

Client satisfaction on 'Covid-19' vaccination services and its associated factors among the beneficiaries – A hospital based study

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Abstract: *Background and objectives:* Satisfaction is considered one of the most frequently used indicators to measure the quality and efficiency of vaccination service. This study aimed to assess the level of satisfaction regarding Covid19 vaccination services provided among the people attending at a tertiary hospital of Kolkata, for the Covid-19 vaccination. *Methods:* A cross-sectional study was conducted among 420 study population attending Covid vaccination site in a tertiary care hospital for a period of 3 months. The study participant was selected by systematic random sampling. A pretested structured questionnaire was used. The cleaned data was entered and analysed in SPSS software version 20.0 for analysis. Multivariable logistic regression analysis was done to identify variables having a significant association with satisfaction. Variables with a *p* value of ≤ 0.05 and adjusted odds ratio with 95% CI were considered having a statistically significant association during multivariable logistic regression analysis. *Results:* Out of total 420 beneficiaries studied, 165(39.3%) subjects showed high level of satisfaction. The mean score of overall service revealed from this study was 4.36 ± 0.55 . The opinion vaccination services assessed in a 3 point likert scale and the finding revealed that greetings on arrival, acceptable waiting time, cooperative staffs and availability of AEFI management facilities were the factors with high level of satisfaction. Multivariate logistic regression identify the predictors of high satisfaction namely, age (>45yrs) (OR = 2.35, $p=0.006$), religion (Islam) and rural residence with low satisfaction (OR=0.41, $p=0.000$). *Conclusion and Recommendation:* This study showed that more than one-thirds of the beneficiaries were satisfied by the Covid vaccination service rendered. However, more efforts need to be put towards improving the service waiting time, cleaning facilities and communication is also recommended to enhance the level of favourable satisfaction among the study participant.

Keyword: Covid 19 vaccine, Hospital, Human, Patient satisfaction.

Introduction

The COVID-19 (corona virus disease 2019) caused by the SARS-CoV-2 virus, emerged as pandemic in late March 2020. Until there was no available vaccine, public health agencies like the Centers for Disease Control had advised the public on specific behaviours to limit transmission e.g., "Physical distancing," wearing a face mask, and frequent hand washing etc. Beyond individual behaviours, local and state governments across the country enacted various "stay-at-home" orders and closed nonessential businesses during parts of March, April, and May 2021. Despite these measures, COVID-19 has

caused a serious disease burden to India's health care system. Recent research has identified that more than 50% of residents in slum communities were exposed to the SARS-CoV-2 [1].

A vaccine provides the best hope for a permanent solution to controlling the pandemic. Vaccines have been a key strategy for improving health outcomes and life expectancy by controlling and preventing infectious diseases, such as smallpox, polio, and plague [2]. However, to be effective, a vaccine must be accepted and used by a large

majority of the population [3]. For the elevated morbidity and mortality associated with COVID-19, the invention of a safe and effective COVID-19 vaccine is a critical step to control the pandemic. Governments of India have ensured a successful large-scale administration of COVID-19 vaccines. Vaccine acceptance could be a critical factor influencing vaccine uptake. Health information has been associated with vaccine acceptance.

To ensure a high vaccination rate, it is important to consider that also in the previous pandemic there was some degree of hostility and hesitancy toward vaccines. In fact, in 2009, although a vaccine against influenza H1N1 was available close to the second wave of the pandemic, vaccination rates were lower than expected, with population coverage ranging from 0.4 to 59% in 22 countries [4].

As for influenza vaccination, a low risk-perception, doubts about the effectiveness of vaccines, and fear of side-effects were the most common reason for rejection. Determination of the degree of client satisfaction will provide evidence as to whether or not the right vaccination services are being provided at the right time, in the right place, in the right way and by the right personnel. This will provide baseline data for assessment of quality improvement strategies which will help increasing vaccination coverage. With this background this study was conducted- to estimate the level of client satisfaction with the vaccination services provided in a tertiary care hospital, Kolkata, West Bengal, India; to assess perceptions related to SARS-CoV-2 vaccination among the beneficiaries attended for Covid -19 vaccines in the tertiary care hospital and to identify the socio-demographic and epidemiological factors related to satisfaction among the study population

Material and Methods

An observational cross-sectional study was carried out from February to April 2021 in IPGMER (Institute of post graduate medical education and research) located in Kolkata, West Bengal. This institute is one of the super speciality hospitals in Kolkata. All health workers and other supporting staffs are enrolled as beneficiary for Covid -19 vaccination for first phase. It is approximately 8500 in total. From 1st

March onwards vaccination was opened for senior citizen, person of 45-59 years having co morbidities, and front line worker (FLW).

A beneficiary who were not cooperative, unable to spend time for the data collection related to the study, having impaired cognition, and who did not give consent was excluded. Informed consent was obtained from all participants. Objectives and benefits of the study were explained in verbally. Participants were assured that their participation was confidential and would not affect the outcomes.

The sample size was calculated using the formula for single proportion $n = z^2(l-P)/\epsilon^2P$

where Z is the standard normal deviate, usually setting at 1.96, which corresponds to a confidence level of 95%; d is the degree of accuracy desired (0.10 for this study); while p was the proportion of clients that receive quality service. In order to achieve the maximum sample size for this study, a proportion of 50% was assumed. Thus, the sample size is 384. Allowing for a non-response rate of 10%, the adjusted sample size is 423.

A pre-tested semi- structured questionnaire was administered on 423 beneficiaries who agreed to respond to the questionnaire, using systematic random sampling method with a list of beneficiaries (considered as sampling frame) allotted for that day. List of front line worker was available from the Co-win portal. The questionnaire was consisting of two parts and important part to mention was a second part. First part consisted of demographic variables which include: Age, sex, marital status, education, employment status, family pattern, and address of residence.

The 2nd part of questionnaire items focused on perception on severity of Covid 19 disease [2], (regarding satisfaction to vaccination services) reception given to beneficiaries, attitude of staff at the centres, waiting time before service was provided, length of time spent by the staff, cleanliness of the environment. Other areas included respect of caregivers' rights to information, access,

safety, confidentiality, dignity, comfort. The questionnaire was developed via expert group discussion and literature reviews and pilot testing was done among 30 participant who were not included in this study.

The data was entered into and analysed using SPSS 20.0(IBM, Chicago). Comparisons and associations were determined using relevant statistical tests, such as Chi-square tests for group proportions. Satisfaction was determined by mean scores. Continuous data was tested for significance by t-test and ANOVA. Linear regression analysis was done to find out the relationship between continuous dependent variable with other independent variables. In all analyses as < 0.05 was considered as statistically significant.

Ethical principle: This study was completely academic in nature and all data provided by the study population will be kept confidential. It will

abide by the principle of ethics. Institutional Ethics Committee permission was obtained prior to start of the study (IPGME&R/IEC/ 2021/136, dated 08.02.2021).

Results

Total enlisted HCW of IPGMER 8025. Diabetes (19.0%) and hypertension (17.6%) were two most common co-morbidities found amongst study population. Among the total study population 28.8% undergone Covid RTPCR test and among them 33.9% were found to be positive (table 1) were health care worker (44.3%) followed by front line worker (22.6%). Majority of them (37.6%) were less than 30 years of age and of resident of urban and semi urban areas (54.3%). More than 86% were Hindu and 46.4% were graduates. All of the study population was literate. More than 60% were belongs to class I socioeconomic group according to modified Kuppuswamy scale (2021).

Table-1: Socio-demographic profile amongst the study population receiving Covid vaccination in a tertiary care hospital Kolkata (n =420)

Socio-demographic characteristic		Frequency	Percentage
Types of beneficiaries	Health care worker	186	44.3
	45+ with co-morbidity	50	11.9
	Senior citizen	89	21.2
	Front line worker	95	22.6
Gender	Male	218	51.9
	Female	202	48.1
Age group (in years)	≤29	158	37.6
	30-44	84	20.0
	45-59	83	19.8
	60-74	78	18.6
	≥75	17	4.0
Residence	Rural	192	45.7
	Urban & semi-urban	228	54.3
Religion	Hindu	364	86.6
	Islam	52	12.4
	Christian	4	1.0
Highest academic qualification	Primary school	5	1.2
	Middle school	25	6.0
	Secondary & higher secondary	104	24.8
	Graduate	195	46.4
	MBBS student	22	5.2
	MD/MS	53	12.6
Socio-economic status	Post doctoral trainee	16	3.8
	I	258	61.4
	II	64	15.2
	III & below	98	23.3

Socio-demographic characteristic		Frequency	Percentage
Co-morbidity	Hypertension	75	17.6
	Diabetes	80	19.0
	Chronic kidney disease	10	2.2
	Asthma/COPD	20	4.8
	Hyperlipidemia	16	3.8
	Unknown	221	52.6
Covid test	Done	121	28.8
	Not done	299	71.2
Covid test Result (n=121)	Positive	41	33.9
	Negative	80	66.1

In this study 39.3% of the study population showed high satisfaction index (≥ 4.01) where as only 3.3% of the beneficiaries expressed low satisfaction (≤ 3.0) (fig1).

Fig-1: Satisfaction level among the study participants

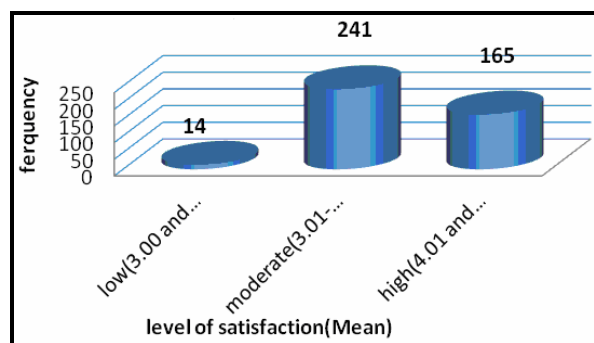


Table 2 showed the findings of the study participant expressing their opinion on vaccination program in a 3 point Likert scale with mean and standard deviation. This study had tried to figure out the factors of high mean of satisfaction (>4.0) like greetings/welcome, acceptable waiting time, cooperative staffs and availability of AEFI management facilities. It also helped to identify the factors with low satisfaction (mean <4) like, non availability of desired type of vaccine, occasional cleaning and sometimes long queue for vaccine. The mean score of overall service revealed from this study was 4.36 ± 0.55 . The lowest mean score was found in cleaning in and around the vaccination site 1.71 ± 0.57 followed by mean score of waiting time for vaccination was 1.83 ± 0.61 .

Item	disagree	Neutral	Agree	Mean	SD
Greeting upon arrival	8(2.0)	33(7.9)	379(90.1)	4.16	0.68
Acceptable Waiting time in registration area	5(1.2)	24(5.7)	391(93.1)	4.17	0.59
Long Waiting time in vaccination area	387(92.2)	28(6.7)	5(1.2)	1.83	0.61
Convenient clinic hour	13(3.0)	25(6.0)	382(91.0)	4.13	0.66
Need of desired type of vaccine not fulfil	370(88.1)	35(8.3)	15(3.6)	1.91	0.73
Staff explaining & answering all queries	19(4.5)	29(6.9)	372(88.6)	4.16	0.77
Covid prevention protocol maintained	0	20(4.8)	400(95.2)	4.28	0.55
Waiting after vaccination strictly maintained(s4)	389(92.6)	21(5.0)	10(2.4)	2.95	1.34
Facility to management of AEFI	2(0.5)	40(9.5)	378(90.0)	4.19	0.61
Occasional cleaning vaccination room	396(94.3)	22(5.2)	2(0.5)	1.71	0.57
Non or inadequate availability of wheel chair/ assisted facility	362(86.5)	31(7.4)	27(6.1)	4.19	0.57
Clean lavatory available	0	36(8.6)	384(91.4)	4.18	0.57
Good signage	10(2.4)	45(10.7)	365(86.9)	4.02	0.69

*data in the parenthesis indicates percentage

In Multivariate binary logistic regression analysis revealed that the predictor of satisfaction age (<45yrs), religion (Hindu) and residence (rural). Compared to study population of more than 45yrs high satisfaction was found with age group <45 years (OR = 2.35, p=0.006). Compared to Islam

and other religion Hindus showed significantly low satisfaction (OR=1.533, p=0.047). Compared to urban population rural resident beneficiaries showed significantly low satisfaction (OR=0.41, p=0.000) (table 3)

Table-3: Multivariate logistic regression analysis of levels for satisfaction of vaccination according to predictors among the study population (n=420)

Variable		Mild to low satisfaction (≤4.00)	High satisfaction (≥4.01)	Chi square value	OR	p Value (CI)
Age	<45yrs	159(62.4%)	83(50.3%)	21.37 P<0.001	2.352	0.006 (1.282-4.314)*
	45-59 yrs	32(12.5%)	51(30.9%)		3.031	0.231(0.494-18.609)
	≥60yrs	64(25.1%)	31(18.8%)		1	
Occupation	FLW	59(21.3%)	36(21.8%)	16.08 P<0.000	1	
	HCW	116(45.5%)	70(42.4%)		1.879	0.91 (0.904-3.909)
	45+comorbidity	18(7.1%)	32(19.4%)		0.249	0.138 (0.040-1.566)
	Senior citizen	62(24.3%)	27(16.4%)		1.216	0.503 (0.686-2.155)
Socio-economic class	Class I	151(59.2%)	107(64.8%)	1.432	1.088	0.75 (0.637-1.859)
	Class II	42(16.5%)	22(13.3%)		0.850	0.648 (0.422-1.711)
	Class III	62(24.3%)	36(21.8%)		1	
Highest Education	Upto HS	83(32.5%)	51(30.9%)	5.27	.715	0.216(0.420-1.217)
	Graduate	126(49.4%)	69(41.8%)		1.208	0.555(0.645-2.264)
	Post graduate & professional degree	46(18.0%)	45(27.3%)		1	
Gender	Male	129(50.6%)	89(53.9%)	0.451	1.126	0.601(0.722-1.756)
	Female	126(49.4%)	76(46.1%)	P>0.05	1	
Religion	Hindu	225(88.2%)	139(84.2%)	1.38	0.533	0.047(0.287-0.991)
	Islam & others	30(11.8%)	26(15.8%)		1	
Residence	Rural	138(54.1%)	54(32.7%)	18.47	0.410	0.000(0.262-0.643)
	Urban	117(45.9%)	111(67.3%)	P<0.001	1	

p value < 0.05 at multivariable logistic regression.

Co morbidity like hypertension, diabetes and or chronic kidney disease shows significant association with levels of satisfaction to vaccination service (p<0.023). Those had the

previous Covid infection prior to vaccination also shows significant association levels of satisfaction to vaccination service (p<0.015) table 4.

Table-4: Distribution of the study population according to Covid related factors and levels of satisfaction				
Covid related variable		Mild to low satisfaction (≤4.00)	High satisfaction (≥4.01)	Chi square (p value)
Co morbidity (n=420)	Hypertension	35 (13.7%)	41(24.8%)	9.550 (p=0.023)
	Diabetes	49(19.2%)	34(20.6%)	
	CKD and asthma/ HTN/ Diabetes	28(11.0%)	16(9.7%)	
	Unknown	143(56.1%)	74(44.8%)	
Covid test (n=121)	Positive	33(47.1%)	13(25.5%)	5.87 (p=0.015)

Discussion

The COVID-19 pandemic is still threatening the world. A vaccine is a great hope to find a solution to control the virus infection. A vaccine must be acceptable and usable among the majority of the population. Thus, the success of a vaccination programme depends on the willingness & satisfaction of the population to the service. So, the evaluation of client satisfaction measurement has become an administrative reality to modify the loopholes identified by the beneficiaries.

In the present study total 420 subjects participated. Most of them were health care worker (44.3%) and other front line worker (22.6%) and more than 37% were belongs to less than 30 yrs of age. Similarly, the study done by El-Elimat T et. Al in Jordan showed the median age of participants was 29 years [5]. In our study majority were male (51.9%) whereas the study done in Malaysia by Syed Alwi et al more than 67% study subject were female [6]. The study in Namas District- Saudi Arabia done by Alkotb H et al. showed that 402 clients ranged from 19 years to 48 years, with Mean \pm SD 29.047 \pm 6.362 years. [7]

A study done in Western Australia by Burt. S et.al on patient satisfaction in general vaccination services revealed that majority of consumers (99.5%) were satisfied with the overall service [8]. In the study conducted in Guatemala by Barrera et al. revealed that overall, 831 (70.4%) participants rated immunization services as "good" or "very good [9]."The study conducted in Ethiopia by Gebre Eyesus. F A et al. revealed

that the overall level of maternal satisfaction towards childhood immunization service was 68.2% which is much higher than present study (39.3%) [10]. In the study by Udonwa NE et al. in South Nigeria found that less than half of the clients (43.6%) were very satisfied with access to services [11]. The study done by Kunno J et al. in urban Bangkok Thailand showed that HCWs had significantly higher total satisfaction scores than GP participants ($p = 0.034$) [12].

The study done in Ethiopia by Gebre Eyesus. F A et al. reported that about 56.3% of mothers were satisfied by the waiting time prior to immunization service [10]. Whereas in the current study showed that the mean value of long waiting time very less (1.83 \pm 0.61). It indicates 92.2% population answered the waiting time is less (<30mints). The study done by Barrera et al the majority of participants said they waited <1 hour to vaccinate their child, but 26.8% waited 1–2 hours and 13.7% waited >2 hours [9].

In the study done in Nigeria by Udonwa NE et al. Seventy-four (18.4%) clients were very satisfied with the waiting time, 123 (30.6%) were satisfied. Concerning the attitude of staff, 50 (12.4%) clients were very satisfied, while 250 (62.2%) were not satisfied. Most participants reported receiving some form of advice upon having their child immunized ($n = 861, 72.9%$) [11]. Study done by GebreEyesus. F A et al. in Ethiopia found that 81.7% of the were greeted by the immunisation worker during a immunisation

session [10]. In our study 88.6% participant agreed that all the quarries and information related to adverse events and date of next dose was given in the vaccination centre.

In the study done in Nigeria by Udonwa NE et al. showed that 105 (26.1%) clients were very satisfied with the reception by the health care providers, 92 (22.9%) were satisfied, while 205 (51%) were not satisfied [11]. In our study seven (1.7%) clients were very satisfied with the length of time the health care provider spent with the child during service delivery, 143 (35.6%) were satisfied, while 252 (62.7%) were not satisfied. One hundred and ten (27.4%) clients were very satisfied with the cleanliness of the facility environment, 124 (30.8%) were satisfied, while 168 (41.8%) were not satisfied. In the present study 91.4% were agreed to the cleanliness of the lavatory and no one disagree with this statement (4.18±0.57).

The study in Namas District- Saudi Arabia done by Alkotb H et al. revealed that clients were satisfied with accessibility at 60%, the humanness of the staff at 57.7%, and the comprehensiveness of care at 52.7% while they were unsatisfied with the physical environment of the facility at 43.3%.[12]

In the present study Multivariate binary logistic regression analysis revealed that the predictor of satisfaction age (<45yrs), religion (Hindu) and residence (rural). Compared to study population of more than 45yrs high satisfaction was found with age group <45 years (OR = 2.35, p=0.006). The study done in Ethiopia by Gebre Eyesus. F A et al. multivariable logistic regression analysis showed that marital status, educational status, maternal attitude, waiting time, greeting/welcoming approach, information about the current vaccine, a dose of vaccine, and next immunization schedule were found to be

statistically significant predictors of maternal satisfaction (p<0.05) [10]. Among HCWs, being married (β 0.157; 95% CI 0.794, 3.278; p = 0.001) or divorced (β 0.198; 95% CI 3.303, 9.596; p < 0.01) was more closely associated with vaccine satisfaction than being single in the study conducted by Kunno J et al in Thailand [12].

Lessons learned: The current study reveals that greeting/welcoming approach by health care providers had a positive effect on the level of satisfaction towards Covid 19 vaccination services. This study offers lessons relevant to future immunization services and efforts to develop a standardized methodology for detecting low satisfaction of the beneficiaries for vaccination. It also helped to improve the shortfalls identified by the participants.

Conclusion

The study showed that more than one-thirds of the study participants were satisfied by the vaccination service rendered. The level of satisfaction was higher with respect to the age, religion residence, and presence of co-morbidity and results of Covid test. This study cannot ascertain cause and effect relationship since it is a cross-sectional type and absence of qualitative study could be mentioned as a potential limitation of the current study

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