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Knowledge And Awareness About The Need To Take Covid-19 Vaccination Among General Population - A Cross Sectional Survey

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ABSTRACT

BACKGROUND: Getting immunised is very important for the community as it is a shield that covers the body from getting infected. Some of the early age mortality disease spread is still prevailing. Creating awareness through the survey can inculcate the importance of getting vaccinated. **AIM:** To assess the Knowledge and awareness of the general public on the necessity and benefits of getting vaccinated against COVID-19. **MATERIALS AND METHODS:** The population of age between 18- 40 was considered for the survey which was taken electronically- a Pre-tested, structured questionnaire containing 8 questions was sent to the participants. The data collected was tabulated and parameters were analysed by Pearson's chi-square test using the IBM SPSS software (version 23). **RESULTS:** About 28.13% are not aware about the necessity and benefits of getting vaccinated. And about 43.75% have not taken any vaccination in the course of time while 35% had ill effects after getting vaccinated. And about 38.13% have tested negative for COVID-19 in which 21.88% of females and 41.25% of males have tested negative in which 15.63% of people aged to 18-20, 33.75% of people aged to 20-30 and 13.75% of people aged to 30-40. **CONCLUSION:** The overall awareness level of the people was inadequate. Educating the public through awareness programs, camps and research programs can improve their attitude and perception towards vaccination. Increasing knowledge and benefits of COVID-19 vaccination would ensure widespread, positive uptake of them.

KEYWORDS: Awareness, Benefits, Covid- 19 Vaccine, Immunisation, Innovative study

INTRODUCTION

Vaccination is the administration of a vaccine to help the immune system develop protection from a disease, representing one of the most significant and cost-effective public health interventions in human history. Vaccines are biologically prepared pharmaceutical products designed to increase the immunity against particular diseases and are prepared from materials typically resembling disease-causing microorganisms, including weakened or killed forms of the microbes, their toxins, or surface proteins, which stimulate the immune system to recognize and destroy the harmful pathogens upon future exposure (1). The fundamental principle underlying vaccination is immunological memory—the ability of the adaptive immune system to mount a rapid and robust response upon re-encounter with a pathogen that has been previously

encountered through vaccination or natural infection. Vaccines are prepared from weakened or killed microbes, or from purified components of microbes, that have been rendered non-pathogenic while retaining their immunogenicity, ensuring that they can stimulate protective immunity without causing the disease itself. By inducing herd immunity when sufficient proportions of the population are vaccinated, immunization programs prevent deadly contagious diseases from spreading within communities, protecting not only vaccinated individuals but also vulnerable persons who cannot be vaccinated due to medical contraindications. Enhancing the information about vaccines that is distributed in the market and through public health channels helps people make proper decisions about their own health and the health of their families, countering misinformation and building trust in immunization programs (2).

The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, has represented one of the most profound global health crises of the modern era, threatening not only the human body through acute illness, long-term complications, and mortality, but also fundamentally disrupting human beings' day-to-day life activities and livelihood on an unprecedented scale. The pandemic has decimated jobs across virtually every economic sector and placed millions of livelihoods at risk through business closures, supply chain disruptions, and economic contraction. These impacts have disproportionately affected workers in the formal economy who lost employment protections, as well as those in poorly protected and low-paid jobs who lacked safety nets, including youth entering the workforce, other workers in precarious employment, and migrants separated from their families and support systems. In this context, vaccination remains a key preventive measure to reduce disease burden on healthcare systems, prevent morbidity and mortality, and mitigate future outbreaks that could further destabilize societies and economies. If not vaccinated, individuals remain susceptible to infectious diseases that can make you very sick, requiring hospitalization and intensive care, cause you permanent disability affecting quality of life, or even kill you despite advances in medical treatment. It is important to acknowledge that not all vaccines are completely effective, as biological systems are complex and individual responses vary. For example, clinical trials and real-world effectiveness studies have demonstrated that the COVID-19 vaccines are approximately 90% effective at preventing symptomatic infection, though efficacy varies by vaccine type, viral variants, and individual factors. This means that some people who are vaccinated might still get disease symptoms if they are exposed to the virus, a phenomenon known as breakthrough infection. However, if this happens, extensive evidence shows that vaccinated people get less severe symptoms, have lower rates of hospitalization and death, and usually recover more quickly than unvaccinated individuals, underscoring the continued benefit of vaccination even when sterilizing immunity is not achieved (3).

Vaccines work really well against disease-causing microbes, representing one of the most successful medical technologies ever developed, but no medicine can be perfect due to the inherent complexity of human biology and pathogen variability. However, most childhood vaccines produce immunity in approximately 90 to 100 percent of recipients when administered according to recommended schedules, providing robust protection against diseases that were once leading causes of childhood mortality and morbidity (4). Our body has its own sophisticated immune system, where once attacked by a disease it has its own defense mechanism called immunological memory or 'memory attacks,' referring to the ability of memory B cells and T cells to recognize previously encountered pathogens and mount accelerated responses. When this natural memory is established through infection, subsequent exposure may not require vaccination for protection, though the risks associated with natural infection often far exceed those of vaccination. The presence of unvaccinated population threatens the health protection of the community and its safety by creating reservoirs of susceptible individuals that can sustain transmission chains and by reducing herd immunity, which protects vulnerable persons who cannot be vaccinated due to age, medical conditions, or treatment contraindications (6). Extensive campaigns were conducted in order to vaccinate people door to door by organizations such as UNICEF in the USA and globally, employing community health workers to reach underserved populations and overcome barriers to access (7). The government of India launched an expanded programme for immunization in 1978 with the goal of providing universal access to vaccines for all children, and this initiative became a key area under the National Rural Health Mission, which works to strengthen healthcare delivery in rural areas (8). Despite these long-standing efforts and significant progress,

India is still experiencing some of the highest preventable childhood mortality of any country in the world, indicating substantial gaps in immunization coverage and healthcare access that must be addressed (9).

The major drawback that India faces in achieving universal immunization is the lack of awareness of vaccination and its benefits among large segments of the population, compounded by the challenge of making coverage available to the entire population due to the country's immense geographical diversity, including remote rural areas, urban slums, and regions with limited healthcare infrastructure (10). The other reasons for suboptimal immunization coverage include inadequate health response at the community level, lack of accountability among healthcare providers and administrators, inadequate supervision and monitoring of immunization activities, lack of micro planning at district level that accounts for local barriers and resources, and lack of coordination between state and central government leading to inconsistent implementation. Falsification and over-reporting of vaccine coverage rates are some of the big threats that make people question the integrity of immunization data, think about security of the information, and interfere with minds, undermining trust in the healthcare system and public health messaging (11). To overcome all these barriers and achieve the goal of universal immunization, it is very important to make people more aware about vaccines and their benefits through culturally appropriate health education, community engagement, and transparent communication.
For many people, vaccination attitudes are shaped not only by healthcare workers and official public health messaging but also by other informational sources including social media, family and friends, religious and community leaders, and increasingly, online platforms where misinformation can spread rapidly. The anxiety while getting vaccination is more pronounced among young people and aged individuals, as hesitation to the injection prevails in many despite awareness of the benefits and knowledge about vaccine-preventable diseases (12). This anxiety can be a barrier to vaccine acceptance even when vaccines are available and accessible, highlighting the need for strategies to address fear and build confidence in vaccination. Our team has extensive knowledge and research experience that has translated into high-quality publications in the fields of public health, infectious diseases, and health behavior, providing a strong foundation for the current investigation (13)(14)(15)(16)(17)(18)(19). The current study aims to evaluate the knowledge and awareness of the general population about getting vaccinated against COVID-19, identifying gaps in understanding and factors associated with vaccine acceptance or hesitancy. By characterizing these knowledge and awareness patterns, the study will generate evidence to inform targeted health communication strategies and improve vaccine uptake in the ongoing pandemic response and future immunization efforts**.**

MATERIALS AND METHODS

Study Design and Questionnaire Development

A cross-sectional study design was employed to assess the knowledge, awareness, and attitudes of the general population regarding COVID-19 vaccination. This design is appropriate for capturing a snapshot of current perspectives and identifying factors associated with vaccine acceptance at a specific point in time. A close-ended, standardized questionnaire was carefully prepared based on a thorough review of existing literature, consultation with public health experts, and consideration of the specific objectives of this study. The questionnaire was designed to be comprehensive yet concise, ensuring that participants could complete it within a reasonable time frame while providing meaningful data for analysis.
The questionnaire consisted of 8 questions covering key aspects related to COVID-19 vaccination, including history of previous vaccination, knowledge about vaccine efficacy and safety, attitudes toward getting vaccinated, sources of information influencing vaccination decisions, and perceptions of barriers to vaccine access. The questions were formulated using simple, unambiguous language to ensure comprehension across diverse educational backgrounds, and response options were designed to capture the full range of possible answers while maintaining clarity for statistical analysis. The questionnaire was developed in English, given the literacy requirement for participation, and was pre-tested on a small sample of individuals to assess clarity, comprehensibility, and completion time before being deployed for the main study.

Data Collection

The finalized questionnaire was converted into an electronic format and circulated using an online platform, specifically Google Forms, which offers several advantages for data collection including widespread

accessibility, automated data entry, and convenience for participants. Google Forms allows for the creation of visually appealing, user-friendly surveys that can be accessed through any device with internet connectivity, including smartphones, tablets, and computers, maximizing the potential reach of the study. The survey link was distributed through various channels including social media platforms, email lists, and messaging applications to reach a diverse cross-section of the population. Only the literate population was considered for inclusion in this study, as the self-administered questionnaire required the ability to read and comprehend the questions independently. This criterion was necessary to ensure the validity of responses and to avoid biases that could arise from interviewer-administered data collection.

To minimize sampling bias and enhance the representativeness of the sample, random sampling was employed in the distribution and collection of responses. The survey link was shared broadly, and responses were collected anonymously to encourage honest and candid answers without fear of judgment or repercussion. The anonymous nature of the survey was emphasized in the introductory section of the questionnaire, along with an explanation of the study purpose, the voluntary nature of participation, and assurances of data confidentiality. Participants were required to provide informed consent by acknowledging their understanding of these terms before proceeding to the questionnaire items.

Sample Size and Participant Selection

The sample size for this study was determined based on practical considerations of feasibility and the need to obtain sufficient statistical power for detecting meaningful associations. A target of approximately 200-300 responses was established to ensure adequate representation across demographic subgroups and to enable robust statistical analysis. Participants were eligible for inclusion if they were adults aged 18 years or older, were literate in English, and voluntarily agreed to participate in the study by completing the online questionnaire. No exclusion criteria were applied regarding gender, occupation, or socioeconomic status, as the goal was to capture a broad cross-section of the general population.

Data Management and Statistical Analysis

Upon completion of data collection, the responses from Google Forms were exported directly into a Microsoft Excel spreadsheet, ensuring accurate transfer without manual data entry errors. The data were carefully reviewed for completeness and consistency, with any incomplete responses or obvious errors flagged for review. The cleaned and coded data were then imported into Statistical Package for the Social Sciences (SPSS) software version 23.0 for Windows (IBM, Chicago, USA) for comprehensive statistical analysis. SPSS is a powerful and widely used statistical software package that offers a range of descriptive and inferential statistical procedures suitable for health research.Descriptive statistics were performed to present the frequency distribution of the options for each question item, providing an overview of the sample characteristics and the patterns of responses across the study population. Frequencies and percentages were calculated for categorical variables, providing a clear picture of how participants responded to each question. These descriptive statistics form the foundation for understanding the knowledge, awareness, and attitudes of the study population and allow for initial identification of trends and patterns.

Additionally, Pearson's chi-square test of association was performed to examine the influence of education level on awareness about vaccination and the measures taken among the participants. This statistical test is appropriate for analyzing the relationship between two categorical variables, in this case, educational attainment (categorized into groups such as high school, undergraduate, postgraduate) and various indicators of vaccine awareness and acceptance. The chi-square test compares the observed frequencies in each category with the frequencies that would be expected if there were no association between the variables, providing a statistical measure of the strength of evidence for a relationship. A p-value of less than 0.05 was considered to be statistically significant, indicating that the observed association is unlikely to have occurred by chance alone. This threshold is conventional in health research and provides a balance between detecting meaningful associations and avoiding false-positive findings.

The results of the chi-square analyses will identify whether educational level is a significant determinant of vaccine awareness and attitudes, providing insights that can guide targeted educational interventions. If significant associations are found, this would suggest that efforts to improve vaccine uptake should consider tailoring messages and approaches to different educational groups. Conversely, if no significant associations

are found, this would indicate that vaccine awareness is more uniformly distributed across educational levels and that other factors may be more important determinants of vaccination behavior. The combination of descriptive and inferential statistical analyses provides a comprehensive understanding of the factors influencing COVID-19 vaccination knowledge and attitudes in this population and generates evidence to inform public health policy and practice.

RESULTS:

In total, 104 participants responded. Where 27.50% of the participants in 18-20 years, 48.13% of the participants in 20-30 years and 24.38% of participants in the 30-40 years age group. 57.50% of participants were male and 42.50% of them were females. The results were concluded based on the responses from the participants. About 38.07% of participants have agreed that their local representatives have taken initiative to get them vaccinated (Fig.1). About 39.75% of participants were aware of the benefits of vaccines (Fig.2) which includes 26.25% of males and 13.13% of females. (Fig.2a) , the majority age group of 20-30 about 21.88% of participants were aware (Fig.2b). While 65% of the participants stated that there was no ill effect after getting vaccinated (Fig.3) in which 41.14% of males and 23.42% of females said no ill effects (Fig.3a), the participants of the age group 20-30 about 33.54% said no ill effects (Fig.3b). About 58.13% of participants prefer private hospitals over government hospitals for getting vaccinated (Fig.4).Due to the post COVID-19 scenario, as the spread of rumors about vaccines are more, 34.38% of participants yet to decide whether to get vaccinated (Fig.5) in which 11.25% of females and 23.13% of males, yet to decide about vaccination (Fig.5a) and the age group of 20-30 19.38% of participants were yet to decide whereas 16.88% of the same age group have taken the vaccine (Fig.5b). About 38.13% have tested negative for COVID-19 (fig.6). Since other vaccinations are also important for the community about 43.75% stated no for other immunisations such as for rabies, swine flu, chicken pox etc.,(Fig.7). As for the government response, it is more important for the pandemic situation about 37.50% of the participants stated that the rate of government response is normal (3.0) and about 20.63% of participants stated that governmental actions are extraordinary (5.0) (Fig.8).

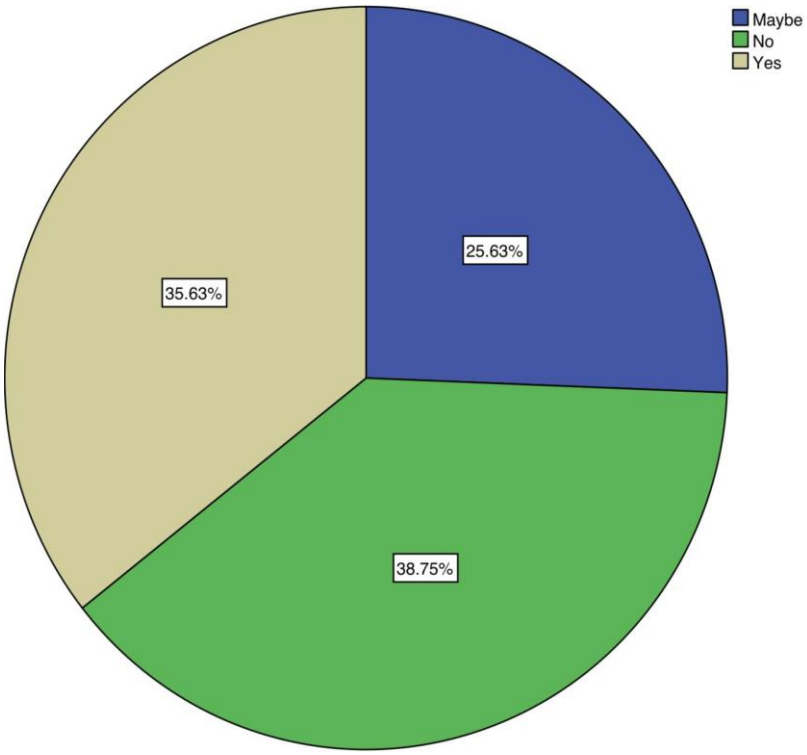

Figure 1: Pie chart represents the response of the study participants regarding the initiatives taken by their local representatives to get them vaccinated against COVID-19. Beige denotes 'yes', green denotes 'no' and blue denotes 'may be'. Majority of the participants (38.75%) completely disagreed, 35.63% of the participants agreed whereas 25.63% of the respondents were not aware of any initiatives.

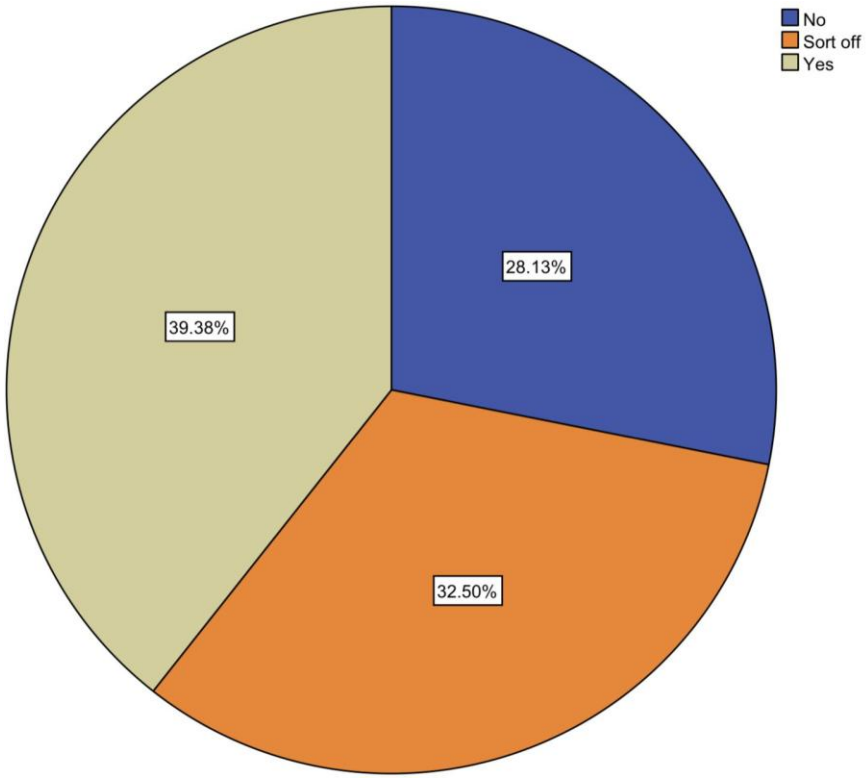

Figure 2: Pie chart representing the awareness about the benefits of getting vaccinated. Beige denotes 'yes', Blue denotes 'no' and Orange denotes 'sort of'. 39.38% of participants were aware whereas 32.50% were not sure and 28.13% were not completely aware of the benefits of vaccination.

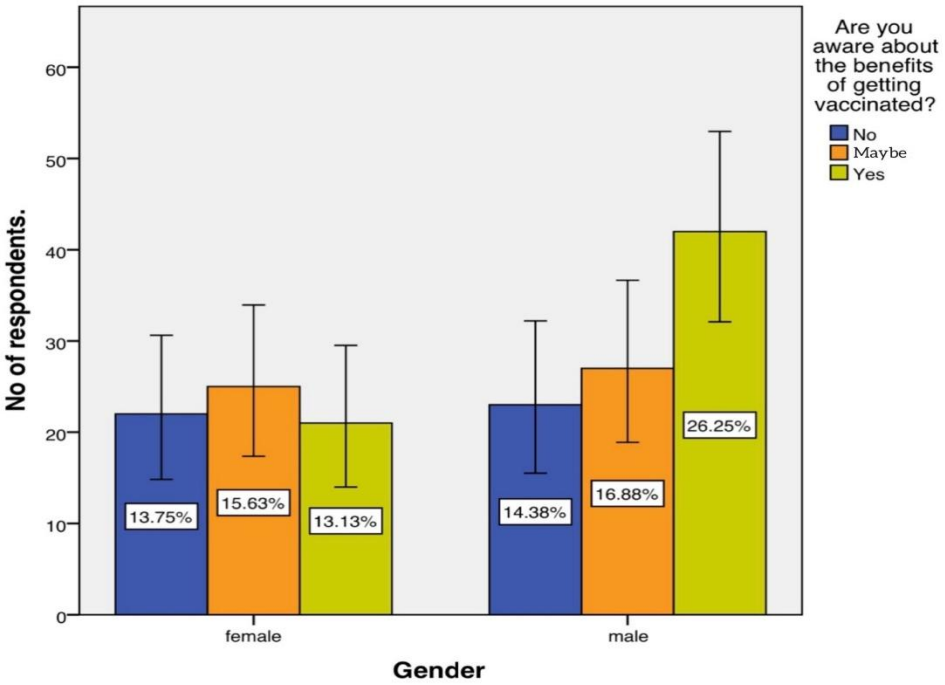

Figure 2a: Bar graph represents the percentage of male and female participants aware about the benefits of getting vaccinated. The X axis denotes the gender of the participants and the Y axis denotes the number of the participants. Where 'Blue' depicts no, 'Orange' depicts maybe and 'Beige' depicts yes. 26.25% of males and 13.13% of females were aware ; 13.75% of males and 14.38% of females were not aware .This

difference between the groups was statistically significant (chi-square test; p value=0.04)revealing that there's a significant percentage of people who are not aware of the benefits of vaccination.

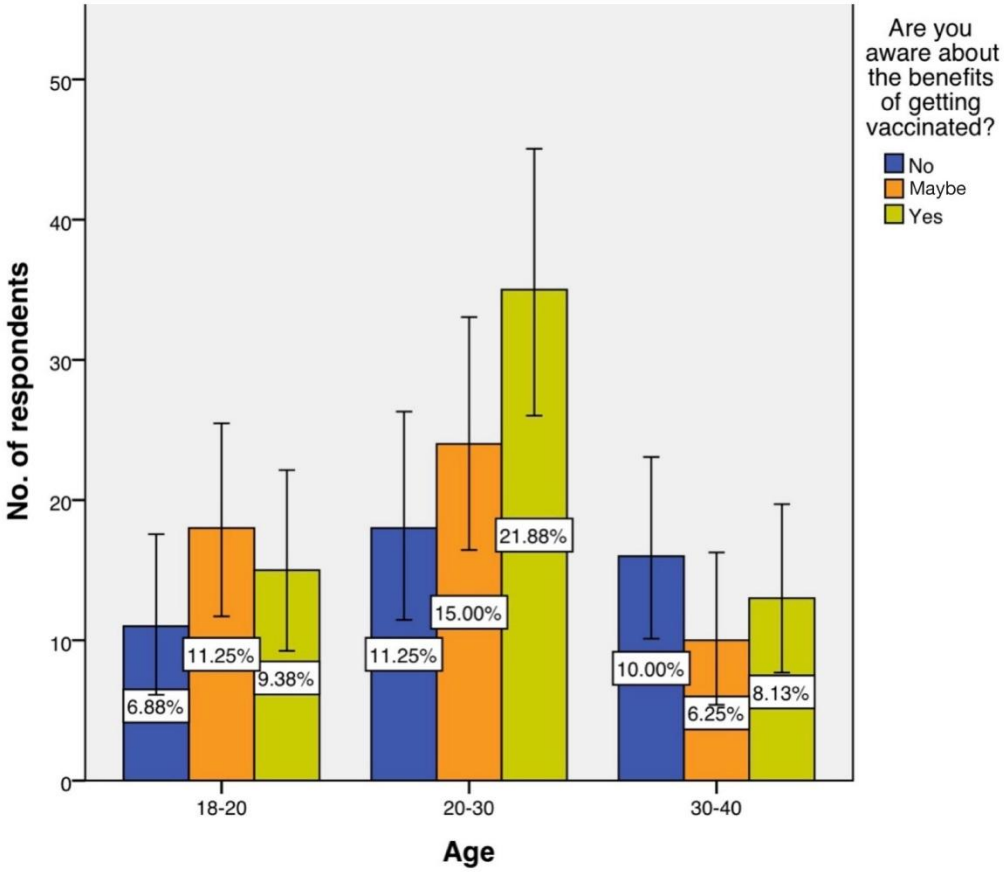

Figure 2b: Bar graph represents the percentage of participants according to age. The X axis denotes the age group of participants aware about the benefits of getting vaccinated and the Y axis represents the number of participants. 'Blue' depicts no, 'Orange' depicts 'maybe' and 'Beige' depicts yes. About 9.38% of people aged to 18-20, 21.88% of people aged to 20-30 and 8.13% of people aged to 30-40 are aware about the benefits of getting vaccinated whereas about 6.88% of people aged to 18-20; 11.25% of people aged to 20-30 and 10% of people aged to 30-40 are not aware about the benefits of getting vaccinated. This difference was statistically significant (chi-square test; p value =0.04) implying that there's a significant percentage of people who are not aware of the benefits of vaccination.

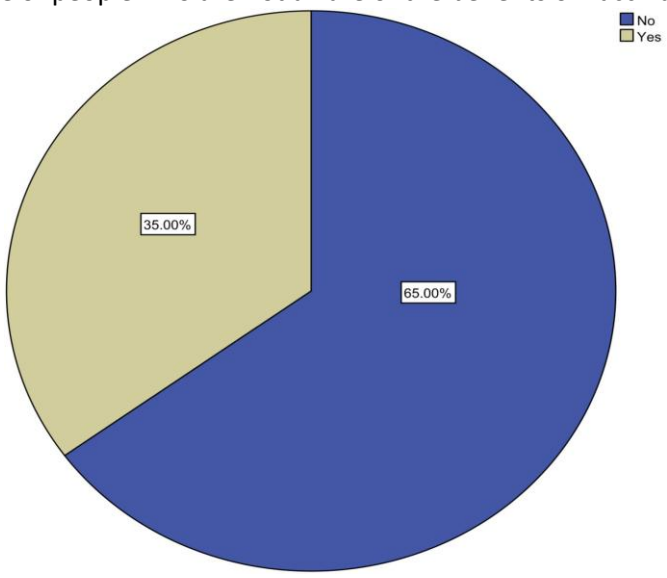

Figure 3: Pie chart represents the percentage of participants whether they have any sort of adverse side-effects after getting vaccinated against COVID-19. Blue denotes 'no' and Beige denotes 'yes'. 65% of participants did not experience any adverse side-effects after getting vaccinated whereas 35% of participants had experienced various side-effects after getting vaccinated against COVID-19.

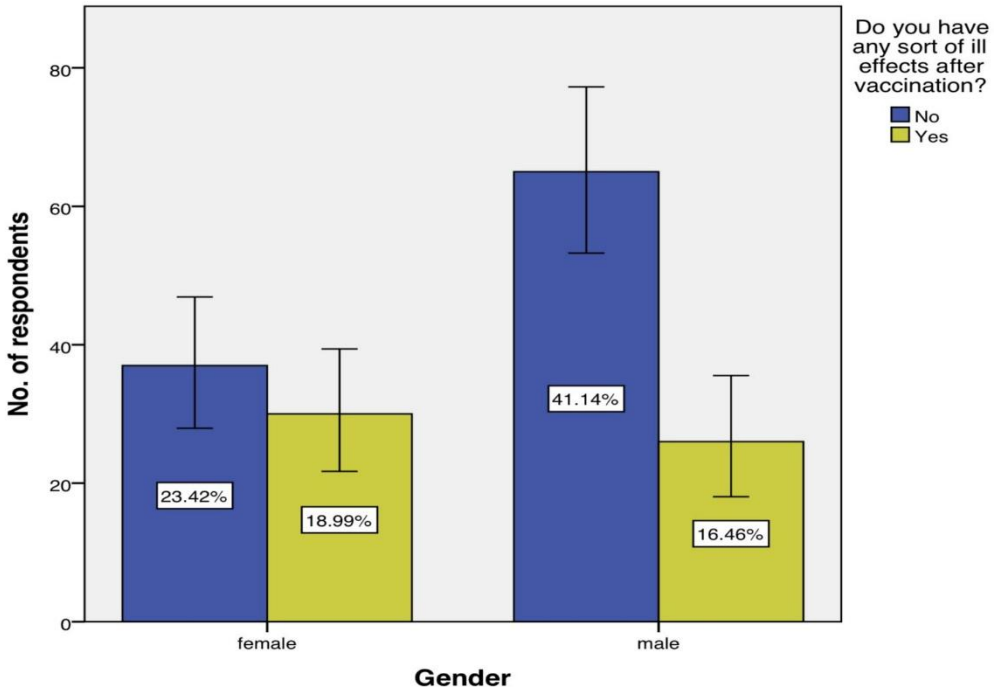

Figure 3a: Represents the percentage of male and female participants. Where the X axis denotes the gender of the participants who have any sort of ill effects after getting vaccinated and Y axis represents the number of the participants. 'Blue' depicts no and 'Beige' depicts yes. About 23.42% of females and 41.14% of males did not have any sort of ill effects after getting vaccinated whereas 18.99% of females and 16.46% of males did have some sort of ill effects after getting vaccinated. This difference was statistically significant (chi-square test; p value =0.04)there's a significant percentage of people who do not have any ill effects after getting vaccinated.

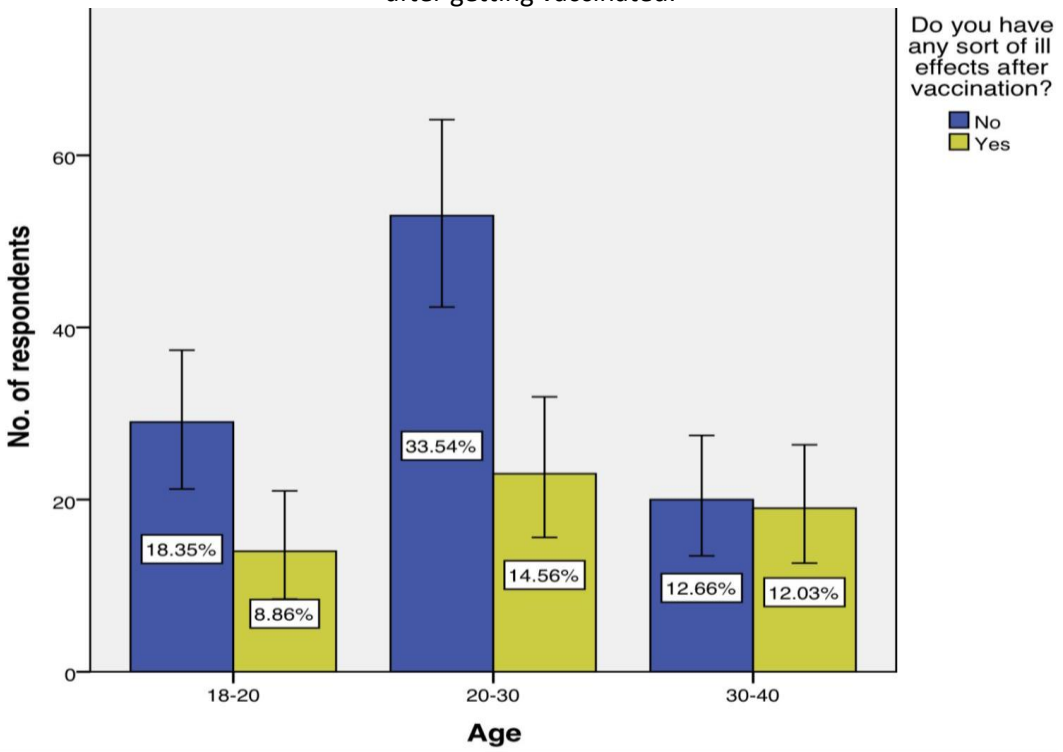

Figure 3b: Bar graph represents the percentage of participants according to age. Where the X axis denotes participants who have any sort of ill effects after getting vaccinated and Y axis represents the percentage of

the participants. 'Blue' depicts no and 'Beige' depicts yes. About 18.35% of people aged to 18-20, 33.54% of people aged to 20-30 and 12.66% of people aged to 30-40 did not have any sort of ill effects after getting vaccinated whereas about 8.86% of people aged to 18-20, 14.56% of people aged to 20-30 and 12.03% of people aged to 30-40 did have ill effects after getting vaccinated. This difference was statistically significant (chi-square test; p value =0.04) there is a significant percentage of participants who did not have any ill effects after getting vaccinated.

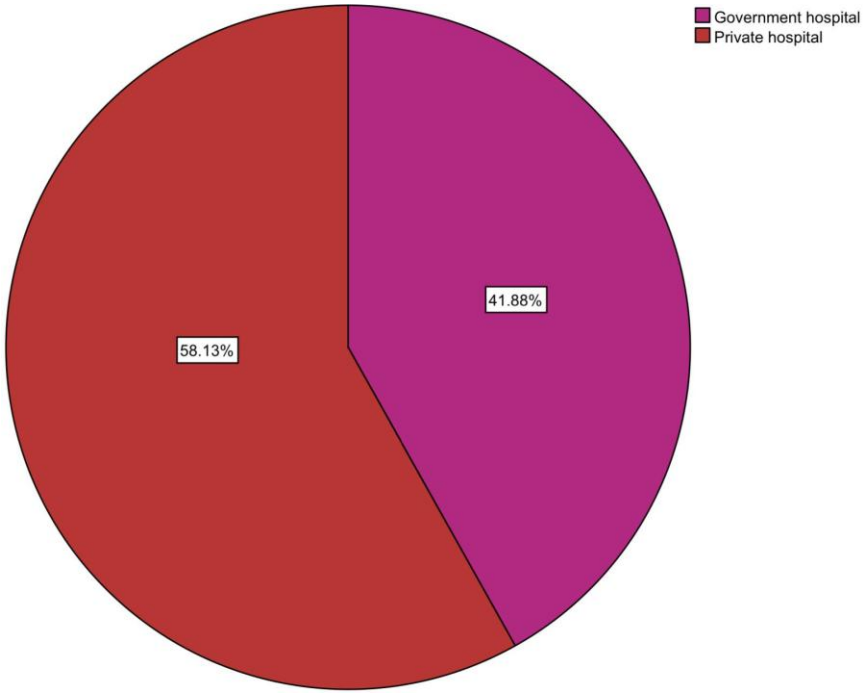

Figure 4: Pie chart represents the percentage of participants' preference of hospital for getting vaccination. Pink denotes 'government hospitals' and Red denotes 'private hospitals'. 58.13% of participants' prefer getting vaccinated in private hospitals whereas 41.88% of participants' prefer government hospitals for getting vaccinated.

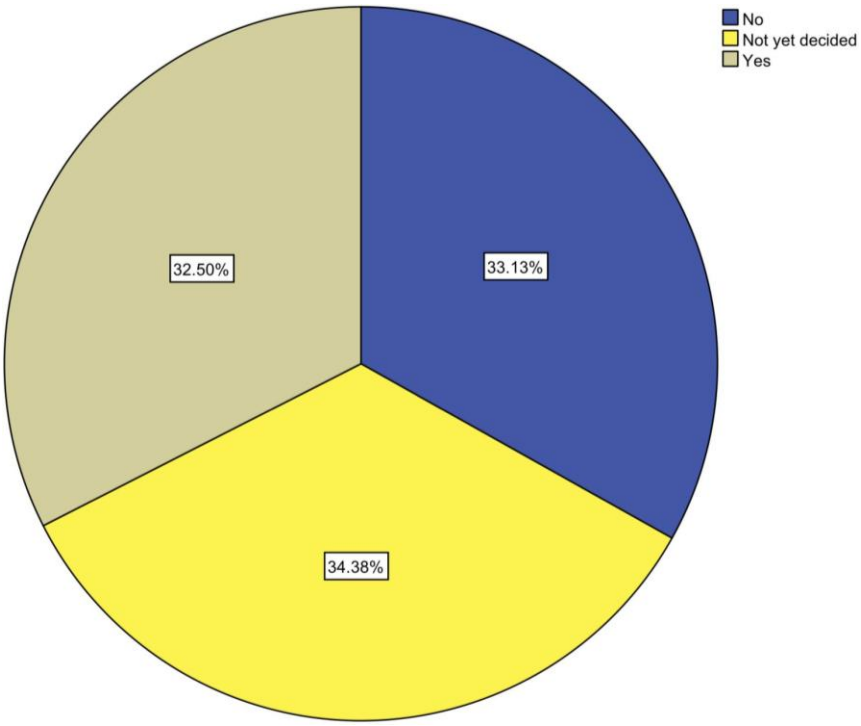

Figure 5: Pie chart represents the percentage of participants willing or not willing or yet to decide about getting COVID-19 vaccinated. Beige depicts 'yes', Yellow depicts 'not yet decided' and Blue depicts 'no'. About 34.38% have not yet decided about getting vaccinated, 33.13% not willing to get vaccinated and 32.50% willing to get vaccinated for COVID-19.

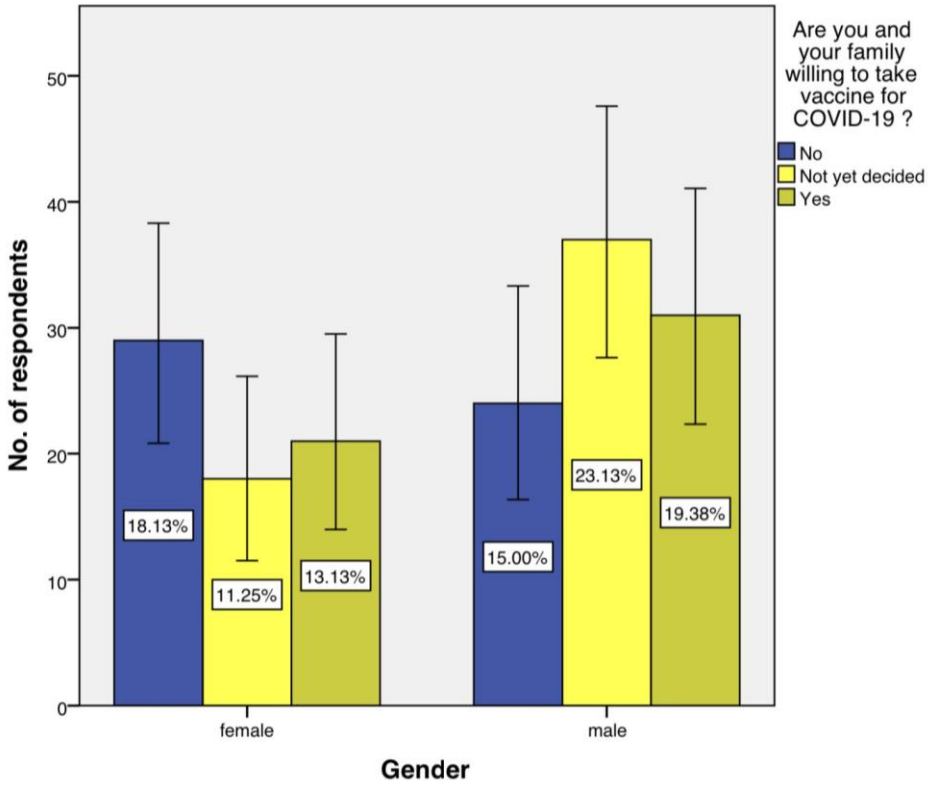

Figure 5a: represents the percentage of male and female participants. The X axis denotes the gender of the participants willing or not willing to get vaccinated and the Y axis represents the number of the participants. 'Blue' depicts no, 'Yellow' depicts not yet decided and 'Beige' depicts yes. About 18.13% of females and 15% of males have decided not to get vaccinated whereas 13.13% of females and 19.38% of males prefer to get vaccinated.This difference was statistically significant (chi-square test; p value =0.04) there is a significant percentage of male participants who are yet to decide about getting vaccination.

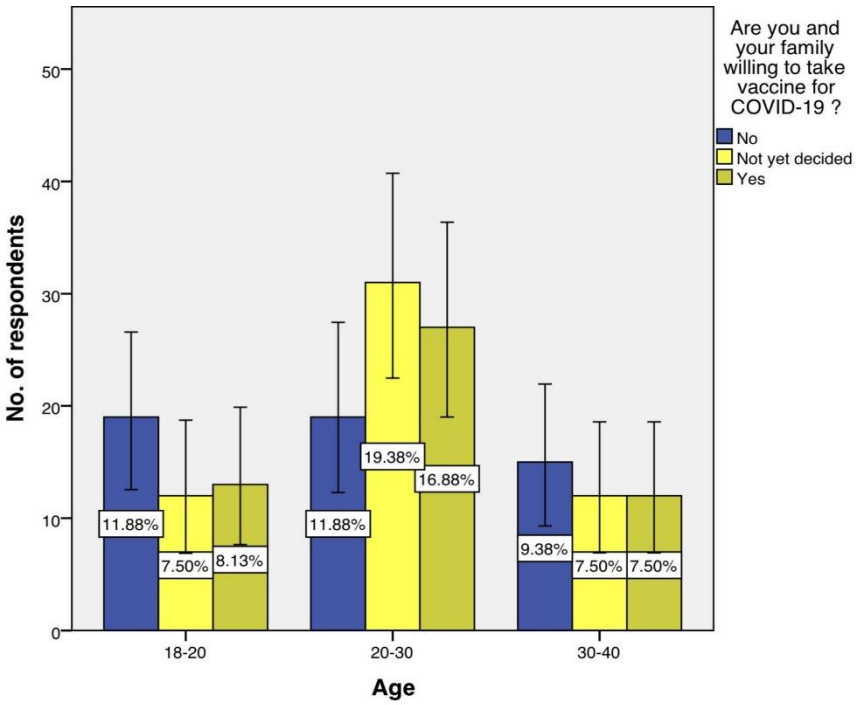

Figure 5b: Bar graph represents the percentage of participants according to age. Where the X axis represents the age group of the participants willing or not willing to get vaccinated and the Y axis represents the number of the participants. 'Blue' depicts no, 'Yellow' depicts not yet decided and 'Beige' depicts yes. About 11.88% of people aged to 18-20, 11.88% of people aged to 20-30 and 9.38% of people aged to 30-40 prefer not to get vaccinated whereas about 8.13% of people aged to 18-20, 16.88% of people aged to 20-30 and 7.50% of people aged to 30-40 prefer to get vaccinated. This difference was statistically significant (chi-square test; p value =0.04) there is a significant percentage of participants in the age group of 20-30 who are yet to decide about getting vaccinated.

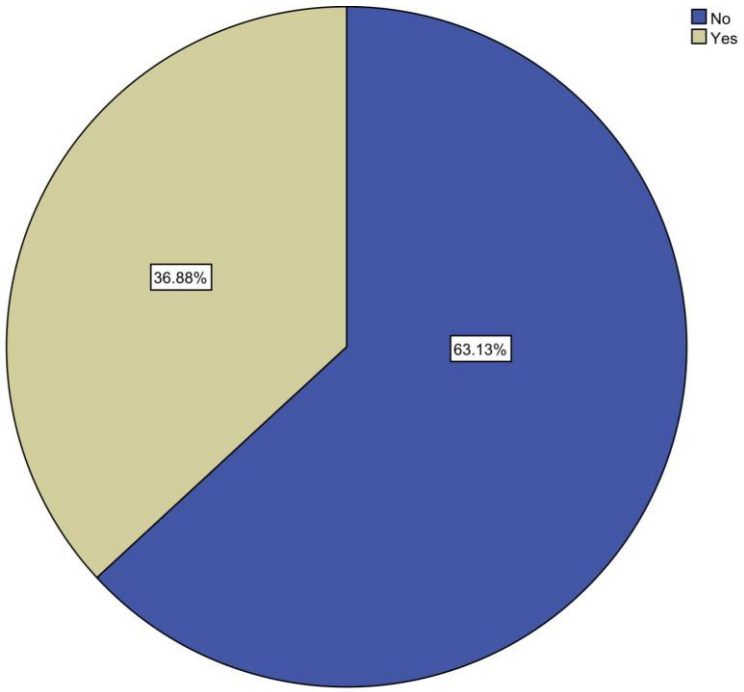

Figure 6: Pie chart represents the percentage of population tested positive for COVID-19. Blue depicts 'no' and Beige depicts 'yes'. About 63.13% have tested negative whereas 36.88% have tested positive for COVID-19

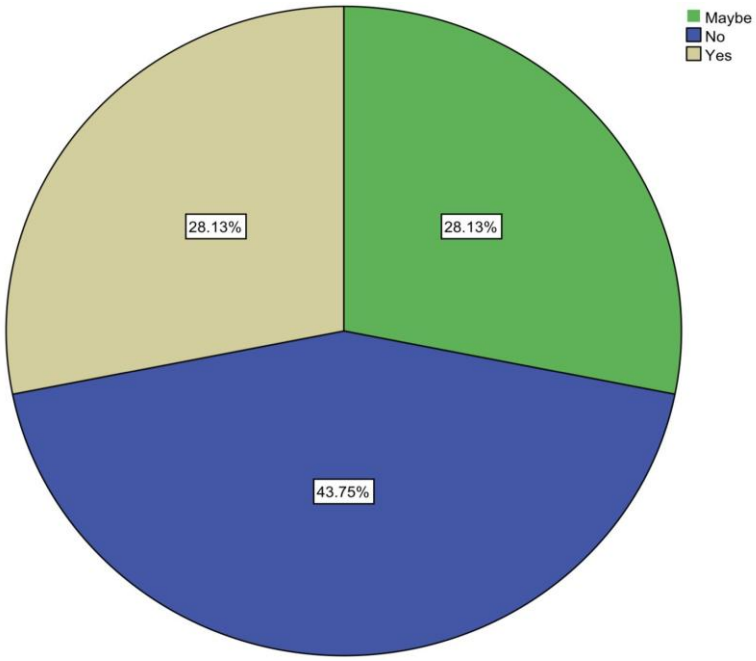

Figure 7: Pie chart represents the percentage of participants who took other vaccinations such as swine flu, rabies etc,. Beige depicts 'yes', Blue depicts 'no' and Green depicts 'maybe'. 28.13% of participants took other vaccines, 43.75% of participants have not taken other vaccines and 28.13% of participants may have taken other vaccines.

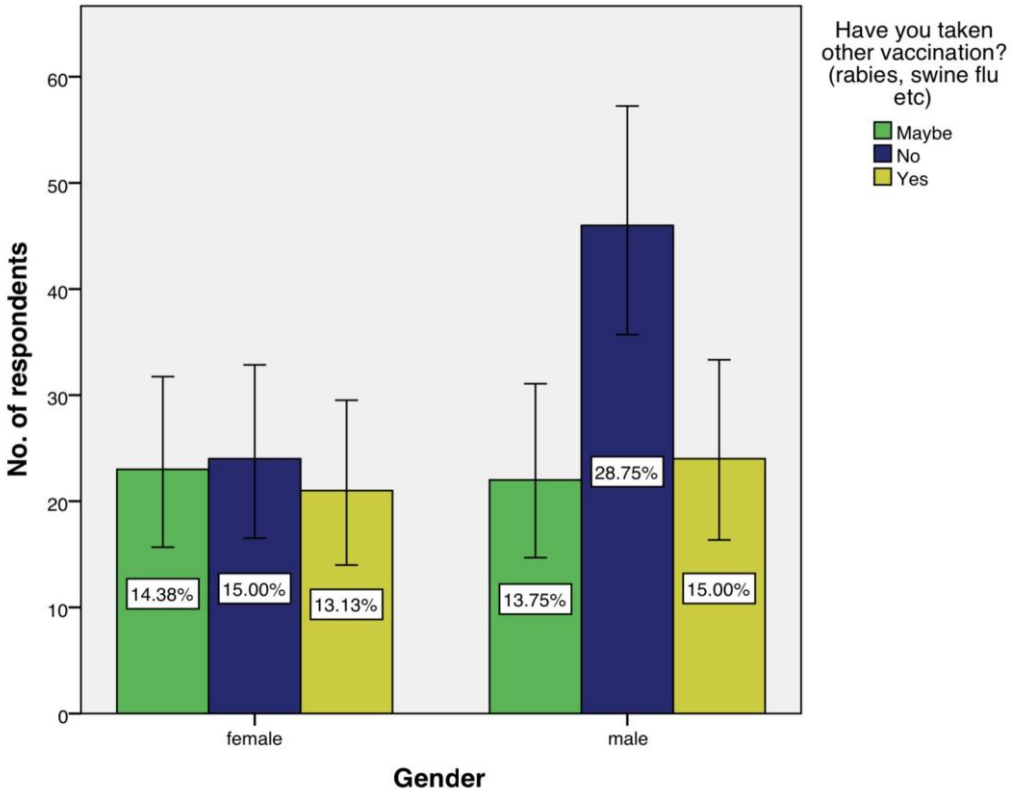

Figure 7a: represents the percentage of male and female participants.Where X axis denotes the gender of the participants who have taken other vaccines such as for swine flu and rabies etc and Y axis represents the number of the participants. 'Blue' depicts no, 'Green' depicts not yet decided and 'Beige' depicts yes. About 15% of females and 28.75% of males have not taken other vaccines whereas 13.13% of females and

15% of males have taken other vaccines. This difference was statistically significant (chi-square test; p value =0.04) there is a significant percentage of male participants who have not taken other vaccinations.

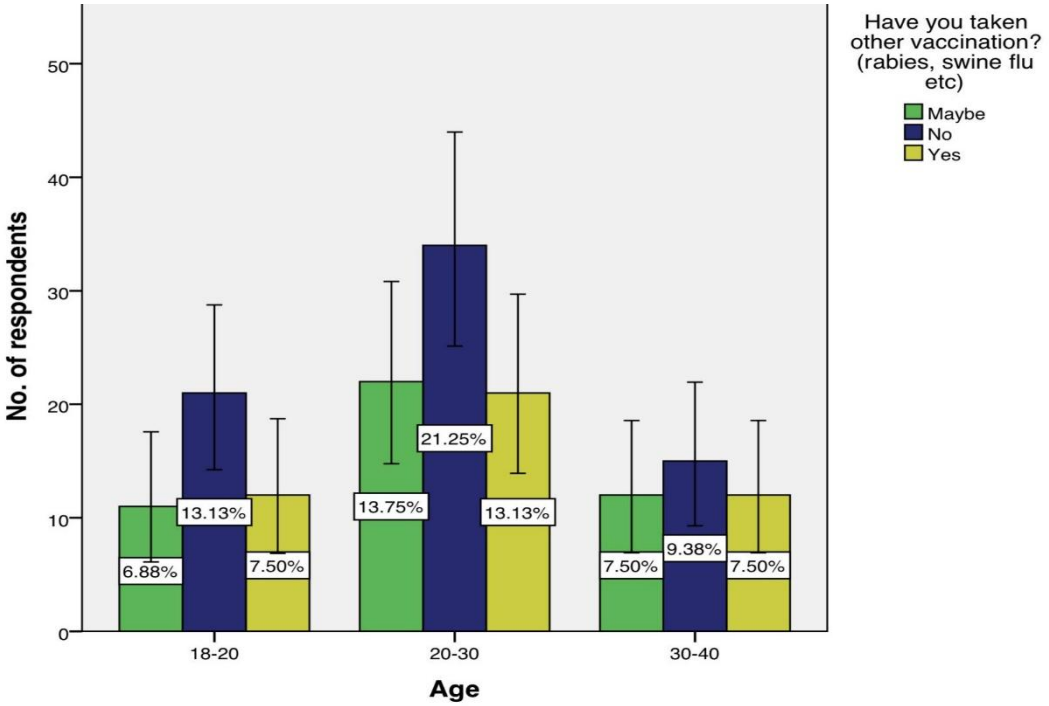

Figure 7b: Bar graph represents the percentage of participants according to age. Where X axis denotes the age group of the participants who have taken other vaccines such as swine flu and rabies etc and Y axis represents the number of the participants. 'Blue' depicts no, 'Green' depicts maybe and 'Beige' depicts yes. About 13.13% of people aged to 18-20, 21.25% of people aged to 20-30 and 9.38% of people aged to 30-40 have not taken vaccines whereas about 7.50% of people aged to 18-20, 13.13% of people aged to 20-30 and 7.50% of people aged to 30-40 have taken other vaccines. This difference was statistically significant (chi-square test; p value = 0.04) there is a significant percentage of participants in the 20-30 yr old age group who have not taken other vaccinations.

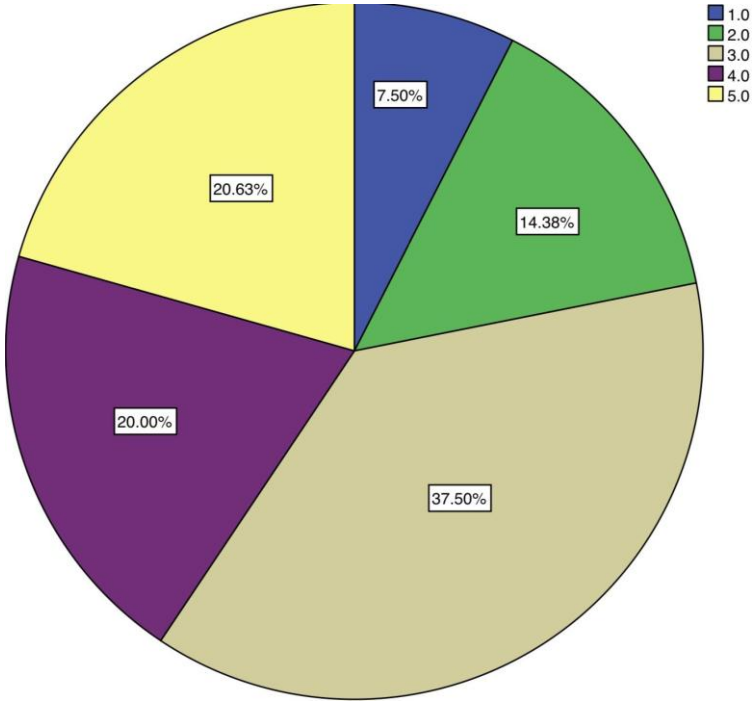

Figure 8: Pie chart represents the percentage of participants rate on governmental actions. Blue depicts '1.0', green depicts '2.0', beige depicts '3.0', purple depicts '4.0' and yellow depicts '5.0'. 7.50% have rated 1.0 on governmental actions, 14.38% have rated 2.0 on governmental actions, 37.50% have rated 3.0 on governmental actions, 20% have rated 4.0 on governmental actions and 20.63% have rated 5.0 on governmental actions.

DISCUSSION

The present study was undertaken to assess the knowledge, awareness, and attitudes of the general population regarding COVID-19 vaccination, providing valuable insights into the factors that influence vaccine acceptance and hesitancy during an ongoing public health crisis. The findings reveal important patterns in public perception, highlight gaps in understanding, and identify demographic variations that have significant implications for vaccination campaigns and health communication strategies. By comparing these results with existing literature, we can better contextualize the findings and develop evidence-based recommendations for improving vaccine uptake.

By the present study, approximately 39.75% of participants demonstrated awareness of the benefits of getting vaccinated, indicating that a substantial portion of the population possesses fundamental understanding of why vaccination is important for individual and public health protection. This level of awareness, while representing a significant minority, also reveals that nearly two-thirds of the population may have incomplete understanding of vaccine benefits, representing a critical target for educational interventions. Furthermore, 58.13% of participants expressed a preference for getting vaccinated in a private hospital setting, revealing important insights about healthcare facility preferences that have implications for vaccination program planning and resource allocation. This strong preference for private facilities may reflect perceptions of higher quality care, shorter waiting times, greater convenience, or higher trust in private healthcare providers compared to government hospitals.

In contrast to these findings, a related article reported substantially higher awareness levels, with approximately 98.8% of participants knowing the meaning of vaccination and 98.9% understanding the reason behind getting vaccinated as it helps in development of immunity (20). This dramatic difference in awareness levels between studies may reflect variations in study populations, geographic locations, timing of data collection relative to the pandemic trajectory, or differences in survey methodology and question framing. The much higher awareness in the referenced study suggests that under optimal conditions, near-

universal understanding of vaccination basics is achievable, highlighting the potential for improvement in the population studied here. Regarding healthcare facility preference, about 53.14% of participants in another study preferred taking vaccines in governmental hospitals, which is directly contradictory to the present study findings where private facilities were preferred by the majority (21). This discrepancy may reflect regional differences in healthcare infrastructure quality and accessibility, variations in public trust in government institutions, or differences in the populations sampled. Understanding the reasons underlying these differing preferences is important for designing vaccination programs that effectively reach diverse populations.

Regarding post-vaccination experiences, approximately 35% of participants in the present study stated that there were ill-effects after getting vaccinated, representing a substantial minority reporting adverse reactions. However, according to another study, about 98.6% of respondents reported that there was no ill-effect after getting vaccinated, indicating a much more favorable safety experience (22). This discrepancy may reflect differences in the specific vaccines administered, variations in how side effects were defined and reported, genuine differences in reactogenicity across populations, or recall bias. The higher rate of reported ill-effects in the present study, whether reflecting true experience or heightened awareness of potential side effects, could contribute to vaccine hesitancy and requires attention through transparent communication about the expected frequency and nature of vaccine reactions.

Mission Indradhanush was launched in December 2014 by the Ministry of Health and Family Welfare, Government of India, as a ambitious initiative to reduce the child deaths occurring due to vaccine preventable diseases by targeting underserved and hard-to-reach populations. This comprehensive program aimed to achieve more than 90% full immunization coverage in children by the year 2020 through intensified vaccination campaigns, improved micro-planning, and enhanced monitoring and supervision (23). The existence of such programs demonstrates government commitment to immunization, yet the ongoing challenges in achieving universal coverage highlight the need for continued efforts and innovative approaches to reach all segments of the population.

The importance of accessible health communication is underscored by the recommendation that posters should be put up in hospitals in the local language to spread awareness about vaccination, ensuring that information reaches individuals regardless of their literacy level in English or other languages. This simple yet effective intervention can help bridge knowledge gaps and reinforce messages delivered by healthcare providers. The urgency of such efforts is highlighted by the finding that approximately 73.4% of people in our country are not aware of the leading reason why we need to get vaccinated, representing a massive knowledge deficit that undermines immunization efforts (24). Even among people who were generally aware about vaccines, some of the in-depth knowledge lacks, such as the ability to identify which specific vaccine prevents which respective disease, indicating that superficial awareness does not necessarily translate into comprehensive understanding. In a previous survey conducted by researchers, approximately 48.76% of participants were able to correctly identify the right vaccine for the appropriate disease, demonstrating significant gaps in specific vaccine knowledge (25). In another survey conducted among adults aged greater than 19 years, awareness levels varied substantially across different vaccines, with approximately 63.4% to 94% reporting awareness about HPV vaccine, 71.5% aware about tetanus vaccination, 72% aware about pertussis, 75.4% aware about herpes zoster vaccine, 75.8% aware about hepatitis B vaccination, and 83.1% aware about pneumonia vaccination (26). These variations highlight that vaccine awareness is not uniform and that education efforts must be tailored to address gaps for specific vaccines. Hence, the awareness that vaccines prevent diseases, and the specific knowledge about which vaccines protect against which diseases, is very much important for informed decision-making and optimal vaccine uptake.

Rumors and misinformation that prevent people from getting vaccinated are very tiresome and represent a persistent challenge to public health efforts worldwide. The impact of misinformation can be severe, as demonstrated by a survey where misinformation about Human Papillomavirus vaccine safety led to the suspension of a Japanese government vaccination campaign, which was called off despite the proven benefits of HPV vaccination for cancer prevention (27). This real-world example illustrates how misinformation can

derail even well-established vaccination programs and has direct relevance to the COVID-19 context. The prevalence of misinformation helps explain why 34.38% of people in the present study reported being yet to decide about getting vaccinated against COVID-19, as conflicting information and unfounded rumors create confusion and delay decision-making. Gaps in young people's knowledge on antibiotics and vaccinations can be linked to their high antibiotic consumption and the insufficient vaccination coverage also identified in the 30-40 age group in this study, suggesting that knowledge deficits have tangible consequences for health behaviors across multiple domains. According to the survey conducted by researchers, adolescents are generally aware about vaccination but they are easily getting influenced by media portrayals, with the result that the number of people getting vaccinated annually is gradually decreasing and so is the immunity in the adolescent population (28). This media influence, combined with the spread of misinformation through social networks, poses an ongoing threat to immunization programs. It is very much important to create positive awareness about vaccination through accurate, accessible, and engaging content, and to encourage people to visit doctors and healthcare providers if they have any doubts regarding vaccines, as the coverage done by media can be somewhat exaggerated or unbalanced. Healthcare providers remain the most trusted source of health information for many people and should be supported in their role as vaccine advocates.

FUTURE SCOPE

For further studies investigating vaccine awareness and acceptance, several important directions should be considered to build upon the foundation established by this research. A larger and more diverse population sample in each demographic category needs to be considered in future research, as expanding the sample size may lead to more accurate and generalizable answers that better represent the broader population. This is particularly important because each age category belongs to a different generation with unique experiences, information sources, and attitudes toward health and vaccination that may influence their perspectives. Longitudinal studies tracking changes in awareness and attitudes over time would provide valuable insights into how vaccine perceptions evolve in response to public health messaging, media coverage, and personal experiences. Comparative studies across different geographic regions and cultural contexts would help identify factors that contribute to higher awareness and acceptance, enabling the sharing of best practices. Intervention studies testing the effectiveness of different educational approaches and communication strategies would provide evidence to guide future health promotion efforts.

To spread more awareness about vaccines and their benefits through modern communication channels, a multi-platform approach should be employed. Along with traditional media such as newspapers, innovative approaches including posters, memes, infographics, short videos, and articles need to be actively circulated on social media platforms such as Facebook, Instagram, Snapchat, Twitter, and YouTube, as these platforms effectively reach and engage the 14-18 years adolescent population group and young adults, helping them learn about vaccination in depth through formats they find accessible and appealing. Collaborations with social media influencers and trusted community figures could amplify vaccine-positive messages and counter misinformation. Integration of vaccine education into school curricula would ensure that all young people receive accurate information regardless of their media consumption habits. Engagement with community leaders, religious institutions, and local organizations can help reach populations that may not be active on social media.

LIMITATIONS

Several limitations of the present study should be acknowledged when interpreting the findings and considering their implications. For the present study, the reference articles used for comparison and contextualization were primarily sourced from the internet, and only those published in English were considered, potentially introducing language bias and excluding relevant research published in other languages or in non-digital formats. This limitation may affect the comprehensiveness of the literature review and the comparability of findings across different linguistic and cultural contexts. The survey data were gathered through Google Forms responses, which, while efficient for data collection, may have made the answers less accurate than would be achievable through in-person interviews, as no supervisor was present to clarify questions, probe for deeper understanding, or ensure that respondents interpreted questions as intended. The absence of supervision also meant that there was no opportunity to observe non-verbal cues

or to assess the respondent's engagement with the survey. Additionally, due to the ongoing pandemic situation and associated restrictions on movement and social contact, face-to-face survey administration was not possible, limiting the ability to gather more in-depth intelligence about participants' thoughts on getting vaccinated and to develop a fair and nuanced understanding of their perspectives. The reliance on online data collection also inherently limited the sample to individuals with internet access and the literacy skills to complete the questionnaire, potentially excluding important segments of the population including those in rural areas with limited connectivity, older adults less comfortable with technology, and individuals with lower literacy levels. These limitations should be addressed in future research through multi-modal data collection approaches that combine online and offline methods to reach more diverse populations.

CONCLUSION

The overall awareness level of the people regarding COVID-19 vaccination was found to be inadequate based on the findings of this study, with only a minority demonstrating comprehensive understanding of vaccine benefits and a substantial proportion remaining undecided about vaccination. People were generally willing to get vaccinated when asked, indicating underlying positive attitudes, but the awareness about vaccination was only high among the literate population, highlighting a critical disparity in health knowledge that must be addressed to achieve equitable vaccine coverage. The preference for private healthcare facilities over government hospitals for vaccination services indicates the need for quality improvement and trust-building initiatives in the public sector. The substantial proportion of participants reporting indecision about vaccination underscores the urgent need for effective communication strategies to counter misinformation and provide clear, accurate information that enables informed decision-making. Educating the public through systematic awareness programs, community health camps, and targeted research programs can significantly improve their attitude and perception towards COVID-19 vaccination, moving individuals from indecision to action and contributing to the population-level immunity needed to control the pandemic. These efforts must be sustained, culturally appropriate, and tailored to the needs of different demographic groups to achieve the goal of universal vaccination coverage and protect community health.

AUTHOR CONTRIBUTIONS

Author 1: Priyanka Rajesh, carried out the study by collecting data and drafted the manuscript after performing the necessary statistical analysis and in the preparation of the manuscript.
Author 2: Dr.S.Gheena, Dr.Sandhya aided in conception of the topic, designing the study and supervision of the study, correction and final approval of the manuscript.

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CONFLICTS OF INTEREST

The authors hereby declare that there is no conflict of interest in this study.

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ANNEXURE: 1

1. Did your local representative have the vaccine and initiated the people to get vaccinated and reminded about its benefits? maybe/no/yes
2. Are you aware about the benefits of getting vaccinated? no/sort of/yes
3. Do you have any iff-effects after getting vaccinated? no/yes
4. Which hospital do you prefer for getting vaccinated? Government/Private
5. Have you decided to get a dosage of COVID-19 vaccine? no/not yet decided/yes
6. Have you tested positive for COVID-19? no/yes
7. Have you taken any other antidote or vaccine? maybe/no/yes
8. Rate the government actions in your locality 1/2/3/4/5