Association of Socio-Demographic Factors with Vaccination Status of Children at Gilgit Baltistan

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ABSTRACT

Objective: To assess the vaccination status of children at Gilgit Baltistan and the association of various socio-demographic factors with none or partial vaccination among these children.

Study Design: Comparative cross-sectional study.

Place and Duration of Study: Department of Pediatrics Combined Military Hospital Gilgit, from Oct 2020 to Mar 2021.

Methodology: Children aged 15 months to 10 years presenting with any condition in the Pediatrics OPD were included in the study. Vaccination status regarding basic vaccines, included in the EPI of study participants was confirmed by vaccination card. Education of father, education of mother, type of family (joint or nuclear) and place of living (rural or urban) was correlated with vaccination status of children included in the study.

Results: Out of 600 children presenting at the Pediatrics OPD, 390 (65%) patients were males, and 210 (35%) patients were females The mean age of the patients was 5.554 ± 3.85 years. 242 (40.3%) patients were vaccinated, 190 (31.7%) were partially vaccinated, while 168 (28%) patients were not vaccinated for basic vaccines included in the EPI. After applying the chi-square test, low education of father and mother, living in joint family and rural living were significantly related to non-vaccination or partial vaccination of children (p-value<0.05).

Conclusion: A large group of children from Gilgit-Baltistan remained non-vaccinated or partially vaccinated even for the basic vaccines included in the EPI program. Children born in joint families, rural areas and parents with a low level of education had more chances of skipping the vaccines.

Keywords: Children, Education, Expanded program of immunization (EPI), Vaccination.

How to Cite This Article: *Khattak SZ, Nawaz S, Ahmed N, Khalid M, Baloch H, Zubair UB. Association of socio-demographic factors with vaccination status of children at Gilgit Baltistan. Pak Armed Forces Med J 2022; 72(2): 654-657. DOI: https://doi.org/10.51253/pafmj.v72i2.6524*

INTRODUCTION

Primary prevention has always been an area of focus for health care professionals.[1,2] Many life-threatening diseases have now been eradicated with the help of vaccines.[3] Despite all the wonders created by vaccines, there is still a group in every society that opposes vacccines.[4,5]

The expanded program of immunization (EPI) covers a lot of basic vaccines for children, and that too is free of cost.[6] Peck *et al*, in 2019 published a study regarding trends of various vaccines from the year 2010 to 2018. They recommended tailored strategies that address local determinants for incomplete vaccination.[7]

Pakistan can cut down on its health budget by focusing on preventive strategies. Government and non-government organizations have been trying their level best for years to achieve full immunization in all the areas of Pakistan, but still, the average annual EPI vaccination coverage had been 70.98% in 2012, 69.39% in 2013, 66.74% in 2014, 61.47% in 2015, and 67.01% in 2016, respectively.[8-0] We targeted the Northern part of the country to assess the vaccination status of chil-dren in Gilgit Baltistan and the association of various socio-demographic factors with vaccination status.

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Received: 02 Apr 2021; revision received: 09 Jun 2021; accepted: 02 Jul 2021

METHODOLOGY

This comparative cross-sectional study was conducted at the department of Paediatrics Combined Military Hospital Gilgit from Oct 2020 to Mar 2021. The ethical approval was taken from Ethical Review Committee (via letter-number Adm-34). The sample size was calculated using the WHO sample size calculator by keeping the prevalence of non-vaccination in children as 9.5%.[11] Consecutive sampling technique was used to gather the sample for this study.

Inclusion Criteria: Children of either gender between the age of 15 months and ten years presenting with any illness in Paediatrics OPD were included in the study.

Exclusion Criteria: Children with a learning disability or an immunocompromised condition, or any other contraindication to immunization were excluded from

the study.

Informed consent from the parents was taken after providing them all the information regarding the study. Vaccination status was asked and checked from the EPI card. Children were classed as vaccinated if they had received all the vaccines included in EPI, partially vaccinated if they had received less than all the vaccines included in EPI and non-vaccinated if they had not received any of the vaccines included in EPI. The current EPI program of Pakistan includes vaccines for tuberculosis, poliomyelitis, diphtheria, tetanus, pertussis, hepatitis B, Hib pneumonia and meningitis, measles and diarrhoea due to the Rot-avirus.[12] EPI card is given to the parent of a child at first dose of vaccination, then every dose is entered on the card to maintain a full vaccination record.[13] Educa-tion of parents was classed as under matriculation or matriculation or above. Joint and nuclear families were defined according to a local study published by Lodhi *et al*, in 2019.[14]

Statistical Package for Social Sciences (SPSS) version 23.0 was used for the data analysis. Mean and standard deviation were calculated for quantitative variables. Status of vaccination (vaccinated, partially vaccinated, non-vaccinated), parental education distribution and patients living in nuclear or joint families were summarized by using the frequency and percentages. Pearson chi-square was applied to establish any statistically significant between the education of father, education of mother, type of family (joint or nuclear) and place of living (rural or urban) with vaccination status of children included in the study. Differences between groups were considered significant if *p*-values were less than or equal to 0.05.

RESULTS

Out of 600 children presenting at the Paediatrics OPD, 390 (65%) patients were males, and 210 (35%) patients were females. The mean age of the patients was 5.554 ± 3.85 years. 242 (40.3%) patients were vaccinated, 190 (31.7%) were partially vaccinated, while 168 (28%) were not vaccinated for basic vaccines included in the Expanded Program of immunization. Table-I summarized the basic socio-demographic profile of the study participants.

Table-I: Characteristics of children included in the study (n=600).

Study Parameters	n (%)
Age	
Mean Age of children	5.554 ± 3.85 years
Vaccination Status	
Vaccinated	242 (40.3%)
Partially vaccinated	190 (31.7%)
Non- vaccinated	168 (28%)
Gender	
Male	390 (65%)
Female	210 (35%)
Type of Family	
Nuclear family	215 (35.8%)
Joint family	385 (64.2%)
Type of Residence	
Urban	329 (54.8%)
Rural	271 (45.2%)

Two hundred and fifteen (35.8%) children lived in nuclear families while 385 (64. lived living in joint families. Table-II showed the results of chi-square test.

Low education of father and mother, living in joint family and rural living were statistically significantly related to non-vaccination or partial vaccination of children included in our study (*p*-value<0.05).

Table-II: Association of various socio-demographic factors with vaccination status in children.

Factors	Vaccinated	Partially vaccinated	Non-vaccinated	*p*-value
Education of Father				
Less than matriculate	171 (70.7%)	19 (62.6%)	98 (58.3%)	0.028
Matriculate or more	71 (29.3%)	71 (37.4%)	70 (41.7%)	
Education of Mother				
Less than matriculate	110 (45.4%)	82 (43.1%)	55 (32.7%)	0.027
Matriculate or more	132 (54.6%)	108 (56.9%)	113 (67.3%)	
Type of Family				
Joint family	112 (46.3%)	59 (39.1%)	44 (26.2%)	<0.001
Nuclear family	130 (53.7%)	131 (60.9%)	124 (73.8%)	
Type of Residence				
Urban	151 (62.4%)	103 (54.2%)	75 (44.6%)	0.002
Rural	91 (37.6%)	87 (45.8%)	93 (55.4%)	

DISCUSSION

Pakistan is a developing country lacking in many aspects of primary health care infrastructure, which sometimes even make mild diseases potentially life-threatening. Vaccines of many diseases remained controversial due to the social, cultural or religious beliefs.

Lapses in the health care system and local health belief model also affect the vaccination procedure, and many children remain unvaccinated for various infectious diseases.[11,14] EPI program has been in practice for a long time. However, it has been a common finding that far-flung areas sometimes remain neglected. We, therefore, targeted the extreme Northern part of Pakistan and planned this study to assess the vaccination status of children in Gilgit Baltistan and the association of various factors with none or partial vaccination among these children.

More than half of our study participants were either partially vaccinated or not vaccinated. These results were in line with the studies done in other parts of the world especially developing countries.[8,9] Education of parents was significantly associated with vaccination status. Similar results were generated by Aalemie *et al*,[15] in Afghanistan. These results affirm the role of parents' education for the health of their children.

Singh *et al*,[16] published a study in 2019 to look for immunization coverage among children aged 12-23 months. They concluded that 90.85% of children were fully immunized. The rest of the children were either partially immunized or had not received any vaccination. Our results were very alarming in this regard, as more than half of our study participants were either partially vaccinated or not vaccinated. The reason may be that we chose the most far-flung part of our country where health facilities and general education of people is still in developing phase.

Butt *et al*, in 2020 highlighted the factors which were hindering the implementation of an expanded program of immunization in all the parts of Pakistan.[17] Lack of education, people living in rural areas and joint family system were some of the essential factors which were responsible for depriving the children of vaccination. Our study results were similar to living in rural areas, and joint family systems emerged as strong factors related to non-vaccination in our study participants.

The recent COVID pandemic had a profound impact on the routine vaccination of children. Chandler *et al*,[18] conducted a study in Karachi and concluded that slums and the poor population have been strongly affected by the COVID pandemic to get their children immunized. We did not specifically study the impact of COVID-19 on vaccination status; however, the rural population was at a clear disadvantage for vaccinating their children in our study as well.

STUDY LIMITATIONS

Vaccination status was checked from the EPI card, and children until the age of 10 were included. This may have created a bias as some patients might have be vaccinated but lost the card. Patients who were vaccinated have clear chances of not getting sick for the diseases so they may not present to the hospital. Therefore, the data was an over-representation of non-vaccinated children. More community-based studies defining the local clusters of the population may generate better results.

CONCLUSION

A large group of children from Gilgit-Baltistan remained non-vaccinated or partially vaccinated even for the basic vaccines included in the EPI program. Children born in joint families, rural areas, and parents with a low level of education had more chances of skipping the vaccines than those born in nuclear families, urban areas, and parents with a high level of primary education.

Conflict of Interest: None.

Authors' Contribution

SZK:, NA: Compilation, SN:, HB: Data collection, Mk: Data revision, OBZ: Formulation.

REFERENCES

1. Kisling LA, M Das J. Prevention Strategies. In: Stat Pearls. Treasure Island (FL): Stat Pearls Publishing; 2021, [Internet] Available at: https://www.ncbi.nlm.nih.gov/books/NBK537222
2. Hanson CL, Crandall A, Barnes MD, Magnusson B, Novilla MLB, King J. Family-Focused Public Health: Supporting Homes and Families in Policy and Practice. Front Public Health 2019; 7(1): 59.
3. Greenwood B. The contribution of vaccination to global health: past, present and future. Philos Trans R Soc Lond B Biol Sci 2014; 369(1645): 20130433.
4. Ginglen JG, Doyle MQ. Immunization. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2021, [Internet] Available at: https://www.ncbi.nlm.nih.gov/books/NBK459331/
5. Gualano MR, Olivero E, Voglino G, Corezzi M, Rossello P, Vicentini C, et al. Knowledge, attitudes and beliefs towards compulsory vaccination: a systematic review. Hum Vaccin Immunother 2019; 15(4): 918-931.
6. Dyda A, King C, Dey A, Leask J, Dunn AG. A systematic review of studies that measure parental vaccine attitudes and beliefs in childhood vaccination. BMC Public Health 2020: 20(1): 1253.
7. Peck M, Gacic-Dobo M, Diallo MS, Nedelec Y, Sodha SV, Wallace AS. Global Routine Vaccination Coverage, 2018. MMWR Morb Mortal Wkly Rep 2019; 68(42): 937-942.
8. Bangura JB, Xiao S, Qiu D, Quyang F, Chen L. Barriers to childhood immunization in sub-Saharan Africa: A systematic review. BMC Public Health 2020; 20(3): 1108.
9. Shrivastwa N, Wagner AL, Boulton ML. Analysis of State-Specific Differences in Childhood Vaccination Coverage in Rural India. Vaccines (Basel) 2019; 7(1): 24.
10. Umer MF, Zofeen S, Hu W, Qi X, Zhuang G. Spatiotemporal clustering analysis of Expanded Program on Immunization (EPI) vaccination coverage in Pakistan. Sci Rep 2020; 10(7): 10980.
11. Newtonraj A, Vincent A, Selvaraj K, Manikandan M. Status of coverage of MR vaccination, after supplementary immunization activities in a rural area of South India: a rapid immunization coverage survey. Rural Remote Health 2019; 19(3): 5261.

12. Naveed Z, Saeed A, Kakar A, Khalid F, Alnaji N, Kumar G. Understanding the accountability issues of the immunization workforce for the Expanded Program on Immunization (EPI) in Balochistan: An exploratory study. J Glob Health 2021; 11(1): 06001. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7916446/
13. Zaidi SM, Khowaja S, Kumar Dharma V, Khan AJ, Chandir S. Coverage, timeliness, and determinants of immunization completion in Pakistan: evidence from the Demographic and Health Survey (2006-07). Hum Vaccin Immunother 2014; 10(6): 1712-1720.
14. Lodhi SF, Khan AA, Raza O, Uz Zaman T, Farooq U, Holakouie-Naieni K. Level of satisfaction and its predictors among joint and nuclear family systems in District Abbottabad, Pakistan. Med J Islam Repub Iran 2019; 33(3): 59.
15. Aalemi AK, Shahpar K, Mubarak MY. Factors influencing vaccination coverage among children age 12–23 months in Afghanistan: Analysis of the 2015 Demographic and Health Survey. PLoS ONE. 2020; 15(8): e0236955. https:// journals.plos.org/plosone/article?id=10.1371/journal.pone.0236955
16. Singh CM. Immunization coverage among children aged 12-23 months: A cross sectional study in low performing blocks of Bihar, India. J Family Med Prim Care 2019; 8(12): 3949-3955.
17. Butt M, Mohammed R, Butt E, Butt S, Xiang J. Why have immunization efforts in pakistan failed to achieve global standards of vaccination uptake and infectious disease control?. Risk Manag Healthc Policy 2020; 13(3): 111-124.
18. Chandir S, Siddiqi DA. Impact of COVID-19 lockdown on routine immunisation in Karachi, Pakistan. Lancet Glob Health 2020; 8(9): e1118-e1120.

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