

COVERAGE AND CAUSES OF NON IMMUNIZATION IN NATIONAL IMMUNIZATION DAYS FOR POLIO; A CONSUMER AND PROVIDER PERSPECTIVE STUDY IN PESHAWAR

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ABSTRACT

Objective: Polio is a viral disease that may cause paralysis and infant death. Despite ongoing efforts, polio has not been eradicated from Pakistan. The purpose of this survey is to estimate the coverage of polio vaccine during National Immunization Days and to determine the factors associated with lack of immunization.

Methodology: A Cross-sectional survey was conducted in Peshawar, Pakistan, from 1st June to 9th June 2010. Confidence level of 95% and confidence interval of 4 was used to derive the sample size (for a population more than 20,000). Parents of 600 children under 5 years were asked about immunization during NIDs of January -May 2010 (5 NIDs). Questions regarding demographics, income, education, occupation, accessibility to health centres and frequency of visits from health workers was inquired. Knowledge and views on immunization were also asked. 40 health personnel involved in immunization were also interviewed and they were asked about hurdles faced in immunization.

Results: 83.7% children were vaccinated in all National Immunization Days, while 94.7% had at least, taken polio vaccine once. 5.3% had not taken polio vaccine during National Immunization Days of 2010. Main reasons for not vaccinating were; Vaccinator absent/not visiting home/vaccine not available (63.36%), no awareness (17.4%), Child ill (5.8%), family problem/mother busy (3.3%) and wrong ideas/sterility (3.3%). Many health personnel (32.5%) considered lack of awareness among people and low accessibility to vaccine as the main hurdles in immunization, besides the poor salaries and incentives.

Conclusion: Polio vaccination during National Immunization Days 2010 was a partial success because some pockets of poor children and afghan refugees were poorly vaccinated. In order to eradicate polio, they must be vaccinated.

Key Words: Oral Polio Vaccine (OPV), Immunization, EPI Pakistan, NIDs\SNIDs (National/Sub Immunization days).

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INTRODUCTION

Polio mainly affects children under five years of age. One in 200 infections leads to irreversible paralysis, usually in the legs. Among those, 5% to 10% die when their respiratory muscles become immobilized. Although, Polio cases have decreased by 99% since 1988, from an estimated 350,000 cases to 1604 reported cases in 2009. However, it still remains to be endemic in four countries in the world i.e. Afghanistan, India, Nigeria and Pakistan.

Persistent pockets of polio transmission in northern India, northern Nigeria and the border between Afghanistan and Pakistan are the current focus of the polio eradication initiative. There are two main strategies to stop transmission of the wild poliovirus in areas considered at high risk i.e high infant immunization coverage with four doses

of oral poliovirus vaccine (OPV) in the first year of life and supplementary doses of OPV to all children less than five years of age during SiA\NIDs (National Immunization Days/ Supplemental Immunization Activities).

Polio vaccine is highly effective; more than five million people who would have been paralysed by polio are healthy today because they have been immunized against polio since the initiative began in 1988¹. In Pakistan NIDs/SiAs have been regularly conducted since 1990s. However, the strategy has not yielded the desired result i.e. eradication of polio²⁻³. The purpose of this survey is to assess the situation in Peshawar which is the most developed part of Khyber-Pakhtunkhwa. This survey highlights the factors associated with low vaccination coverage and non immunization with respect to the user as well as the provider and to compare these findings with other relatively developed semi-urban parts of Pakistan.

METHODOLOGY

A cross sectional survey was conducted from 1st to 9th of June 2010 to determine the coverage and find factors associated with lack of vaccination during the immunization days from January to May year 2010. Five NIDs/SiAs took place from January to May 2010, in the mid of each month. The survey area was Peshawar urban and rural areas. Two stage cluster random sampling was done. The total population of the selected areas was about 130,000 with approximately 15% (n=20,000 approx.) population under 5 years. This population i.e. 20,000 was used to derive the sample size of 600 with confidence level of 95% and confidence interval of 4.

Households were interviewed in selected urban areas of Peshawar university campus, Peshawar Saddar, Hashtnagri and rural areas of Naway Kalay and Pawaka village. A researcher-administered standard questionnaire was used as a data collecting tool. Parents of 600 children were interviewed. These children were under 5 years. All data was collected through informed consent and parents were given a choice to end the interview anytime they wished.

The questionnaires collected information regarding demographics, education status (none, primary, middle, matric, higher education, traditional/Madrassa), occupation and income of the family earner, parents knowledge and views on immunization, mothers' access to T.V\radio and the performance of vaccination staff. Immunization record was noted through memory recall. Complete vaccination was defined as child been vaccinated

during all NIDs/SiAs from January to May 2011. Incomplete vaccination was defined as child receiving at least one vaccination. Not vaccinated was defined as a child who did not receive any vaccination.

Forty health personnel involved in immunization were also interviewed in immunization centres at Khyber Teaching Hospital, Lady reading hospital and Peshawar University Campus. Health personnel from BHUs (Basic Health Units) of Hashtnagri, Pawaka and Naway kalay were also interviewed. These interviews were carried out through a separate questionnaire designed for them which collected their demographic data, main hurdles faced to them, their access to vaccines, quality control measures, availability of cold chain equipment, availability of transport, their salaries (yes, no, somewhat satisfied) and whether special performance based incentives were given or not.

They were also asked about the department coordination, supervision and monitoring. The role of parents and their cooperation, knowledge of parents, community leaders and general public was also asked (poor, average, good, very good, excellent). They were told to give one main suggestion for improving the immunization programme.

All data was analyzed using the Statistical package for the Social science SPSS 16.0. Pearson's chi-square test was used as the statistical tool for testing the significance of relation between variables. A P value of < 0.05 was considered significant.

RESULTS

Out of 600 children, 324 (54.0%) were females and 276 (46.0%) were males. Urban population was 334 (55.7%) while rural population was 266 (44.3%).

Vaccination coverage for OPV (oral polio vaccine) during NIDs from January to May 2010 (5 NIDs) was: 83.0 % completely vaccinated, 10.7% incompletely vaccinated and 5.3 % were not vaccinated even once.

The reasons for not vaccination (n=121) were Vaccinator absent/not visit home/vaccine not available (63.36%, n=77), no awareness of importance (17.4%, n=18) followed by child ill (5.8%, n=8), centre too far (4.1%, n=5), family problem/mother busy (3.3%, n=4), wrong ideas/sterility (3.3%, n=4), fear of reactions (2.4 %, n=3), and others (1.6%, n=2).

91.5% considered immunization programme beneficial but 8.5% did not. The reasons behind negative views were; fear of

reactions (35.3%, n=18), thinks not effective (35.3%, n=18) having wrong ideas about vaccine e.g. sterility (21.56%, n=11) and bad experience (7.8%, n=4).

When asked about place and time they would prefer for immunization, most answered home (57.3%) and morning (73.9%).

Comparison between education of earning parents and the immunization status clearly showed low immunization among uneducated and high immunization among educated families. (Figure 1) (p<0.001).

High immunization rates were found for urban areas (Table 1) (p<0.001). The males and females completely immunized were 83.3% and 82.6% respectively (P=0.878) so the relation between gender and immunization was not significant.

The relationship of monthly income and complete immunization of children was as follows: Where income was less than Rs.3,000 53.3% children were immunized completely, from Rs.3,000-10,000 82.6% were immunized, from Rs.10,001-17,000 84.3% were immunized, from Rs.17,001-24,000 97.8% and when income was greater than Rs.24,000 93.9% were immunized (p<0.001). Parents who thought immunization wasn't beneficial had lower immunization status (39.2%) than the respondent's children who thought immunization was beneficial (87.1%) (p<0.001).

Mothers who were literate and had access to T.V, radio and printed materials had higher immunization rates (100%, n=39 completely immunized) than mothers who had access to T.V/radio only (88.0%, n=431 completely immunized). Only 39.4%, (n=28) complete immunization was found where mothers had no access to electronic and print media at all (p<0.001).

Regarding fathers' ethnic groups, Urdu speaking had immunization rates of 100% (n=26), followed by local pushtoons 84.5% (n=451) and afghans 47.2% (n=17) (p<0.001).

All the health workers quoted to have had training and knew how to handle cold chain. EPI staff had adequate equipment for cold chain. Most of the staff was not satisfied with the salaries and incentives (70%). Most of the health personnel believed that sufficient transport was not available (75%) and EPI staff was insufficient (65%). Main difficulties faced by immunization staff are given in figure 2. Suggestions for improvements by immunization staff were; increase awareness among people (45.0%, n=18), more transport facilities (20.0%, n=8) and security (12.5%, n=5).

Most of the immunization staff placed the community leaders' and parents' cooperation as good (50%). A significant number placed their Cooperation as poor (30%). Immunization staff placed parents' knowledge at average (52.5%) and poor (37.5%).

Figure 1: Cross Tabulation Between Education of Earning Parent and Immunization

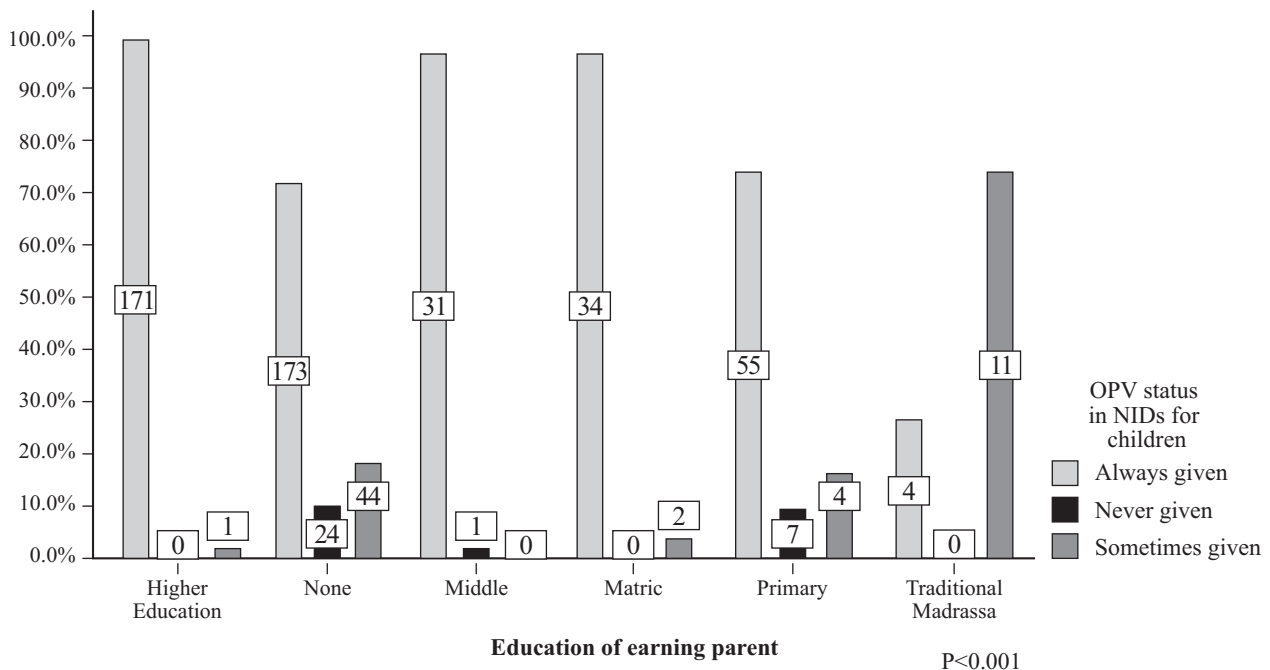
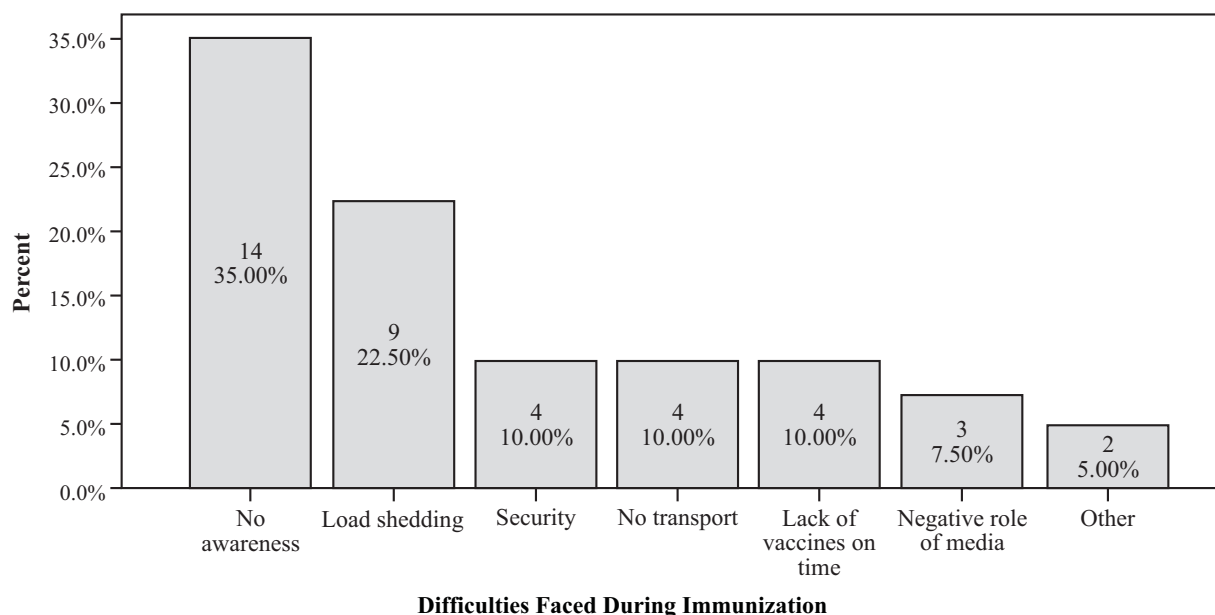


Table 1: Comparison between Urban/Rural areas and OPV status P<0.001

Urban/Rural area		OPV status in NIDs for children			
		always given	never given	sometimes	Total
Rural	Count	180	26	60	266
	% within Urban/Rural	67.7%	9.8%	22.6%	100.0%
Urban	Count	318	6	10	334
	% within Urban/Rural	95.2%	1.8%	3.0%	100.0%
Total	Count	498	32	70	600
	% within Urban/Rural	83.0%	5.3%	11.7%	100.0%

Figure 2: Difficulties Faced During Immunization by Health Workers



DISCUSSION

The full immunization coverage was 83%. However, at least 93.7 % had one dose of polio vaccine during the 5 NIDs conducted from January to May 2010. Health Survey reported 76% complete immunization during year 2009 in Khyber-Pakhtunkhwa. Other studies report slightly less coverage but they were conducted in Pakistan in 1997. Reasons for not vaccinating were vaccinator absent/not visit home/vaccine not available (63.36%), no awareness of importance (17.4%) followed by family problem/mother busy (3.3%), centre too far (4.1%), 3.3% wrong ideas/sterility Child ill (5.8%) and fear of reactions (2.4%). Different types of studies on immunization

in Khyber-Pakhtunkhwa⁴, other parts of Pakistan and India show somewhat similar results⁵⁻⁸.

Most of the parents would like to immunize their children in morning and at homes. This shows that if immunization is done at homes, a much higher rate can be achieved⁹.

Comparison between immunization and education showed low immunization among families with uneducated earning parent and vice versa (Figure 1). It was also noted that mothers having knowledge about immunization and its importance had much greater immunization rates for their children. This shows clearly the impact of education of both parents on immunization, stressing the importance of education in success of

immunization programme. Such findings have been found in other studies too^{3,4,10,11}.

A significant pattern was not observed regarding sex. Remarkably, this was in contrast to studies conducted elsewhere^{12,13}. The reason behind this could be that social factors regarding sex do not come to play in children at such a young age especially when it comes to availing free services like immunization.

Immunization coverage was high for those households where family heads held government and private jobs rather than those where they were labourers. This relationship could have been due to income disparities between these jobs. Similarly, mothers having government jobs were much more likely to immunize their children. However, the reason behind this is that mothers having government jobs were educated and the family income was mostly high^{4,6,10}.

A high coverage rate was found in urban areas of Peshawar than rural areas and this was consistent with other studies. The reason behind this is low accessibility by health staff but is more likely due to lack of awareness in parents, associated with poverty as established by other studies comparing rural and urban areas^{6,14}.

The income of family and the immunization status had a very clear relationship. This was consistent with results in Khyber-Pakhtunkhwa and elsewhere^{7,14}. The reason behind this could be that more poor people lived in rural areas which are targeted poorly, other reasons could be the lack of time by the caretaker, poor accessibility to health centres, social depravity and poor education, that are associated with poor economic condition.

Most of the mothers thought vaccination was useful but significant number didn't consider it useful (8.5% n=51), indicating the need for health education. There were still misconceptions like sterility and considering vaccines ineffective. This is not an unexpected finding⁶. Electronic and print media should be utilized to eliminate such misconceptions. Moreover health education should be done at all centres and hospitals regarding immunization.

This study also found that Afghan migrants had a very low immunization rate. In order to achieve better overall results, immunization coverage in Afghan nationals should be increased by appropriate measures and incentives. Low immunization in Afghan refugees has been reported previously as well¹⁵.

Mothers who were literate and had access to printed material, T.V and radio had slightly

higher immunization rate than mothers who had access to T.V/radio only. The coverage was much lower where mothers had no access to both. T.V and radio are more effective tools in health education because uneducated people also benefit from it^{16,17}. The print media is not used as widely as TV/Radio and could do little for an uneducated person. Thus, electronic media should be utilized more efficiently to increase awareness.

All the health workers had sufficient training and knew how to handle cold chain. There was no shortage of cold chain equipment. This was in contrast to studies conducted in Pakistan previously¹⁸. The reason behind this is most likely that Peshawar is the Provincial capital and centre of health facilities. However, studies with similar methodologies have come to the same conclusion^{3,4,7,17}.

Lack of awareness and severe load shedding caused hurdles in maintaining the cold chain. Transport was also a problem as it restricted the movement of the EPI staff. Insecurity was also considered a limiting factor and the main reason behind recent fall in immunization in some areas of Khyber-Pakhtunkhwa. Other studies also showed similar results^{7,19}. Thus, resolving power crisis, improving security, transport and more staff would bring a major impact on immunization.

The cooperation from parents and general public community leaders was very good. According to health workers, parents and community leaders' knowledge on immunization was not satisfactory. Thus, awareness programmes are needed at the community level as well. This would improve immunization coverage in those areas where vaccination staff may not visit⁷.

Most of the staff was not satisfied with the salaries and incentives, as found in previous studies^{7,17,19}. This can be the reason of low interest and poor performance of EPI staff.

Several methodological issues and limitations have to be considered regarding this survey. First, the cross sectional nature of the study does not permit an interpretation of clear relationship between the associated factors found in this study and lack of immunization. Secondly, many of the associated factors existed simultaneously together and were interdependent i.e. Improving one factor can show improvement in the other. Some confounding variables are expected to affect the study outcome including income, ethnic group and education. It is hard to establish the exact effect of each on immunization. Further detailed studies are required to establish a more accurate relationship. The survey was conducted in Peshawar which being the capital

attracts a substantial amount of immigrants from other parts of the province and especially the afghan migrants. The fact that they have not been immunized is a point of concern.

CONCLUSION

Polio vaccination during NIDs in Peshawar has been a partial success, a portion of rural population and some ethnic groups as well as low socioeconomic pockets of population haven't been fully immunized. This can be the reason for polio cases still being reported. It is imperative that such pockets are immunized in order to eradicate polio.

The immunization staff faced difficulties like lack of awareness, load shedding, transport, and security. Lack of incentives may be the reason for low interest of the EPI staff. These issues have to be addressed to further improve the short comings in NIDs.

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None Declared

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CONTRIBUTORS

MN supervised the project, prepared the basic study design and devised the statistical method of data analysis. MZK prepared the original manuscript and did data analysis. MA contributed in the Data collection and field work. SHA contributed in the data collection. AK, MUK and SMN contributed in preparation of questionnaires and data collection. All the authors critically reviewed the manuscript.