Prevalence of Booster Dose Vaccine Hesitancy and to Understand the Factors Leading to Vaccine Hesitancy of Rural Community People: A Cross-Sectional Study

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Abstract

Background: Coronavirus disease 2019 (COVID-19) is a new strain infection which is caused by severe acute respiratory syndrome coronavirus 2 (SARSCOV-2). By the World Health Organization in March 2020, it has been classified as a pandemic. For better and long lasting protection, a booster dose of CO19VID vaccine is intended to increase the immune system. There is a further protection from delta and Omicron variants in booster doses.**Objectives:** Assess the prevalence of booster dose vaccine Hesitancy. Identify the factors leading to booster dose vaccine Hesitancy. **Materials and methods:** A cross-sectional study was conducted in a rural community in Poonjeri, Chengalpet district, Tamil Nadu. A group of 255 participants was selected using a purposive sampling. Self-structured questionnaire was used to collect data. The gathered information was coded and examined. **Result:** In vaccination status 91% (n=232) were First dose of COVID-19 vaccination taken and 23% (n=23) were not taken First dose of vaccination. 82% (n=190) were second dose of COVID-19 vaccination taken and 18% (n=42) were not taken. 25% (n=46) were booster dose of vaccination taken and 75% (n=144) were not taken. Based on factors leading to booster dose vaccine hesitancy 41% (n=60) sample indicates that fear of complication, 27% (n=40) sample indicates that fear of getting covid, 16% (n=24) indicates that I will not getting covid and 13% (n=27) indicates that fear of death.

Key words: COVID-19, Booster dose, Vaccine hesitancy, Community people, Rural area

Introduction

First cases of the coronavirus SARS-CoV-2 leading to COVID19 were detected just over a two year ago. The knowledge of the virus and how to deal with it has changed significantly during this period. In fact, for all concerned, that has been a steep learning curve. Coronavirus disease 2019 (COVID-19) is a new strain infection which is caused by severe acute respiratory syndrome coronavirus 2 (SARSCOV-2). The World Health Organisation declared the outbreak as a pandemic in March 2020. The pandemic affected the world economy and society in a profound way, besides human mortality and morbidity. It is a fatal, serious, and highly contagious disease from human to human primarily by direct contact and respiratory secretions. As of November 29, 2021 report, more than 261 million people have been infected by COVID-19 pandemic and more than 5 million of them have died worldwide. Vaccine resistance has risen to become one of the biggest concerns in both advanced and developing countries despite people worldwide's enthusiasm for vaccine development. However, there is insufficient evidence concerning the opinion and perception of health professionals regarding COVID 19 vaccine. In general, the attitudes and perceptions of healthcare professionals towards COVID 19 vaccine in this study area have not been satisfactory. Knowledge on COVID-19 vaccine, ages of health care professionals toward the COVID-19 vaccine in the study area were unsatisfactory. Knowledge about the COVID-19 vaccine, age of health care workers, and place of work are the factors which affects attitude towards COVID-19 vaccine.

Need for the study

This Pandemic had infected nearly 183 million people and caused 3 million death worldwide, whereas the India had 4,46,69,421 cases, Recovered rate is 4,41,32,433 and death rate is 5,30,586 from 30 January 2020 to till the date. In Tamil Nadu had 35,93,862, Recovered rate is 35,55,332 and the death rate is 38,049. Total vaccination in India is 2,19,86,38,566. In Tamil Nadu total number of people who received vaccine is 12,73,23,585, Dose I – 5,66,44,508 and Dose II - 5,34,60,877 are taken. (As per My Gov.in website). Life saving inventions have been

responsible for the eradication and prevention of many infectious diseases around the world, by providing safe and effective vaccines. It is common knowledge that, when the majority of individuals are vaccinated against this kind of infection, they indirectly prevent unvaccinated people from becoming infected. Vaccine hesitantness is becoming a serious threat to public health, even though the successful SARSCOV-2 vaccine has been developed within short periods of time and there are still vaccines available. A meta-analysis showed that a 21% decline in vaccine effectiveness from 1 month to 6 months following primary vaccination for SARSCoV2 infection was observed. Following booster vaccination, however, a higher level of antibodies will be produced in the recipient's body, thus providing protection against the virus Therefore, booster doses are currently being administered in various countries to improve the overall immunization level of populations.**IN TAMILNADU**prevalence of vaccine hesitancy and refusal i.e., not willing to get vaccinated in the future was 51.2% and 12% respectively.The prevalence of vaccine hesitancy was 40.7%.

Objectives

The research study objectives to assess the prevalence of booster dose vaccine Hesitancy and to identify the factors leading to booster dose vaccine Hesitancy

Materials and methods

Research design

A community based cross-sectional research was completed in January 2023.The Institutional Human Ethics Committee at Chettinad Academy of Research and Education provided their approval for the study with theproposal number **(IHEC-I/1591/23)**.

Setting

The study was focused on the people of Poonjeri Village in Tamil Nadu's Chengalpet District. The community is situated 25 kilometers from Chengalpet and 21 kilometers from Kelambakkam. According to the 2020 census, Poonjeri Village has about 750 citizens.

Sample size

Sample size formula, n = Z2Xp(1-q)/E2/1+Z2Xp(1-q)/E2/N Where, n is the sample size, Z is the significant level of the normally distributed at the appropriate confidence level, Z=1.96 for a 95% confidence interval, Z^2 is 3.84, p is the sample proportion (0.6), E is the margin of error (0.05), and N is the population size 750. The estimated sample size was n-255.

Participants

The study participants include population available at the time of data collection. Willingness people are participate in this study. The prevalence of booster dose vaccine and was assessed through a questionnaire. The samples will be selected from the population using purposive sampling technique. Written consent was obtained from the study participant.

Questionnaire development and data collection

A self-structured English questionnaire was developed after a thorough examination of the literature. The content of the questionnaire was verified by expert assessment team. It was translated into Tamil (the regional language) by the investigator and tool verified by Tamil expert. The study questionnaire was created with three parts (Socio-demographic, prevalence status of booster dose vaccine and Factors to identify the hesitancy of booster dose vaccine). The data was collected over a one week in the rural Poonjeri area. The goals of the research was explained and obtained the informed written consent before gathering the primary information Age, sex, marital status, education, occupation. The factors of vaccine hesitancy was collected. Information was collected from one participant through the questionnaire.

Statistical analysis

Statistical analysis was carried out with SPSS V26. The gathered information was summarized and incorporated into a Microsoft Excel spreadsheet. The continuous data were reported as the mean standard deviation, whereas the descriptive analysis was expressed as the percentage. Findings were presented in the pie charts, bar graphs, and frequency distributions.

Result

Demographic variables:

On the basis of people's age 43% (n=110) were belonging to 45-60 years, 35% (n=90) were belonging to 18-45 years and 22% (n=55) were belonging to more than 60 years. Considering the sex mostly 57% (n=145) were belonging to female, 43% (n=110) were belonging to male. Regarding marital status mostly 91% (n=232) were belonging to married people and 9% (n=23) were belonging to unmarried people. Considering education 38.8%

(n=99) were belonging to higher secondary education, 28.2% (n=72) were belonging to illiterate, 17.3% (n=44) were belonging to secondary education and 7.8% (n=20) were belonging to primary education and 7.8% (n=20) were belonging to graduate. Considering occupation 37.3% (n=95) were belonging to self-employed, 20% (n=51) were belonging to private, 19.2% (n=49) were belonging to others, 12.5% (n=32) were belonging to unemployed, 9.8% (n=25) belonging to student and 1.2% (n=1.2%) were belonging to student.

Table- 2.1 on the basis of sources of knowledge about the booster dose the result shows that 47% (n=120) source of information from both Relatives and friends, 3% (n=7) from colleagues, 2% (n=6) from Television and 0.8% (n=2) from newspaper. 0.2% (n=1) from social media Mean is 1.63 and standard deviation is 0.725.

Table- 2.2 on the basis of vaccination status the result shows that 91% (n=232) were First dose of COVID-19 vaccination taken and 23% (n=23) were not taken First dose of vaccination. 82% (n=190) were second dose of COVID-19 vaccination taken and 18% (n=42) were not taken. 25% (n=46) were booster dose of vaccination taken and 75% (n=144) were not taken.

Table- 2.3 on the basis of places of getting vaccinated the result shows that government hospital (n=140) sample taken their 1st dose, (n=140) sample taken their 2nd dose and (n=20) sample taken their booster dose. In Private hospital (n=60) sample taken their 1st dose, (n=20) sample taken their 2nd dose and (n=20) sample taken their booster dose. At workplace (n=32) sample taken their 1st dose, (n=30) sample taken their 2nd dose and (n=06) sample taken their booster dose.

Table- 2.4 On the basis of Reasons of getting booster dose vaccination the result shows that 44% (n=20) were to preventing disease, 26% (n=12) were preventing spreading of disease, 15% (n=7) were compulsion from family and friends and mandatory at work place.

Table- 3 on the basis of factors of vaccine hesitancy, hesitancy of booster dose shows that 41% (n=60) sample indicates that fear of complication, 27% (n=40) sample indicates that fear of getting covid, 16% (n=24) indicates that I will not getting covid and 13% (n=27) indicates that fear of death. On the basis of hesitancy of First and Second dose 22% (n=14) indicate fear of myth, 18% (n=12) indicate fear of death, 15% (n=10) indicate fear of complication and fear of getting covid, 12% (n=8) indicate I will not covid covid disease, 9% (n=6) indicate long waiting time and 8% (n=5) indicate timing is not suitable.

Discussion

The main objective of the study was to find out the prevalence of Booster dose and to understand the factors leading to hesitancy of booster dose in rural population. Majority of sample's age 43% (n=110) were belong to 45-60 years. Majority of sample's sex 57% (n=145) were belong to female. Majority of sample's marital status was married 91% (n=232). Majority of sample's education was higher secondary education 39% (n=99). Majority of sample's occupation was self- employed 37% (n=95). Based on source of knowledge majority of sample's received from relatives and friends 47% (n=120).Based on booster dose vaccination status 25% (n=46) were taken and 75% (n=144) were not taken. Based on place of vaccination government hospital (n=140) sample taken their 1st dose, (n=140) sample taken their 2nd dose and (n=20) sample taken their booster dose. In Private hospital (n=60) sample taken their 1st dose, (n=20) sample taken their 2nd dose and (n=20) sample taken their booster dose. At workplace (n=32) sample taken their 1st dose, (n=30) sample taken their 2nd dose and (n=06) sample taken their booster dose. On the basis of reasons of getting booster dose vaccine 44% (n=20) were to preventing disease, 26% (n=12) were preventing spreading of disease, 15% (n=7) were compulsion from family and friends and mandatory at work place. Based on factors leading to booster dose vaccine hesitancy 41% (n=60) sample indicates that fear of complication, 27% (n=40) sample indicates that fear of getting covid, 16% (n=24) indicates that I will not getting covid and 13% (n=27) indicates that fear of death.

Conclusion

This study provides information about the prevalence of booster dose vaccine, hesitancy towards booster dose and factors behind the hesitancy of booster dose vaccination. A COVID-19 vaccine booster dose is intended to boost the immune system for better, long lasting protection. Booster doses provide additional protection against both delta and omicron variants.

Recommendation

To reduce the re-infection and boost the immune system the government should be take step forward to bring awareness about booster dose vaccine in village area.

Limitation

In this study we are included only booster dose vaccination (covishield) population but some of the people getting covaxin vaccination that people we are excluded from the study.

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Conflict of interest - There are no conflicts of interest.
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Table 1

S.NO	**Demographic Variable**	**Frequency**	**Percentage %**
1.	**Age**		
	a) 18 – 45yrs	90	35%
	b) 46 – 60yrs	110	43%
	c) More than 60yrs	55	22%
2.	**Sex**		
	a) Male	110	43%
	b) Female	145	57%
	c) Transgender	0	0%
3.	**Marital Status**		
	a) married	232	91%
	b) divorced	0	
	c) separated	0	
	d) unmarried	23	9%
	e) widowed	0	
4.	**Education**		
	a) illiterate	72	28.2%
	b) primary	20	7.8%
	c) Secondary	44	17.3%
	d) Higher secondary	99	38.8%
	e) Graduate	20	7.8%
5.	**Occupation**		
	a) Government	3	1.2%
	b) Private	51	20%
	c) Self employed	95	37.3%
	d) Unemployed	32	12.5%
	e) Student	25	9.8%
	f) Others	49	19.2%

Table 2

Table 2.1: Frequency and percentge distribution of sample based on sources of information of covid-19 booster dose vaccine.

S.NO	Knowledge Of Covid-19 Booster Dose Vaccine	Frequency	Percentage	Mean	Standard Deviation
1.	Sources Of Information a) Relatives b) Friends c) Colleagues d) Television e) News paper f) Social media g) Health professional h) others	 120 120 7 6 2 1 0 0	 47% 47% 3% 2% 0.8% 0.2	1.63	0.725

Table 2.2 Frequency percentage distribution of sample based on the vaccine status (1st dose, 2nd dose, booster dose)

S.NO	Vaccine Status	Frequency	Percentage
2.	First dose		
	Taken	232	91%
	Not taken	23	9%
	Second dose		
	Taken	190	82%
	Not taken	42	18%
	Booster dose		
	Taken	46	25%
	Not taken	144	75%

Table 2.3 Frequency distribution of sample based on their place of vaccination

S.NO	Place Of Vaccination	Dose 1	Dose 2	Booster
3	Government hospital	140	140	20
	Private hospital	60	20	20
	At work place	32	30	06

Table 2.4 Frequency Percentage Distribution Of Sample Based On Their Reasons Of Getting Booster Dose (N=46)

S.NO	Reason Of Getting Vaccinated	Frequency	Percentage
4	Prevent disease	20	44%
	Prevent spread	12	26%
	Mandatory at work place	7	15%
	Compulsion from family and friends	7	15%

Table 3

Table 3.1 Frequency percentage distribution of sample based on their factors to identify the hesitancy of booster dose vaccine (n=144)

Factors	Frequency	Percentage
Complacency		
I will not get covid disease	24	16%
Confidence		
Fear of complication	60	41%
Fear of death	20	13%
Fear of getting covid	40	27%

Table 3.2 Frequency percentage distribution of sample on their factors leading to identify the hesitancy of first dose and second dose (n=65)

Factors	Frequency	Percentage
Complacency		
I will not get covid disease	8	12%
Confidence		
Fear of complication	10	15%
Fear of death	12	18%
Fear of getting covid	10	15%
Fear of myth	14	22%
Convenience		
Long waiting time	6	9%
Timing is no suitable	5	8%