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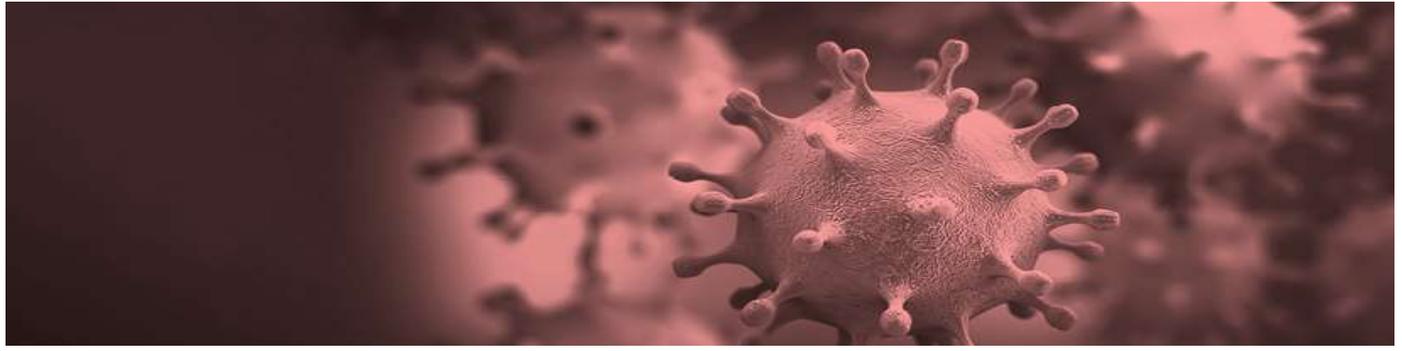
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Mitigation strategies and Covid appropriate and risk behavior : A descriptive study at slums of Bhubaneswar, Odisha.

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ABSTRACT

Bhubaneswar, the capital of state Odisha, is a fast upcoming educational and industrial hub. In that context a number of slums have arisen in the city to address the developmental needs of the city as well as the needs of migrant population from other districts, who have come for sake of employment opportunities.

These slums as they do not fall under any civic body, are perceived to have poor or less access to basic amenities as well as health services. However, now every facet of urban planning has programmes and strategies laid down to address the issues of the slum population and Odisha state government has shown the way in this case to the whole world. Being continuously plagued with cyclones, epidemics and climate change issues year after year, the state government has inbuilt integrated measures to safeguard health and livelihood for the slum population. Nevertheless, it cannot be denied that the living conditions of these areas are not optimum for this population.

The current study tries to explore the pandemic preparedness of slums under the catchment area of the medical college and the mitigation strategies exercised. The covid positivity was below 1/0,000 population for this population in the study period and covid appropriate behavior was best in terms of not venturing out of homes i.e restricting human activity to the minimum and usage of mask was seen for 93% of subjects and practising hand washing with soap and water by 91% of subjects. Problems noted were sharing of masks(9%). Inappropriate disposal of masks in uncovered bins. Emphasis needs to be put in for improving sleep hygiene, cough hygiene and personal hygiene among the under 5 and elderly and women who were homemakers reported mental health issues due to lack of income and also alcoholism of spouse.

The study gives a dipstick measure of containment of disease in slums and some best practices can be taken up for other cities.

KEYWORDS: covid appropriate behavior, covid risk behavior, pandemic mitigation strategy, slums

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I. INTRODUCTION

COVID-19 is the disease caused by a new coronavirus strain called SARS-CoV-2. WHO(World Health Organization) first learned of this new virus on 31 December 2019, following a report of a cluster of cases of 'viral pneumonia' in Wuhan, People's Republic of China. Since then it has spread to all the regions of WHO causing millions of cases and lakhs of deaths globally with India being among one of the worst hits. The number is rising rapidly making every one vulnerable to the infection.⁽¹⁾ SARS-CoV-2, the causative agent can spread through both direct means (droplet and human-to-human transmission) and by indirect contact (contaminated objects and airborne contagion). As recommended for other respiratory infections like the flu or the common cold, preventive measures are critical to slow the spread of illnesses and the everyday preventive actions includes staying home when sick; physical and social distancing between people; covering mouth and nose with flexed elbow or tissue when coughing or sneezing; washing hands often with soap and water and cleaning frequently touched surfaces and objects for reducing transmission. Wearing a medical mask is one of the prerequisites that can limit the spread of certain respiratory viral diseases, including COVID-19.⁽²⁾ As is the case for any infectious disease, the Urban poor or slum dwellers are among the most vulnerable to be affected and these communities are at high risk of COVID-19 transmission (hot spots) and the least equipped to handle an outbreak. Slums are characterized by high population density, poor housing, illiteracy, overcrowding, indoor air pollution, increased level of both intersocial and intrasocial mixing within slums, limited accesses to water and sanitation or myths and poor health seeking which increases the risks posed for this population.⁽³⁾

The provision of safe water, sanitation and waste management and hygienic conditions is essential for preventing and for protecting human health during all infectious disease outbreaks, COVID-19, which is highly compromised in these urban settlements.

The disease offers a challenge, wherein in the absence of health infrastructure and lack of confirmatory efficacious medicines, promotive and preventive measures are the mainstay of containing the disease. The nation as a whole went through the lockdown from mid-March to May 2020 and gradual unlocking of man activities through the subsequent months of 2020. These activities were mainly directed towards limiting the numbers of cases. In a populous country like India, and more so in the underserved populations, the acceptance and adherence of these strategies were questionable. In spite of all conceived

shortcomings, cases amongst the urban slum dwellers have been restricted dramatically in Bhubaneswar, capital of Odisha, contrary to slums of big cities like Delhi and Mumbai.

Urban Field practice setting of Department of Community Medicine, KIMS offers preventive and promotive services to five slums of Bhubaneswar within a radius of 9km of its centre. This study attempts to gain insight into the mitigation strategies, other health and social safeguard measures, more so in the lockdown period and covid appropriate behaviour adopted in these compromised settings of civic amenities, or supported through the state administration, that has enabled them to keep the infection under control. It would also bring out some major deviations that is likely to make them more susceptible to such airborne droplet diseases in future, and we the public health fraternity may suggest corrective measures in time.

Objective: To assess the mitigation strategies and Covid appropriate behaviour in slums of Bhubaneswar for containment of Covid infection.

II. METHODOLOGY

Study site: Urban slums under the field practice area of KIMS Medical College, Bhubaneswar

Study population: Residents of the slums

Study design: A point descriptive study was conducted from June to December 2020 using a pretested and semi structured questionnaire (mix of open ended and close ended questions), pretested and translated into local language (Odia), after due informed consent of the participants.

Sampling: Feasibility sampling was used to contact all the households with valid contact details (including telephonic contact details) from the family cards maintained for field practice area. Households that responded to the call and gave consent to participate in the study were taken up. Out of the 400 households contacted from the family card folders, few had mismatched contact information which might be due to their inability to retain a mobile phone or inability to recharge the phone because of financial constraints. Some families had migrated to their native villages during this period and were currently not staying in the study area and another group of households did not consent to participate in the study. Each household was attempted thrice for contact at different hours of the day: morning, afternoon and evening on two consecutive days and then excluded from the study in case of non-response or denial. The final sample size was thus 106 households who gave consent and provided the necessary information.

Method of the study: The list of the households with valid contact details recorded in their respective family cards was obtained and each household was approached by the study team via telephone. The head of the household or any responsible adult member of the family was explained about the study and invited to participate and provide requisite information as per the study tool after via a long and detailed telephonic conversation, at the desired time slot obtained from the respondent after the first contact was built. If the head member was very old or sick or unable to give the information for any reason, then any adult member suggested by him or her was interviewed. The child care practices were validated from the mother of the child. Details provided over telephonic contact was validated by a physical visit to the participating household by members of the study team as a part of the regular health education campaign activity organized by our urban centre in the catchment area. This method of study was adopted in view of minimizing the exposure and contact risk of both the study participants and the researcher team.

Ethical Approval: The study protocol was submitted and approved from the institutional Ethics committee (KIIT/KIMS/IEC/346/2020).

Data Analysis: All questionnaires were checked for completeness at the end of data collection. Data was entered into Microsoft excel 2007 spreadsheet and analyzed using SPSS software version 21.0 Responses from the questions were coded before entry into the computer. For categorical variables, frequencies and percentages were used. Descriptive statistics were used to find out the Covid risk and protective behaviours.

Limitation: A more robust sampling and one to one interview of the pregnant woman could have helped enhancing the study results.

III. RESULTS AND DISCUSSION

A. Socio-demographic details of the study households

All the eligible and consenting 106 households with a total of 280 family members of various age categories were included in the study. It shows that 90.6 % of the families were Hindus and the rest belonged to the Muslim religion (9.4%). The median age of the respondents, who answered the call and provided information was 42 years with minimum age being 17 years and maximum age being 80 years. 62% of the participants belonged to general caste and 68% resided in a nuclear family setting with limited family number of members in the family to support during the lockdown, which might have acted as an advantage to run the household during the crisis with

limited resources. 76% (80) of the houses included were owned by the participants, out of which 75 houses were pucca houses with separate kitchen and in built toilet, majority of which was built under the housing scheme of state government, thus reducing the economic burden of the slum dwellers to pay rent, as well as reducing the exposure risk generated of using a community or shared toilet and additional respiratory hazard risk of the indoor air pollution generated from using the living room for cooking space. Moreover, majority of the households(93.4%) used cooking fuel as LPG, as they are provided at subsidized rates, which helped curb the risk of indoor air pollution, which was earlier attributed to use of kerosene or coal.⁽⁴⁾ This was contrary to results in study on Mumbai slums ⁽⁵⁾ one of the most densely populated slums, which during the contemporary study period had 421 cases, a 12% growth rate and case doubling rate of 18 days. For Niladri Vihar slums (of this study) it was 0.01% growth rate with case reporting at 2 cases in the period of study. Bhubaneswar as a city had learnt its lessons from the recurrent disasters of cyclones in past few years and hence the sync between the governmental, health and community to manage disasters had already been tested and tried over the years. Slums which were also worst affected in these disasters of the past, had urged the state government to offer them planned housing with ecofriendly and economic toilet and kitchen facility. Unlike Dharavi which had generations of families staying, here more nuclear families, who have come from nearby villages were residing. The slums were catered by the Medical college, governmental Aaganwadi centers and dispensary, which offered primary as well as secondary care at doorstep. The presence of ICMR sister concern, Regional Medical Research Center (RMRC) added to the favourable opportunity for slums of Bhubaneswar, wherein regular free testing and seroprevalence studies were in progress.^{(6),(7)} All these demographic determinants of the slum population restricted the disease to the minimum.

B. Covid-19 risk and appropriate behaviour among the communities:

Study participants with history of travel either outside the district and the state was only reported among 02 members among the 106 households of the slum, which can be attributed to the various employment sectors like shops, small factories, construction sites, domestic services at homes and others, in and around the capital city absorbing majority of the workforce from the slum dwellers and thus limiting their exodus for employment. Very few families(10%) reported to have their kins returning from other states or districts under the migrant category, which probably would have been the only reason contributing to the cases(only 02 reported) in

the slums, contrary to the largest burden of cases in state as seen in Ganjam district(2000 cases/d) due to migrants from Surat and Hyderabad. ⁽⁸⁾

Residents of the slums did their best to practice personal hygiene measures especially hand washing and social distancing .91% of the households uses soap and water at various moments of hygienic practices like before cooking(35%),before eating(46%),after eating(42%),after using toilet(76%) and before offering prayers(4%).The community gets timed piped water supply in most of its dwellings, which had made it easier to wash hands regularly and also to keep the house clean. Others who did not use soap, were using running water to wash hands during the same activities, This appropriate behaviour against preventing infection of covid 19 disease was a major boost to the containment of spread of the disease. Same is noted in another study in Odisha⁽⁹⁾, wherein 86% reported a change in hand washing behaviour. Akin to this study, in this study too cleaning of water tanks, household water treatment and house cleaning was enhanced in the pandemic period under the Swatch Bharat Abhiyan and other sanitation committees.

Although, observation of social distance norms amongst residents is not easily applicable in the slum especially with more people staying at home and houses being so close together, attempts were made by the local shops and small traders, whose owners had done floor markings for following the social distancing norms .The residents were mobilized to set up the social distancing foot marks near the common or shared amenities and facilities like water tap or toilets, to avoid gathering in front of the same.

Usage of face mask was reported by 93% of the household members during going out in public places. Majority of them were buying the mask from nearby stores or vendors(86%) while 14 % of the slum dwellers ,considering the difficult economic situation, complaint that the bought masks were too costly, hence preferred using homemade masks.

From a public health point of view, greatest concern is the proper use and disposal of the masks. Risk behaviours like ,37% were reusing the mask after washing with either water or soap water and 9 % reported sometimes they are bound to share their mask with other family members, out of their inability to afford for all, were noted among the residents. Uncovered street bins were used to dispose the masks by most of the participants of the study, which enhanced the risk of the community to acquire the infection. Paucity of space led to lack of sleep hygiene as nearly in 81% respondents slept in a designated space or single room. Cough hygiene was also heavily

compromised in 83% of households especially in 5 to 15 years age group.

While enquiring about the coping strategies adopted during the ongoing pandemic, it was found that the COVID-19 containment measures have led to massive closure of employment sectors leading to loss of income , especially for low income daily wage earners . This unprecedented situation of the slums all over the city, were lifted up to a great extent by the state government and self help groups who, were providing free food grains and essentials to the communities. Home remedies and food supplements like kadha with tulsi leaves and other herbs, amla ,lemon, consumption of hot water were adopted by the 95%/residents of the slums. With the male members staying indoor for long hours, being unemployed, anxious and stressed to bear the economic responsibility of the whole family, increased cases of domestic violence, both in the form of both physical and emotional abuse was reported by the female participants. This was also identified in a study done in pandemic period across the world ^{(10),(11),(12)}

C. Care taken for the special groups

Children below 12 years, pregnant women and elderly population above 60 years were the most vulnerable group amongst all and had to be taken special care of in the containment of Covid-19 disease. With the slums being deprived with the basic amenities in the slum setting, it was difficult to care for these groups, despite the study found out that elderly population were encouraged to use mask, stay indoors and avoid going to mass gatherings , same was noted for the pregnant lady ,if present in the family. Practice of using mosquito nets during sleeping hours in majority of the households, helped warding off the risk of malarial infection, which or else would have added on the healthcare burden.

While for the children(46 households had child <12 years) it was a difficult time, as all the education centres, schools were closed and provision of alternative sources of education like online classes were out of reach of the families with an average of 2-3 child in the family. Parents on the other hand acted responsibly and counselled children to adopt measures to prevent being infected as shown in the table down below(table 1). Defiant behaviours among the children was noted among a portion of children mostly in the school going age group, which could be due to lack of any entertainment sources and inability to play outdoors and roam around the community, which was their usual pass time in the earlier days.

Table 1: Preventive measures adopted for children

Practices followed among children(n=46)	Frequency		Percent	
	Yes	No	Yes	No
Discourage playing outdoor	44	02	96	04
Engage in indoor activities	45	01	98	02
Educate on cough etiquette	43	3	93	7
Eduacte on hand hygiene with soap and water	42	4	91	9
Eduacte on social distancing	43	3	93	7
Ensure maintainance of hand hygiene after returning from outside	42	4	91	9
Deviant behaviour noted in child	39	7	85	15

Positive reinforcement of covid appropriate measures adopted by the residents and that they are doing well can be the driving force for containment of the disease in the community. However, risky social behaviours shows serious concern, that should be addressed on priority to enhance all the efforts and prevent the spread of the disease. State government have taken firm efforts to implement the required measures and hence are aiming to protect these vulnerable group of population. Measures like arrangement of institutional quarantine for migrants returnees, surveillance activities, COVID sachetak committee doing awareness campaigns, providing transport facility for admission in the dedicated covid care facilities for positive cases and followed by daily surveillance in the same locality, setting up fever clinics in the existing selected Anganwadi centres in the slums ,thereby identifying symptomatic either by self-reporting or during the UHND sessions, were taken by the Municipal Corporation of the city.⁽¹³⁾

Community leaders and other stakeholders are equally responsible for spreading the valid information and messages to them and thus help them reach the right facility at right time.

IV. CONCLUSIONS AND RECOMMENDATIONS

This study largely reinforces that integrated effort of government and community participation, alone can curb contain this kind of infectious diseases, even in compromised settings like slums.

This population was targeted from the beginning as most vulnerable and taking tips from the debacle of Mumbai, Delhi and Uttar Pradesh, the state government through its local civic body ie Bhubaneswar Municipal Corporation, have advocated strictly in bringing the 3T strategy ie trace ,test and treat in slums. On a PPP mode, private medical colleges were upgraded as Covid Hospitals or clinics and requisite care at the time of isolation was offered .

What was seen missing was addressal of the psychological trauma of children and elderly as well as domestic violence due to prolonged home confinement and loss of wages. Women self-help groups would be targeted to do the same.

Another thing that was lacking was cough, sleep and hand hygiene among the children. This would have to addressed by behaviour change mechanisms by health providers.

Recently, under the largest vaccination drive against COVID-19 being organized, the state government has made provision for free vaccination amongst the slum dwellers in the age group 45 years and above, which will be soon extended to the age group between 18 to 45 years as well. This would add to the efforts being made to curb the disease and tackle the pandemic situation of the country.

The simple yet descriptive study offers a strong example of handling aftermaths of a pandemic in a vulnerable hot spot is not possible by a snapshot decision. Proper and sustained town planning and reinforcement of good health measures, over years makes the task achievable and easy.

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