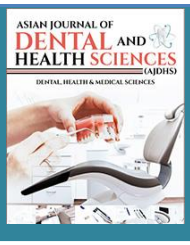

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The Impact of Social Determinants of Health on Vaccination Uptake

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Abstract

This review sought to establish the impact of social determinants of health on vaccination uptake. The analysis established that the link between SDH and vaccination uptake is multifaceted with different factors affecting the uptake rates. For instance, economic stability affected vaccination uptake because it affected people's ability to access insurance coverage or keep up with vaccination schedule. Healthcare access was also a key determinant factor to vaccination uptake. Lack of access limited individuals' abilities to access vaccines. Other factors that played a role are education levels, social and community context, and built environment. The interaction between these factors contributed to disparities, inequities, and lower immunization rates. Addressing the disparities and inequities in vaccination uptake is important because it derails efforts that have already been made in addressing communicable diseases. It affects herd immunity, leads to strain of healthcare systems, and affects resource utilization. Due to these negative effects, it is important to take measures that can address the disparities. Collaboration with the community, policy reforms, and community interventions are some of the measures that can be used to increase uptake. These measures can address the underlying factors that cause disparities and affect vaccination uptake.

Keywords: Social determinants of health (SDH), vaccination uptake, health outcomes, access, economic stability, health disparities

Introduction

Vaccination is one of the most effective public health interventions that plays a crucial role in disease prevention. Research has established that vaccinations prevent millions of deaths and disabilities across the globe with estimates showing vaccination has prevented up to 154 million deaths since 1974.[1] However, despite the availability and proven efficacy of vaccines in preventing communicable disease, vaccination rates remain low. According to the World Health Organization, vaccine disparities still exist especially in poor countries.[2] For instance, in 2022, 14.3 million infants failed to receive their initial dose of diphtheria, tetanus, and pertussis (DTP) despite a widespread campaign to ensure no one is left behind.[2] Most of the infants who did not receive their vaccine were mainly from low-income countries in Africa and Asia. The failure of these infants to receive their vaccines was attributed to lack of access to immunization and health services. The discrepancy between vaccine availability and uptake has led to researchers and other health organizations to begin research on factors that influence vaccine uptake. According to research, there are other factors that inform low vaccination uptake beyond the individual choices.[3] These factors are social determinants of health (SDH). Research on how SDH affects vaccination uptake is growing.[4] The research explores how SDH shape vaccination behaviors and overall outcomes.

Social determinants of health are the conditions in which people are born, grow, live, work, and age.[5] According to Healthy People 2030, social determinants are key determinants of health outcomes affecting factors such as accessibility and availability.[6] SDH are shaped by factor such as income levels, education, the built environment, insurance coverage, access, among other factors. WHO recognizes that SDH contribute to health inequities and affect overall health outcomes.[5] When it comes to vaccination, these social and economic factors can significantly influence an individual's or community's likelihood of receiving recommended immunizations because they influence factors such as access and availability.

The impact of SDH on vaccination uptake is complex. Factors such as education, income, employment, housing, social support networks, and access to healthcare services all play crucial roles in determining whether individuals and communities get the necessary vaccinations to prevent them against communicable diseases.[7] The correlation between SDH and vaccination uptake is complex. For example, individuals with high literacy levels are likely to have a higher vaccination uptake because they have a better understanding of the importance of vaccination on health.[8] Income levels are also likely to have an impact on vaccination uptake. Individuals in the lower income quantile and those living in poverty are likely to have lower vaccination uptake because of limited access to vaccination programs. The impact of poverty levels on vaccination uptake was evident during COVID-19 pandemic when low-income countries experienced disparities when it came to vaccine access, uptake, and coverage.[9,10] Other SDH such as individual lifestyle factors, working and living conditions, and cultural and environment conditions also play a role when it comes to vaccination uptake. For instance, cultural beliefs about vaccination may inform individual's decision whether to get the vaccine or not.

Understanding the impact of SDH on vaccination uptake is important because it can help in developing strategies and policies that can increase uptake and coverage. Such strategies and policies should align with the existing strategies such as the WHO Immunization Agenda 2030 that seeks to leave

no one behind when it comes to vaccine coverage.[11] Increasing vaccination uptake with particular focus on SDH should go beyond addressing individual factors that limit uptake to addressing the broader social and economic factors that affect uptake as well. To achieve success, there is a need for collaboration among relevant stakeholders such as healthcare professionals, policymakers, community leaders, among others who are involved in the vaccination process. Collaboration will lead to the development of comprehensive interventions that can tackle the root causes of vaccine disparities.

Therefore, the aim of this review is to examine how social determinants of health influence vaccination uptake. The review will also explore, how SDH influence health outcomes and the impact of poor vaccination uptake on overall health. The review will also make recommendations on how to achieve equitable and effective immunization programs, ultimately leading to better health outcomes for individuals and communities worldwide.

Impact of Social Determinants of Health on Overall Health Outcomes

The social determinants of health are the factors that influence medical outcomes and influence health inequities. These factors are the ones in which people are born in, grow, work, live, and age.[6] These factors influence health outcomes because they shape the conditions of life. Healthy People 2030 classify SDH into five categories. They include economic stability, education access and quality, health care access and quality, social and community context, and neighborhood and built environment.[6]

Economic Stability

Economic stability refers to the ability of people to afford things like healthy food, healthcare, and housing.[6] They key factors that determine economic stability are income levels, employment, financial security, housing stability among others. Economic stability has a significant impact on health outcomes because it determines whether an individual is able to afford things that influence healthcare such as healthy food and health care access.

Research has determined that income inequality is a key determinant of health with individuals who have high income inequality being the most affected by health disparities and poor outcomes.[12,13] Populations that tend to be the most affected by poverty and who belong to the low-income quintile have poor health outcomes which is as a result of health disparities.[14] These populations tend to have challenges with health care access and affordability. In addition to challenges access healthcare, impoverished individuals and communities do not have adequate access to resources that are need to support good health and well-being. Such resources include healthy foods, stable housing, and safe neighborhoods.[15] Poverty also limits access to employment and education opportunities which widens the income gap even further. Research has shown that poverty increases risk of poor disease outcomes including the risk for poor mental health, chronic disease, and high mortality rates.[16,17,18] The relationship between poverty and poor health outcomes begins all the way from childhood. For instance, research has documented that children who are affected by poverty are likely to have developmental delays, increased likelihood of chronic illness, nutritional deficits, and even chronic stress.[19,20] Childhood poverty has also been linked to poverty in adulthood which means that such individuals are likely to have poor outcomes.[21] Economic stability also affects housing stability with lack of stable housing being associated with poor health outcomes. Housing instability leads to poor health outcomes because it makes it difficult to have healthcare continuity and receive social support.[22] Economic instability also contributes to delayed healthcare because it makes people forego medical care when they need to which leads to severe outcomes.

Education Access and Quality

Education access and quality is an additional social determinant of health that affects health outcomes. Healthy People 2030 recognize education as important in determining health outcomes with emphasis on increasing education opportunities for children and adolescents.[23] Education level influences health outcomes in a number of ways. First is health literacy. Research has documented that health literacy is associated with better understanding of health information and consequently good health outcomes.[24] Individuals who have higher education levels are more likely to make informed decisions pertaining their health and also navigate the complex healthcare systems. Individuals with limited health literacy have more risk of misunderstanding health information or losing their way in the fragmented healthcare system.[25] Several researchers associate health literacy with better disease prevention and control and overall good health outcomes.[26,27,28] Low literacy is associated with poor disease outcomes because it increases the rate of hospitalizations, increases use of emergency care, reduces utilization of preventative services, affects individuals' ability to interpret labels and health messages, increases mortality, and increases overall costs of care.[26] Low health literacy also affects shared decision-making with individuals who have low literacy finding it difficult to engage in their care.

Education does not only impact health literacy. It also affects individuals' abilities to have access to equal employment opportunities. Having higher education levels has been linked to access to better paying jobs which is a key determinant of health outcomes because it influences one's ability to access care.[29] Better paying jobs also have lower occupation hazards which expose workers to increased risk of work-related injuries and illness.[30] Having higher education levels is also linked to safer working conditions and better control of work schedules which impact health. For instance, having flexible work schedules is linked to good mental health while high demanding jobs are linked to work-related stress.[31] The link between flexible work schedules and good mental health outcomes can be attributed to work-life balance. A job that has good work-life balance is likely to have positive impact on mental health and well-being because it is associated with better sleep patterns and regular working hours which enables an individual to engage in personal activities. Lack of education also increases the risk of unemployment which is linked to poor health outcomes.

Healthcare Access and Quality

Healthcare access and quality is another domain of SDH as identified by Healthy People 2030. Access to quality healthcare services is a key determinant of health with various factors such as insurance coverage, geographic disparities, health system navigation, quality of care, and continuity of care affecting healthcare outcomes. Access to quality care is a key determinant of health because it influences timely use of health services and subsequent outcomes.[23] Barriers such as lack of insurance coverage prevents and limits access to health care services when they are needed contributing to health disparities and poor outcomes. Lack of insurance coverage still remains a significant barrier to access despite numerous efforts to increase coverage for all. According to the 2022 National Health Interview Survey (NHIS), 12.2% of Americans aged 18 to 64 did not have health insurance. In total, 27.6 million of the population was uninsured.[32] The report also established that only 22% Americans had public coverage with most (67.8%) having private insurance coverage. The lack of insurance

coverage means that a large number of people opt for out-of-pocket medial care which is associated with significant delays and foregoing the needed care. Research has established that lack of insurance coverage is often associated with poor outcomes.[33] For instance, uninsured adults are likely to have many unmet needs including lack of routine checkups for conditions such as diabetes and hypertension.[34]

In addition to insurance coverage, geographic disparities affect access to quality care. Geographic disparities in this case means people who are not near healthcare facilities and experience difficulties accessing these facilities. The disparities can be as a result of a number of factors including being located in rural areas where transportation is unreliable or as a result of residential segregation.[35] Geographic disparities have been linked to poor health outcomes with lack of proximity to health facilities being linked to poor disease management.[36] Residential segregation can also contribute to limited access and coverage. This can happen where health facilities are available but are overcrowded or have long wait outcomes.

Other factors that affect health care access are difficulty navigating healthcare systems, variations in quality of care, and fragmented care. Difficulty navigating healthcare systems is attributed to complexity more so in individuals who have lower health literacy.[37] Difficulty in navigating healthcare systems leads to uncertainty, disorientation, and suboptimal use of the already available systems. Fragmented care can also affect access more so when it comes to continuity of care. Fragmented care makes coordination difficult leading to poor outcomes. Lack of quality care also affects access and leads to health disparities.

Neighborhood and Built Environment

Neighborhood and built environment are another domain of SDH that affects health outcomes. The neighborhood and built environment refer to the places where people live and work. Some of the factors of the neighborhood and built environment that affects health are housing quality, water quality, air pollution, neighborhood safety, and the food environment. Factors such as air pollution and water quality are linked to poor health outcomes because they increase risks of diseases such as asthma and water-borne diseases.[38] The housing quality also matters when it comes to health. People who live in poorly built houses that lack proper ventilation or are infested with mold and pests are more likely to report respiratory issues and allergies.[39] This is particularly the case for children. The built environment comprising of how the neighborhood is built is also instrumental when it comes to health.

Congested and overcrowded neighborhoods are linked to poor health outcomes because of the absence of sidewalks, parks, bike lanes, and recreational facilities to support physical activities.[40] Lack of such activities influences behavior and increases risk of chronic diseases. Other aspects of then neighborhood and built environment that influences behavior are safety and violence and food environment. Neighborhoods that have high crime rates are known to be disproportionately affected by disease.[41] High crime rates are associated with health disparities because they limit outdoor activities and increase the likelihood of mental health problems. The food environment refers to the availability of healthy vs. unhealthy food outlets and sources. Food environment has impact on dietary intake. Areas that have higher numbers of food deserts which are areas with limited access to healthy and nutritious foods have poor health outcomes including high risk of obesity and diabetes.[42] Living in such environments contributes to poor dietary habits which explains why they are associated with poor health outcomes.

Social and Community Context

Social and community context is another domain of SDH that plays a crucial role in shaping health outcomes. Social and community context entails availability of social and community support within the community. Having strong support or social capital within the community that one lives in is associated with better health and well-being.[43] Poor social relationships and isolation have been linked to poor health outcomes more so in older adults.[44] Social isolation increases the risk of mental health, premature death, and cognitive decline. Community cohesion is an additional factor that is linked to good health outcomes. Communities that have high levels of cohesion tend to report better health outcomes more so on their mental health and well-being.[45] The reason why community cohesion is associated with good health outcomes is because it influences behavioral and psychological pathways such as the need to eat a healthy diet or engage in healthy behaviors. Therefore, social and community cohesion provides an avenue for emotional support which is linked to good health outcomes and well-being.

Evidently SDH have an impact on overall health and well-being. They affect many aspects of health and well-being leading to poor health outcomes and health disparities. SDH can also affect other aspects of health such as vaccination uptake. These factors can influence rates of vaccine uptake and even availability.

Impact of Social Determinants of Health on Vaccination Uptake

The impact of SDH on vaccination uptake is complex and multifaceted with a number of factors affecting the uptake rates. The correlation between SDH and vaccination uptake was evident during the COVID-19 pandemic.[46] During this period, a lot of disparities with regard to vaccination uptake were experienced with a number of SDH contributing to the low uptake. For instance, economic stability is a contributing factor when it comes to vaccination uptake. Individuals with low-income levels and those living in poverty are likely to face a number of barriers that may affect vaccination uptake. Areas that face deprivation and marginalization are likely to have high vaccine hesitancy.[47] The high vaccine hesitancy in such regions can be attributed to a number of factors including low health literacy levels on the importance of vaccination, limitations when it comes to transportation costs to healthcare facilities, and lack of coverage of vaccinations by health programs. Adebowale et al. established a correlation between household wealth and vaccination uptake with children from higher income households having higher uptake rates than those from low-income households.[48]

The correlation between economic stability and vaccination uptake goes beyond household level. It has been established at the country level. The national income can have an impact on vaccine rollout, uptake, and hesitancy. This was evident during COVID-19 where low- and middle-income countries experienced low rollout levels compared to their high-income counterparts.[49] Economic stability also affects vaccination uptake because has an influence on insurance coverage. Individuals with low-income levels are likely to be uninsured which can limit access to vaccines especially where there are no public programs. According to a study by Lu et al., vaccination coverage was lower among people who did not have health insurance compared to those who had insurance.[50]

An additional determinant of health that affects vaccination uptake is education level. This includes both education attainment and health literacy. Higher education attainment has been linked to increased vaccination uptake with individuals who have higher education levels being more

likely to go for vaccination.[51] Health literacy is an additional factor that influences vaccination uptake. Individuals who are health literate are more likely to take vaccination because they understand the impact of vaccines on health outcomes.[52] Health literacy also influences a person's understanding of the risk perceptions associated with vaccines. As such, they are likely to make informed decisions whether to take vaccines or not.

Healthcare access and quality is a key determinant when it comes to vaccination uptake. Factors such as geographic disparities, insurance coverage, and availability of the healthcare provider determines whether the uptake will be high or not. Geographic disparities can affect the ability of the individual to keep up with vaccination routine.[53] Proximation to healthcare facilities is important because it determines whether an individual will go for vaccination as required. Geographic disparities also affect transport networks with people living in remote areas finding it challenging to access healthcare facilities for vaccines.[54] Shortage of primary care providers and lack of insurance coverage can also limit vaccine administration and uptake. Individuals that lack insurance are less likely to keep up with vaccination schedules.

Neighborhood and built environment influences vaccination uptake in terms of vaccine accessibility. The neighborhood and built environment can affect vaccination uptake through two main ways. One is presence or absence of healthcare facilities or community health centers. Limited access to such facilities is likely to lead to lower uptake. Lack of reliable public transportation in the neighborhood can also make it difficult to access healthcare facilities that provide the vaccine.

Another key domain of SDH that influences vaccination uptake is social and community context. Social and community context in this case are the social norms that exist in a community or religious and cultural beliefs. Cultural and religious beliefs influence vaccination uptake with some of these beliefs being against vaccination.[55] The attitudes that a community has towards vaccination can lead to vaccine hesitancy on a personal level.

Increasing vaccination uptake requires broader understanding of how social determinants influence individual decisions to get vaccinated. It also helps to understand broader community factors that influence vaccination uptake. Having a good understanding of these factors is important in designing targeted interventions that can address the specific barriers experienced by individuals and the community. Understanding the impact of SDH on vaccination uptake can also influence policy changes because policies can be implemented to deal with the identified barriers.

Addressing poor vaccination uptake is important because of the impact it has on health outcomes. Vaccination can be used as a disease prevention and control strategy more so for communicable diseases. Using vaccination as a measure to prevent and control the spread of communicable diseases reduces strain on healthcare systems and ensures effective resource allocation.[56] Strain on healthcare systems can have a negative effect on health as was witnessed during COVID-19 pandemic.

Poor vaccination uptake also leads to increase disease incidence. Failing to take vaccination according to vaccination schedule increases the incidence and resurgence of preventable diseases.[57] Some of these diseases are associated with high morbidity and mortality rates. Poor vaccination uptake also comprises herd community.[58] Compromising herd community increases the risk of disease spread more so vulnerable populations. It also increases the risk of disease outbreaks.

Conclusion

This review establishes that social determinants of health affect vaccination uptake. The analysis determines that the relationship between SDH and vaccination uptake is multifaceted with different factors influencing the uptake rate. The SDH interact in complex ways contributing to disparities, inequities, and lower immunization rates. The disparities in vaccine uptake derails the efforts that have already been made with regard to vaccination and makes it difficult to reach the WHOs vision of providing vaccine for all by 2030. Inadequate vaccine uptake is associated with negative effects on health hence the need for measures that can increase uptake. Collaboration, policy reforms, and community interventions are some of the measures that can be used to increase uptake. These measures can address the underlying factors that affect vaccination uptake. It is also important to acknowledge how SDH affects vaccination uptake and taking measures to address the resulting disparities and inequities. Addressing the disparities associated with SDH can lead to improvement in vaccination uptake.

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