

Perception of Rural Population Towards Vaccination Drive in Vadodara

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Abstract — One of the best preventive healthcare strategies for reducing infectious diseases and enhancing public health is vaccination. To guarantee that vaccines reach both urban and rural populations, governments and international health organizations have put in place a number of immunization programs. Initiatives like Mission Indradhanush and the Universal Immunization Programme have greatly increased vaccine accessibility in India, especially in rural areas. However, how rural populations view vaccination drives is still influenced by disparities in awareness, education, cultural beliefs, and access to trustworthy healthcare information. This study looks at how rural residents in the Vadodara district feel about vaccination programs and analyzes how sociodemographic factors like awareness, education, age, and income affect vaccine acceptance. A structured questionnaire was used to gather primary data from 200 rural respondents using a descriptive research design. Academic research and public health publications provided secondary data. The findings show that age, education level, and awareness have a significant impact on vaccination perception and participation, while income level has little effect because government vaccination services are free. To increase vaccination acceptance and support the efficacy of immunization programs in rural communities, the study emphasizes the significance of bolstering awareness campaigns, enhancing health communication, and promoting community involvement.

Keywords— Vaccination perception, Rural healthcare, Immunization programs, Vaccine acceptance, Public health awareness.

I. INTRODUCTION

One of the best preventive healthcare strategies for reducing infectious diseases and enhancing general public health is vaccination. Immunization campaigns have been instrumental in stopping the spread of deadly illnesses like polio, measles, and tetanus over the past few decades. Vaccines greatly reduce the burden of disease and enhance the quality of life for all populations by boosting the immune system and offering defense against infectious pathogens.

The government of India has launched a number of national immunization programs to increase vaccination rates and guarantee that all citizens have access to necessary vaccines. To improve vaccine availability, especially in rural and underserved areas, initiatives like the Universal Immunization Programme (UIP) and Mission Indradhanush have been put into place. These programs aim to prevent avoidable diseases in vulnerable groups, such as children, pregnant women, and the elderly. Despite these initiatives, differences in social beliefs, healthcare accessibility, awareness, and educational attainment still affect vaccination rates in rural areas.

Inadequate health information, a lack of healthcare infrastructure, and the impact of traditional beliefs or misconceptions about vaccines are some of the issues that rural populations frequently deal with. Sometimes vaccine hesitancy or vaccination delays are caused by fear of side effects and a lack of trustworthy information. Therefore, increasing the efficacy of immunization campaigns and guaranteeing greater participation rates requires an understanding of how rural populations view vaccination programs.

The current study focuses on how rural residents in the Vadodara district perceive vaccination drives. Additionally, the study looks at how sociodemographic variables like income, age group, education level, and awareness affect vaccine acceptance. The study aims to provide insights that may assist healthcare authorities in creating more successful awareness campaigns and bolstering vaccination outreach in rural areas by identifying the major factors influencing vaccination perception.

II. LITERATURE REVIEW

Morshed et al. (2023) conducted a study titled “Willingness and Perception About COVID-19 Vaccine Among Rural Adults” to examine the willingness of rural populations to receive COVID-19 vaccination. The study was conducted in six villages of Palashbari Upazila in Gaibandha District using structured questionnaires and face-to-face interviews. The findings revealed that approximately 89.1% of respondents were willing to receive the vaccine because they believed vaccination could protect them and reduce the risk of infection. However, a small proportion remained hesitant due to concerns about safety and possible side effects. The researchers concluded that awareness programs and targeted communication strategies are necessary to address misconceptions and improve vaccine participation among rural populations.

Ramesh et al. (2021) conducted a community-based survey titled “Attitude Towards COVID-19 Vaccines and Vaccine Hesitancy in Urban and Rural Communities in Tamil Nadu, India.” The study involved 564 unvaccinated individuals selected through multistage random sampling. The results showed that nearly half of the respondents had a positive attitude toward vaccination, while around 40.7% were hesitant and 19.5% strongly opposed vaccination. The study identified lack of trust in healthcare systems, fear of side effects, and preference for natural immunity as major causes of vaccine hesitancy. The authors suggested the implementation of targeted behavioral communication strategies to improve vaccination acceptance.

Khanam et al. (2023) conducted a qualitative study titled “COVID-19 Vaccine Barriers and Perception Among Rural Adults.” The research involved in-depth interviews with rural residents and healthcare workers in Bangladesh. The results revealed that although many participants recognized the importance of vaccination, several barriers such as misinformation, limited knowledge, and logistical difficulties affected vaccine acceptance. The study emphasized that effective health education programs and community-based communication strategies are essential for overcoming vaccination barriers in rural communities.

Setia et al. (2024) examined vaccine acceptance in rural and tribal areas of Maharashtra through household surveys conducted in six villages. The study found that 63.3% of respondents had completed two vaccine doses, while a significant portion remained partially vaccinated or unvaccinated. Fear of side effects, mistrust in healthcare authorities, and lack of awareness were identified as major factors contributing to vaccine hesitancy. The researchers highlighted the importance of culturally appropriate awareness campaigns and improved healthcare accessibility in rural regions.

Patel and Shah (2022) conducted a study titled “Socio-Demographic Factors Influencing Vaccine Hesitancy in Rural Gujarat.” The study analyzed the influence of education, gender, and income on vaccination behavior. The results indicated that individuals with higher education levels were more likely to accept vaccination due to better understanding of scientific information and health awareness. The research also highlighted gender differences in vaccination participation and recommended awareness initiatives focused on improving health literacy among rural communities.

Mehta et al. (2023) examined the “Role of Community Health Workers in Enhancing Immunization Coverage in Rural Areas.” The study found that villages with active involvement of ASHA workers and other frontline healthcare professionals experienced significantly higher vaccination coverage. These workers play a critical role in spreading awareness, addressing misconceptions, and building trust within rural communities. The authors suggested strengthening the training and support systems for healthcare workers to improve vaccination outreach.

Deshmukh et al. (2021) conducted a study on “Knowledge, Attitude, and Practices Toward Immunization in Rural Maharashtra.” The findings revealed that although many respondents recognized the benefits of vaccination, misconceptions about vaccine safety and side effects were still prevalent. The study recommended continuous health education programs and awareness initiatives to improve knowledge and reduce hesitancy among rural populations.

Rao et al. (2023) explored barriers to routine immunization services in rural India. Through interviews with healthcare workers and community members, the study identified several structural challenges including transportation issues, long distances to healthcare centers, irregular vaccination schedules, and misinformation within communities. The authors concluded that strengthening healthcare infrastructure and improving communication strategies are essential for improving vaccination coverage.

Several important factors affecting rural populations' perceptions of and participation in vaccinations have been identified by prior research:

- Vaccine acceptance is greatly increased by awareness and health education.
- Understanding the advantages of vaccinations and dispelling false information depend heavily on educational attainment.
- The development of trust in immunization programs is greatly aided by frontline healthcare personnel.
- The main reasons for vaccine hesitancy are misinformation and fear of side effects.
- Transportation and healthcare infrastructure accessibility concerns have an impact on vaccination rates.

Research Gap

The majority of research focuses on general vaccination behavior or specific diseases like COVID-19, despite the fact that many studies have looked at vaccine acceptance and hesitancy in various regions. There aren't many studies that specifically examine how rural populations feel about district-level vaccination campaigns, especially in places like Gujarat's Vadodara. Furthermore, a lot of research concentrates on awareness and reluctance rather than examining the combined effects of sociodemographic variables like awareness, income, age group, and education level on vaccination perception.

Localized research is therefore required to examine how these factors affect vaccination attitudes and participation in rural communities. By analyzing rural residents' perceptions of vaccination drives in Vadodara and identifying the major sociodemographic factors influencing vaccine acceptance, the current study seeks to close this gap.

III. PROBLEM STATEMENT

Vaccination programs play a crucial role in preventing infectious diseases and improving community health. To raise vaccination rates in both urban and rural areas, the Indian government has launched a number of programs, including Mission Indradhanush and the Universal Immunization Program. In certain rural communities, vaccination rates are still uneven despite the availability of free vaccines and ongoing awareness campaigns.

Due to a lack of knowledge, fear of side effects, cultural beliefs, and false information, many rural residents continue to be hesitant or uncertain about vaccinations. Additionally, people's perceptions of vaccination programs may be influenced by socio demographic factors like age and education level. Vaccination decisions are still influenced by informational and trust-related issues, even though government initiatives have significantly decreased financial barriers.

As a result, it's critical to comprehend how rural populations view immunization campaigns and pinpoint the variables affecting vaccine acceptance. The purpose of this study is to investigate these attitudes among Vadodara district rural residents.

IV. OBJECTIVES OF THE STUDY

The main objective of this study is to understand the perception of rural populations toward vaccination drives in the Vadodara district. The study also aims to identify the socio-demographic factors that influence vaccination acceptance among rural residents.

The specific objectives of the study are as follows:

1. To examine the relationship between awareness of vaccination programs and perception toward vaccination drives among the rural population of Vadodara.
2. To analyze the influence of education level on vaccine acceptance among rural residents.
3. To study the association between age group and vaccine acceptance among the rural population.
4. To assess whether income level influences vaccine acceptance among rural residents.

V. HYPOTHESIS OF THE STUDY

Based on the objectives of the study, the following hypotheses have been formulated:

H₀₁: There is no significant relationship between awareness of vaccination programs and perception toward vaccination drives among the rural population of Vadodara.

H₁₁: There is a significant relationship between awareness of vaccination programs and perception toward vaccination drives among the rural population of Vadodara.

H₀₂: Education level does not significantly influence vaccine acceptance among the rural population of Vadodara.

H₁₂: Education level significantly influences vaccine acceptance among the rural population of Vadodara.

H₀₃: There is no significant association between age group and vaccine acceptance among the rural population of Vadodara.

H₁₃: There is a significant association between age group and vaccine acceptance among the rural population of Vadodara.

H₀₄: Income level does not significantly affect vaccine acceptance among the rural population of Vadodara.

H₁₄: Income level significantly affects vaccine acceptance among the rural population of Vadodara.

VI. RESEARCH METHODOLOGY

Research Design

In order to investigate how rural populations in the Vadodara district perceive vaccination drives, this study uses a quantitative and descriptive research design. Because the study's goal is to comprehend rural residents' awareness levels, attitudes, and behavioral patterns regarding vaccination programs, the descriptive approach is appropriate. The study also incorporates analytical components since it uses statistical testing to assess the connection between socio-demographic characteristics and vaccine acceptance.

A structured questionnaire was used to gather data from respondents at a single point in time as part of the study's cross-sectional design.

Data Sources

The study is based on both **primary and secondary data sources**.

a. Primary Data:

A structured questionnaire was used to directly gather primary data from rural residents. The survey asked about vaccination behavior, attitudes toward vaccines, awareness of vaccination programs, and demographics.

b. Secondary Data:

Secondary data were obtained from academic journals, government health reports, World Health Organization publications, and previous research studies related to vaccination awareness and rural healthcare.

Target Population

The study's target population comprises adult residents residing in the rural regions of Vadodara district. These respondents are from different age groups, levels of education, jobs, and income brackets. The chosen population illustrates the socio-economic diversity of rural communities and offers insights into their attitudes towards vaccination initiatives.

Sampling Method

The study employs a random sampling technique to choose respondents from rural villages in the Vadodara district. This method helps lessen sampling bias and gives people from different backgrounds a fair chance to take part in the study.

Sample Size

The study included 200 people who answered questions. The sample size was deemed sufficient to examine the patterns of awareness, perception, and vaccination behavior among rural residents given the available time and resources.

Research Instrument

This study primarily employs a structured questionnaire as its research instrument. The questionnaire was created to gather demographic data as well as answers about knowledge and attitudes toward vaccines. There were four main parts to the questionnaire:

1. Demographic data: age, sex, level of education, job, and income.
2. Awareness section: what you know about vaccination programs and where to find information about them.
3. Attitude section: thoughts on the safety and benefits of vaccines, as well as trust in vaccination programs.
4. Behavioral section: getting vaccinated, waiting, and telling others to get vaccinated.

A five-point Likert scale, with Strongly Disagree (1) to Strongly Agree (5), was used to measure most opinion-based questions.

Data Analysis Techniques

Statistical methods were used to look for patterns and relationships between variables in the data that had been collected. The following techniques were employed for data analysis:

- Analyzing the percentage and frequency distribution
- Charts and tables that show data in a visual way
- Cross-tabulating demographic variables
- A Chi-Square Test of Independence to see if there is a link between socio-demographic factors and vaccine acceptance.

These analytical methods helped figure out if awareness, education level, age group, and income level have a big effect on how people in rural areas think about getting vaccinated.

II. DATA ANALYSIS AND INTERPRETATION

This chapter provides an analysis and interpretation of the data gathered from rural respondents in the Vadodara district. This analysis aims to comprehend the perceptions of rural populations regarding vaccination initiatives and to investigate the impact of socio-demographic factors on vaccine acceptance.

A structured questionnaire was used to gather data from 200 people. The answers were looked at using statistical methods like frequency distribution, percentage analysis, and the Chi-Square test. The data has been shown in a clear and easy-to-understand way using tables and charts.

Demographic Profile of Respondents

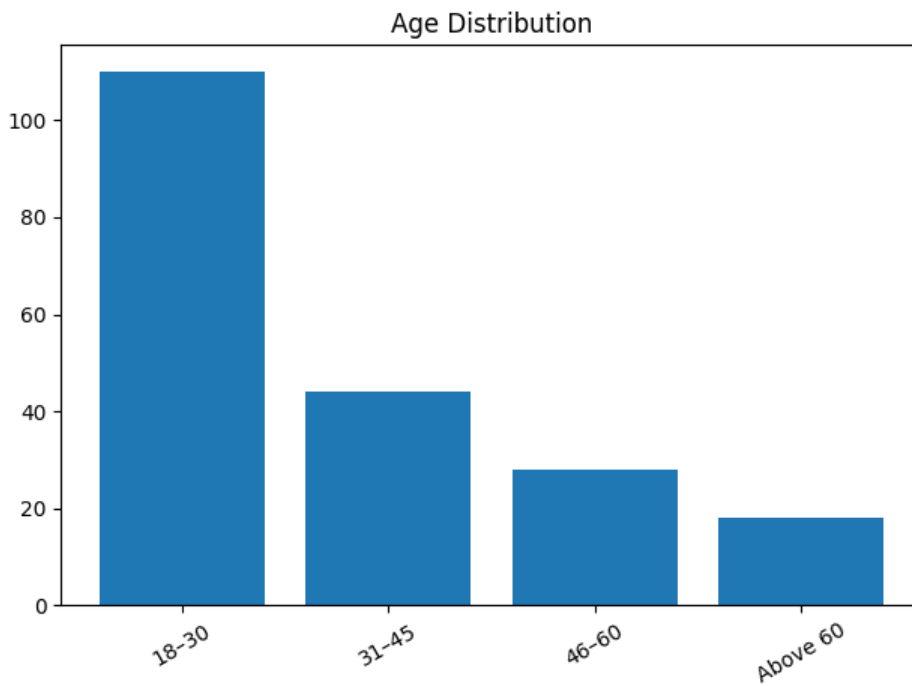
Understanding the demographic characteristics of respondents helps in interpreting their attitudes and behaviors toward vaccination programs.

Table1: Age Distribution of Respondents

Age Group	Frequency	Percentage
18–30	110	55%
31–45	44	22%
46–60	28	14%
Above 60	18	9%
Total	200	100%

Table 1 shows that the majority of respondents (55%) belong to the **18–30 age group**, followed by the **31–45 age group (22%)**. A smaller proportion of respondents fall in the older age categories. This indicates that younger individuals constitute a significant portion of the rural population participating in the survey.

Fig. 1: Age Distribution



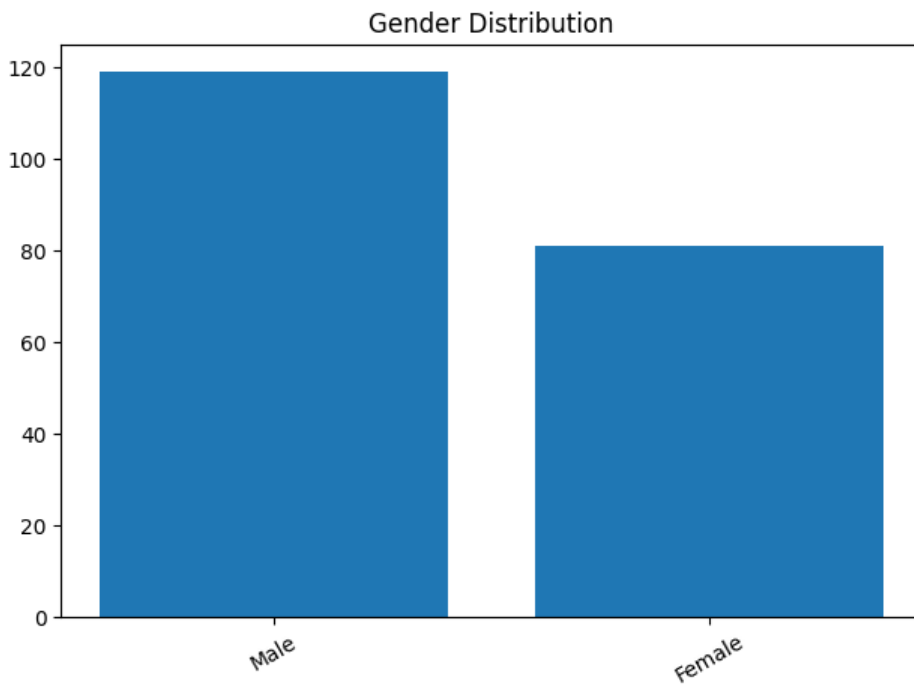
Gender Distribution

Table2: Gender of Respondents

Gender	Frequency	Percentage
Male	119	59%
Female	81	41%
Total	200	100%

Table 2 indicates that **59% of respondents are male** while **41% are female**. Although male participation is slightly higher, the representation of female respondents is also considerable, allowing meaningful insights into vaccination perception among both groups.

Fig. 2: Gender Distribution



Educational Qualification of Respondents

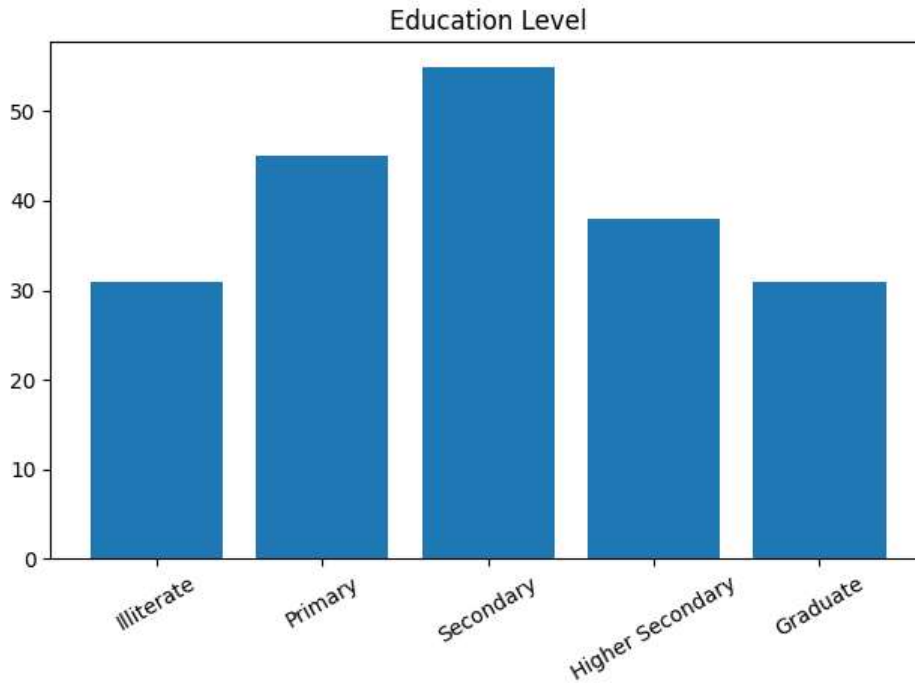
Education often plays an important role in shaping health awareness and vaccination attitudes.

Table3: Education Level

Education Level	Frequency	Percentage
Illiterate	31	15.5%
Primary	45	22.5%
Secondary	55	27.5%
Higher Secondary	38	19%
Graduate	31	15.5%
Total	200	100%

Table 3 shows that the largest group of respondents (27.5%) have secondary education, while a smaller portion of respondents are graduates. Approximately 15.5% of respondents are illiterate, indicating that education levels vary significantly within the rural population. This variation may influence awareness and understanding of vaccination programs.

Fig.3: Education Level



Vaccination Status of Respondents

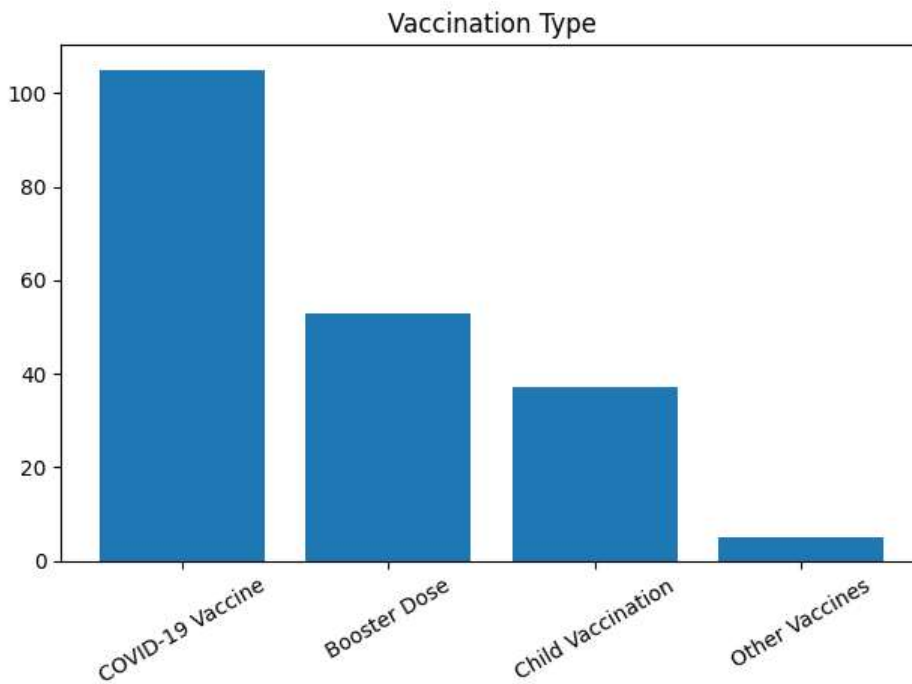
Respondents were asked about the type of vaccination they had received recently.

Table4: Vaccination Received

Vaccine Type	Frequency	Percentage
COVID-19 Vaccine	105	52.5%
Booster Dose	53	26.5%
Child Vaccination	37	18.5%
Other Vaccines	5	2.5%
Total	200	100%

The results of Table 4 shows that COVID-19 vaccination has the highest participation rate (52.5%), reflecting the widespread vaccination campaign conducted during the pandemic. Child vaccination programs also show considerable participation, indicating awareness among parents regarding the importance of immunization.

Fig. 4: Vaccination Type



Delay in Vaccination

Respondents were asked whether they had ever delayed vaccination.

Table5: Delay in Vaccination

Response	Frequency	Percentage
Yes	100	50%
No	100	50%
Total	200	100%

The results of Table 5 reveals that **50% of respondents reported delaying vaccination at some point**, suggesting that vaccine hesitancy or logistical barriers still exist in rural areas. Understanding the reasons behind these delays is essential for improving vaccination participation.

Reasons for Delaying Vaccination

Table 6: Reasons for Delay

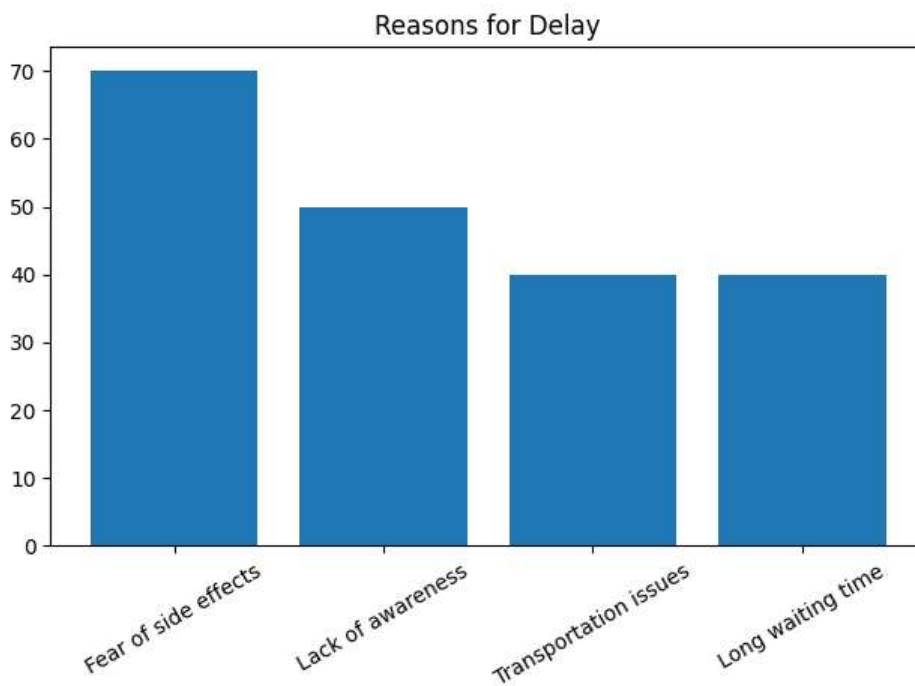
Reason	Frequency	Percentage
Fear of side effects	70	35%
Lack of awareness	50	25%
Transportation issues	40	20%

Reason	Frequency	Percentage
Long waiting time	40	20%
Total	200	100%

Table 6 shows most common reason for delaying vaccination is **fear of side effects (35%)**. Limited awareness and logistical challenges such as transportation difficulties and waiting time also contribute to vaccine hesitancy.

These findings highlight the need for improved communication and better healthcare accessibility in rural areas.

Fig. 5: Reasons for Delay



Hypothesis Testing

To examine the relationship between socio-demographic factors and vaccine acceptance, the **Chi-Square test of independence** was applied.

Table 7: Hypothesis Testing Summary

Hypothesis	Test Used	Result	Decision
Awareness vs Perception	Chi-Square	$p < 0.05$	Reject H_0
Education vs Acceptance	Chi-Square	$p < 0.05$	Reject H_0
Age vs Acceptance	Chi-Square	$p < 0.05$	Reject H_0
Income vs Acceptance	Chi-Square	$p > 0.05$	Accept H_0

The results of Table 7 indicates that **awareness, education level, and age have a significant relationship with vaccine acceptance** among rural residents. However, **income level does not show a significant relationship**, which may be due to the availability of free vaccination services through government programs.

Summary of Data Analysis

The analysis shows that vaccination awareness is relatively high among rural residents of Vadodara. However, psychological concerns such as fear of side effects and limited health literacy continue to influence vaccination decisions.

Education and age appear to play important roles in shaping vaccination perception, while income level does not significantly affect participation. These findings suggest that improving awareness programs and strengthening community engagement can further enhance vaccination acceptance in rural communities.

VIII. FINDINGS, IMPLICATIONS AND SUGGESTIONS

Key Findings

The data analysis revealed a number of significant conclusions about how rural populations in the Vadodara district view immunisation campaigns.

First, people's perceptions and involvement in vaccination drives are greatly influenced by their knowledge of vaccination programs. Immunisation was viewed more favourably by respondents who were more knowledgeable about government programs and vaccines.

Second, vaccine acceptance is significantly influenced by educational attainment. Higher educated people were more likely to be aware of the advantages of vaccinations, and as a result, they were more inclined to get them.

Third, vaccination participation is also influenced by age group. Due to their perception of a higher risk of health issues, older respondents generally showed greater acceptance of vaccination than younger ones.

Lastly, the study discovered that vaccine acceptance is not substantially impacted by income level. This could be as a result of government-funded immunisation programs being available to all segments of society at no cost.

Implications

The results emphasise how critical it is to raise awareness and provide health education in rural areas. Reducing misconceptions and promoting increased vaccination program participation are two benefits of improving health literacy. In rural areas, community health workers can be vital in disseminating correct information and fostering trust.

Suggestions

Reliable information about vaccine safety should be made available, and awareness campaigns should be reinforced in order to increase vaccination rates in rural areas. In order to increase accessibility, healthcare authorities should also keep assisting community health workers and setting up immunisation camps in rural areas.

In conclusion, awareness, education, and age are the main factors influencing vaccination acceptance among rural populations in Vadodara. Despite the widespread availability of vaccines, improving communication between rural communities and healthcare providers is crucial to boosting vaccination rates and improving public health outcomes.

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