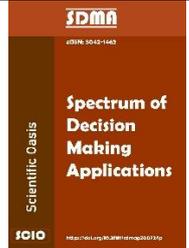




SCIENTIFIC OASIS

Spectrum of Decision Making and Applications

Journal homepage: www.dmap-journal.org
ISSN: 3042-1462



Vaccine Behaviour and the Perception of Vaccine Among Marginalised Population in India: An Exploratory Study

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ARTICLE INFO

Article history:

Received 28 January 2025

Received in revised form 7 April 2025

Accepted 23 May 2025

Available online 7 June 2025

Keywords:

Vaccine behaviour; Perception; Marginalised population; Misconceptions; Exploratory study.

ABSTRACT

The COVID-19 vaccine helped arrest the rapid spread of the virus and saved millions of lives across the world. India was one of the countries worst hit by the pandemic. Vaccination was the only way to curb the virulence of the virus. The broad objective of the study was to understand vaccine behavior and perceptions regarding vaccines among marginalized populations. The study employed mixed-method research using a specially developed semi-structured questionnaire by the investigators, which included both open-ended and closed-ended questions. The findings revealed that 94.6% of the study subjects had taken the vaccine. Among them, 10.8% had taken only the first dose, 78.4% had taken the second dose, and 10.8% had received the booster dose. The thematic analysis helped the researchers identify factors that facilitated vaccine uptake, including the subjects' positive perceptions of vaccine effectiveness. An overwhelming majority (87.3%) believed that vaccination helped their community stay safe and enabled them to return to everyday work life. A small percentage of individuals did not get vaccinated due to fear of side effects, disbelief in COVID-19, lack of awareness, displacement, and limited accessibility. The non-availability of booster doses, lack of understanding about their availability, waiting for the due date, conformity behavior, and concerns about side effects were predominant factors for the low intake of booster doses among study subjects. Informal discussions revealed some myths related to vaccines, including beliefs in the non-existence of COVID-19, lack of faith in vaccines, and fears that vaccines could negatively impact reproductive capacity. Based on these findings, the researchers suggested several key measures to address similar situations in the future.

1. Introduction

Mass vaccination campaigns aimed at curbing the COVID-19 pandemic received significant global attention. Due to vaccination, we are now in a new era with significantly lower rates of acute critical

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<https://doi.org/10.31181/sdmap31202638>

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illness and mortality. However, SARS-CoV-2 infection still affects millions weekly and continues to emerge in waves with new variants [1]. Although the spread of the SARS-CoV-2 virus has been contained through social distancing, the success of any prevention or intervention program—such as a vaccination drive—depends on various factors, including the cooperation and compliance of the target population [2]. While vaccinations offer protection against COVID-19 infection, refusal or delay in vaccination negatively affects both individuals and the broader community. To develop effective interventions, it is essential to understand the behavioral aspects of vaccine hesitancy or refusal.

Several factors often act as barriers to the success of government-led vaccination campaigns. These include a lack of community sensitization about the benefits and availability of vaccines, educational background, social networks, access to information, myths and misconceptions, accessibility, cost, and the influential role of service providers. To understand vaccine behavior, we must assess capacity, motivation, and opportunity [3].

India has vaccinated over 220 crore people with COVID-19 vaccines (e.g., Covishield [ChAdOx1 nCoV-19 developed by AstraZeneca], Covaxin, Sputnik V), with 74% receiving at least one dose and 68% fully vaccinated. Social distancing, mitigation, and vaccination measures were implemented to control the spread of the virus. In Tamil Nadu, 80% of the population received the first dose and 73% received the second dose [4]. According to an article published in *The Lancet*, COVID-19 vaccination in India prevented an additional 4.2 million deaths annually [4,5].

Unquestionably, vaccination is one of the greatest medical innovations ever made, saving millions of lives each year. However, certain individuals and demographic groups remain unvaccinated. Individual determinants of vaccine hesitancy include perceived constraints, distrust, and risk perceptions, which can be better understood through psychological insights. Contextual determinants include social norms, socioeconomic status, education level, health system structure and funding, and conspiracy theories circulated through social media [6].

Conversely, recent evidence concerning vaccination acceptability indicates moderate to high acceptance rates among adolescents and adults [7,8]. Perceived benefits and efficacy of the COVID-19 vaccine are strong predictors of vaccine acceptance [9-11]. Willingness to vaccinate is also influenced by perceived pandemic severity, vaccine safety, minimal financial concerns, low levels of stigmatization, a pro-social mindset, and trust in health authorities [12]. In an online cross-sectional study conducted in Upper Egypt, Hamza *et al.*, [13] found that participants demonstrated good knowledge and a positive attitude toward vaccines, with social media playing an important role. Predictors of good knowledge included medical proficiency and higher educational attainment.

Stigma associated with COVID-19 led to misunderstandings among patients, their families, recovered individuals, nomadic pastoralist communities, other “outsiders,” and even medical professionals. Stigma affected health education, testing, contact tracing, and treatment. Individuals who recovered and returned home often faced social boycotts and were not allowed to return to work [14]. COVID-19 patients were also reported to experience social rejection, diminished respect, and marginalization. Several studies have found that education and rural background are significantly associated with social stigma related to the COVID-19 vaccine [8]. For example, a study conducted in Bangladesh by Abedin *et al.*, [15] reported a significant refusal rate among older adults, those with low education levels, and those living in rural and semi-urban areas, including slum dwellers, farmers, day laborers, homemakers, and individuals with low trust in the national healthcare system. The authors emphasized the critical role of media in informing the public about the benefits of vaccination.

Vaccine hesitancy is particularly high among individuals with mental health challenges. One study revealed that COVID-19 vaccine hesitancy was significantly higher among community-dwelling patients than hospitalized ones. Further data analysis indicated that unemployed individuals,

community-dwelling patients, and those with high perceived stigma were more likely to exhibit vaccine hesitancy [16]. Chen *et al.*, [17] reported depression among COVID-19 patients in China, with feelings of entrapment and decay fully mediating the relationship between social stigma and depression. The authors concluded that COVID-19 has caused mental health challenges for many and that the problem is growing. They recommended that policymakers address this issue to prevent rising rates of depression. Ekstrand *et al.*, [18] found that over one-third of participants met the criteria for being “vaccine hesitant,” reporting either unwillingness or a desire to delay vaccination. This hesitancy was linked to concerns about vaccine safety, side effects, efficacy, and distrust in commonly used sources of vaccine information. Lazarus *et al.*, [19] noted that vaccine acceptance is higher among highly educated individuals in Ecuador, France, Germany, India, and the U.S., whereas in countries like Canada, Spain, and the U.K., higher education was negatively associated with vaccine acceptance.

India, the second-most populous nation with high population density, necessitates a study of vaccination behavior grounded in empirical research. An Indian study also emphasized the need for mental health support facilities for the population during pandemics [20]. However, few studies have examined vaccine hesitancy or acceptance in India, leading to a lack of empirical evidence—particularly regarding how marginalized populations perceive and respond to vaccinations. This gap underscores the need for the current study.

Objectives:

- i. To study the background of the study subjects.
- ii. To study the vaccine behaviour of the study subjects.
- iii. To study the perception of the study subjects about the COVID-19 vaccine.
- iv. To find the gender differences in the vaccine behaviour and perception of the COVID-19 vaccine.

Hypothesis:

- i. There is no significant association between gender and vaccine behaviour among marginalized populations in India.
- ii. There is no significant association between gender and perception of COVID-19 vaccine among marginalized populations in India.

2. Methods

2.1 Design

This exploratory study employed a mixed-method design encompassing qualitative and quantitative data collection methods.

2.2 Sample

Marginalized individuals working as casual laborers and aged between 16 and 60 years included primarily sales boys and girls, boys working in small hotels, lorry and auto drivers, helpers, daily wage laborers, contractual workers in the organized sector, security personnel, gardeners, cooks, petty shop owners, street vendors, and so on.

In the current study, marginalization was conceptualized in terms of economic status and the nature of work performed in society. The final sample consisted of 204 participants from socio-economically marginalized backgrounds. A convenience sampling technique was employed to recruit the participants.

2.3 Study Tool

A specially designed semi-structured questionnaire developed by the investigators was used to collect data from the study subjects. It included both open-ended and closed-ended questions related to vaccination behaviour, perceptions, and quantitative data. The questionnaire consisted of three sections:

Section I: Background Information

This section includes ten questions related to gender, age, education, occupation, marital status, income, family size, native place, and mother tongue.

Section II: Vaccine Behaviour

This section comprises 12 questions designed to explore the vaccine behaviour of the participants. For example: (i) Did you take a vaccine? (ii) If not, why? Most questions in Section II use a dichotomous response format, i.e., 'Yes' or 'No'. Some questions offer options such as 'Yes', 'No', and 'Do not know'.

Section III: Perception of COVID-19 Vaccine

This section consists of 14 questions aimed at understanding participants' perceptions of the vaccine. For example: (i) How do you perceive vaccines? (ii) Do you think the COVID-19 vaccine is effective? (iii) If not, why? Most questions in Section III use options such as 'Yes', 'No', and 'Unable to comment', followed by space for open-ended responses.

The face validity of the semi-structured questionnaire was assessed by four experts. Based on their inputs, necessary modifications were made to the tool. Not all questions were mandatory due to the inclusion of conditional questions. For example: "Do you think the COVID-19 vaccine is effective?" "If not, why?"

2.4 Data Collection

Data was collected through face-to-face interviews. A group of 208 participants from socio-economically marginalized communities voluntarily participated in the study. A pilot study was conducted with a small sample of 10 individuals to assess the suitability of the study tool. Minor changes were made based on the feedback from the pilot study. Among these participants, four belonged to the third-gender community and were excluded from the final sample for the convenience of data analysis. Two of the four authors were involved in the data collection process. Care was taken to ensure that respondents' daily earnings were not affected by their participation in the study. The survey was conducted in person at their workplaces and leisure areas. The aim of the study was explained to the participants before the survey. The investigators recorded the responses due to the participants' lack of proficiency in English. The responses were then coded and subjected to further analysis.

3. Analysis

Statistical analysis was carried out using SPSS version 20. In addition to calculating frequencies and percentages, a chi-square test for independence and thematic analysis were conducted to identify the facilitating and inhibiting factors for vaccine behaviour and participants' perception of its effectiveness.

3.1 Ethical Consideration:

The researchers obtained clearance from the Institutional Ethics Committee to conduct the study (Ref. No. IEC/2023/01). In addition, all ethical considerations were addressed during data collection, including obtaining informed consent from all participants after explaining the objective of the study, ensuring data confidentiality, conducting interviews at the convenience of the participants, and

allowing them to withdraw from the study at any time without consequences if they felt uncomfortable answering any questions or due to their work schedule.

4. Results

Data provided in Table 1 highlight the background of the marginalized individuals who voluntarily participated in the study. As far as age is concerned, about two-fifths (40.2%) belonged to the 19–30 age group. The remaining participants were distributed as follows: 32.8% were above 41 years, 25.0% were in the 31–40 age group, and 2.0% were below 18 years. More than three-fifths were women (63.2%), while 36.8% were men.

Regarding education, 32.4% had studied up to the primary level, while 29.4% had studied beyond that. The illiteracy rate among the marginalized participants was 17.2%. The study subjects were primarily casual workers in contractual jobs and security staff.

About 68% of them were married, and half had two children. The family size of more than two-fifths (42.6%) of the subjects was four members. The monthly income of the same percentage of participants (42.6%) was above Rs. 20,000. The monthly income of the remaining participants was as follows: 8.3% earned below Rs. 10,000, 23.5% earned between Rs. 10,001 and 15,000, and 25.5% earned between Rs. 15,001 and 20,000. Most participants were from Tamil Nadu, while 27.5% were from other Indian states.

Table 1
 Socio-demographic and background of the participants (n=204)

Variable	N (%)	Variable	N (%)
Age		No. of children (<i>n</i> =138)	
<18 years	4 (2.0)	1	35 (25.4)
19-30	82 (40.2)	2	70 (50.7)
31-40	51 (25.0)	3	19 (13.8)
>41	67 (32.8)	More than 3	2 (1.4)
		No children	12 (8.7)
Gender		Family size	
Male	129 (63.2)	2	17 (8.3)
Female	75 (36.8)	3	49 (24.0)
		4	87 (42.6)
		More than 4	51 (25)
Education		Family income per month in Rs.	
Illiterate	35 (17.2)	<10000	
Up to primary	66 (32.4)	10001-15000	17 (8.4)
Up to secondary	43 (21.1)	15001-20000	48 (23.5)
Above secondary	60 (29.6)	>20000	52 (25.5)
			87 (42.6)
Occupation		Native place	
Unemployed	5 (2.5)	Tamil Nadu	148 (72.5)
Casual worker	9 (4.4)	Others	56 (27.5)
Contractual worker	39 (19.1)		
Security	12 (5.9)		
Others	139 (68.1)		
Marital status		Mother tongue	
Married	138 (68)	Tamil	148 (72.5)
Unmarried	66 (32)	Hindi	17 (8.3)
		Bengali	7 (3.4)
		Others	32 (15.7)

Table 2 highlights COVID-19 vaccine behaviour among the marginalized population. It was observed that 94.6% were vaccinated, with a higher rate among women. More than three-fifths

(61.3%) reported being informed about the side effects of vaccines at the time of vaccination. Female subjects were more likely to be informed than their male counterparts. About 67.6% were given paracetamol if they experienced a high fever; in this case, more women (80.5%) received better attention than men (66.1%).

About four-fifths (78.4%) of the subjects had received a second dose of the vaccine, while only 10.8% had received a booster dose. An overwhelming majority (97.9%) received the vaccine free of cost, while only 2.1% paid for it, having taken it at a private medical centre. Although most subjects (77.7%) did not experience any health problems after taking the vaccine, about 22.3% reported issues such as pain, swelling, and skin rashes. More than 90% of the participants reported that their family members were also vaccinated.

Table 2
 COVID 19 vaccine behaviour among marginalized population (n=204)

Question	Male		Female		Total		χ^2
	N	%	N	%	N	%	
Vaccination status							
Taken	121	93.8	72	96.0	193	94.6	
Not taken	8	6.2	3	4.0	11	5.4	
Information about the side effects at the time of vaccination							
Informed	63	52.1	56	77.8	119	61.3	11.8*
Not informed	58	47.9	17	22.2	75	38.6	
Were you given Paracetamol with instructions?							
Yes	80	66.1	58	80.5	138	67.6	
No	39	32.2	14	19.4	53	26.0	
Unable to recall	10	1.7	1	0.1	13	6.4	
No of doses of vaccine taken							
One	13	10.7	8	11.1	21	10.8	0.2
Two	94	77.7	58	80.5	152	78.4	
Booster	14	11.6	7	8.4	20	10.8	
Payment status for taking vaccine							
Paid	2	1.6	2	2.8	4	2.1	
Free	119	98.4	71	97.2	189	97.9	
Health problems after taking vaccine							
Present	18	14.9	25	34.7	43	22.3	10.2
Absent	106	85.1	47	65.3	150	77.7	
Did all your family members take vaccines?							
Yes	120	93.0	65	86.7	185	91.1	2.9
No	9	7.0	10	13.3	19	8.9	

*Significant at $p < 0.05$ df=2

The study also attempted to understand the perception of the study subjects regarding vaccines. More than three-fourths (77.0%) perceived the vaccine as safe, while 3.4% stated that it was not good for health. About 19.6% had no idea about the vaccine. Interestingly, more than half of the subjects (56.9%) perceived vaccines as effective. About one-third reported that they had no idea about its effectiveness.

Before administering the vaccine, a doctor or nurse should examine a person's medical condition, such as blood pressure, any signs of chronic disease, height, and weight. Upon inquiry, it was found that medical examinations before vaccination were performed on only 40.2% of the subjects.

An overwhelming number of subjects (87.3%) remarked that vaccination helped the community remain safe. Likewise, 77.0% believed that vaccination helped marginalized people work for survival and return to everyday life. Vaccination and social distancing also helped family members feel mentally comfortable and secure after receiving the vaccine, as reported by 81.4% of the participants. However, only about 59.8% felt that people in the community followed social distancing. Not many gender differences were observed in the perception of vaccines. No significant associations were found between gender and various factors related to vaccine behaviour, except for receiving information about the immediate side effects of the vaccine at the time of vaccination ($\chi^2(2) = 11.8$; $p < 0.05$), Table 3.

Table 3
 Perception about Covid-19 vaccine among the marginalized population (n=204)

Question	Male		Female		Total		χ^2
	N	%	N	%	N	%	
Perception about vaccine							
Safe	99	76.7	58	77.3	157	77.0	
Not good for health	3	2.3	4	5.3	7	3.4	
No idea	27	21	13	17.4	38	19.6	
Perception about the effectiveness of vaccine							
Effective	76	58.9	40	53.3	116	56.9	0.9
Not effective	8	6.2	7	9.3	15	7.4	
Unable to comment	45	34.9	28	37.4	73	35.8	
Medical examination before vaccination							
Followed	52	40.3	30	40.0	82	40.2	5.9
Not followed	46	35.6	36	48.0	82	40.2	
Unable to comment	28	24.1	9	12.0	40	19.6	
Do you think vaccination helped the community to remain safe?							
Yes	111	86.0	67	89.3	178	87.3	0.4
No	2	1.5	1	1.3	3	1.5	
Unable to comment	16	12.5	7	9.4	23	11.3	
Do you think vaccination helped marginalized people to work for survival and return to normal life?							
Yes	99	76.7	58	77.3	157	77.0	3.4
No	5	3.9	7	9.3	12	5.9	
Unable to comment	25	19.4	10	13.4	35	17.2	
Do you think your family members felt mentally comfortable and secure after taking the vaccine?							
Yes	107	82.9	59	78.7	166	81.4	
No	6	4.6	3	4.0	9	4.4	
Unable to comment	16	12.5	13	17.3	29	14.2	
Perception about social distancing helped in minimizing infection.							
Yes	109	84.5	57	76.0	166	81.4	2.3
No	6	4.6	6	8.0	12	5.9	
Unable to comment	14	10.9	12	16.0	26	12.7	
Perception about people following social distancing							
Properly followed	75	58.1	47	62.7	122	59.8	2.3
Not followed	24	18.6	8	10.7	32	15.7	
Unable to comment	30	23.3	20	26.6	50	24.5	

Thematic analysis of responses concerning vaccine behaviour addressed three issues: (i) reasons for taking vaccines, (ii) reasons for not taking vaccines, and (iii) behaviour regarding booster dose vaccination, revealing interesting findings. For example, responses related to reasons for taking vaccines were grouped into three broad categories: perception of safety, conformity behaviour, and obedience. Regarding the second issue, reasons for not taking vaccines were categorized into seven broad groups: fear, disbelief in the spread of COVID-19, lack of availability, lack of awareness, negligence, displacement, and accessibility.

Concerning behaviour related to the booster dose, responses were grouped into seven categories. Among these, three categories overlapped with those from the first issue, while the remaining four were different: conformity behaviour, health issues after vaccination, waiting for the due date, and lack of interest. Some verbatim responses for each category are provided in Table 4 to offer a better understanding of the study subjects' behaviour.

No significant associations were found between gender and various perception factors about COVID-19 vaccines ($p < 0.05$).

Table 4

Thematic analysis of responses given by participants on COVID-19 vaccine behaviour (n=204)

Domain	Responses	Interpretation	Sample verbatim response
Reasons for taking vaccines	Perception about safety	The idea that vaccine is for safety	"Vaccine is for safety only; I have seen on TV"
	Conformity	The idea that many people are taking vaccine for their community	"Everyone is taking vaccine so I also took"
	Obedience	Obedience to authority acts as a reason for taking vaccines.	"My supervisor told if I am not taking vaccine my job will go" "It was compulsory in my company to take vaccine"
Reasons for not taking vaccines	Fear	Includes fear of death, health getting harmed	"Because of fear I didn't take vaccine". "Many people died due to vaccination"
	Not believing in COVID-19	The idea that COVID-19 is a hoax	"COVID-19 is not there, then why to take vaccine?"
	Lack of availability	Vaccines were not available in the nearby health centres	"When I went to take vaccine it was not available"
	Lack of awareness	Lack of awareness about where to take and when to take vaccine	"I don't know where to take vaccine" "I took one injection six months ago, I don't know when I have to take the next one"
	Negligence	Lack of understanding about the need, family ignorance (especially towards women)	"My husband and son took the vaccine; they are saying that I stay inside, so vaccine is not needed"
	Displacement	Participants have come from different places so they have no idea where to take the vaccine (especially for second dose)	"When I took first dose I was in my hometown, now I am here, so where will I take, I don't know" "I will take when I will go home again"
	Accessibility issues	Health centre is far away, no camps were conducted	"There are no camps happening near to our place" "Health centre is far away from my home"

Table 4

Continued

Domain	Responses	Interpretation	Sample verbatim response
Behaviour on booster dose vaccination	Lack of availability	Booster doses were not available or out of stock	"When I went to health centre, they told vaccine didn't come"
	COVID-19 is no longer existing	Vaccination is no longer needed in the absence of COVID-19	"COVID-19 has ended, I think there is no need of taking vaccine"
	Conformity	The idea that people are taking vaccines because many people in their community are taking.	"People are not taking vaccine nowadays, so I am also not taking"
	Health issues after vaccination	After taking vaccination many people developed health issues	"I am feeling very tired, my hands are paining, before vaccination these were not present"
	Waiting for due date	People are waiting for their due date to take vaccine	"My due date didn't come to get the vaccine".
	Lack of interest	The idea that due to lack of interest in vaccination, it is not taken.	"I have taken earlier doses, but now I am not interested in taking vaccines".
	Lack of awareness	Lack of awareness about where to take and when to take vaccine	"Booster exists?"

Thematic analysis of the responses concerning perception about vaccines relating to four issues: (i) Perception about individual safety, (ii) Perceptions about the safety of the community, (iii) Perceptions about social distancing, and (iv) Myths about vaccination, have been provided in Table 5. Regarding the first issue, i.e., individual safety, mixed responses were found and grouped into four categories, as mentioned in Table 5. However, regarding community safety, a vast majority perceived it as a safeguard against infection, despite their opinion about individual safety. i.e., vaccines helped the community to remain safe and to return to everyday working life. Likewise, social distancing helped in minimizing the spread of COVID-19 further. Interestingly, the study disclosed some vaccine myths mentioned in the following table. Verbatim responses clearly illustrate the perception of the study subjects about vaccines.

Table 5

Thematic analysis of responses given by participants on perception about COVID-19 vaccine (n=204)

Domain	Responses	Interpretation	Sample verbatim response
Perception about individual safety	Vaccine is ineffective	The idea that vaccine is inefficient in curbing infections and deaths	"People are dying out of COVID-19 even after taking vaccine"
	Vaccine is harmful to health	The idea that vaccine creates some sort of health issues	"After vaccination I feel tired, headache and frequent chills" "After vaccination I am unable to work like before. I am getting tired easily"
	Vaccine provides safety	The idea that vaccination provides safety to the individual	"Vaccine means safety only" "Because of vaccination only death rates decreased"
	Psychological comfort	The idea that the anxiety and fear about getting infected by COVID-19 reduced after vaccination.	"I was fearful about taking vaccine earlier, now I feel better" "After vaccination only I feel confident to come out"

Table 5
 Continued

Domain	Responses	Interpretation	Sample verbatim response
Perceptions about the safety of community	Vaccine helps the community remain safe	The idea that vaccines help the community to remain safe.	“Everybody reacts to vaccine differently, but generally it provides safety” “I am having some issues after vaccination, but the death rate decreased drastically”
	Vaccine helped in returning to normalcy	The perception about how vaccination helped or not helped to return to normalcy.	“Still we didn’t return to normalcy, I still have huge financial burden” “Business is dull even now, but things getting better after people took vaccine”
Perceptions about social distancing	Helped in curbing the spread of COVID-19	The idea that social distancing helped the curbing of the infections	“Social distancing is better than vaccination”
	Not helped in curbing the spread of COVID-19	The idea that social distancing didn’t help the spread of COVID-19	“People were very casual about social distancing” “If you are outdoor, social distancing is not needed, so I didn’t follow”
Myths about vaccination	COVID is no longer existing	The idea that the spread of COVID-19 has stopped	“COVID-19 is created by doctors to kill people and get money”
	Not believing in vaccine	The idea that vaccine is a hoax	“COVID-19 came from soil like a cyclone, what will you do with the vaccine?”
	Vaccine influence on reproduction	The idea that vaccination negatively influences the reproductive system	“I have taken the first two doses, but I heard that it is difficult to conceive”
	Health conditions	The idea that vaccination is not safe for people with certain health conditions	“I have given blood recently, so I didn’t take the booster” “My son is having heart problem, so except him, we all took vaccine”

4. Discussion

The perception of the COVID-19 vaccine among marginalized populations is mainly positive; that is, it is considered safe and effective. Many were vaccinated, with women being more likely to be vaccinated. The vaccination rate (94.6%) is higher than the national average as well as the average for Tamil Nadu (94.6% vs. 74.0% national average and 80% Tamil Nadu average) [21]. The majority took the first dose, indicating high awareness and concern about vaccination among marginalized populations. This finding contradicts a UK study that found lower vaccine uptake among lower socio-economic strata [22]. The percentage of vaccine hesitancy is similar to international research in Japan, where misconceptions and myths are associated with this behaviour [23-25].

Regarding gender, some findings support the evidence from the current study. Females are more likely to contract SARS-CoV-2 infection, especially without a cohabitant [26].

Nevertheless, booster dose uptake was much lower among the study population than national figures. This was primarily due to lack of availability, lack of awareness about the booster dose after its introduction [27], long waits for the due date of the booster dose, conformity behaviour, and concerns about negative health impacts [23,27]. Although lack of availability was reported, ironically, 25 crore vaccine doses were disposed of due to expiration [28].

Human behaviour is peculiar. People tend not to take the vaccine when it is available but show more interest during a crisis. One study observed a similar trend, i.e., decreased intention to get a COVID-19 vaccine once it becomes available [29]. Furthermore, that study reported that those with less favourable attitudes toward COVID-19 vaccination also perceived the virus as less threatening. Similarly, a section of people always harbour negative notions toward vaccination [30,31], despite positive reports about vaccine benefits [32,33].

The study analyzed perceptions of vaccines among subjects. Over 70% perceived the vaccine as safe, while 19.6% were unaware of its effectiveness. A total of 56.9% believed the vaccine was effective. Only 40.2% of subjects had medical examinations before vaccination. Vaccination helped communities remain safe, especially marginalized individuals. Vaccination and social distancing also helped family members feel secure. No significant gender differences were found in vaccine perception, except for information about immediate side effects. From healthcare workers' perspective, physicians, younger healthcare workers, those who believe more strongly in the benefit of a second booster dose, and people willing to receive a second booster were more likely to advise their patients to get one [34].

The study found that 38.6% of respondents reported not being informed about the vaccine's side effects, highlighting the need for increased medical ethics awareness among healthcare providers. Many patients experienced health issues after vaccination, prompting the provision of paracetamol tablets. Almost 98% of marginalized people received vaccines free of cost, with 22.3% experiencing health issues, particularly among females. Despite this, many marginalized family members have been vaccinated [35,36].

Most people took the vaccine because of their strong belief in its positive effects, followed by group behaviours such as conformity and obedience. Using thematic analysis, the study examined vaccine behaviour, focusing on reasons for taking vaccines, not taking vaccines, and booster dose vaccination. Reasons for taking vaccines were categorized into safety perception, conformity behaviour, and obedience. Reasons for not taking vaccines included fear, lack of availability, lack of awareness, negligence, displacement, and accessibility. Behaviour regarding booster doses was categorized into conformity behaviour, health issues after vaccination, waiting for the due date, and lack of interest. The present study's findings also align with previous research concerning situational and individual-level factors that influence vaccine attitudes and behaviour, including risk perceptions and demographic characteristics. People tend to opt for vaccines when risk perception is high [37,38].

Thematic analysis helped to understand the reasons behind not taking vaccines. However, the number of people who did not take the vaccine was small. For not taking the vaccine, fear was the predominant factor, followed by disbelief in the existence of COVID-19, lack of vaccine availability at local health centres, lack of awareness about availability, negligence, displacement due to the nature of occupation, and distance to the health centre.

The study analyzed responses related to vaccine perceptions about individual safety, community safety, social distancing, and myths. Mixed responses were found on personal safety, but most perceived vaccines as a safeguard against infection. Social distancing helped minimize COVID-19 spread. Some vaccine myths were revealed, highlighting participants' perceptions about vaccines. Perceptions varied among subjects. Most marginalized people perceived vaccines as safe, as they decreased mortality rates. Additionally, vaccination made marginalized people feel psychologically confident to resume their daily work. Marginalized people have little savings, so they must work regularly for survival. Research evidence shows that, compared to vaccine rejecters, vaccine hesitators are more likely to be motivated by perceptions of vaccine safety and efficacy, normative influences such as close friends or family who had been vaccinated, recommendations from providers, and if they themselves were immunized [39]. Resistance to receiving the COVID-19

immunization was linked to COVID-19-related attitudes and behaviours. Reluctance to get the influenza vaccine and worries about COVID-19 were connected to a decline in vaccine hesitancy [40].

5. Conclusion

The study found that the marginalized population in Kanchipuram District of Tamil Nadu is satisfied with vaccination, with 94.6% having taken the first dose and 10.8% having taken the booster dose. However, the percentage of booster dose uptake is low due to lack of knowledge, conformity behaviour, and negligence. Many were vaccinated at government health centres but were not informed about side effects or medical examinations. The study recommends that health policymakers engage more health workers in vaccination drives, adhere to medical ethics, and implement intensive awareness programs to inform marginalized populations about vaccine availability and the importance of vaccination.

There are a few limitations to the study. First, data collected from the study subjects was based on self-report. Second, since the number of third-gender individuals was small, their perspectives on COVID-19 could not be captured. Third, the study was confined to Kanchipuram District only, so the findings can only be generalized to the present sample. The sample size for the present study was small. Another study with a larger sample is suggested. The incidence of recall bias was also not assessed since the data was not collected immediately after vaccination.

Acknowledgement

This research was not funded by any grant.

Conflicts of Interest

The authors declare no conflicts of interest.

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