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Original Research Article

COVID-19 vaccine hesitancy among parents of school-going adolescents in an underprivileged area of Bangalore city

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ABSTRACT

Background: Despite the availability of COVID-19 vaccines, vaccine hesitancy remains a challenge, especially in underprivileged areas. Parents of adolescents are important stakeholders in adolescent vaccination.
Methods: A cross-sectional study was conducted from October to December 2022 in a Government Boys' Higher Secondary School in Austin Town, Bangalore. The study included parents of adolescent boys aged 10–19 years. A structured, face-validated questionnaire captured socio-demographic details, COVID-19 vaccination status, and parental reasons for vaccine hesitancy. Data were analysed using IBM SPSS Statistics 20, with chi-square tests to assess associations.
Results: Out of 100 adolescent boys, 90% were vaccinated. There was no significant association between vaccination status and age, religion, family type, parental occupation, or education. However, higher socioeconomic status was significantly associated with vaccination uptake (p=0.007). Vaccine hesitancy among parents was observed in 10% of respondents, primarily due to concerns about vaccine necessity (80%), side effects (60%), and negative rumours (40%). Fear of adverse effects on growth, intelligence, or fertility also contributed to hesitancy.
Conclusions: The high adolescent vaccination coverage in this study may be attributed to free school-based vaccination programs and mandatory vaccine certification for school attendance. However, vaccine hesitancy among 10% of parents highlights the need for targeted health education campaigns to address misinformation and build vaccine confidence. Strengthening parental awareness through school-based health communication strategies could play a critical role in improving adolescent vaccine acceptance.

Keywords: Adolescents, Bangalore. COVID-19, Parental attitudes, Socio-economic factors, Vaccine hesitancy

INTRODUCTION

World Health Organisation (WHO) declared Novel Coronavirus Disease (COVID-19) outbreak as a pandemic on 11 March 2020 and the first vaccines were rolled out in India in January 2021.[1,2] The Government of India began its COVID-19 vaccination programmes for adolescents aged 15-18 years in January 2022, for adolescents aged between 12 and 15 years in March 2022 and for children aged 6-12 years in April 2022.[3]

Vaccine hesitancy refers to the delay in acceptance or refusal of vaccines despite the availability of vaccination services. This phenomenon is influenced by factors such as complacency, convenience, and confidence and varies across time, place, and specific vaccines.[4] In a nationwide study conducted across 27 states and union territories when the COVID-19 vaccines were first rolled out, vaccine hesitancy was reported among 27% of respondents, and almost 70% of the population had concerns regarding the vaccines.[5]

Vaccine hesitancy among adolescents can be due to various factors, an important one being parental attitudes, which play a crucial role in shaping adolescent vaccination decisions.[6] Parents are typically the primary decision-makers when it comes to their children's health, including vaccination choices.[7] Their views on vaccines, health practices, and COVID-19 specifically can directly influence whether adolescents are vaccinated or not. Understanding vaccine hesitancy among parents of adolescents can help in addressing the issue and increasing vaccination rates, which is crucial for achieving herd immunity and controlling the spread of COVID-19, especially in schools.[8]

People from lower socio-economic backgrounds often have limited access to reliable health information and less trust in government health agencies, and the healthcare system in general. This mistrust is often rooted in historical inequalities, lack of access to quality healthcare, or negative past experiences with the healthcare system.[9]

Hence, this study was conducted with the objective of estimating COVID-19 vaccine coverage among adolescents living in an urban underprivileged area of Bangalore city and to determine the reasons for vaccine hesitancy among the parents of these adolescents.

METHODS

Study design and setting

This was a cross-sectional study conducted in the Government Boys' Higher Secondary School in the underprivileged area of Austin town, Bangalore, the urban field practice area of the Department of Community Health, St. John's Medical College, Bangalore. Permission to conduct the study in the nearby girls' school was not granted, and hence, the girls' school could not be included in this study.

Study period

This study was conducted from October to December 2022.

Sampling frame

Parents of adolescent boys aged 10-19 years studying in the school.

Sample size

The minimum sample size for this study was calculated taking 50% COVID-19 vaccine coverage among adolescents (in the absence of published literature on vaccine coverage among adolescents at the time this study was planned). With 10% absolute precision, the sample size was calculated to be 96.

Sampling technique

Universal sampling technique was followed.

Inclusion criteria

Parents of an adolescent (aged 10-19 years) studying in the government secondary school at Austin Town.

Exclusion criteria

Students who did not return the filled forms or submitted incompletely filled forms.

Data collection

The purpose of the study was explained to all the secondary school students, and each student was given a copy of the subject information sheet, informed consent sheet and questionnaire to take home to their parents. After the parents filled the questionnaire (either individually or jointly after discussing), the students returned the filled questionnaire and informed consent form during the following week.

Study tool

A structured questionnaire was used to capture socio-demographic details, COVID-19 vaccine details and parental reasons for vaccine hesitancy. This questionnaire was face-validated by two experts in the field of public health. Operational Definitions: 1) Vaccinated: Student who has received at least one dose of COVID-19 vaccine. 2) Unvaccinated: Student who has not received a single dose of COVID-19 vaccine. 3) Vaccine Hesitancy among parents: Parents of an unvaccinated child who have no intention of getting the child vaccinated.

Statistical analysis

The data was entered in Microsoft Excel and analysed using IBM Statistical Package for Social Sciences version 20 [IBM SPSS Statistics for Windows, version 17 (IBM Corp., Armonk, N.Y., USA)]. Variables were described using numbers and proportions. Outcome variable (COVID-19 Vaccination Status: Vaccinated or unvaccinated) was associated with various independent covariates, using Chi-Square test. P value of <0.05 was considered statistically significant for all analyses.

RESULTS

A total of 100 completely filled questionnaires were collected. All the students were boys as it was a boys' school. Most of the participants were parents of adolescents from the age group of 13-15 years (80%). Being a secondary school, none of the boys were between 10-12 years of age. Majority of the subjects were Hindu by religion (63%) from nuclear families (72%) and from

socio-economic status Class 2 (87%) by Modified BG Prasad Socio-economic Classification. All the fathers were gainfully employed, while 60% of the mothers were housewives. Majority of the mothers were uneducated (40%), while most of the fathers had studied up to secondary school (50%).

Table 1: Sociodemographic details of the study participants.

Variable	Category	Total N (%)	Vaccinated 90 (90%)	Unvaccinated 10 (10%)	P value *
Age of the child (years)	13-15	80 (80)	70 (87.5)	10 (12.5)	0.096
	16-18	20 (20)	20 (100)	0 (0)	
Religion	Hindu	63 (63)	58 (92.1)	5 (7.9)	0.549
	Muslim	18 (18)	15 (83.3)	3 (16.7)	
	Christian	19 (19)	17 (89.6)	2 (10.4)	
Type of family	Nuclear	72 (72)	63 (87.5)	9 (12.5)	0.202
	Non-nuclear	28 (28)	27 (96.4)	1 (3.6)	
Mother's occupation	House wife	60 (60)	56 (93.3)	4 (6.7)	0.173
	Gainfully employed	40 (40)	34 (85.0)	6 (15.0)	
Father's education	Uneducated	5 (5)	5 (100)	0 (0)	0.816
	Primary	26 (26)	24 (96)	2 (4)	
	High school	50 (50)	44 (80)	6 (20)	
	Graduate	19 (19)	17(89.47)	2 (10.53)	
Mother's education	Uneducated	40 (40)	34(85)	6 (15)	0.393
	Primary	29 (29)	26(89.6)	3 (10.4)	
	High school	17 (17)	16(94.1)	1 (5.9)	
	Graduate	14 (14)	14(100)	0 (0)	
Socio-economic status of the family	Class 1	0	0	0	0.007 #
	Class 2	87 (87)	81(93.1)	6 (6.9)	
	Class 3	13 (13)	9(69.2)	4 (30.8)	
	Class 4	0	0	0	
	Class 5	0	0	0	

*Chi-Square test # Statistically significant at p<0.05

Of the 100 adolescent boys, 90% were vaccinated (60% received two doses, and 30% received only one dose). There was no significant association between vaccination status and age of the adolescent, religion, type of family, parental occupation or education. There was a significant association between higher socioeconomic status and vaccination (p=0.007).

Table 2: Reasons for vaccine hesitancy among parents (n=10).

Reason for Vaccine Hesitancy	N (%)
Feel that vaccine is not required if necessary precautions are taken against COVID infection	8 (80)
Feeling that the adolescents are not at risk of COVID infection	7 (70)
Concerns about COVID vaccination side effects	6 (60)
Do not have any information on COVID vaccine for adolescents	6 (60)
Negative rumours about the vaccine	4 (40)
Do not trust the vaccine	5 (50)
The adolescent is scared of injections	3 (30)
Fear of side effects in the distant future	2 (20)
Fear of the vaccine affecting growth	2 (20)
Fear of vaccine affecting intelligence	2 (20)
Fear of vaccine affecting future fertility	2 (20)
Believe that vaccines will worsen pre-existing health conditions	2 (20)
Belief that vaccination is not required in case of prior infection with COVID	2 (20)
Against religion/culture	2 (20)

Vaccine hesitancy among parents was seen in 10% of the respondents. Among these, most felt that vaccines are not required if necessary precautions are taken against COVID-19 infection (80%) and that vaccines are not required if necessary precautions are taken against COVID-19 infection (70%). Parents who have vaccine

hesitancy reported concerns about COVID-19 vaccination side effects (60%) and about the negative rumours about the vaccine (40%). These parents also had fear of the vaccine affecting growth, intelligence or future fertility, or that it would worsen pre-existing health problems like asthma.

DISCUSSION

Majority of the adolescent boys in this study were vaccinated. This can be attributed to the free COVID-19 vaccination camps that were conducted in government schools under the Bangalore Municipal Corporation. The success of free school-based vaccination camps in India has played a crucial role in achieving this high coverage, as this strategy provides easy access to vaccines.[10] Schools had also made COVID-19 vaccination certificate mandatory for attending classes, and the COVID-19 vaccination certificate had been made mandatory while travelling which also could have contributed to the high vaccine coverage among adolescents.[11,12] There were many awareness programmes regarding COVID-19 vaccination with discussions in the media, which could have boosted the confidence of the general public with regards to COVID-19 vaccines. These reasons would likely explain why the vaccine coverage in our study was much higher than that found among adolescents in the USA (42.4%) where the vaccine was not mandatory and why it is more similar to the coverage of 98.4% in a study among Chinese adolescents.[13,14]

A higher socioeconomic status was significantly associated with greater COVID-19 vaccination uptake in our study, similar to the findings of a study in Israel, which aligns with existing literature suggesting that higher socioeconomic status often correlates with better healthcare access, awareness, and acceptance of public health interventions.[15,16]

Vaccine hesitancy was observed in 10% of the parents in our study, with concerns primarily centred around vaccine safety and potential side effects. Additionally, misinformation and negative rumours contributed to hesitancy among 40% of the hesitant parents. Vaccine hesitancy among parents in our study was slightly more than among Brazilian parents of children and adolescents where it was 3%.[17] This difference could have been because our study was conducted in an urban underprivileged area, whereas the study in Brazil was among a hospital-based study with parents from various economic backgrounds. A study in the US suggested that increasing parental confidence in vaccines is important to improve COVID-19 vaccine coverage.[18] Findings from a study across the USA suggest that exposure to misinformation and believing rumours as true could increase COVID-19 vaccine hesitancy and reduce behavioural intention to get vaccinated.[19] Similarly, in Gorakhpur, Uttar Pradesh, a negative attitude towards the vaccine showed a four times higher likelihood of COVID-19 vaccine hesitancy among adults.[20] In an Ethiopian study conducted among adolescents, it was found that COVID-19 vaccine hesitancy was 29%. Being female, having poor knowledge of COVID-19 disease and the vaccine, an unfavourable attitude, and negative social media were factors significantly associated with COVID-19 vaccine hesitancy among adolescents.[21]

A rapid review article published during the pandemic stated that the misinformation spread on social media had a negative effect on vaccine hesitancy and uptake.[22] Our study highlights the importance of targeted health education campaigns to address misconceptions and provide clear, evidence-based information about vaccine safety and efficacy.

The study also found that a significant proportion of mothers were uneducated (40%), and most fathers had only secondary-level education (50%). Given that maternal education plays a crucial role in healthcare decision-making, initiatives aimed at improving health literacy among parents-especially mothers-may be beneficial in reducing vaccine hesitancy.

A key strength of this study is its focus on adolescent vaccination in an urban underprivileged area, a crucial area in pandemic control. However, limitations include the relatively small sample size and the study being confined to a single boys' school, which may limit generalizability. Including both boys and girls could have provided a more comprehensive understanding of parental vaccine hesitancy trends across different demographic groups.

CONCLUSION

The high adolescent vaccination coverage in this study may be attributed to free school-based vaccination programs and mandatory vaccine certification for school attendance. However, vaccine hesitancy among 10% of parents highlights the need for targeted health education campaigns to address misinformation and build vaccine confidence. Strengthening parental awareness through school-based health communication strategies could play a critical role in improving adolescent vaccine acceptance.

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