A MIXED – METHODS STUDY IN THE ROLE OF SOCIAL DETERMINANTS IN PUBLIC HEALTH DISPARITIES

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ABSTRACT

The social determinants of health are the underlying circumstances that influence the conditions in which people are born, grow up, live, work, and age. They include a variety of health factors, usually split into upstream and downstream determinants. The upstream/downstream metaphor describes the association between these factors, with the upstream determinants being the underlying causes of health and disease, situated close to the source of the issue. Conversely, downstream determinants are nearer to the health effects and therefore are more observable and easier to reach for intervention. But targeting solely downstream determinants might not be as impactful as intervening at the root upstream factors, which cause a chain of causal events leading to undesirable health effects. Thus, the most significant yet unexplored chances for enhancing health and lowering health inequalities can frequently be found by concentrating on the upstream, basic causes. Since equity entails justice, it usually refers to distributive justice, the moral precept that opportunities and resources ought to be allocated equitably, especially when they have an impact on health.

Keywords: *Social determinants of health, public health disparities, mixed methods study*.

INTRODUCTION

Health and geography are closely linked. The social, built, and environmental settings in which we are born, live, and work profoundly influence our health and susceptibility to a range of diseases. Environmental conditions, including air and water quality, climate, and availability of green space, fundamentally determine human health, impacting our wellbeing and quality of life [21]. A variety of place-based attributes like physical (altitude, temperature, water, air, pollution etc.), social (religion, language, race, perception of

risk behavior, social access to care etc.), and economic (quality of nutrition, access to better healthcare services etc.) affect health at a greater extend. Comprehending how these location-specific characteristics affect health is one of the most difficult yet significant geographical issues of our day [1]. The study of public health, diseases, their prevention and management has been an important and a growing field of interest [13]. Health geographers and healthcare workers join forces to solve intricate health issues, such as measuring and comprehending patterns, prevalence, and burden of disease, designing strategies for controlling and preventing disease, and enhancing access to health care services, especially for disadvantaged groups, in addition to eliminating health hazards in order to diminish environmental health risks [15]. Their end goal is to offer more effective and equitable health care solutions [14]. The study of public health is therefore very significant as it attempts to serve local, national, and international communities and meet many exciting challenges in protecting the public health today and reducing the human sufferings today and in future [16] [20]. Different individuals, places, and circumstances have been formed by nature. Generally accepted as normal, these distinctions are referred to as natural differences. Constraints are another term for the circumstances surrounding these inherent distinctions [2]. Man has, nevertheless, always worked to reduce these limitations in order to progress along the developmental path. The differences that occur due to social, economic, political, religious, and cultural causes are called disparities or inequities, and not just differences. These inequities are classified according to their root causes, e.g., social, economic, political, religious, or cultural inequities. The World Health Organization (WHO) has described the social determinants of health as the conditions in which people are born, grow, live, work, and age [9] [17]. With regard to the Sustainable Development Goals (SDGs), India has projected ambitious goals for lowering its maternal mortality ratio to 70 per 100,000 live births and neonatal and under-five mortality to 12 and 25 per 1,000 births, respectively, in the next 15 years.

Figure 1: layered model of social determinants of health (SDOH)

According to an official source, the health ministry and other relevant departments recently met and came to an agreement on the new targets [11]. Many issues still need to be resolved, according to experts. For example, family planning has the potential to save lives, and the government should increase the number

of options available. Nonetheless, the administration is optimistic that India will come very close to meeting the MDG objective if the present yearly reduction trend continues. To combat the issue, the government has recently increased health services, such as the vaccination campaign. An intricate interaction of social, economic, environmental, and personal factors determines individual and population health [12]. Having access to preventive care, quality education, stable jobs, and safe living conditions, for example, may lead to healthier and longer lives. Interactions between people and their social and physical environments, on the other hand, can compound adverse health consequences. Social determinants, more specifically, have a major part to play in sustaining unjust and avoidable health inequities within and between populations, underscoring the importance of dealing with these determinants in order to foster health equity. The importance of the family, job, school, neighborhood, and community in promoting health is acknowledged by the choice of social determinants as a leading health topic. The rapid rate of population increase varies greatly between communities and between regions. The birth and mortality rates, as well as the social determinants of health, determine the population size. Numerous socioeconomic and other factors also influence this complete element. There are various ways in which these components relate to one another. Therefore, research into how these factors affect young people's health has become essential.

Objectives

- To identify key social determinants influencing public health disparities – This includes analyzing factors such as income level, education, employment, housing conditions, healthcare accessibility, and social support systems.
- To assess the extent to which social determinants contribute to differences in health outcomes – By using quantitative methods, the study aims to measure disparities in disease prevalence, mortality rates, healthcare utilization, and overall well-being across different demographic groups [10] [19].

Research question

- Which social variables are most important in causing differences in public health amongst various demographic groups?
- What effects do socioeconomic variables like housing, work, education, and money have on health outcomes?

Literature review

The social determinants of health include the conditions under which people are born, grow, live, work, and age. These conditions are influenced by the distribution of wealth, power, and resources at global, national, and local levels. The socioeconomic determinants of health are the main causes of health inequalities, which are unfair and avoidable differences in health status that occur within and between nations. Finally, social patterns of stratification, in which resources, power, and prestige are not equally distributed among social groups, are the fundamental cause of health disparities, driving inequities and compromising health outcomes [4]. Researchers who study health equity and socioeconomic determinants of health must carefully examine "power" as a crucial component in forming social hierarchies and, consequently, conditioning health disparities among groups [18]. It is necessary to comprehend how power functions in all facets of economic, social, and political relationships in order to comprehend the causative mechanisms underlying health disparities and to properly evaluate what can be done to change them. Young health disparities are continued by a myriad of factors that include poverty, restricted access to healthcare, harsh environmental conditions, and educational inequities. Low-income children and minority youth are disproportionately burdened, and they have less favorable health results and diminished medical care access when compared to similar peers from wealthier socioeconomic communities. This, in return, may result in higher absenteeism rates, potentially affecting their academic performance negatively, establishing a cycle of disadvantage that has the potential to have lasting effects on their health, education, and future prospects.

One's earning potential and health are significantly influenced by their level of education. People who are better educated, make more money, and are healthier. The average lifespan of people who do not complete high school is 6 to 9 years shorter than that of those who do. [5] Moreover, the cycle is perpetuated when their offspring also suffer from worse health. One recognized way to escape poverty is to complete high school and earn a college degree. However, many minority and impoverished students are unable to take that route. The social determinants of health (SDOH) are the economic and social conditions that affect the health of individuals and groups and their distribution among the population. They include factors of one's place of work and residence that affect health, such as the distribution of wealth, income, power, and influence. Unlike individual risk factors such as genetics or behavioral risk factors, SDOH are concerned with the larger environmental and societal determinants of health that influence health outcomes, emphasizing the social and economic structures' role in promoting or hindering health. Public policies that reflect the impact of the dominant political ideology of people in charge of a jurisdiction are said to be responsible for shaping these distributions of social determinants.

Methodology
An explanatory sequential mixed-methods design is used in this study to investigate how social variables contribute to inequities in public health. Three stages make up the research process: First, patterns and connections between social factors and health outcomes are found using a quantitative study; second, a qualitative investigation explores the lived experiences behind these patterns; and third, an integration phase merges both datasets to provide a comprehensive understanding of the issue [6]. This approach ensures that the statistical findings from the quantitative phase guide the qualitative inquiry, allowing for a more in-depth exploration of disparities.

Research design: To find trends and connections, quantitative data is gathered and examined first. After then, qualitative data is gathered to offer more profound understanding of the statistical results. The results of both methods are combined to provide a more comprehensive understanding.

Study population and sampling:
Population: Individuals from different socioeconomic backgrounds across urban and rural areas.
Sampling Method: Stratified random sampling to ensure representation based on income level, education, geographic location, and race/ethnicity.

Sample Size: Determined using power analysis, ensuring statistical significance.
Population: Individuals and healthcare professionals from marginalized communities.

Sampling Method: Purposive sampling to select participants with diverse experiences related to health disparities.

Experimental analysis
The World Health Organization underscores that the unequal share of health-harming experiences is not a natural process, but the consequence of a combination of adverse factors such as bad politics, unjust economic systems, and poor social policies. Such factors disproportionately burden the vulnerable populations and widen the health disparities. Early and middle childhood set the stage for long-term health, education, and wellbeing. Adverse childhood experiences, including violence and maltreatment exposure, can have long-lasting effects on physical, mental, and social-emotional wellbeing. These experiences have been found by research to increase the risk of obesity, diabetes, heart disease, and sexually transmitted disease, and risky sexual activity, smoking, and drug use.[7]

Table 1: KMO and Bartlett's Test

Factors	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
What is the impact of social determinants on health disparities, and how do these disparities vary across different populations?	3.017	33.522	33.522	2.864	31.819	31.819
Can social determinants predict public health outcomes, and if so, which determinants are most strongly associated with these outcomes?	2.005	22.274	55.796	2.016	22.401	54.220
How do social determinants interact with each other to influence public health outcomes?	1.153	12.816	68.612	1.295	14.391	68.612

The physical environment can have negative impacts on the development and health of young children, exposure to pests and lead paint hazards standing out as concerns. Young people and adolescents are most susceptible to environmental factors as they experience continuous changes in development. The wellbeing and health of young people can be either fostered or negated by a range of environmental factors, such as peer relations, family, school environment, neighborhood, policies, and societal norms. Encouraging positive youth development can promote healthy behaviors and lead to the development of a healthy and productive population in adulthood. On the other hand, young people who develop in deprived areas are at a higher risk of exposure to violence, substance abuse (e.g., alcohol and tobacco), obesity, and risk sexual activity..

Table 2: Variance Explained

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
How do quantitative measures of social determinants (e.g., census data) align with qualitative accounts of individuals' experiences with these determinants?	3.236	35.957	35.957
Can qualitative findings on the social and cultural contexts of social determinants inform the development of quantitative measures and models?	2.349	26.102	62.058
How can mixed-methods approaches be used to evaluate the effectiveness of interventions addressing social determinants and public health disparities?	1.361	15.120	77.179
What effects do mixed-methods findings have on practices and policies meant to lessen public health disparities?	.766	8.515	85.694

How can the intricate relationships between socioeconomic determinants and public health outcomes be found and addressed using mixed-methods research?	.464	5.160	90.854
What effects do social determinants have on people's health and well-being, and how do communities and individuals feel this?	.339	3.772	94.626
What are the social and cultural contexts in which social determinants operate, and how do these contexts influence health outcomes?	.275	3.060	97.687
How do social determinants affect access to healthcare and health-promoting resources, and what are the consequences for health disparities?	.137	1.522	99.209
What viewpoints and experiences do legislators and healthcare professionals have on the part social determinants play in public health disparities?	.071	.791	100.000

Lastly, to create a comprehensive picture of how social determinants affect health inequalities, the integration step triangulates the results from the two approaches. The study examines whether statistical trends align with personal narratives, identifying gaps that may not be captured through numbers alone [8]. This phase also provides policy recommendations based on the combined findings, offering evidence-based solutions for reducing health inequalities. Throughout the study, ethical issues are meticulously handled, including securing informed permission, protecting participant privacy, and receiving institutional ethics approval. By combining rigorous statistical analysis with rich qualitative insights, this study aims to provide a comprehensive, evidence-based perspective on the social factors driving public health disparities and inform policies aimed at fostering greater health equity.

Conclusion

Numerous upstream socioeconomic determinants are strongly and consistently linked to a wide range of health outcomes, according to a substantial body of observational research, and the pertinent underlying pathways and biological mechanisms are becoming better understood, albeit still lacking. However, there is limited agreement on the best times, locations, and methods of intervention for addressing upstream social determinants that promote health and lessen health disparities. The lack of agreement mostly reflects political and ideological disputes, reflecting differing societal ideals, even though it also partially reflects a lack of understanding about the specifics of initiatives. The most prevalent indicators of socioeconomic status (SES) in the US are income or poverty level and education. SES is a person's absolute and relative position within a hierarchy on the basis of socioeconomic criteria. In Europe, occupational status is usually utilized as an SES indicator. It is argued by some researchers that "socioeconomic position" is a more accurate description of the relative aspect of socioeconomic attributes, highlighting the fact of social hierarchies of relative advantage or disadvantage. Other experts hold that "status" better communicates the relative aspect, perhaps better than "position," and social status in particular denotes relative social position. Furthermore, many people are familiar with the word "socioeconomic status," while "socioeconomic position" is not.

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