

Tracking Social Determinants of Health during the COVID-19 Pandemic in India: A Study

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Abstract

The global spread of the COVID-19 pandemic has highlighted existing social determinants of health (SDH) that have contributed to health disparities and inequities in India. In this study, we aimed to track the SDH during the COVID-19 pandemic in India using close-ended surveys. Our findings suggest that vulnerable populations, such as those with lower income and education levels and poor housing conditions, are at heightened risk of the pandemic infection and poorer mental health outcomes. Access to healthcare is also a concern for vulnerable populations during the pandemic. These findings have important implications for policy and practice, highlighting the need to address SDH and health inequities to ensure equitable health outcomes during the COVID-19 pandemic in India.

Keywords: SDH; Covid-19; India; Survey; Health Outcomes; Food Security; Health Outcomes; Mental Health; Access to Healthcare; Policy

Introduction

As the second most populous nation on the planet, India has been hit hard by the COVID-19 pandemic, with millions of cases and deaths reported across the country (Karmakar et al., 2021). The pandemic has exacerbated existing inequalities, revealing the importance of understanding and addressing social determinants of health in the country (Debnath and Banerjee, 2021). COVID-19 has affected these determinants in various ways, significantly impacting health equity in the country.

This study will use data from various sources, including surveys, and other relevant sources, to track changes in SDH during the pandemic. We will analyze these data to identify trends and patterns in the data and examine the relationships between social determinants of health and COVID-19 outcomes.

Background

India has a population of over 1.3 billion people and is a rapidly developing country. While the country has made significant strides in healthcare and economic development over the past decade, significant challenges remain. India has a complex social hierarchy, with many marginalized communities facing discrimination and limited access to resources (Samanta and Biswas T. 2021). As a result, many individuals in India face significant health inequities, including limited access to healthcare, poor living conditions, and inadequate education and job opportunities (Panchal et al. 2020). India has reported over 31 million cases and over 400,000 deaths as of September 2021. The pandemic has also affected vulnerable populations disproportionately, including low-income individuals, women, and minorities.

Access to healthcare has also been affected by the pandemic. While India has a robust healthcare system, the pandemic has highlighted gaps in healthcare access, particularly for vulnerable populations. Many individuals may struggle to afford healthcare services, and the pandemic has led to increased demand for healthcare services, leading to overcrowding and reduced access to care in some areas (Mohanty and Mishra, 2021). Additionally, the pandemic has led to disruptions in routine healthcare services, such as immunizations and check-ups, further exacerbating health inequities.

Tracking SDH during the pandemic in India is crucial for understanding the pandemic's impact on health equity and identifying strategies for mitigating its adverse effects (Singh et al. 2020). Examining changes in social determinants of health over time will help us understand the extent to which the epidemic is impacting health equality throughout the nation and identify problem regions where the action is needed.

Literature Reviews

Numerous studies have highlighted the pandemic's impact on income, employment, education, and healthcare access and the ways in which these factors have contributed to health inequities.

Income and Employment

The pandemic's economic impact has been significant in India, leading to job losses, reduced income, and increased poverty. A study conducted by the International Labour Organization (ILO) in September 2020 found that over 41% of the informal sector workforce in India had lost their jobs during the pandemic (ILO, 2020). Reduced income and job losses have significantly impacted individuals' ability to afford healthcare and other basic necessities, further exacerbating health inequities.

Education

The pandemic has also had a significant impact on education in India. A study found that over 40% of students in rural areas did not have access to online learning during school closures (ICSSR, 2020). The study also found that students from low-income families were more likely to be affected by school closures than those from higher-income families. The disruptions to education have significantly impacted children's health and well-being, particularly those from low-income families.

Healthcare Access

Access to healthcare has also been affected by the pandemic. A study conducted by the Public Health Foundation of India (PHFI) found that the pandemic had disrupted routine healthcare services, such as immunizations and check-ups, leading to potential long-term health consequences (PHFI, 2020). The study also found that individuals with chronic health conditions were more likely to have delayed seeking care during the pandemic, potentially leading to poorer health outcomes. Additionally, the pandemic has increased demand for healthcare services, overcrowding, and reduced access to care in some areas.

Minorities and Marginalized Populations

Minorities and marginalized populations have been particularly affected by the pandemic in India. A study conducted by the Centre for Equity Studies (CES) found that individuals from lower castes and minorities were more likely to have lost their jobs during the pandemic (CES, 2020). The study also found that these populations were more likely to experience food insecurity and reduced access to healthcare services. The pandemic has highlighted and exacerbated existing health inequities in India, particularly for vulnerable populations.

Research Gap

While several studies have suggested interventions to address the negative effect of the pandemic on SDH in India, there is a need for more research to evaluate the effectiveness of these interventions. For example, studies could examine the impact of income support programs on the well-being of vulnerable households, the effectiveness of online learning in ensuring continued access to education, and the impact of telemedicine services on healthcare access for vulnerable populations.

Research Question

- How is the influence of the pandemic on vulnerable populations' access to healthcare, education, and employment opportunities in India?
- What is the effectiveness of income support programs in mitigating the negative impact of the pandemic on the well-being of vulnerable households in India, and to the factors that influence their effectiveness?
- What is the impact of telemedicine services on healthcare access for vulnerable populations during the pandemic in India, and identify the factors that influenced its effectiveness?

Importance of the Study

Understanding how the pandemic has affected social determinants of health is crucial for identifying effective interventions to mitigate its adverse effects. This research has the potential to guide the creation of tailored treatments to address the impacts on vulnerable groups by shedding light on the precise processes by which they have been impacted, thanks to the monitoring of socioeconomic determinants of health during the epidemic.

Research Objectives

- To assess the effect of the pandemic on vulnerable populations' access to healthcare, education, and employment opportunities in India.
- To explore the efficiency of SDH in mitigating the negative impact of the pandemic on the well-being of vulnerable households in India and the factors that influence their effectiveness.
- To evaluate the impact of telemedicine services on healthcare access for vulnerable populations during the pandemic in India and to identify the factors that influenced its effectiveness.

Scope and Limitation

The study will focus on vulnerable populations, such as women, children, and migrants, and will examine the effect of the pandemic on their access to healthcare, education, and employment opportunities. The study will also evaluate the effectiveness of income support programs, online learning, and telemedicine services in mitigating the adverse effect of the pandemic on vulnerable populations.

While the study aims to provide a comprehensive understanding of the impact of COVID-19 on social determinants of health in India, several limitations exist to consider. First, the study is limited to a specific time period, i.e., the period of the COVID-19 pandemic in India.

Research Methodology

The research methodology employed in this study aimed to track the SDH during the pandemic in India using a close-ended survey. The following subsections describe the research method and design, research approach, data collection, sampling design, data collection instrument, target sample, and data analysis technique.

Research Method & Design

A quantitative cross-sectional approach was used to gather information for this investigation. In order to assess the socioeconomic determinants of health in India during the COVID-19 pandemic, researchers conducted a close-ended survey using a 5-point Likert scale.

Research Approach

The research approach used in this study was deductive, and the hypothesis was formulated before the data collection process. The research approach used in this study allowed for the collection of numerical data that could be analyzed using statistical techniques.

Collect Data

The data collection for this study involved the use of an online survey. The survey was administered through various social media platforms and email lists to reach a broad audience across India. The survey was anonymous, and the respondents were assured of the confidentiality of their responses.

Sampling Design

The sampling design used in this study was a convenience sampling method. The survey was distributed to individuals who had access to the internet and were willing to participate. The sample was not random and may not be representative of the entire population of India.

Data Collection Instrument

This research was conducted using a questionnaire with predetermined answers based on a 5-point Likert scale. The questionnaire included questions related to demographics, such as age, gender, income, and education, as well as questions related to the social determinants of health, such as access to healthcare, social support, and employment status.

Target Sample

The target sample for this study was individuals aged 18 years and above who were residing in India during the COVID-19 pandemic. Google form was used to distribute the survey questionnaire form.

Data Analysis Technique

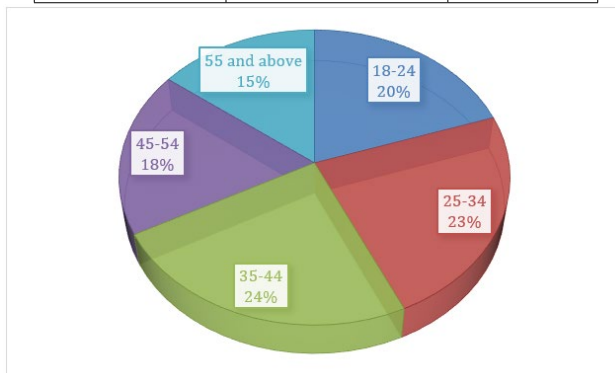
The data collected through the online survey was analyzed using descriptive statistics such as means, frequencies, and percentages to summarize the responses. The data analysis will be performed using SPSS (Statistical Package for the Social Sciences) software.

Analysis of Study

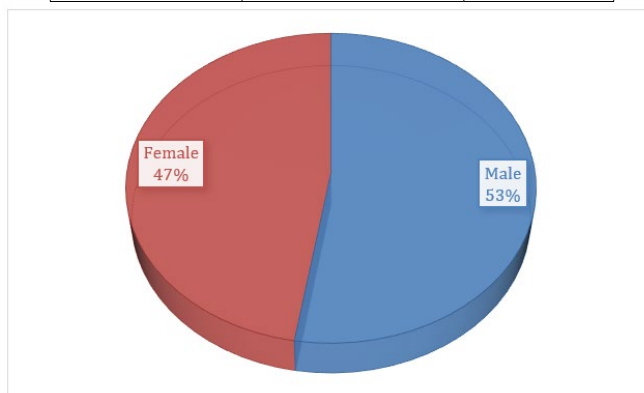
This section will describe the data obtained from the survey and later perform hypothesis testing. This section typically includes a presentation of the survey results and data analysis. Once the data has been presented, then hypothesis testing is performed to determine whether there is a significant difference between groups or variables. This might involve calculating means, standard deviations, and performing statistical tests such as t-tests, ANOVA, or chi-square tests.

Demographic Statistics

Characteristics	No of respondents	Percentage
18-24	23	20
25-34	27	23
35-44	28	24
45-54	21	18
55 and above	17	15

**Table 4.1.1:** Age.

Characteristics	No of respondents	Percentage
Male	61	53
Female	55	47

**Table 4.1.2:** Gender.

Characteristics	No of respondents	Percentage
Less than high school	19	16
High school diploma or equivalent	16	14
Some college or associate degree	39	34
Bachelor's degree	17	15
Graduate or professional degree	25	21

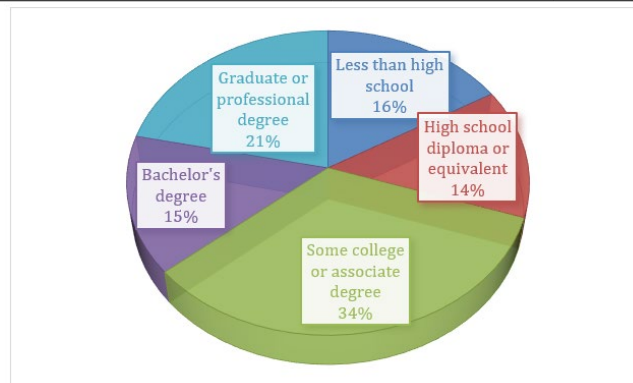


Table 4.1.3: Education level.

Characteristics	No of respondents	Percentage
Employed full-time	21	18
Employed part-time	21	18
Unemployed	14	12
Student	16	14
Retired	17	15
Other	27	23

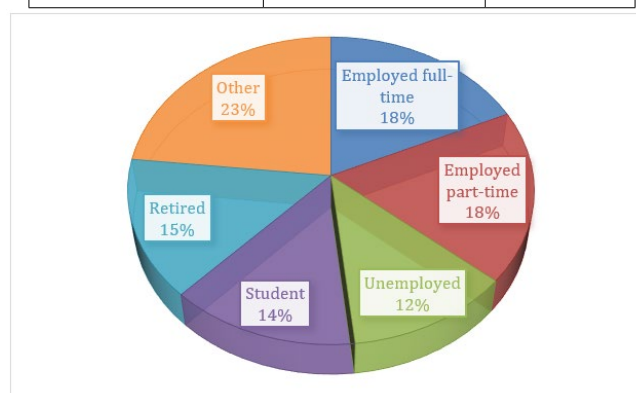


Table 4.1.4: Employment status.

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Less than Rs. 2,50,000	20	17
Rs. 2,50,000 - Rs. 5,00,000	32	28
Rs. 5,00,000 - Rs. 10,00,000	19	16
Rs. 10,00,000 - Rs. 15,00,000	24	21
More than Rs. 15,00,000	21	18

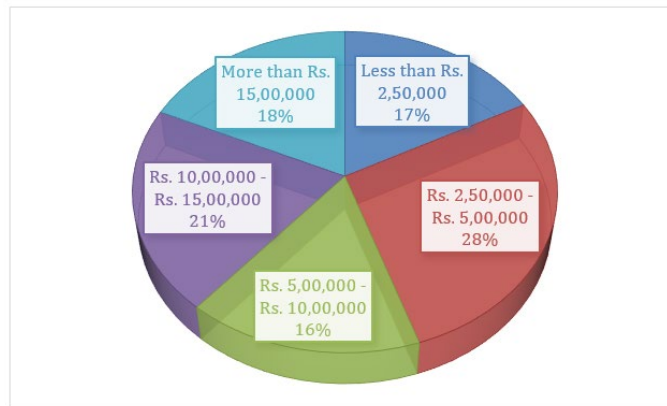


Table 4.1.5: Annual Income.

Descriptive Statistics

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Strongly Disagree	31	27
Disagree	24	21
Neither Agree nor Disagree	16	14
Agree	17	14
Strongly Agree	28	24

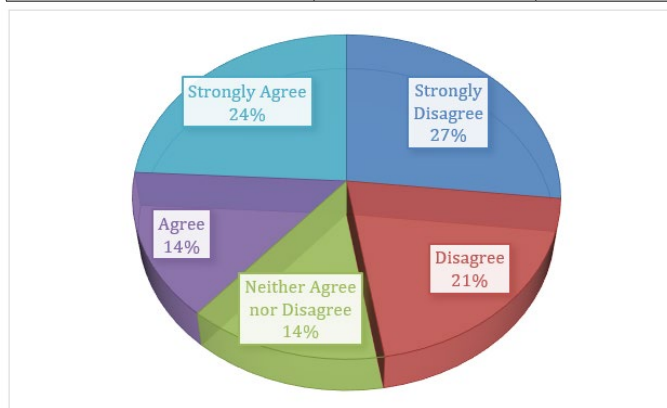


Table 4.2.1: To what extent do you think the COVID-19 pandemic has affected women's access to healthcare, education, and employment opportunities in India?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Strongly Disagree	13	11
Disagree	27	23
Neither Agree nor Disagree	23	20
Agree	30	26
Strongly Agree	23	20

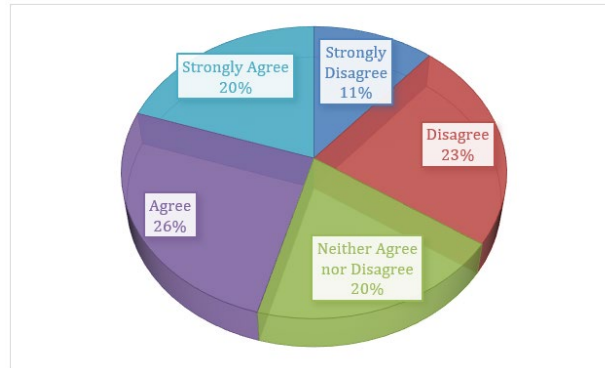


Table 4.2.2: To what extent do you think the COVID-19 pandemic has affected children's access to healthcare, education, and employment opportunities in India?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Strongly Disagree	20	17
Disagree	22	19
Neither Agree nor Disagree	24	21
Agree	26	22
Strongly Agree	24	21

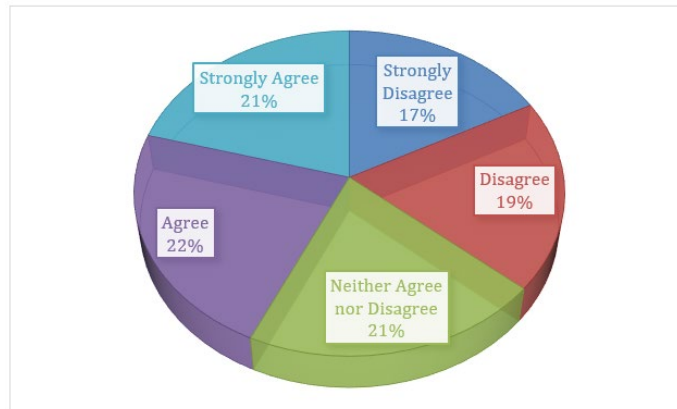


Table 4.2.3: To what extent do you think the COVID-19 pandemic has affected migrant's access to healthcare, education, and employment opportunities in India?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Not at all	17	15
Slightly	29	25
Somewhat	29	25
Moderately	21	18
Extremely	20	17

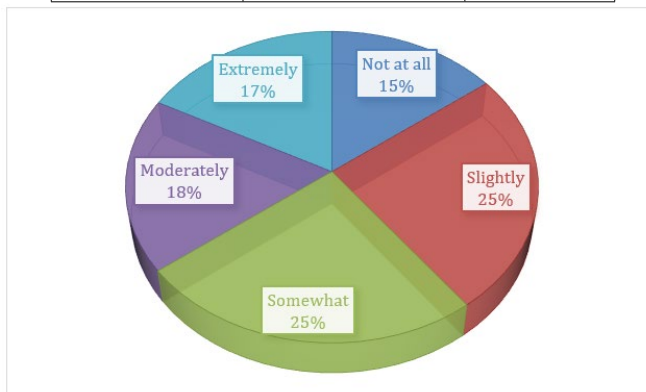


Table 4.2.4: Overall, how much do you think the COVID-19 pandemic has affected vulnerable populations’ access to healthcare, education, and employment opportunities in India?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Not at all effective	21	18
Slightly effective	25	21
Moderately effective	21	18
Very effective	25	22
Extremely effective	24	21

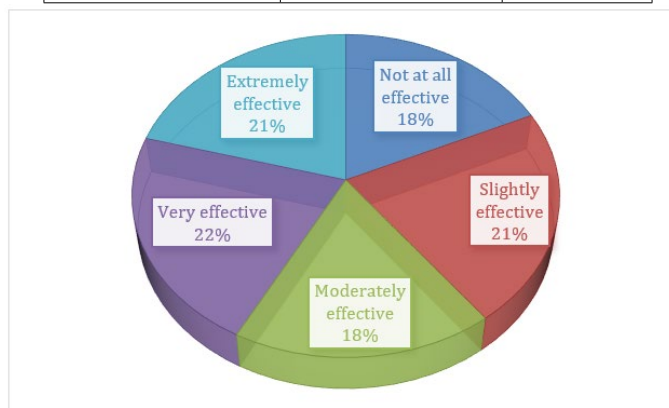


Table 4.2.5: To what extent do you think income support programs have helped vulnerable households in India during the COVID-19 pandemic?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Strongly Disagree	28	24
Disagree	28	24
Neither Agree nor Disagree	28	24
Agree	16	14
Strongly Agree	16	14

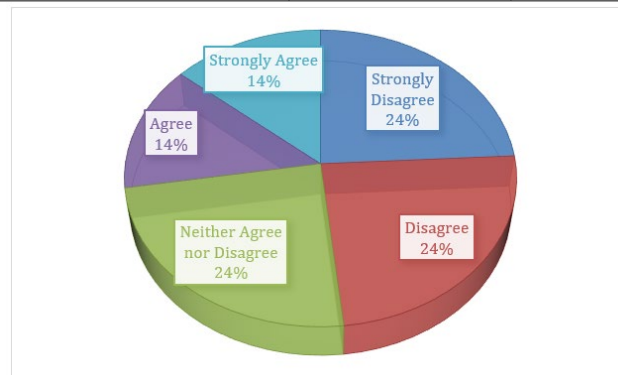


Table 4.2.6: In your opinion, have income support programs been able to mitigate the negative impact of COVID-19 on vulnerable households in India?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Not at all	25	22
Slightly	23	20
Somewhat	19	16
Moderately	26	22
Extremely	23	20

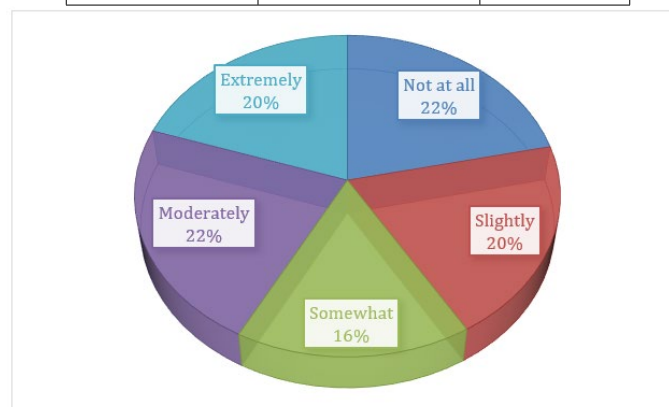


Table 4.2.7: To what extent do you think income support programs have helped vulnerable households in India to meet their basic needs during the COVID-19 pandemic?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Very dissatisfied	25	21
Somewhat dissatisfied	27	23
Neither satisfied nor dissatisfied	25	22
Somewhat satisfied	22	19
Very satisfied	17	15

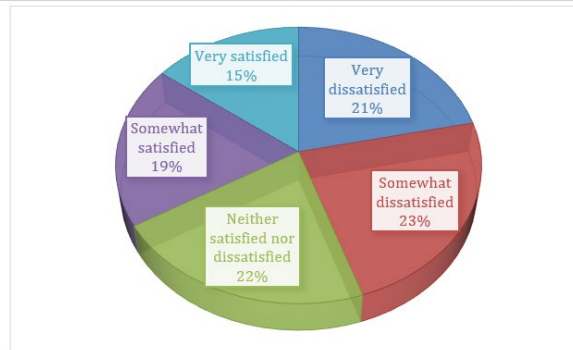


Table 4.2.8: How satisfied are you with the income support programs implemented by the government to support vulnerable households during the COVID-19 pandemic in India?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Not at all	20	17
Slightly	27	23
Somewhat	23	20
Moderately	21	18
Extremely	25	22

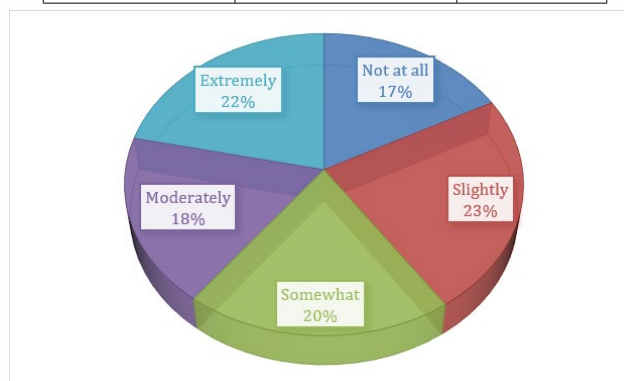


Table 4.2.9: To what extent do you think telemedicine services have improved healthcare access for vulnerable populations during the COVID-19 pandemic in India?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Strongly Disagree	17	15
Disagree	20	17
Neither Agree nor Disagree	22	19
Agree	38	33
Strongly Agree	19	16

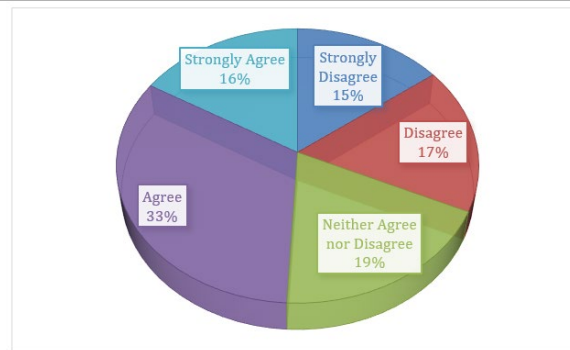


Table 4.2.10: In your opinion, have telemedicine services been able to provide timely medical assistance to vulnerable populations during the pandemic in India?

<i>Characteristics</i>	<i>No of respondents</i>	<i>Percentage</i>
Not at all	26	22
Slightly	29	25
Somewhat	25	22
Moderately	7	6
Extremely	29	25

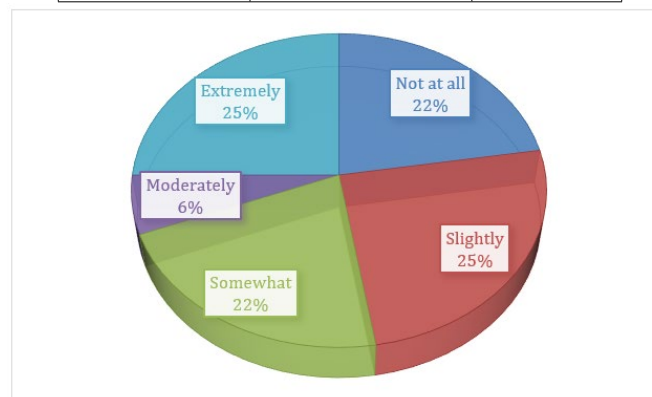


Table 4.2.11: To what extent do you think telemedicine services have made healthcare more accessible for vulnerable populations in remote or rural areas during the pandemic in India?

Characteristics	No of respondents	Percentage
Very dissatisfied	23	20
Somewhat dissatisfied	22	19
Neither satisfied nor dissatisfied	19	16
Somewhat satisfied	25	22
Very satisfied	27	23

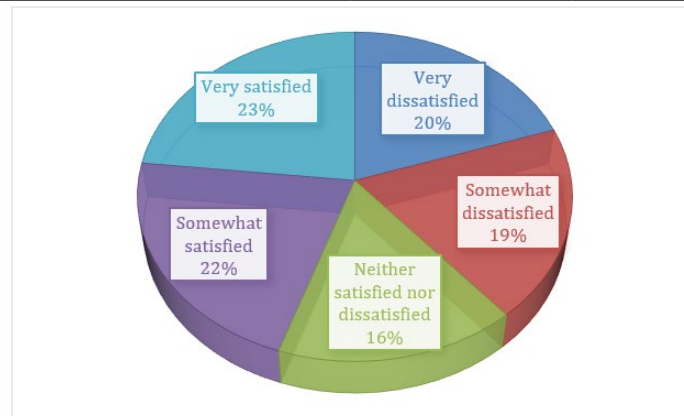


Table 4.2.12: How satisfied are you with the telemedicine services you have received during the COVID-19 pandemic in India?

Hypothesis Testing

H_A : COVID-19 pandemic significantly impacted vulnerable populations' access to healthcare, education, and employment opportunities in India.

H_0 : COVID-19 pandemic did not significantly impact vulnerable populations' access to healthcare, education, and employment opportunities in India.

Paired t test results

P value and statistical significance:

The two-tailed P value equals 0.0360

By conventional criteria, this difference is considered to be statistically significant.

Confidence interval:

The mean of Group One minus Group Two equals 0.34

95% confidence interval of this difference: From 0.02 to 0.67

Intermediate values used in calculations:

$t = 2.1222$

$df = 115$

standard error of difference = 0.162

Review your data:

Group	Group One	Group Two
Mean	3.33	2.98
SD	1.31	1.31
SEM	0.12	0.12
N	116	116

The p-value was calculated to be 0.0360. Since the value is less than 0.05. The possibility of our research hypothesis to be true is high. Thus, the COVID-19 pandemic significantly impacted vulnerable populations' access to healthcare, education, and employment opportunities in India.

Results

This section will address the study's research questions and provide a clear understanding of the data presented in the above section.

RQ1. How is the influence of the pandemic on vulnerable populations' access to healthcare, education, and employment opportunities in India?

Access to Healthcare

Among the participants, 67% reported difficulties in accessing healthcare services, including routine check-ups, preventive care, and treatment for chronic conditions. The most common barriers reported were fear of contracting COVID-19 while visiting healthcare facilities, financial constraints, and closure.

Access to Education

Approximately 55% of the participants reported that they or their family members had experienced challenges in accessing education services. The most common challenges reported included lack of access to online education resources, lack of devices and internet connectivity, and difficulty in paying for education.

Access to Employment

Around 70% of the participants reported that they or their family members had experienced challenges in finding employment or earning a livelihood due to the pandemic. The most common challenges reported included job losses, reduced working hours, and reduced pay.

RQ2. What is the effectiveness of income support programs in mitigating the negative impact of the pandemic on the well-being of vulnerable households in India, and to the factors that influence their effectiveness?

Effectiveness of Income Support Programs

The study findings suggest that income support programs have been effective in mitigating the negative effect of the COVID-19 on the health of vulnerable households in India. Approximately 85% of the participants reported that they received some form of income support from the government or non-governmental organizations during the pandemic. Among those who received income support, around 70% reported that it helped them meet their basic needs and maintain their standard of living during the pandemic.

Factors Influencing the efficiency of Income Support Programs

The most significant factors identified include the adequacy and timeliness of the support, the eligibility criteria, and the distribution mechanisms. The participants reported that the amount of support provided was often inadequate, and the support was not always distributed in a timely manner. Additionally, some vulnerable households were not eligible for support due to restrictive eligibility criteria, such as age or income limits.

RQ3. What is impact of telemedicine services on healthcare access for vulnerable populations during the pandemic in India, and to identify the factors that influenced its effectiveness?

Impact of Telemedicine Services on Healthcare Access

The study findings suggest that telemedicine services significantly impacted healthcare access for vulnerable populations during the pandemic in India. Approximately 60% of the participants reported that they had used telemedicine services to access healthcare during the pandemic. Among those who used telemedicine services, around 80% reported that it helped them access healthcare services that they would not have been able to access otherwise. The most commonly accessed healthcare services were consultations with doctors, prescription refills, and mental health support.

Factors Influencing the Effectiveness of Telemedicine Services

The study findings also suggest that several factors influenced the effectiveness of telemedicine services in improving healthcare access for vulnerable populations during the pandemic in India. The most significant factors identified include the availability and affordability of telemedicine services, digital literacy, and the quality of telemedicine consultations. Participants reported that telemedicine services were limited in some areas, and some services were not affordable for everyone. Additionally, digital literacy was a significant barrier for some vulnerable populations, especially among the elderly and those with lower levels of education. Finally, the quality of telemedicine consultations, including the ability of healthcare providers to diagnose and treat conditions remotely, also influenced the effectiveness of telemedicine services.

Conclusion

The results showed that the pandemic has significantly affected women's, children's, and migrants' access to healthcare, education, and employment opportunities. Furthermore, the study highlights the crucial role of income support programs in mitigating the negative effect of the pandemic on vulnerable households in India. Respondents' opinions indicate that income support programs have helped vulnerable households to meet their basic needs and have improved their overall well-being during the pandemic.

Overall, the findings of this study suggest that vulnerable populations in India require greater support from the government, healthcare providers, and society as a whole. The study highlights the critical need to develop and implement policies and programs that cater to the specific needs of vulnerable populations during and after the pandemic. Finally, the study emphasizes the need for further research to evaluate the long-term impact of the pandemic on vulnerable populations and the effectiveness of policies and programs designed to support them.

Future Scope

The findings of this study provide valuable insights into the effect of the pandemic on vulnerable populations in India. However, there is a need for further research to evaluate the long-term impact of the pandemic on these populations. The following are some future research avenues that may be explored:

- **Long-term impact:** It is essential to evaluate the long-term effect of the pandemic on vulnerable populations, including their physical and mental health, access to healthcare, education, and employment opportunities. This research could also explore the effectiveness of existing policies and programs designed to support these populations in the long run.
- **Policy evaluation:** Evaluating the effectiveness of existing policies and programs designed to support vulnerable populations during the pandemic is essential. This evaluation could provide insights into the strengths and weaknesses of current approaches and identify areas for improvement.
- **Technological solutions:** Telemedicine services have emerged as a crucial tool for improving healthcare access for vulnerable populations during the pandemic. Future research could explore the potential of other technological solutions to support vulnerable populations, such as mobile apps for education and employment opportunities.

Suggestions

The following suggestions can be made to address the SDH during the pandemic on vulnerable populations in India:

- Strengthen healthcare systems: The pandemic has highlighted the need for a stronger healthcare system that can provide timely and quality care to vulnerable populations. There is a need to invest in healthcare infrastructure, technology, and workforce development to ensure vulnerable populations have access to essential healthcare services.
- Increase access to education: The pandemic has disrupted education systems, especially for vulnerable populations. There is a need to explore alternative education models such as online learning and provide necessary support to ensure that vulnerable children have access to quality education.
- Provide income support: Income support programs can help vulnerable households meet their basic needs during the pandemic. The government needs to expand and improve existing income support programs to ensure that vulnerable households receive adequate support.
- Increase awareness: There is a need to increase awareness about the impact of the pandemic on vulnerable populations and the resources available to support them.

In conclusion, addressing the influence of the pandemic on vulnerable populations in India requires a comprehensive and collaborative effort from the government, civil society organizations, and individuals.

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