Journal of Social Sciences Review (JSSR)

How to Cite This Article: Khan, K., Khan, A., & Riaz, M. K. (2022). Determinants of Children Vaccine Hesitancy among the Parents of Newly Merged Districts of Khyber Pakhtunkhwa. *Journal of Social Sciences Review*, 2(4), 213-219.

Determinants of Children Vaccine Hesitancy among the Parents of Newly Merged Districts of Khyber Pakhtunkhwa

Kamran Khan	Assistant Director, Training Directorate of EPI, Health Department, Khyber Pakhtunkhwa, Pakistan.
Adnan Khan	PhD Scholar, Department of Economics, University of Peshawar, KP, Pakistan.
Muhammad K Riaz	Institute of Management Sciences, Peshawar, KP, Pakistan.

Vol. 2, **No.** 4 (Fall 2022)

Pages: 213 – 219

ISSN (Print): 2789-441X

ISSN (Online): 2789-4428

Key Words

Vaccine Hesitancy, Newly Merged Districts (FATA), Expended Program of Immunization (EPI), Public Health

Corresponding Author:

Muhammad Kamran

Email: Kamrankundi86@gmail.com

Abstract: *Vaccine hesitancy for children immunization vaccine programs in parents is one of key topics in public health in the Global South including most of Pakistan. However, in the erstwhile Federally Administered Areas (FATA) which are now merged in Khyber Pakhtunkhwa, known as Newly Merged Districts (NMDs), there is a dearth of such research. This study aimed to fill this void. Through two-staged sampling, 384 participants were selected and administered with WHO SAGE Vaccine Hesitancy Scale along with open-ended question for quantum and determinants of vaccine hesitancy. The study found that more than one third of the parents (35.41%) are severely hesitant regarding their children routine immunization while more than half (55.72) are moderately resistant which is alarming. Major factors affecting vaccine hesitancy are negative perceptions about vaccination (22.14%), religious conspiracies (14.06%), lack of information about vaccination (11.72%), fears of adverse effects (11.7%), Western funding for vaccination (6.25%) demand of other life necessities from the Government (7.81%) and few others. Interestingly, Odd Ratios (OR) values revealed that sever hesitancy is more prevalent in those who has both formal education and religious education (OR=19.4, p>.001) than only formally educated or religiously educated parents, this point need further investigation. Similarly, parents who has availed Seht Sahulat Card, sever hesitancy (OR=1.5, p>.001) in them was less than those who didn't avail it (OR=1.3, p>.001). Results also showed that moderate hesitancy is more prevalent in high-income parents than middle- and lower-income parents. Expanded Program of Immunization – EPI was operational in NMDs (former FATA), but it got momentum recently, still there is alarming vaccine hesitancy in these areas. This call for a comprehensive and all-stakeholders inclusive strategy to eradicate this vaccine hesitancy in these vulnerable tribal areas of Pakistan.*

Introduction

Vaccination for improving immunization in early age, is the safest way to safeguard children from life threating disease (UNICEF, 2022). It is also an important part of the global development as Sustainable Development Goal 3 deals with health (World Health Organization, 2015). World Health Organization (WHO) has estimated that childhood vaccination is preventing 4 million deaths per year globally (Orenstein & Ahmed, 2017). But many children are deprived of these invaluable vaccination programs to many reasons, one such reason is vaccine hesitancy i.e., a delay in acceptance or refusal of vaccines despite the availability of vaccination services (Strategic Advisory Group of Experts, 2014; MacDonald, 2015). Vaccine hesitancy is a complex issue, and it varies according to persons, place, and time (Nuwarda, Ramzan, Weekes & Kayser, 2022; Dasgupta, Bhattacherjee, Mukherjee & Dasgupta, 2018)

Orenstein and Ahmed (2017) discussed average annual morbidity in 20th century in comparison annual data of 2016 in US. Huge reductions are noted such as 100% for smallpox and diphtheria, 99% for measles, 97% for mumps, 92% for rubella, tetanus, and pertussis. In 1978, the Government of Pakistan initiated the Extended Program on Immunization (EPI). The initial program was immunizing the children against diphtheria, Pertussis, Tuberculosis, Tetanus, measles, and Poliomyelitis. In 2002, Hepatitis B was included in the program, followed by the Hib vaccine in 2009, the pneumococcal vaccine in 2012, and the inactivated polio vaccine has been added in 2015 to this schedule (Tanzil, Suleman, Akram, Baig, & Khalid, 2021). The EPI includes six-time of vaccination up to 15 months of age. In November 2021, the Measles and Rubella vaccination are initiated (Pakistan Federal Directorate of Immunization, 2022). In March 2021, more than 12 million children were immunized with the Typhoid Conjugate Vaccine (TCV), making Pakistan the first in the world to include TCV in its routine immunization schedule (Malik, 2021).

Third-Party Verification of Immunization Coverage Survey (TPVICS) concluded that 71.6% per cent of children under the age of 2 years have received the full course of vaccinations under Expanded Program on Immunization – EPI (Soofi, Hilbi, Habib, Ansari, Rizvi & Ahmad, 2022) indicating that 28.4% children are deprived of EPI vaccination which is frightening. Pakistan EPI failed to meet the global standards of vaccination uptake in Pakistan (Butt, Mohammed, Butt, Butt & Xiang, 2020). One of the major causes of this failure is vaccine hesitancy among parents of this left-out children which is one named among 10 big threats to public health by WHO in 2019 (Geoghegan, O'Callaghan & Offit, 2020). In the start, there were blunt refusal in Pakistan which are now diminishing but hesitancy prevails (Malik, Awan & Saleem, 2020). Researchers studied vaccine hesitancy in various areas of the country. In District Swabi of Khyber Pakhtunkhwa, Shah, Aalia, Zeb and Ullah (2022), found that religious misconceptions, perceptions Western funded Muslim population control initiative, fear of detrimental impacts of child health, beliefs of porcine content in vaccines, poor knowledge of immunization and accessibility issues are key determinants of vaccine hesitancy. Malik, Awan and Saleem (2020) while investigating issues with social mobilization in tacking vaccine hesitancy in Sargodha and Khushab districts argued that insufficient knowledge, incorrect understanding of vaccinations (misconceptions), fear of side-effects etc., nictitates the proper planning and execution of social mobilization campaigns. Findings of Third-Party Verification of Immunization Coverage Survey (TPVICS) regarding vaccination coverage in the Newly Merged Areas are alarming. As in these areas, fully vaccinated, partially vaccinated, and non-vaccinated children's percentages are 42.8%, 20.1% and 37.1% in comparison of country level percentages of 76.4%, 17.7% and 5.9%. All these call for study and examination vaccine hesitancy in the newly merged areas erstwhile FATA. Therefore, this study aimed to investigate the quantum of vaccine hesitancy and its determinants in these areas.

Methodology

The study being community-based cross-sectional, aimed to look in to vaccine hesitancy prevalence in parents of vaccine-needing children, factors affecting this hesitancy an relation and impacts of demographics of parents with vaccine hesitancy in Newly Merged Districts (NMDs) of Bajaur, Mohmand, Khyber, Kurram, Orakzai, South Waziristan, and North Waziristan, the Erstwhile Federally Administered Tribal Areas (FATA). The data was collected during November 2021 to January 2022. A Sample size was calculated by Open Epi,

an online tool for calculating the sample size of cross-sectional studies, with a confidence interval of 95% and keeping a margin of error of 5%, the sample size resulted was 385 (Dean, Sullivan & Soe, 2013). The sampling technique used was stratified random sampling. Seven NMDs were divided into the subsequent tehsils and then union councils among those tehsils were selected. In each union council, 32 parents were interviewed, 16 for Polio refusal and 16 for routine immunization refusal. These parents are those who refused to vaccinate against Polio and refused routine EPI vaccinations to their children and were living for at least 12 months in the NMDs.

Data was collected through the 10 items Vaccine Hesitancy Scale of the WHO SAGE workshop (Strategic Advisory Group of Experts – SAGE, 2014). The scale measured the parent's knowledge about the importance of childhood vaccines, vaccine effectiveness, the parent's belief in the beneficence of the vaccination programs offered by the government. An open-ended question i.e. what are factors and determinants of vaccine hesitancy and refusal in parents. Parent's education and literacy level, number of children in the family, and monthly income variables were also added. Parents of children aged 0-59 months residents of NMDs and agreed to participate in the study who were hesitant to vaccinate their children are included in the study while parents of newborn who has not started routine immunization and parents who were hesitant to vaccinate their children but are not resident of NMDs are not included in the study.

Analysis and Results

Data were analyzed through SPSS version 26. Descriptive statistics and Frequencies were taken for the total number of children in the household under the age of 15 months, and the number of children under the age of five years. Odds Ratio (OR) were analyzed for the chances of hesitancy within independent variables such as occupation, income, education and type of graduation. Multinomial logistic regression was applied for the purpose.

The mean number of children per household was 5.89 (range 1-19 children per HH). The mean age of father was 41.03 (range 21-70 years) and mean age of mother was 34.51 (range 16- 70 years).

In all age groups of fathers, the values for moderate hesitancy were insignificant and for severe hesitancy the values were highly significant. OR=18.76 in age group of 21-30 with p<.00, OR=18.74 in age group of 31-40 with p<.00. The age group of 41-50 years was found with OR=19.03 with highly significant value of p<.00. Moderate hesitancy in mother age group was also insignificant in all age groups and severe hesitancy was significant, age group of 15-25 years had OR=20 with p<.00, age group of 26-35 years had OR=21 with p<.00, 36-45 years age group had OR=21 with p<.00 and 46-55 years had OR=20.4 with p<.00.

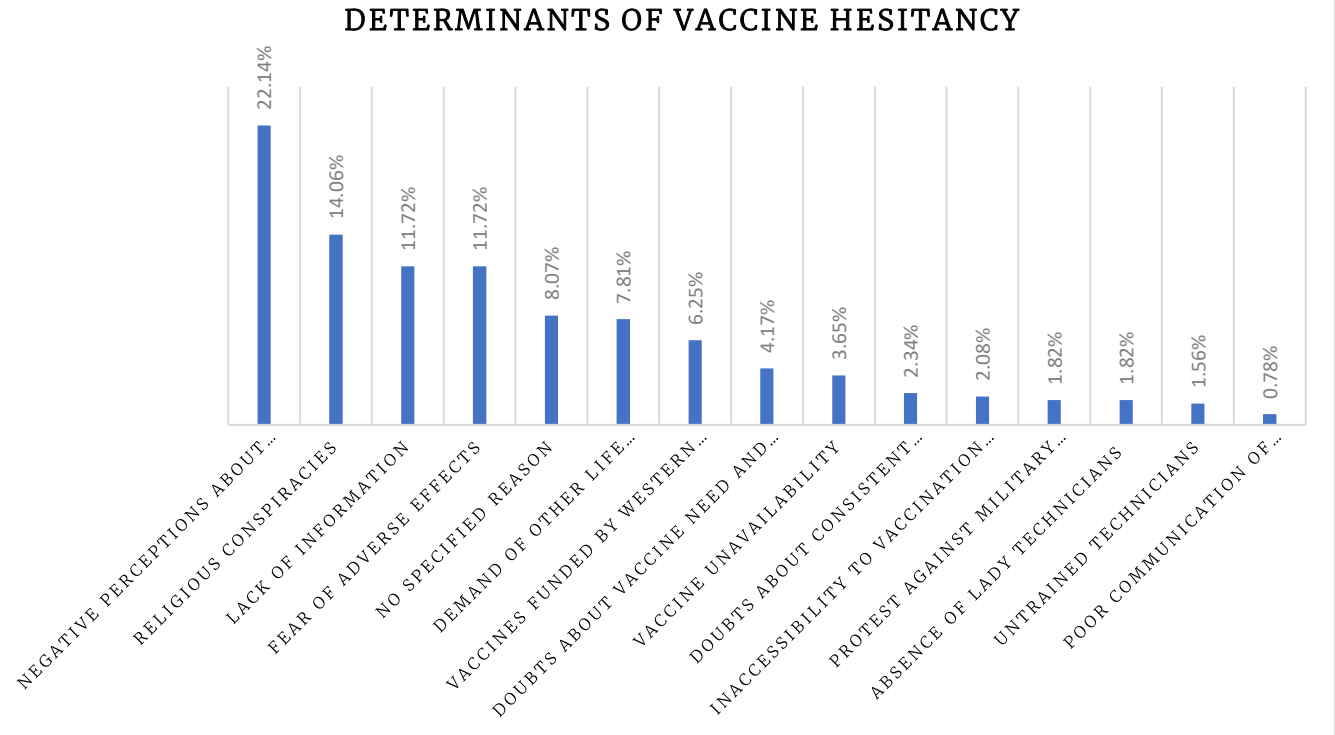
Regarding the employment status, the common population group was from daily wagers about 43% of all participants, the full-time employment, 38.28%, part time, 10.41%, 5.20% participants were unemployed, 2.08% participants did not responded for employment and 1% of participants were retired.

Education profile indicated that 52.86% are not literate while in the educated ones, most parents were from Islamic Madrassas (29.17%, n=112), 9.9% (n=38) were having formal education (school/college/university) and 8.07% (n=31) were having both school/college and religious education. Economic status revealed, most participants were from middle income category (43.75%, n=168) while 29.68% (n=114) from high income and 26.56% (n=102) from lower income categories. Regarding Sehat Card utilization, only 14% of the HH utilized SSC in the last six months.

Table 1: Parents' Demographics

Employment Status		
Unemployed	20	5.2%
Daily Wagers	165	42.96%
Part Time	40	10.41%
Full time	147	38.28%
Retired	4	1.04%
Data Not Provided	8	2.08%
Education Background		
School/College/University	38	9.90%
Islamic Madrassa	112	29.17%
School/College+ Religious Education	31	8.07%
No Education	203	52.86%
Income Status		
Lower Income	102	26.56%
Middle Income	168	43.75%
High Income	114	29.68%
Sehat Sahulat Card Utilization		
Yes	54	14%
No	330	86%

Regarding vaccine hesitancy, 35.41% of participants had severe hesitancy and 55.72% and 8.5% had moderate and mild hesitancy toward vaccination.



The most common reason for vaccine hesitancy was negative perception about the vaccine (22.13%), then religious factor 14% and third most common factor was lack of information 12.7%. Fear of adverse effects accounts for 11.7%, unspecified reason 8.07%, demand of other life necessities from govt 7.8%, vaccine funded from west 6.25%, unavailability of vaccine 3.64% and other less common reasons as shown in table below.

The odds of moderate vaccine hesitancy in employment of parents revealed OR=20, p<.00 in non-respondent group, OR = 20.32, p<.00 in retired group, OR = 3.27, p<.00 in full time employment group and OR = 1.61, p<.00 in daily wagers. The OR for un-employed (p=0.327) and part time employed(p=.27) groups were non-significant. The odds of severe vaccine hesitancy in employment status of parents revealed OR = 19.37, p<.00, in non-responded group, OR = 19.21, p<.00 in retired group, OR = 2.96, p<.00 in full time employment group, OR = 2.30, p<.00 in part time employment group and the remaining groups of employment status were not associated with vaccine hesitancy with non-significant p value.

Moderate hesitancy was recorded the highest with in the graduates of the religious as well as the university graduates and colleges or school graduates OR=20, p<.00, then in conventional education OR=2.63, p<.00 and illiterate groups OR=1.24, p<.00. Severe hesitancy was recorded highest in Conventional + Religious Education group OR=19.4, p<.00, then in conventional education OR=3.13, p<.00and religious education OR=2.67, p<.00 respectively.

The odds of occurrence of hesitancy revealed increasing with increasing economic status i.e., moderate hesitancy was highest in upper economic class then in middle and lowest in lower economic class. Severe hesitancy was recorded the same i.e., highest in upper class and lowest in lower class with p<0.05.

The chances of moderate hesitancy were comparatively higher in the households that had used Sehat Sahulat card in the last six months with OR=2.4, p<.00, as compared to the OR=1.8, p<.00 for the HH that hadn't utilized SSC. In the severe hesitancy category, the OR=1.5, p<.00 was recorded higher in the HH that hadn't used SSC as compared to the OR=1.3, p<.00 in the HH that had utilised SSC.

The Pearson correlation for vaccine hesitancy and father occupation showed the correlation value of 0.2 that showed small positive association. The value was highly significant at P=0.00, as p<0.05. The Pearson correlation for vaccine hesitancy and number of graduates showed the correlation value of -0.04 that showed small negative association. The value was not statistically significant as p>0.05, as p=0.45. The Pearson correlation for vaccine hesitancy and household monthly income showed the correlation value of 0.08 that showed small positive association. The value was not statistically significant as p>0.05, as p=.11.

Discussion

This community-based cross-sectional study was aimed to find the vaccine hesitancy and refusal factors in the Polio and routine immunization in Newly Merged Districts (Erstwhile FATA) of Khyber Pakhtunkhwa.

As the study focused on the children's vaccine hesitancy and refusal, the two groups of interest were the children under the age of fifteen months for routine immunization and under the age of five for the polio vaccine refusal and hesitancy. A total of 2085 children were found in the 384 HHs out of which 574 were the children under the age of fifteen months and 896 were the children in the age range of fifteen months to five years. Thus, the total number of under-five children was 1470, which was 70% of the total number of children. Study conducted in Pakistan at Mayo Hospital Lahore stated the association of mother education status and HH income level with coverage of routine immunization in children. Although this study didn't show any association between vaccine hesitancy and its odds in different age

groups of parents. The study finds out the association between maternal education and vaccination coverage in children is highly significant with P=0.01. (10) our study revealed that odds of occurrence of hesitancy in different kind of graduation were evident, but the OR was higher in Madrassa graduates than in conventional education with p<0.05. A study from India stated the mother education level as a contributing factor to vaccine hesitancy. In the findings, the researchers stated that 73% of the mother had an education level lower than middle schooling. (13) A study on the vaccine hesitancy in children from India recommended the mother's education and awareness about the vaccine uses and its benefits crucial for the achievement of optimum vaccine coverage. The researchers stated that such goals cannot be accomplished without increasing the current awareness status about vaccines at the community level and within societies. (14)

In our study, covid vaccination rate was 12.54%. According to Reuters covid 19, Tracker 59.4% of the Pakistanis population has been vaccinated against covid 19. Thus, vaccination rate is 5 times lower in the parents that were hesitant to vaccinate their children for Polio and routine immunization. (15) The SSC was studied for its association with vaccine hesitancy and if there was any association between the two variables. Only 14% of the HHs had ever used the SSC in the last six months. In the mild hesitancy group, the use of SSC was OR=2.4 with p=.00 against the counterparts that hadn't utilized SSC in the last six months. The group that hadn't used SSC had OR=1.9 with P=.00. Although in the severe hesitancy group the group that had used SSC had OR=1.3 and the group that hadn't used SSC had OR=1.5 with p=.00.

Recommendations

This study stated the determinants and background variables associated with vaccine hesitancy and refusal. The mother and father's education status, sociodemographic factors like monthly income, level of education, type of graduation, and the number of graduates in the family were all found associated with the vaccine hesitancy. The government should focus on health promotion and awareness strategies, the focal group discussions and education at the community level are crucial for the achievement of vaccination coverage.

Conclusion

The results showed parents' age in the late adulthood, low coverage of covid vaccination of adults in the HH, several graduates, and type of graduation were the background determinants of vaccine hesitancy and refusal. The routine immunization campaigns and polio vaccination programs should adhere to the local community needs and should focus on the social determinants that contribute to vaccine hesitancy in such population groups

References

Agrawal, A., Kolhapure, S., Di Pasquale, A., Rai, J., & Mathur, A. (2020). Vaccine Hesitancy as a Challenge or Vaccine Confidence as an Opportunity for Childhood Immunisation in India. *Infectious Diseases and Therapy, 9*(3), 421–432.

Ali, A., Ali, L., Shah, M., Khan, N., Shafee, M., & Jan, S. K. (2018). Polio vaccination: An analysis of cultural and traditional barriers. *The Professional Medical Journal, 25*(01), 67-72.

Butt, M., Mohammed, R., Butt, E., Butt, S., & Xiang, J. (2020). Why have immunization effforts in Pakistan failed to achieve global standards of vaccination uptake and infectious disease control? *Risk Management and Healthcare Policy, 13*, 111–124.

Butt, M., Mohammed, R., Butt, E., Butt, S., & Xiang, J. (2020). Why have immunization efforts in Pakistan failed to achieve global standards of vaccination uptake and infectious disease control? *Risk Management and Healthcare Policy, 13*,111–124.

Dasgupta, P., Bhattacherjee, S., Mukherjee, A., & Dasgupta, S. (2018). Vaccine hesitancy for

childhood vaccinations in slum areas of Siliguri, India. *Indian Journal of Public Health, 62*(4), 253-258.

Dean, A. G., Sullivan, K. M., & Soe, M. M. (2013). *OpenEpi: Open Source Epidemiologic Statistics for Public Health*. http://www.openepi.com/SampleSize/SSPropor.htm

Geoghegan, S., O'Callaghan, K. P., & Offit, P. A. (2020). Vaccine safety: myths and misinformation. *Frontiers in Microbiology*, 11, 372.

MacDonald, N. E. (2015). Vaccine hesitancy: Definition, scope and determinants. *Vaccine, 33*(34), 4161-4164.

Malik, A. S. (2021). Millions of children vaccinated against Typhoid in Pakistan.UNICEF Pakistan. https://www.unicef.org/pakistan/stories/millions-children-vaccinated-against-typhoid-pakistan

Malik, M. N., Awan, M. S., & Saleem, T. (2020). Social mobilization campaign to tackle immunization hesitancy in Sargodha and Khushab districts of Pakistan. *Journal of Global Health, 10*(2), 021302

Murtaza, F., Mustafa, T., & Awan, R. (2016). Determinants of nonimmunization of children under 5 years of age in Pakistan. *Journal of Family & Community Medicine, 23*(1), 32-37

Noh, J. W., Kim, Y. M., Akram, N., Yoo, K. B., Park, J., Cheon, J., Kwon, Y. D., & Stekelenburg, J. (2018). Factors affecting complete and timely childhood immunization coverage in Sindh, Pakistan; A secondary analysis of cross-sectional survey data. *PloS one*, 13(10), e0206766.

Nuwarda, R. F., Ramzan, I., Weekes, L., & Kayser, V. (2022). Vaccine hesitancy: Contemporary issues and historical background. *Vaccines*, *10*, 1595

Orenstein, W. A., & Ahmed, R. (2017). Simply put: Vaccination saves lives. *Proceedings of the National Academy of Sciences*, 114(16), 4031-4033.

Pakistan Federal Directorate of Immunization (2022). *Immunization Schedule*. http://www.epi.gov.pk/immunization-schedule/

Pakistan: the latest coronavirus counts, charts and maps. https://graphics.reuters.com/world-coronavirus-tracker-and-maps/countries-and-territories/pakistan/

Shah, S. S. H. ., Aalia, B. ., Zeb, M., & Ullah, I. (2022). Determinants of vaccine hesitancy and refusal in children of District Swabi Khyber Pakhtunkhwa, Pakistan. *Journal of Gandhara Medical and Dental Science*, 9(2), 65–69.

Soofi, S. B., Hilbi, I.H., Habib, M. A., Ansari, U. Rizvi, A., & Ahmad, I. (2022). *Third-Party Verification of Immunization Coverage Survey (TPVICS)*. Report No. 001, Aga Khan University, Karachi

Strategic Advisory Group of Experts – SAGE (2014). Report of the SAGE Working Group on vaccine hesitancy. https://www.asset-scienceinsociety.eu/sites/default/files/sage_working_group_revised_report_vaccine_hesitancy.pdf

Tanzil, S., Suleman, Y., Akram, D., Baig, L., & Khalid, F. (2021). Strengthening supportive supervision: A case study of the Expanded Programme on Immunization in Sindh, Pakistan. *Journal of Global Health, 11*,06004

UNICEF (2022). Immunization. https://www.unicef.org/immunization

World Health Organization. (2015). Health in 2015: from MDGs, millennium development goals to SDGs, sustainable development goals. https://apps.who.int/iris/bitstream/handle/10665/200009/?sequence=1