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“SOCIAL DYNAMICS AND ITS RELATIONSHIP WITH THE SPREAD OF DISEASES IN INDIAN SLUMS”

Naseem Ahmad ¹, Dr. N.N. Awasthi ², Dr. Vikrant Sharma ³

¹ PhD. (Sociology), Faculty of Arts, PK University, Shivpuri India

² Head of Department, Department of Social Work, Bundelkhand University, Jhansi, India

³ Dean, Department of Arts, PK University, Shivpuri, India

ABSTRACT

The non-communicable diseases (NCDs) may be sometimes epidemics developing higher levels of life risk. the slum dwellers. Experts use Social Determinants of Health (SDH) parameters to measure or understand the impact of NCDs and social dynamics. This is especially relevant for the slum dwellers and the poor. In many ways, SDH parameters have helped to understand it clearly those NCDs are not just restricted within the affluent people of our society but the poor are equally at risk However, its influence on the policy makers of our country is not clear. Given the host of factors that are referred for the presentation of NCDs, making SDH as a framework.* policies and programs in this realm that addresses the relative intricacy of slums has been caught up.*

The objective of this paper is to clear up the multifaceted networks of relations among different social determinants of health (SDH) in slum areas to find out the best options for the municipalities in India so that they can develop policies that could create short-term impacts.

This research reviews the available literature in this realm providing information of SDH in slums in India. The study specifically focuses on the literature that establishes relations between NCDs and SDH, at least feebly. Then, the in-depth investigation has been made to find out the actual cause of such relations between NCDs and SDH.

Poverty is considered the most obvious SDH in the slum areas in India. However, it is not the sole cause of the rapid spread of NCDs in the slum areas. The link between SDH and NCDs are multidimensional in nature. The whole link, considering its complex networks, is based on the four pillars, viz. The scarcity of clean drinking water, low education, poor transportation, and hazardous physical activities. The literature review helped in developing four logic trees for imagining the relations between SDH and different NCDs. Each of these logic trees helps in differentiating indicative problems from their more distal reasons. Recommendations are developed accordingly. The features of these relations that seem acceptable for policy development are only recommended.

It is possible to go for an in-depth examination of SDH through the root cause analysis only. The conditions and complexities of Indian slums made it clearer. It offers guidance for the expansion of the policies that are actually based on the most obvious health issues in the slum areas in India. The root cause analysis also help to find out the complex and complete pathways through which NCDs are socially constituted.

Key Words: Informal settlements, chronic illnesses, slum health, root cause analysis.

I. INTRODUCTION

There were 56 million deaths registered worldwide in 2012. There were more than 38 million deaths (about 68%) due to NCDs. Moreover, 28 million or nearly 74% of these deaths due to NCDs registered in the Low and Middle Income Countries (LMICs) [1]. Sufficient empirical evidence is available showing that the slums are the breeding ground of NCDs and related risk factors [2-5]. During the period 2000 to 2010, the number of slum dwellers in the developing has grown from 767 million to near about 830 million [6]. Continued growth of slums and rise in NCDs will increase the density of chronic sickness in the slum areas and poverty. Thus, getting an idea of the casual pathways of NCDs in the slums and finding the direct and indirect causes is going to be a major step for slowing down the rapid proliferation of NCDs as a whole. Slums have clear legal and physical features. Lack of proper sanitation, lack of good housing and healthy lifestyle, scarcity of pure water, insecure residential quality, lack of personal space and overcrowding, etc. are some distinguishable characteristics of slums [6]. The accessibility to healthcare is also limited to the slum dwellers this is mainly due to poor economic conditions [7]. However, slum dwellers develop several habits specific to urban populations such as higher consumption of processed foods, decreasing physical activity, etc. They do not seem much interested in health issues or adopting a healthy lifestyle that is also a part of urban life [8]. While addressing NCDs in the slums, different causes of these diseases including social and contextual factors must be considered along with the Social Determinants of Health (SDH) for the study.

At the same time, the physiological reasons for the disease should be given equal; attention. The SDH provide information on the social, economic, behavioral, and environmental factors of NCDs [9]. SDH includes several variable factors of the society such as education level of a community, availability of transportation, social status, gender, and income. There are some broader social aspects too, like the lifestyle of common people, cultural norms and macroeconomic policy [10]. These factors help to find out the more obvious causes of NCDs such as the use of tobacco and alcoholism among a certain population.

The wider outlook on the epidemiological presentations of different diseases provided by SDI-1 has received intense attention from the researchers. These studies have validated the links between different NCDs and their risk factors. Some of these studies have even associated NCDs with several environmental and socio-economic factors. Several studies have found a close link between inactive lifestyles and unhealthy eating habits to overweight and obesity especially in the LMICs [11]. Studies have also found low-quality education [12], unhygienic living condition [13], and poor social interaction [14] as the other causes of NCDs. Empirical research on the basis of SDH has revealed the fact that NCDs are not the diseases of affluent only. Moreover, it is also found that the impact of NCDs on government policies is not so clear. The Canadian Government took some drastic steps for the prevention of type 2 diabetes in the country. Raphael et al studied the effects of those public policies of the Canadian Government [15]. They found that the public policies targeting the SDH were largely ineffectual. Krumeich and Meershoek [16] have warned that formulating policies on the basis of SDH without considering the local contexts may be ineffectual [16].

This raises a serious concern: how the SDH can be used for the policy formulation and more specifically, as a part of this study, how SDH can be used for the formulation of policies for the slum areas?

The actual report published by the Commission on Social Determinants of Health included slums and urbanization [10]. The report opined that with the expansion of slums and slum populations, the daily living condition also needs to be improved. They included drinking water, sanitation, electricity, and well-structured streets as the prime factors to be considered first. Moreover, whose Kobe Center provided a model for the "Health in the New Urban Settings" [17] that included the SDH as a part of an ecological model? The model was influenced by urban settings and urbanization. This research work accepted governance as a serious casual pathway for understanding the SDH. The research outcomes show that the municipalities need to be involved as much as possible. The recommendation of the research comprises of the following features: Inhabitants and ecological-based that can include several upstream health determiners for the whole community; integrative in the sense that several contextual interventions can be used simultaneously; and, systems-based that is directly connected with the principles and models of good governance. As per an estimate in 2005, collective funding for the upgradation of the slums all over the world was almost US\$100 billion [18]. It proves that the SDH related activities in the slum areas have been gaining momentum. This study tries to identify the possible policies that can reduce the risk of NCDs in the slum areas keeping into focus the feasibility of the policies for the municipalities.

II. METHODS

A review of the literature was done to find the peer-reviewed papers that take into account the casual relationships between NCDs and the SDH in the slum areas of India. A broad range of keywords and databases were used for identifying the related literature from all possible domains. Following search terms or keywords are used with different combinations: slums; low- and middle-income countries; non-communicable diseases; chronic illness; social determinants of health; SDI-I; socioeconomic status; urbanization; health; illness; globalization; informal settlements; poverty; social exclusion; children; and women. Following bibliographic databases were considered for the above-mentioned search: JSTOR, ERIC, PUBMED, MEDLINE, CINAHL, Web of Science, Science Direct, and Humanities International Complete. Different articles were also searched for relevant information.

Only the articles and research papers published in between 2000 and 2016 were considered. Moreover, all articles and research papers that have applied qualitative quantitate, and mixed methods to identify the casual links between NCDs and the SDH were considered. At first, the titles, abstracts or executive summaries of the research papers and articles were reviewed. Then, the relevant papers and articles were saved in a bibliographic database system. The PDF files of the papers and articles were downloaded before reading each of these papers and articles thoroughly. The database also included the theoretical analyses of NCDs in the slum areas in India and SDH. Following are the four document types that were accepted for the literature review: Government publications, Peer-reviewed scientific articles, Policy documents, and Books. Some documents such as pamphlets, opinion papers, editorials, and monographs were not considered. The primary interest was in the articles published in the peer-reviewed scientific journals. Some institutional publications such as the publications of WHO were also considered if those are referenced in the peer-reviewed articles. The relevance of the articles and research papers were at first judged from the Indian slums' perspectives. Then, the articles and research papers were studied to see whether they have any description of casual pathways of NCDs.

III. RESULTS

From a thorough investigation of the articles and research papers reviewed in this context, four different themes emerged during the RCA. This structured the prime social determinants of NCDs specific to slum areas: 1. The scarcity of drinking water 2. Lack of proper education 3. Inadequate physical activity 4. Lack of proper transportation. The studied literature has mentioned poverty as the foremost SDH creating different health issues in the slums in India [17]. Though poverty is found to be the most deep-rooted cause of NCDs in the slums, without developing the casual pathways tree keeping poverty at the top, more analysis was made to identify the related outcomes of poverty. This would empower the policymakers with more information in this field. Three categories of literature data were utilized in the analysis:

- I. The link between locations and NCDs (explanatory and quantitative).
2. Slum dwellers' experiences with different types of NCDs (explanatory and qualitative).
3. The surge of different kinds of NCDs in the slum areas (quantitative). In the following sections, detailed outcomes of the RCA related to the reviewed literature that includes the casual pathways of NCDs are described.

IV. LACK OF CLEAN WATER

Friel et al conducted a thorough literature review related to health inequity in Asia [22]. The researchers argued that the mass health of this continent (Asia) largely shaped by the socio-economic and environmental factors but the influence of persistent health inequity could not be ignored either. They mentioned that the scarcity of pure drinking water was one of the strongest indicators of health inequity in this continent. Clean water is not adequately available in slums and there always remains a high risk of contamination of water by different vectors raising the risk of NCDs in the slum areas in India. This is a casual pathway which is specifically mentioned Ogoina and Onyemelukwe [23] in their review-based research paper. The authors found several NCDs including autoimmune diseases sourced by contaminated water in the slums [24].

In India, lack of socio-economic infrastructure is the prime reason behind the scarcity of pure drinking water. Cronin et al. conducted an extensive literature review [25] in this field. The authors observed that water pollution and

contamination levels in India were critical that could be very harmful to the people if not taken care of immediately. Hence, India has three primary concerns: 1. Sanitation 2. Clean water for drinking 3. Sustainability of the projects related to sanitation and clean drinking water. Allen et al performed a comparative case study on five different cities [26]. The authors found that the lack of sufficient public policies from the local governments and private initiatives are the main reasons behind the scarcity of clean water. They opined that lack of pure water in urban areas induce the urban dwellers to pay higher prices to avail of drinking water. Hence, the author's opined, poor people in slums are compromising on the quality of water and looking for alternative water resources [27].

Goli et al made a comparative study taking data from Indian Census 2001 [28]. The researchers lack pure drinking water in most of the Indian cities, especially for the slum dwellers, lead to poor health and different water diseases. Joshi et al did a comparative ethnographic study covering Dhaka, Chittagong, Nairobi, and Hyderabad [29]. The researchers argued that focus on drinking and daily usable water can solve many problems including cultural, social, and economic complexities in these cities. Reddy and Snehalata opined that lack of clean water has made the life of slum women more complicated as women did most of the daily domestic chores [30]. Joshi did a longitudinal study in this field [31]. The author observed that women are assigned most of the water-related tasks and their ability is judged on the basis of how they perform these tasks on a daily basis. As such, men normally keep themselves away from these chores which have become a culture of the society, especially in the slums.

Sahoo et al conducted research on the impact of sanitation on the lifestyles of the women in slums in the Odisha, India [32]. The researchers interviewed 56 households. The results show that sanitation in the slums area is just a part of slum women as they have to preserve water for dozens of other chores. The authors found that women bear a huge pain in collecting water and storing them on a daily basis. Water collection is a challenge for these women as they have to cross a long distance or stand in a long queue for hours. Problem is more obvious for the pregnant women who need frequent urination due to changing physical condition. Lack of water makes them susceptible to different diseases as hygiene is widely compromised. A qualitative study conducted by Khanna and Das in Uttar Pradesh showed almost similar results [33]. They found that some women needed to walk more than a mile to find a place for personal hygiene. It puts them at risks of illnesses, accidents, violence, and overexertion. The authors found that though the women were responsible for securing water for the entire family they had the lowest accessibility of water. Several other studies revealed the same results [34].

V. EDUCATION

Educational lower level is regarded as the social factor that is crucial for development of CVD among females. Yusuf et al (2011) in Mumbai and strived to determine the impact of education on the morality of CVD [36]. It was seen that CVD is largely responsible for both men and women death in all educational levels. But the same was found to be largely high among those who have been to primary school or are partially literate. The HR for both is equivalent but the same is considerably less at secondary, middle school and college. They have attributed corresponding findings with the fact that educated ones are aware of the hazards of NCD and have more access to desired data [37].

With respect to a review done on literature pertaining to the children education who suffers from poverty, Nambisan saw the quantity of questionable schools as a part and other being the exorbitant fees of private school tuition which compels the poverty stricken children to further problems. Employing a survey of around 417 homes belonging to two slums of Delhi along with the reports of National Sample Survey, the factors that affect the depriving children from education has been analysed by Tsujita (2009) [38]. She stated that the incompetency of parents to give the schooling fees is clubbed with adverse perception with respect to education serving the primary cause leading to drop outs and absenteeism of all slum children of the age that lies between 5-14. Other factors has been studied by Chugh (2011) pertaining to the drop outs of children of slum that are of age fifteen to nineteen stating that gender, parents and limitations of institution, adverse impact of education being significant determining factor [39]. A purpose sampling of all the 432 slum students of Delhi of all drop outs, she saw that females as compared to men, have greater chances to drop out from schools and that too at earlier ages since they are expected to aid their mothers in household chores and also take care of their cousin. Girls were prone to drop out owing to the need of marriage and men for work. Further, results suggested that the education quality of females were less is compared to men as there occurred a belief that women did not contribute much toward the family income. Further, men have the obligation to study to earn. Wu et al (2007) saw the cultural influence on the education and also girl linkage to performing household chores, sibling care and further marriage [40].

With respect to a survey conducted of all the East Delhi slum schools, Dixon and Tooley (2007) observed educational preference to boys [41]. Further, it was seen that slums are primarily situated across city centers but the students had to walk at least 2-3 km to reach schools as these have comparatively lesser fees. These huge walks often lead to discouraging the attendance majorly the girls causing fear and physical exhaustion among all. Owing to the leveraged rate of school drop outs in all students of primary school, Sajjad et al (2012), indulge into a deep study that comprising of 129 students that had dropped out from school during 2010-2011 [42]. Further, they saw that the efforts of government pertaining to universal education, values beliefs, that leads to discrimination among men and women. Mukherjee and Das (2008) saw that the educational and the work status of father have a desirable role in the schooling of kids [43]. Further, Dutt (2010) debated that education of girls is restricted to specific norms even though that exposes them to freedom [44]. She found multiple social and structures cultural in the nation have no provision for education of girls.

VI. PHYSICAL (IN) ACTIVITY

In one of the NCD reports, WHO found that physical acts are one of the crucial steps taken to prevent NCD? Mendelbaum has supported the above health practice in course of his study of Indian ethnograph in lieu of the social expectations that is put on girls, boy, women and men. Supporting the above, Anand et al (2007), conducted a survey of Faridabad slums and revealed that men had more physical activity as compared to women [4]. A stepwise approach was used by Tripathy et al (2016), to survey the NCD factors of risk drawing a conclusion that the lack of recreational activities lead to reduced PA among slum women [47]. But this survey was not able to consider household activities as physical work that is the main task of women. Chomitz et al (2013) performed a cross sectional study links Indian cultural context assigns household activities to women that have less physical act [48]. Adlakha et al (2016), while linking the physical activity and built environment support the PA understanding that is restrictive to three different categories work, travel and leisure that does not considers the household activities [49]. Further, Manjerekar (2014) has linked the less PA women to the greater NCD risk while laying a comparison of women both working and non-working [50].

VII. TRANSPORTATION

The report by WHO on the health equity determinants socially in all urban setting suggest that one of the health determinants is urbanization. While the mental health was analysed, Mullen et al (2016) World Bank Report that urbanization impose certain disadvantage but also leads to greater risk on health [53]. A case study conducted in Meerut, Chennai, Bhubaneshwar, Shillong, they stated transportation is of those critical factors accustomed to urban health depicting both positive and also negative opportunities. Giles-Corti et al (2016) conducted a literary review on multiple disciplines to draft a connection between the city and Health planning [54]. Even though they stated that LMIC evidences has been limited to set up urbanand transportation integration important for the inquiry of health equity and found that congestion of traffic is linked with CVD. Similarly the transportation undeveloped and consequent use of the twp wheeler for attaining mobility leads to obesity, type 2 diseases and hypertension owing to lack of significant physical activity. So they agree upon collaboration with the agency of government to work with the patterns that change in all urban transportation. Adlakha et al (2016) explored the connection that prevails between the physical activity and BE in Chennai [51]. This further distributed the IPEN survey of 292 questionnaires from 4 SES. It suggests that people who have lower SES seek PA from travel and consequently one with higher SES obtain PA from leisure. Also, it was observed that people with lesser SES require public transportation as they cannot attain the transportation price.

VIII. DISCUSSION

The slum area risk factors along with the dwellers of slum lead to dynamic and also complex communication highlighting the problems of establishment of drafting a causal relationship between the NCD and different determinants. Men sre seen to mitigate to open systems where's the women are kept refined to a particular closed system in slums. Behavior of all individual that open up in the condition of slum owing to the NCD pathways fail to cope with the recommendation of policy that relies on quantitative data and is seen to ignore the core interplay of slum

SDH conditions with respect to culture, poverty, politics, actions and economy.

While analysing and reconstructing the literature that exists of Indian slums SDH, the significant relationship of risk of NCD as experienced are unable to be delineated. For instance, analysis of connectivity between NCD and poorly educated women, RCA suggests that lower education is directly related to the wider effect of NCD on the risk factors of mental health. But, if the same gets connected with all other factors of slum as women seclusion, teacher's abusive attitude, less walkability, greater transportation cost, and absence of clean water, the same is seen to have a major impact on the risk factors that lead to NCD majorly the CVD. Here, the study further extends to all quantitative study that promotes the associated risk factors. For instance in Menon, the quantitative study on the NCD prevalence in the Kerala rural settings were seen to live below the line of poverty in the setting that are associated with corresponding stroke. The fig two and three reflect that in all slum settings, poverty would interact with the factors that are contextually bound as for example the parent's status, women given water tasks and hence lead to greater risk factors of NCD

Multiple conclusions have been drafted. The first being the reframing of slum setting NCD. Owing to the consideration of slum as living spaces, it regrets all slums are considered as people and all other consideration to be synonymous and does not need clarification. Living spaces slum put light on the way citizen thrive in slums along with their living experiences. Next by focusing on the relationship between the slum dwellers and slum, it is possible to delineate the connection amidst several SDH. It also suggests the impact of such events on NCD risk factor. RCA is seen to highlight the multivariate and the nonlinear links as identified in terms of risk factors in all slums. Turning all these pathways open, several researchers has formulated intervention that experiment the casual relationship with the prime aim of tackling the problems of NCD.

Further, an analysis conducted to into consideration the reality of all slum condition; it further leads to greater policy development possibility along with several programs that abide by the health risk of all slum dwellers. As an example, the establishment of empirical research pertaining to the illiterate women is prone to CVD development. It can be stated as low education is responsible for limiting the power of making decisions and so they are keeping confined to all the house activities. Hence, women own only a small window of growth. So, as her health risk is targeted, women employment is seen to be centered on the education or health policy. An important example consists of developing ALS in Phillipines that promote sending girls to school and cater to the entire dropout. Hence, the slums are not about the individual or the physiological activities but additionally about the social structure and also about the ways undertaken by the government to cope with the issue related to slum. The 3rd figure indicated that several policies that are responsible for aggravating the economic production or the output of education are insufficient to address all the NCD issues. Further the fig4 suggest that even though all the less educated men are largely mobile, they are more prone to developing CVD because of constant exposure to pollution

On the basis of RCA, the following has been recommended.

- Absence of clean water is an important issue and necessitates the need of step to be taken by the government and address for a longer time. Whereas, for a short term, municipalities and local government must focus on ensuring delivery of regular water to all the slum community that do not have plumbed water. This eradicates the huge time spend on obtaining water and also reduce water irregularities.
- Now, because education is seen to be the freedom ticket, it is crucial to provide education to all the girls of slum. Apart from developing AIS for all the school students, it is imperative to lay several reward programs for all the teachers of the school in slums to promote teaching quality. This would induce greater levels of self-esteem and be realized in terms of monetary benefits and chances of promotion.
- Next, to promote physical activity several hubs be created in slums to be used for mediation and yoga, Also, organizing several sports activities and events along with several churches, NGOs, schools and local government encouraging physical activity among all.
- Last, about the public transportation, developing multiple scheme's that help reduce the overall cost of

transportation must be promoted. And also several walkable or bike friendly environment be created by the local or the national government. Also, an analysis suggest considering gender for integration of project plans.

The research strength relies on the literature review having qualitative and quantitative data that reflect the experience of dwellers of slum and their experiences. After the slum residents. This further omitted the quantitative literature that signifies the risk factors of NCD and has not been substantiated the desired data to find the relationship with all other risk factors. As the literature is gathered from various domains, the study is both holistic and integrative approach. Nonetheless, the study is largely restricted to issues available in the literature.

IX. CONCLUSION

The above study has found to lay significant contribution on the slum NCD literature. A system adopted of the SDH model framing, combination of the slum association with the quantitative data, and identification of the slum NCD risk. Turning the NCD determinants social relationship is seen helpful in identification of all the policy maker's option. This led to a better understanding of all slum interaction, their health and respondents that has taken a significant approach for facing the issues of NCDs.

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