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# Covid-19 Vaccination and Routine Childhood Vaccinations: Comparison of Hesitancy among Parents

**Syed Fawad Mashhadi, Nazish Khan, Ubaida Bin Ilyas, Omer Farooq, Aashir Waseem, Abdullah Cheema, Sahab Murtaza**

Army Medical College/National University of Medical Science (NUMS) Rawalpindi Pakistan

## ABSTRACT

***Objectives:*** To assess perceptions of parents regarding vaccinating their children against COVID-19 and to assess the prevalence of COVID-19 vaccine hesitancy as compared to routine childhood vaccinations.

***Study Design:*** Analytical, cross-sectional, quantitative study

***Place and Duration of Study:*** Study was conducted in Rawalpindi/Islamabad Pakistan, from Nov 2021 to Apr 2022.

***Methodology:*** Parents having children of either gender, 12 to 18 years of age, residents of Rawalpindi/Islamabad Pakistan were included in the study. Study was conducted online using Google forms. Sample size of 303 was taken and participants were enrolled through non probability convenience sampling. Modified Vaccine Hesitancy Scale (VHS) was used. Parental attitudes towards routine childhood vaccinations versus COVID-19 vaccines were compared using paired sample T test.

***Results:*** Among 303 parents, 196(64.5%) were willing to vaccinate their child with COVID-19 vaccine. Reasons for COVID-19 vaccine hesitancy included insufficient vaccine safety information (16.8%), avoidance of vaccines/ medications in general (8.9%), inconvenient / painful vaccine administration (7.9%), perceiving child as not at high risk of developing complications of he gets infected by COVID-19(6.3%) and concerns of getting COVID-19 through the vaccine (4.6%). An encouraging attitude was seen among parents for routine childhood vaccination as compared to COVID-19 vaccination with higher mean VHS 2.68±0.44 vs. 2.52±0.43 respectively ($p$<0.001).

***Conclusions:*** A large proportion of parents were hesitant regarding the COVID-19 vaccine as compared to routine childhood vaccines. Relying on the national authorities regarding the immunization information is a much better option to limit hesitancy.

**Keywords:** COVID-19 vaccine, Routine childhood immunization, Vaccine-hesitancy.

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## INTRODUCTION

WHO Strategic Advisory Group of Experts on Immunization (SAGE) defines Vaccine hesitancy as "a delay in the acceptance or refusal of vaccines despite availability of these services".[1] It is included among the top ten threats to global health. COVID-19 pandemic, emerged in 2020, was the biggest challenge for the world. There were more than 89 million confirmed cases of COVID-19 and almost 2 million deaths due to COVID-19 worldwide by the start of 2021. Ever since the emergence of COVID-19 pandemic,[2] world had been on the search for the eradication of this disease. History shows that diseases have been eradicated as a result of successful immunizations leading to herd immunity among population. The only way for achieving herd immunity was to vaccinate the masses but vaccine hesitancy proved to be a major hinderance.

On February 26 2020, first case of COVID-19 was reported in Pakistan.[3] Pakistan faced many challenges for controlling this pandemic including geopolitical, economical, low literacy and environmental factors all favouring spread of the disease. World Health Assembly in May 2020 passed a resolution identifying the role of widespread vaccination as the most effective measure for preventing and discontinuing transmission of COVID-19.[4,5] Vaccine acceptance is influenced by an extensive range of political, cultural, socioeconomic, religious and peer factors. Here an important role is played by communication and media channels to clarify the misconceptions prevalent among the masses regarding newly developed intervention.[6] Keeping in view the significance of massive immunization required for development of herd immunity, governments acted in various ways. Prior to roll out of COVID-19 vaccinations, governments executed non pharmaceutical interventions like physical distancing, isolation and quarantine to contain the disease and manage demand and provision of health care services.[7] With implementation of these measures' governments had restricted the spread of the disease till the time an

**Correspondence: Dr Nazish Khan,** Department of Public Health, Armed Forces Post Graduate Medical Institute Rawalpindi Pakistan

effective vaccine was available against the disease. However, the development of vaccine was not enough to counter the disease, as world faced a great hesitancy towards initial acceptance of vaccine in general and towards childhood vaccination in particular.

A formidable challenge regarding COVID-19 vaccination in Pakistan was the parental acceptance of it. Pakistan is still very vulnerable to conspiracy narratives and has experienced failure of polio campaigns in the country.[8] In a country that still has parents who are reluctant to vaccinate their children with routine vaccinations, a completely new vaccine offered a new challenge as the parents who have already showed hesitancy towards routine immunization of their children must still show such hesitancy toward COVID-19 vaccination. Moreover, since the vaccine is newly developed and its long-term effects are yet to be unveiled, the parents having a positive attitude towards routine Immunization may still show some degree of hesitancy towards COVID-19 vaccination as they may have some apprehensions regarding the benefits versus risk of this new vaccine.[9]

This issue is not inherent to developing countries like Pakistan but globally vaccine hesitancy is still a major contributor in the inability to achieve herd immunity.[10] Addressing the issue of vaccine hesitancy is imperative for the success of mass vaccination programmes. Very less work has been done in Pakistan on this very important but much neglected issue as is evident by deficient local literature on this topic, so we undertook this study to evaluate perceptions of the parents regarding COVID-19 vaccination of their children and to measure their hesitancy for COVID-19 vaccines versus routine childhood vaccinations.

## METHODOLOGY

This analytical cross-sectional study was conducted in Rawalpindi/Islamabad Pakistan over a period of six months, from November 2021 to September 2022. By using epi info software version 7, keeping 95% confidence interval and margin of error at 5%, a sample size of 303 participants was calculated. Participants were enrolled through non probability convenience sampling.

**Inclusion Criteria:** Parents having children of either gender, 12 to 18 years of age, residents of Rawalpindi/ Islamabad Pakistan were included in the study

**Exclusion Criteria:** The respondents who did not complete all the responses were excluded from the study.

Considering the limitations in conducting face-to-face study amidst pandemic, study was conducted online using Google forms. A modified Vaccine Hesitancy Scale (VHS) was used. The questionnaires were distributed via emails and through social media using facebook and whatsapp. Unique identifiers were employed that allowed only one response per user. Moreover, the Google forms did not accept additional entry from the same google account. Informed voluntary consent was taken from the participants and they were ensured of the anonymity and confidentiality of their responses. Questionnaire consisted of dichotomous (yes/no) questions to evaluate the parents' perceptions regarding COVID-19 vaccines, their acceptance of COVID-19 vaccine as a part of routine immunization and the factors influencing their COVID-19 vaccine acceptance. Data was analysed using Statistical Package of Social Sciences (SPSS) version 26.0. Mean and standard deviation were used for continuous variables while frequency and percentage were used for categorical variables. Parental attitude towards routine childhood vaccinations and COVID-19 vaccines was compared using paired sample T test. $p$-value $<0.05$ was taken statistically significant. Results were presented in the form of tables and graphs.

## RESULTS

Out of 303 parents included in the study, 111(36.6%) were mothers and 192(63.4%) were fathers. Majority of the participants 103 (34.0%) were in age group of 25-34years, followed by 21.1% being in age group of 35-44 years. One hundred forty-eight (48.8%) of parents had education till university while 44(14.5%) had only primary education. Among the participants 149(49.2%) of the parents were employed, 80(26.4%) were healthcare workers and 74(24.4%) were unemployed/freelancers. Furthermore 89(29.4%) had a child with pre-existing medical condition whereas 214(70.6%) had children with no underlying medical illness. Sociodemographic details are given in Table-I.

When compared with routine childhood vaccinations, 64.7% parents were willing to vaccinate their children against COVID-19 while only 35.3% were hesitant. Sixtysix percent of respondents had received COVID-19 vaccine themselves. For routine childhood immunizations, 76.9% were willing to get their children vaccinated, whereas 23.1% were hesitant, as shown in Table-II.

**Table-I: Sociodemographic details of respondents (n=303)**

| Variable | n(%) |
|---|---|
| **Age (years)** | |
| 18-24 | 49(16.2) |
| 25-34 | 103(34.0) |
| 35-44 | 64(21.1) |
| 45-54 | 48(15.8) |
| 55-64 | 23(7.6) |
| >65 | 16(5.3) |
| **Relation to child** | |
| Mother | 111(36.6) |
| Father | 192(63.4) |
| **Education** | |
| Primary school | 44(14.6) |
| Middle school | 56(18.5) |
| High school | 55(18.2) |
| University | 148(48.7) |
| **Income (per month)** | |
| < Rs 25000 | 46(15.1) |
| Rs 25000 – Rs 50000 | 63(20.7) |
| >Rs 50000 | 194(64.2) |
| **Employment** | |
| Employed | 149(49.2) |
| Health care worker | 80(26.4) |
| Unemployed/ Freelancer | 74(24.4) |
| **Pre-existing Medical illness in Child** | |
| Yes | 89(29.4) |
| No | 214(70.6) |

**Table-II: Parental attitude towards COVID-19 vaccination of their Children**

| Variables | n | % |
|---|---|---|
| **Are you vaccinated against COVID-19** | | |
| Yes | 201 | 66.3% |
| No | 102 | 33.7% |
| **How is the family's commitment to precautionary measures against COVID-19** | | |
| Rarely Committed | 25 | 8.3% |
| Slightly Committed | 32 | 10.6% |
| Highly Committed | 93 | 30.7% |
| **Are you willing to vaccinate your children against COVID-19** | | |
| Yes | 195 | 64.7% |
| No | 107 | 35.3% |
| **Are you willing to vaccinate your children with routine childhood immunizations** | | |
| Yes | 233 | 76.9% |
| No | 70 | 23.1% |

Reasons given by parents who were hesitant to vaccinate their children against COVID-19 included inadequate data about the vaccine safety (47.7%), general avoidance of medications/vaccines (25.2%), painful administration of vaccine (22.4%) and avoidance due to child having already suffered COVID-19 (14%) among many other reasons. Reasons for parental hesitancy towards COVID-19 vaccination are given in Figure-1.

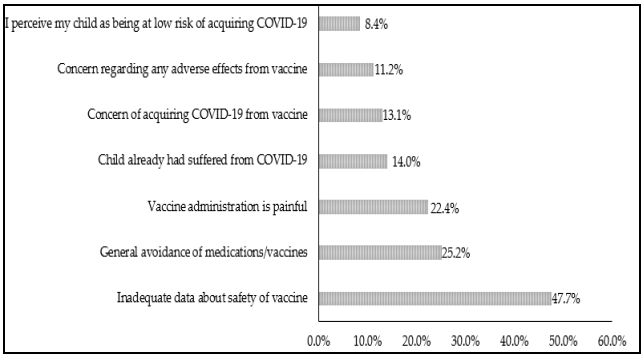


**Figure-1: Parental reasons for not vaccinating their children against COVID-19 (n=108)**

Mean Vaccine Hesitancy Score (VHS) of routine immunizations was found to be 2.68±0.44 while that of COVID-19 vaccination was 2.53±0.44. Paired sample T Test was applied to compare hesitancy of parents towards routine childhood vaccination as compared to COVID-19 vaccination of their children as measured by VHS, which showed a significant difference between parental attitude towards the two vaccinations ($p$<0.001) (95% Confidence Interval 0.097–0.215).

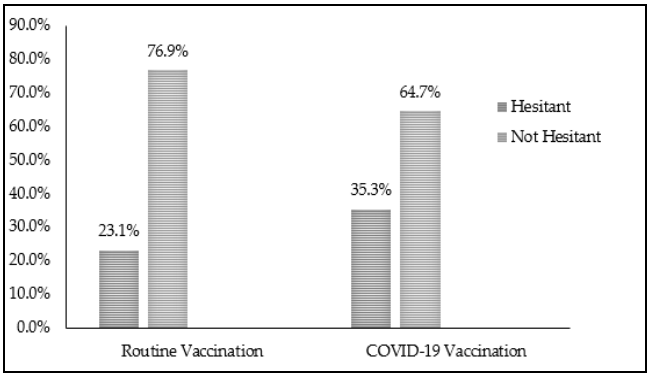


**Figure-2: Comparison of vaccine hesitancy among the parents (routine childhood v/s COVID-19 vaccination)**

## DISCUSSION

COVID-19 pandemic was the most challenging health encounter for the world in recent times. The only way for achieving herd immunity was to vaccinate the masses but vaccine hesitancy proved to be a major hinderance. With the development of various mythologies around the COVID-19 vaccination, people had started to think in much more emotional terms about the said menace leading to fear and

anxiety.[11] The result of such emotions was an increase in the problem of vaccine hesitancy.

Our study showed that 64.7% parents were willing to vaccinate their children against COVID-19 as compared to 76.9% willing for routine childhood vaccinations. A survey conducted in Brazil by Bagatelle L *et al*. found that in USA and Australia less than 50% of pregnant women intended to immunize their child against COVID-19. Whereas in lower income countries like Brazil, Colombia and Mexico more than 50% of pregnant women were willing to vaccinate their children.

A study conducted in Italy stated that only a marginal number of parents (~10%) were hesitant towards COVID-19 vaccination of their children. However, surveys carried out few months after implementation of COVID-19 vaccine programs explored that about half of US parents were reluctant about COVID-19 vaccination of their children.[12] Keeping in view the changing trends and rising awareness among the masses, there is a dire need to provide updated results on vaccine beliefs and COVID-19 vaccine attitudes among parents worldwide.[13]

Similarly, a study conducted in Qatar by Musa S *et al*.[14] showed that overall the vaccine hesitancy rate was 17.9%. Parents of 12-years adolescents were more hesitant (21.6%) as compared to the 13 years (16.0%) and 15-years (15.2%) groups ($p$<0.05). Parents of adolescents belonging to Gulf Countries (mostly Qatri) were more hesitant (35.2%) as compared to the four remaining groups of nationalities (Asiatic; excluding Gulf Countries), North-African, African and European /American, 13.3–20.4%, ($p$<0.001). Vaccine hesitancy rates were greater in parents whose children suffered from chronic disease as compared to those without any chronic disease (21.3% vs. 17.4%, $p$< 0.05) or who had previously suffered from COVID-19 as compared to those who had not (24.1 vs. 17.5%, $p$< 0.01). This study also showed that age groups, nationa-lities and recovery from COVID-19 were the chief predictors of vaccine hesitancy.

A study conducted by Mack W *et al*. in Los Angeles stated that parental willingness to vaccinate with childhood vaccines before and during the pandemic did not change.[15] .But for countries like Pakistan the pandemic's impact on routine immunization is of grave importance.[16] In countries with poor vaccination coverage rates, the hesitancy aggravated by pandemic could lead to much more morbidity and mortality from vaccine-preventable diseases (VPDs). Sustained vaccine coverage rates and success of the vaccination programs would show remarkable results in reducing the attack rate and thus controlling the infection spread.[17,18]

A systemic review by Malik Sallam,[19] published in 2021 highlights regional differences in vaccine acceptance rates and quotes that highest rate are found in Ecuador (97.0%), Malaysia (94.3%), Indonesia (93.3%) and China (91.3%). While least vaccine acceptance rates were found in Jordan (28.4%) and Kuwait (23.6%) amongst many other countries. Studies amongst parents/guardians showed vaccine acceptance rates of more than 70%.

## LIMITATIONS OF STUDY

Our study was conducted only in Rawalpindi/ Islamabad Pakistan so it has limited generalizability.

## RECOMMENDATIONS

Although government is doing very well in communicating relevant info regarding the COVID-19 vaccine, but still much work has to be done to counter the infodemic regarding this novel vaccine. If information keeps getting disseminated through the official channels of communication, it will only be a matter of time that even the minor proportion of parents showing more hesitancy towards COVID-19 vaccination will also become adamant of the vaccine.

## CONCLUSION

Keeping in view the results of the research we can safely say that a large proportion of parents were hesitant towards the COVID-19 vaccination as compared to the Routine Childhood Vaccinations, which was pretty much expected keeping in view the relative newness of the COVID-19 vaccine and still lesser amount of knowledge about it in the general public.

**Conflicts of Interest:** None.

**Author's Contribution**

Following authors have made substantial contributions to the manuscript as under:

SFM: Conception of idea, study design, literature review, data analysis plan, manuscript review, technical support & final apporval of the version to be published.

NK: Conception of idea, study design,literature review, data analysis plan, manuscript review, technical support & final apporval of the version to be published.

UI: Statistical Analysis, Referencing, Introuction, Discussion, results, Literature review & final apporval of the version to be published.

OF:Abstract, Introduction results, Discussion, conclusion & final apporval of the version to be published.

AW: Introuction and Referencing, Limitations, Statistical analysis & final apporval of the version to be published.

AC: Results, Discussion, Manuscript review & final apporval of the version to be published.

SM: Data collection Questionnaire, results compilation & final apporval of the version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investi-gated and resolved.

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