



ORIGINAL RESEARCH PAPER

General Medicine

KNOWLEDGE, ATTITUDES AND PRACTICES OF PEOPLE WITH REGARDS TO ADULT VACCINATION IN SOUTHERN INDIA, A CROSS SECTIONAL STUDY.

KEY WORDS: Vaccine, Adult Vaccination, India, Knowledge, Attitude, Practices, Questionnaire, Infectious Diseases, Diseases, Awareness

Dr Nidhishri Sridhar

MBBS, Intern, Vydehi Institute of Medical Sciences and Research Centre

Dr Akshatha S

MBBS, MD General Medicine, Professor in the Department of General Medicine, Vydehi Institute of Medical Sciences and Research Centre

Dr Nachiketh Rao

MBBS, Intern, Vydehi Institute of Medical Sciences and Research Centre

Dr Ojas Balaji

MBBS, Intern, Vydehi Institute of Medical Sciences and Research Centre

Dr Koushal Sattaru

MBBS, Intern, Vydehi Institute of Medical Sciences and Research Centre

Dr Shreya Muralidharan

MBBS, Intern, Vydehi Institute of Medical Sciences and Research Centre

ABSTRACT

Background: Adult vaccination has long been recommended in India however, there is a general lack of awareness in the general public due to its non-compulsory nature. However, the Covid-19 pandemic, has thrust vaccines into the spotlight. With this in mind, this study sought to provide more data on public knowledge, attitudes and practices and also qualitative insights into current vaccination perceptions. **Method:** This was a cross sectional study conducted between October 2022 to December 2022. **Results:** 717 responses were collected, which revealed a significant gap in public awareness. Only 258 participants were aware of the existence of a government recommended vaccination schedule. Encouragingly, vaccination rates were relatively high with 363(86.84%) out of 418 men and 263(87.95%) out of 299 women being vaccinated at least once in their life. However, it is noteworthy that only 303 participants reported receiving a vaccine other than the SARS-COV2 vaccine. **Conclusion:** The study highlights the overall low awareness of the adult vaccination schedule in India, emphasizing the need for a collected effort from the government and healthcare workers to address this issue. Enhancing the public knowledge about vaccination practices is essential to ensure widespread participation and ultimately improve public health outcomes.

INTRODUCTION:

A vaccine is a pharmacological compound that improves a person's immunity to a particular disease. Major health bodies across the world recommend vaccination as soon as after birth; it has been proven to prevent various diseases. The WHO added lifelong vaccination as a core in its 2030 sustainable life goals.[1] In India, while there is a lot of emphasis on infant and child vaccination, onus on adult vaccination is a new development in recent years. This is owing to the emergence of infections like HIV which have brought forth new challenges of opportunistic infections and re-emergence of infections like measles and tuberculosis due to inadequate childhood vaccination coverage. [2] There is also an additional demographic of adults with diseases like Diabetes mellitus, which is associated with a higher susceptibility to diseases owing to an impaired ability to mount an adequate immune response.

Adult vaccination has been a difficult endeavor in India owing to difficulty in tracing adults requiring vaccination, doubts among healthcare workers regarding vaccine efficacy and lack of perception of the burden caused by vaccine preventable diseases in the adult population. With improvements in cold chains and vaccine handling practices, it is now possible to expand the universal vaccination program beyond children. Currently, there is no funding available for adult vaccination in India, however there are recommendations available from the National Centre for Disease Control, Directorate General of Health Services under the Government of India, issued in 2011. [3]

With this background, this study aims to understand the current knowledge, attitudes and practices regarding adult vaccination, due to the lack of data on adult awareness and perception of the national adult vaccination recommendations in India.

This study was a cross sectional questionnaire-based study, and was administered to participants in the outpatient rooms of an urban tertiary care hospital. The study was approved by the institutional ethics committee. Participants were obtained by random purposive sampling. To be eligible for participation, the participants had to be at least 18 years old. Informed consent was taken from all participants before administering the questionnaire.

Power calculations indicated that in order to detect group differences in the participants, we needed a minimum of 357 at 95% confidence interval with a Z value of 1.96($\alpha = 0.05$). Information was gathered from 717 eligible participants from October 2022 to December 2022.

Procedure:

The participants completed a self-administered questionnaire. The questionnaire was prepared by the principal investigators and validated both by subject experts and a pilot study. Data was tabulated using Microsoft Excel 2019. For continuous variables, univariate statistics as means and standard deviations were used and percentages for categorical variables.

The questionnaire was in a language of their understanding. No personal details of the participants were collected, and only demographic details relevant to the study were collected. The participants were explained about the purpose of the study and were given free will regarding their participation in the study. The researchers gathered qualitative data by conducting semi-structured interviews with participants regarding their opinions about vaccination.

RESULTS:

The investigators collected the data over a period of two months on a daily basis, with a total of 717 responses. Of these, 418(58.3%) were males and 299(41.7%) were females. A total

METHODS AND METHODOLOGY:

of 167(23.3%) participants reside in a rural area and 550(76.7%) in an urban area. Tables 1 and 2 provide additional information on the age demographic and the educational status of the participants.

Age Range	No. of Participants
18-20	49(6.83%)
21-30	224(31.24%)
31-40	187(26.08%)
41-50	125(17.43%)
51-60	83(11.57%)
61-70	44(6.13%)
71-80	5(0.69%)

Level of education	No. of participants
Primary School	19
High School	54
Pre-University	148
Bachelor's Degree	371
Post Graduate Degree and higher	114

In the knowledge section of the questionnaire, we found that 258(35.98%) participants were aware of the existence of a vaccination schedule recommended by the government, and 459(64.02%) were unaware of the same. 237(33%) participants were aware that vaccines can prevent cancers and 480(67%) were unaware of this. Out of the 237 who answered yes to this question, 156(65.82%) of them were females, while 81(34.18%) of them were males. 639(89.12%) participants believe that vaccination is effective against severe forms of diseases. 475(66.24%) participants think that vaccination can help prevent some diseases completely. 21(3%) participants think that vaccines have no benefits, 649(90%) believe that vaccines do have a benefit while 47(7%) weren't sure of the same. 433(60.4%) participants believe that vaccines can cause additional diseases. Tables 3 and 4 illustrate some factors that affect the behavior of participants with regards to their health.

Source of healthcare information	No. of participants
Friends and family	521(72.66%)
News	471(65.69%)
Social media	375(52.30%)
Primary care physician	401(55.92%)
Government or panchayat	343(47.83%)

Biggest motivation to get vaccinated	No. of participants
Government suggestion	361(50.34%)
As travel precautions voluntarily	104(14.50%)
As requirements either by employer or for travel	277(38.63%)
Fear of getting the disease	227(31.65%)
Doctor's recommendation	500(69.73%)
Suggestions from friends and family	271(37.79%)

In the attitude section of the questionnaire, we found that 310(43.23%) participants admitted that they would skip a vaccine if they hear about its side effects, 233(32.49%) would not and 174(24.26%) would maybe skip a vaccine due to side effects. 611(85.21%) chose that they would get vaccinated if they found that it had proven benefits while 49(7%) chose that they would not. 57(7.79%) were not sure about what they would do. 284(39.60%) would skip a vaccine if the disease wasn't a cause of significant comorbidities while 290(40.44%) would not. 143(19.96%) were uncertain. 197(65.88%) women out of 299 would take a vaccine during their pregnancy if the doctor recommends it, 48(16.05%) would not, 54(18.07%) were uncertain. 310(43.23%) participants would take a vaccine if a doctor recommends it, 178(24.82%) would not and 229(31.95%) would think about it before making a decision. Figures 1 and 2 depict the responses to questions regarding the thoughts of the participants with regards to adult vaccination.

Fig 1: On whether adult vaccination should be made compulsory

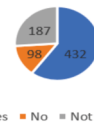
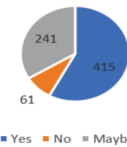


Fig 2: Would they take vaccines if it were compulsory



In the practices part of the questionnaire, the participants were mainly asked about vaccination practices in their family. We observed that out of the 717 participants, 656 had children in the family who were vaccinated, of which 478 of them reported having been complete vaccination as per the National Immunization schedule. 31 reported that no children were vaccinated in their family. A total of 280 participants reported vaccination of family members who were more than 65 years old and of the 280, excluding the vaccines against Sars Cov 19, only 160 reported completion of all the required doses. Table 5 outlines the various vaccines received by the participants.

Vaccines received by participants	Number of Participants
Sars Cov 19(including Covishield, Pfizer and Covaxin)	394
Hepatitis B	111
Tetanus toxoid	123
Yellow Fever	12
Pneumococcal Conjugate Vaccine	53
Influenza Vaccine	109
Meningococcal Vaccine	45
Varicella Vaccine	21

Of those who have received a vaccine after 18 years of age, 523(72.94%) had completed all the required doses and booster doses, while 27(3.76%) did not. 30(4.18%) were unsure if they had completed the course.

DISCUSSION:

Vaccines were first discovered in 1796 by Dr Edward Jenner, when he discovered the immunity generated to the small pox virus after inoculation of the cowpox virus. Since then, there have been many improvements made to the processes of manufacturing, methods of administration and improvement of efficacy. There is substantial data that supports the effectiveness of vaccines in preventing diseases. But with the widespread access to information via the internet and news, there has been a rise in vaccine misinformation and hesitancy in recent years. The COVID-19 pandemic of 2019-2020 brought forth these issues, as governments advocated for vaccines around the world and were met with multiple instances of vaccine refusal, misinformation and fear of adverse effects. India had a moderately good rate of vaccination with 2.20 billion doses administered as of 15-10-23[4], with about 75% of the population receiving atleast 1 dose. But this was fraught with fears and hesitancy from the population, which also prevented the target from reaching 100%. With this background in mind, we conducted this study to assess the current perception of the public to the currently suggested adult vaccination schedule, and to understand how their perceptions have changed after a global pandemic.

The study was conducted under three categories: knowledge, attitudes and practices. Out of the 717 responses, only 258 participants were aware of the existence of adult vaccination recommendation guideline by the Government of India. For our study, we reviewed a study by Archana Kumari et al. on "Knowledge, barriers and facilitators regarding COVID-19 vaccine and vaccination programme among the general population: A cross-sectional survey from one thousand two hundred and forty-nine participants". They found that there

was a lack of knowledge in participants on vaccine eligibility for vulnerable populations. They also found that older patients had a better understanding about vaccination and were more ready to receive vaccinations whereas the younger and urban populations tended to question the efficacy of vaccines. [5]

However, another study by Umakanthan S et al. titled "COVID-19 Vaccine Hesitancy and Resistance in India Explored through a Population-Based Longitudinal Survey" found a relatively higher resistance to vaccination in the older age groups. [6] We had similar findings to both studies when we interviewed the participants. Most of the participants who were over the age of 40 were slightly more apprehensive about receiving vaccines. Most of them had no particular reason for the same but a few of their apprehensions could be traced back to rampant misinformation present on social media. We also found that while the older populations were more aware of current guidelines compared to the younger population, hesitancy was much lower in the younger population. Our theory is that the younger population is more adept at navigating social media and thus they are resilient to fake news and is more likely to question what they read. This led to them being more accepting of evidence-based guidelines.

In addition to this, a study done by Annelies Wilder Smith et al titled "Knowledge, attitude, and practices with regard to adult pertussis vaccine booster in travelers" found that although a majority of the study participants understand that pertussis is a serious illness, only 38% expressed interest in receiving the vaccine and no one in the participants was vaccinated. [7]

When we tried to compare the above findings with our study, we found a few similarities. Most of our participants who were unaware stated the reason as a general lack of awareness due to there never having been any mainstream coverage regarding the schedule. The participants who knew about it were aware either because they frequently travel out of the country, their peers were healthcare workers or due to constant visits to their family care provider who advised them regarding the same.

A study by Rashid S et al. titled "Knowledge, Awareness and Attitude on HPV, HPV Vaccine and Cervical Cancer among the College Students in India" stated that girls had a higher knowledge about cervical cancer and HPV vaccines. [8] This supports the findings in our study. We also discovered a general lack of awareness about the vaccines that help prevent cancer, as only 237(33%) of the participants answered yes. The participants commonly listed the HPV vaccine against Ca Cervix (193, 26.91%) and Hepatitis B against hepatocellular carcinoma (34, 4.7%). Women were more aware about vaccines against cancers, and this was attributed to them having consults with gynecologists for unrelated health issues who advise them about the same.

However, majority of the participants agreed that vaccines have benefits and can prevent severe forms of diseases or some diseases completely. When interviewed about the reasons for not having received the vaccine, cost was cited as the major factor. In a developing country like India where the minimum wage is low, spending out of pocket for this vaccine can be difficult. The costs of the HPV vaccines are not yet covered by the government which makes them available only to the factions of society that can afford the same.

521(72.6%) participants stated that friends and family were their source of health-related information followed by news (471, 65.7%), social media (375, 52.3%), primary care physician (401, 55.92%) and the government (343, 47.83%). According to them, family and friends are someone they have a high level of trust in and are inclined to believe them more than other sources. Many respondents expressed that social

media and news from relatively unknown sources have become less reliable due to the recent surge of misinformation on social media. They also stated that the government is not a consistent source for them due to the lack of reach of government campaigns to the common man, either due to a language barrier or lack of notices and pamphlets in common news sources as India is a diverse country with many different languages.

Lack of data on trials which are proof of efficacy due to information not being in the public domain	35(4.9%)
Disease severity is low, so there is no need for vaccination	89(12.41%)
Family members discourage the participants due to fears of side effects	135(18.82%)
Have a family to support and cannot afford vaccines	208(29%)
Limited trials available on vaccine effects during pregnancies	130(18.13%)
Already had the disease once and hence felt that there was no need for further vaccination	90 (12.55%)

The recent pandemic showed how important the role of the government is while enforcing vaccination policies, as evident in the high degree of coverage of the covid vaccination. Almost 50% of the participants stated that government guidelines were one of their biggest motivating factors.

Nargis K Bali et al in their study titled "Knowledge, attitude, and practices about the seasonal influenza vaccination among healthcare workers in Srinagar, India" found that influenza vaccine coverage was low in Srinagar even though 95% of the participants believed that the vaccine was beneficial. [9] In our study, doctors' recommendation was the biggest motivating factor(69.73%) to get vaccinated, and participants stated that they would be more likely to receive a vaccine if their primary care physician recommended it. They said that they would have more faith in the benefits of the vaccine if the physician has also received it.

Additionally, it was seen that 349(63.45%) of the urban participants would be ready to receive vaccinations if it was compulsory while only 66(39.52%) of the rural participants would do so. This was attributed to the higher degree of misconceptions about vaccines, as it was seen that 106(63.47%) of the rural participants would skip vaccines if they heard about side effects, in contrast to just 204(37.1%) of the urban participants. The rural population had a relatively lesser education than urban one. We noted that the level of knowledge in science and biology knowledge in particular was less among the rural participants. Thus, this could also be a factor affecting the spread of misconceptions. In spite of all this, 581(81.03%) participants have reported vaccination being vaccinated atleast once in their life and 394 of these participants had received any one form of the Sars Cov19 vaccine, which is a testament to what raising awareness and the involvement of the government can do to people's beliefs.

Out of the 717 participants, 454 were married and among them, 224(49.33%) said they would skip vaccinations if there were side effects while 86(32.7%) of the 263 unmarried participants would. When questioned as to why, the married participants stated that they were either the breadwinners of their family or felt a responsibility to their family and could not risk potential harm. Unmarried participants had no such inhibitory factors and said that they would be willing to suffer from the side effects if it was beneficial in the long run.

On whether women would receive a vaccine if their doctor recommended it, 197(65.88%) of them would get vaccinated

while 48(16.05%) of them wouldn't. This could be attributed to their having a level of trust in their doctors. However, they would receive it only if their obstetrician suggested it and not otherwise. Apart from this, table 7 shows the gender wise differences in behavior in response to vaccine side effects.

	Number of participants who would skip vaccines on hearing about side effects
Males	190(45.45%)
Females	120(40.13%)

Overall, 363(86.84%) out of 418 men were vaccinated while 263(87.95%) out of 299 females were vaccinated at least once in their life. When interviewed, it was seen that males had a better access to information due to better access to smartphones and on account of going out for jobs which allows for more interaction with peers who would influence them to a certain degree. Females, on the other hand, were more likely to stay at home, thus reducing their interaction with peers. Table 8 shows how employment status affects vaccination rate as per the responses in our study.

	Total	Males	Females
Employed who have received a vaccine	346	237(86.11%)	109 (93.16%)
Unemployed who have received a vaccine	238	88(89.89%)	150(82.41%)

During the COVID-19 pandemic, employer mandated vaccination played a major role in the vaccine acceptance among the general population. Private companies are entitled to make their own rules across the world and this was reinforced during the COVID-19 pandemic. While there have been concerns raised about the ethical implications of this process, it is currently still practiced in countries across the world, including India.[10] In table 8, we have listed the statistics obtained from our responses. Males form a huge component of the Indian workforce and the higher number of employed men who were vaccinated compared to the unemployed men could indicate the importance of workplace policies.[11] Additionally, our interpretation of these statistics is that males being considered the heads of families in India, and if they were vaccine compliant, it could have a positive effect on their families.

Limitations:

Our study was an attempt to understand the current scenario regarding the public perception of vaccines and has found some data that can be helpful going further to improve adult vaccination efforts. The study included a relatively small sample size, as only 717 responses were collected, which may not be fully representative of the population in South India. The study was conducted in an urban tertiary care hospital, which may introduce selection bias and limit the generalizability of the findings to other settings. The authors took precautions such as having the participants fill the questionnaire in their presence to avoid confusions, but since the study relied on self-reported data, it is subject to recall and response biases. The questionnaire was administered in the outpatient rooms, which may have influenced the participants' responses and may not reflect their true knowledge, attitudes, and practices outside of the healthcare setting.

CONCLUSION:

This cross-sectional study was an attempt to understand the public perception of adult vaccines in India currently. This is relevant now more than ever as the world is still grappling with the effects of a global pandemic. With the data obtained in terms of what could be perceived as reliable sources of information, it can be used to plan out further policies to improve awareness among citizens. Gender-wise studies provide an insight into further nuances that are needed for policy-making and importance of having different approaches to different population groups. The key to

reducing a country's healthcare costs lies in preventing diseases and vaccination is an effective mode of prevention which should be explored further.

Conflict of interest:

No conflict of interest was reported among authors.

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