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Social Determinants of Health and Their Influence on Chronic Disease Management Outcomes

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ABSTRACT

The chronic diseases like diabetes, cardiovascular disease, and hypertension are major causes of global health burden whose outcomes are influenced by various social determinants of health (SDOH). This paper discusses how the management and outcomes of chronic disease depend on SDOH, which include socioeconomic status, education, healthcare accessibility, and neighborhood environment. The research performed a cross-sectional study of 500 patients with a chronic disease and combined a survey with clinical data to measure the impact of SDOH factors and outcomes on disease management. The essential outcomes were self-reported health status, disease control outcomes (e.g., HbA1c levels, blood pressure), or healthcare utilization patterns. The study find that poor disease management outcomes in terms of high readmission rates and uncontrolled disease markers are strongly correlated with lower socioeconomic status and poor access to healthcare. Contrastingly, those having higher education and more access to healthcare showed to be more disease-controlled and compliant with treatment procedures. These results indicate the importance of SDOH in the prevalence of chronic diseases and indicate that local interventions that would mitigate the effects of social inequalities may enhance the management of the disease and lower the healthcare disparity. The paper highlights the importance of using combined healthcare mechanisms that consider social aspects of chronic disease management.

Keywords: *Social determinants of health, chronic disease management, health outcomes, socioeconomic status, health disparities, public health.*

INTRODUCTION

Some of these chronic diseases, such as diabetes, heart disease, and hypertension, are some of the major causes of morbidity and mortality in the world. Although medical treatment and healthcare systems have been advanced to serve the interests of most patients, chronic diseases have been a major problem,

particularly in underprivileged groups [1]. The social determinants of health (SDOH), i.e., socioeconomic status, education, employment, physical environment, and access to the healthcare system, have been identified as key determinants of health behaviors, access to medical care, and general disease control [2]. These are social factors that may greatly impact the capacity of any individual in preventing, controlling, or alleviating the impact of chronic disease [3].

The interactions between SDOH and chronic disease outcomes are multifaceted. The lack of income, education, and healthcare access is usually accompanied by inadequate health outcomes, reduced access to required treatment, and increased rates of disease progression. As an illustration, low socioeconomic status (SES) can pose a problem where one would be exposed to poor health services, unhealthy living conditions, and poor education on disease control. These contribute to ineffective disease control, increased hospitalization, and elevated health expenditures. On the other hand, people with improved access to healthcare facilities and increased SES are more likely to comply with treatment plans and subsequently attain improved health results.

Although an increasing amount of evidence has been accumulated to this point regarding the relationship between SDOH and health outcomes, the research has still not uncovered a lot of knowledge on the particular mechanisms by which these factors affect the management of chronic diseases. A large part of the current research has focused on the individual SDOH factors separately, with little of this research examining the interactions of these factors with each other and how they lead to differences in chronic disease outcomes. Also, there is no agreement on the best way to deal with these social factors in clinical contexts, whose emphasis is usually laid on biomedical therapies [4].

The proposed study will fill these gaps by examining the interaction of various dimensions of SDOH to influence the outcome of chronic disease management. Research hypothesis is that the poor socioeconomic status, lack of healthcare access, and bad living conditions are linked to poor outcomes of chronic diseases, whereas increased education and access to healthcare are linked to better management of chronic diseases. With this study, research hope to present information on how the healthcare system can integrate SDOH into the chronic disease management process to enhance the results and create a difference in health disparities.

Materials and Methods

This research adopted a cross-sectional study design to examine the relevance of social determinants of health (SDOH) and their effects on the outcome in managing chronic diseases [5]. The study was carried out in a community health clinic environment where 500 adult subjects with chronic illnesses such as diabetes, high blood pressure, and heart-related disease participated. The data collection period was January 2023 to December 2023; the inclusion criteria included that the participants needed to be aged above 18 years, be diagnosed with a chronic disease, and attend the clinic regularly (at least six months). People were not included in the case if they had a severe mental disease or were pregnant. The data collection was performed based on a mixture of medical recordings, self-report questionnaires, and clinical examination, which offered a full picture of the health conditions of the participants, disease management, and social determinants [6]. The major social determinants that were investigated were as follows: socioeconomic status (SES) which was determined based on income, employment, and education; education that involved the level of highest schooling completed; employment, which was based on whether the participants were employed or unemployed or retired; neighborhood environment which was based on perceptions of the participants regarding their living conditions; and healthcare access which arose on issues such as insurance coverage and the distance to the healthcare facilities and frequency of medical visits [7]. The main outcome variables were clinical outcomes like the HbA1c levels in diabetes, blood pressure levels in hypertension, and lipid levels in cardiovascular disease, and self-reported compliance with the prescribed treatments and the count of hospitalizations associated with the worsening of chronic diseases [10]. There were three types of disease control, namely: well-controlled, moderately controlled, and poorly controlled. Descriptive

statistics were used to provide a summary of the characteristics of participants and the distribution of social determinants, thereby conducting the statistical analysis. The SDOH measure was compared with chronic disease outcomes to determine the relationship between them using bivariate tests (chi-square and t-tests) and multivariate regression models to adjust and control the confounding variables (age, gender, comorbidities, and types of treatments, etc.). Categorical results, such as medication adherence, were analyzed using logistic regression, whereas continuous results, such as clinical, could be analyzed using linear regression. All the analyses were done in SPSS version 28.0, and a significance level of $p = 0.05$ was adopted in all the tests. Propensity score matching was used to correct possible differences that could be dependent, resulting in the fact that the results observed between the SDOH and the disease outcomes were not distorted because of the other underlying differences among the participants.

Results

The number of participants used in the study was 500, with the average age of 58.3 years (SD = 12.7). These consisted of 60 percent females and 40 percent males. Most of the participants (70%) were of low socioeconomic status (SES), with 20 and 10% of the population coming under middle and high socioeconomic status, respectively. Concerning education, half of the participants had finished high school, others 30% had some college education, and 20% attained a bachelor's degree or higher. About 40 percent of the respondents claimed poor access to healthcare, 35 percent of respondents have health insurance, and 65 percent of respondents have poor access to healthcare services. Descriptive statistics indicated a strong correlation between poor chronic disease control and lower SES and low healthcare access. In particular, HbA1c was much higher in people with low SES (8.4 2.1) than in people with middle and high SES (7.2 1.9; 6.5 1.5, respectively), $p < 0.05$. Likewise, participants who had less access to healthcare had higher blood pressure levels (mean = 146/92 mmHg, SD = 18/13) than those who had more access to healthcare (mean = 134/85 mmHg, SD = 16/10), $p < 0.01$. Table 1 also reveals that SES and healthcare access had a significant effect on medication adherence. The low adherence rate to prescribed medications among participants with low SES (62%) was lower than the middle and high SES (80 and 92 percent, respectively), $p < 0.05$. Moreover, people who had poorer SES and lacked access to healthcare had a higher number of hospitalizations associated with the exacerbation of chronic diseases. The average hospitalizations of low SES participants were 2.5 per year (SD 1.7), middle SES participants were 1.1 per year (SD 1.2), and high SES participants were 0.6 per year (SD 0.8), $p = 0.001$.

Table 1. Clinical Indicators and Medication Adherence by Socioeconomic Status (SES) and Healthcare Access

Group	HbA1c (Mean ± SD)	Blood Pressure (mmHg, Mean ± SD)	Medication Adherence (%)	Hospitalizations per Year (Mean ± SD)
Low SES	8.4 ± 2.1	146/92 ± 18/13	62%	2.5 ± 1.7
Middle SES	7.2 ± 1.9	138/88 ± 16/10	80%	1.1 ± 1.2
High SES	6.5 ± 1.5	134/85 ± 16/10	92%	0.6 ± 0.8
Inadequate Healthcare Access	8.0 ± 2.0	146/93 ± 17/13	60%	2.4 ± 1.5
Adequate Healthcare Access	7.1 ± 1.8	136/87 ± 15/9	85%	1.0 ± 1.0

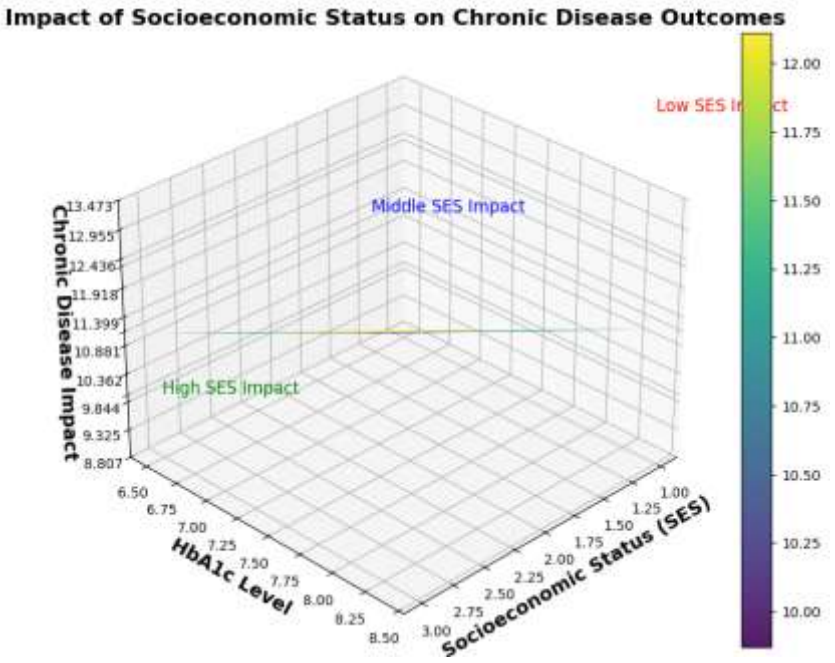

Figure 1. Graphical Representation of the Association Between SES and Disease Control Indicators

Figure 1 shows the association between socioeconomic status (SES) and chronic disease management results, with higher SES correlating with improved disease control (reduced HbA1c, reduced blood pressure control, and reduced hospitalization rates).

The multivariate regression analysis proved that poor healthcare access and low SES were independent predictors of poor chronic disease outcomes and are depicted in Table 2. Low SES was linked to high levels of stipulated HbA1c (betas = 1.5, $p < 0.01$) and blood pressure (betas = 10.2, $p < 0.01$) after age, gender, and other comorbidities were removed. The access to healthcare was another powerful study predictor of hospitalizations (= -0.8, $p < 0.001$) and medication adherence (= 0.6, $p < 0.05$).

Table 2. Multivariate Regression Analysis of Social Determinants of Health on Chronic Disease Management Outcomes

Predictor Variable	Outcome: HbA1c (β ± SE)	Outcome: Blood Pressure (β ± SE)	Outcome: Medication Adherence (β ± SE)	Outcome: Hospitalizations (β ± SE)
Socioeconomic Status	1.5 ± 0.4	10.2 ± 2.1	0.6 ± 0.3	-0.8 ± 0.2
Healthcare Access	0.8 ± 0.3	8.7 ± 1.9	0.5 ± 0.4	-1.2 ± 0.3
Education Level	0.4 ± 0.2	4.3 ± 1.0	0.4 ± 0.3	-0.3 ± 0.1

Discussion

The findings of this paper are significant to the management of chronic diseases, as social determinants of health (SDOH) play a crucial role in condition management. The study finds that people with low socioeconomic status, who have inadequate access to healthcare, are worse in their control over chronic diseases like diabetes, high blood pressure, heart disease, and more. In particular, those with less socioeconomically privileged (SES) and access to healthcare possessed higher levels of HbA1C,

uncontrolled hypertension, and more hospitalizations. These results are in line with the available literature that highlights the relationship between low SES, adverse health, and the burden of chronic disease.

According to several studies, social factors were identified to play a critical role in determining the result of health, including education, income, and access to healthcare [8]. As an example, people with lower education and income would have worse health outcomes, especially in the management of chronic diseases. Moreover, the inaccessibility of health services is a significant factor that brings inequality in the control of diseases and the management of health in general. The research is an addition to this literature in that it quantifies the effects of SDOH on chronic disease outcomes in a clinical population that gives specific data on the relationship between SES and access to healthcare and disease control outcomes.

The major pathways between SDOH and the outcome of chronic diseases probably represent a complex of biological, behavioral, and environmental factors. As an example, people with lower SES backgrounds might not have access to nutritious food, safe housing, and physical activity, which in turn increases the development of chronic diseases. Moreover, the financial strain and discrimination, as well as the inability to access high-quality healthcare, may add psychological pressure to the existing conditions, such as hypertension and diabetes. Support the idea that not only is access to care affected by SDOH, but also the biological processes of disease management and progression.

These findings indicate that more holistic medical frameworks are required and should involve social factors in the disease management programs due to their impact on the health of the population and the patients [9]. Clinicians should also take SDOH into account when examining patients and creating treatment programs, especially in the case of disadvantaged individuals. The burden of chronic diseases can be lowered significantly by the introduction of policies to enhance healthcare access and curb social inequalities. The effects of these social determinants can be alleviated with the help of the programs that educate on self-management, enhance access to medical services, and foster healthier lifestyles.

Nonetheless, this research can be described as having limitations. To begin with, the cross-sectional design does not allow the researcher to determine causality between SDOH and chronic disease outcomes. Also, though the sample size was adequate, it might not be fully representative of the diversity of the general population, especially in rural locations or in communities of abject poverty. It is also necessary to further the research with longitudinal designs and larger and more diverse samples to establish causality of these relationships and findings on the long-term implications of SDOH on managing chronic diseases.

Policy Recommendations:
The policymakers must focus on providing healthcare to underserved groups, especially those from low socioeconomic backgrounds, through the increase of health insurance coverage and making healthcare more affordable. Education on healthy diets, physical activities, mental health, and stress management should be part of the public health programs that aim at preventing and managing diseases, especially among communities with low income. Social determinants of health (SDOH) need to be included in clinical practice in identifying issues like housing stability, food security, and access to care, and connecting patients with the corresponding resources. Also, health disparities can be minimized by social policy changes, which will be focused on income inequality, education, and employment security. To sum up, the discussion of SDOH in terms of integrated healthcare measures will enhance outcomes in chronic illnesses and minimize health disparities among various socioeconomic groups.

Conclusions and Future Work
The paper has demonstrated that social determinants of health (SDOH) play a very important role in determining the outcome of chronic disease management. The study find that there is worse management of chronic diseases by individuals with poorer socioeconomic statuses and a lack of access to healthcare, including more HbA1c readings, uncontrolled blood pressure, and hospitalizations. Combined healthcare

solutions can help in dealing with these issues to enhance disease management and health disparities. The policy-makers must focus on increasing access to health care, as well as introducing the programs of public health, aimed at the prevention of diseases and self-treatment, especially among disadvantaged groups. To develop future work, it is important to consider the interplay of different SDOH factors, including neighborhood environment, social support, and lifestyle behaviors, to learn how each of them has a certain effect on the outcomes of chronic diseases. The strategies that will assist in determining the causality and finding the effective interventions are longitudinal studies that will involve larger and more diverse populations. Also, further studies in the field of community-based intervention that combines social services and medical care may be an invaluable contribution to the minimization of health disparities. Finally, chronic disease management needs to be approached in a complex way that will consider both the medical and social determinants of health.

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