male-female health-survival paradox' indicating the greater life expectancy in women is reprised by several chronic diseases, physical impairment and functional dependence. [23] Conversely, men are more susceptible to chronic diseases with a worse vital prognosis, such as cancer and ischemic heart disease. [24] Clustering of Hypertension, Hypercholesterolemia & Alcohol disorder in diverse combinational mode among many dyads stood out noteworthy suggesting generalised clinical care & counselling approach for life-style reformation to offer comprehensive management in contrast to solitary patient care & treatment. [25]Illiterate smoker men in 5th decade of life from lower-most SE status having the lowest per-capita income indulging in alcohol, were significantly affected by chronic diseases. Out of the 07 socio-demographic traits, correlation with aging was recounted as the most significant; followed by drinking and smoking. Correlation of chronic diseases with low SES corroborate with the findings of earlier study where a significant association was found between multi-morbidity and socio-economic status & individual income. [26] Similar observations have been reported in studies conducted in LMICs. [27,28] Risk of multi-morbidity increases with aging; as has been deliberated by many studies in the past. [29,30] These findings are reflective of the present intent, where aging found as the most significant risk for acquisition of multiple diseases. Therefore, increasing longevity has likely consequences of multi-morbidity patterns of elderly, which needs policy attention to avert the challenges of morbidity, disability and functional frailty at old age. Smoking and drinking are nevertheless important risks for many chronic diseases and has been reported so in the past in congruity with the present work. [14,31]

The study unveiled the complexities of slum life in Kolkata burdened with multitude of social, civic and chronic health problems. Stacked up with sciolism, meagre subsistence and myriad of chronic diseases, flow of life and survival appeared trailing behind in Kolkata slum. Migration to slum in the quest of settlement, stability and secured life undesirably induced big question mark on healthy survival and sustenance. Improvement in municipal and civic facilities, up-gradation of educational services and realistic income generation provisos can go a long way to uplift the slum life; need to be backed up by medical care for the affected to ensure better physical and functional health.

This has been a limited study in a slum community in Kolkata; therefore the results need guarded consideration for generalisation. Medical data used in this study has been secured by direct review of existing medical reports of the subjects issued by Govt./Pvt. hospitals/clinics without much intervention/tests conducted by the researcher. Study being descriptive and cross-sectional can't generate causal association. In spite of these restrictions, the study portrayed the real picture of urban slum life in a metro city, its complexities & connotations of nitty-gritty; thereby suggesting more detailed research in these directions to ascertain better avenues to augment the life of slum-dwellers.

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