Students' Corner
Original Article

Availability of Expanded Programme of Immunization services provided to children in a rural Pakistani village

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Abstract

Objectives: To evaluate the immunization status of children under 5 years age, living in the Nurpur Shahan area and to identify various factors which influenced the rate of immunization.

Methods: A cross sectional study was conducted in which mothers of children under 5 years of age were questioned about the immunization of their children and the immunization services provided in the area. Systematic random sampling was used and the collected data was analyzed using SPSS v. 10.0.

Results: The overall immunization rate in the children of Nurpur Shahan was 77.4%. This study found strong correlations to immunization rates in children. Increased educational status of the mother, greater maternal immunization during pregnancy, and home delivery of vaccines, were all directly linked to higher rates of immunization amongst children. Lack of awareness, followed by inadequate facilities were the most commonly cited reasons for discontinuing the programme or abstaining from it altogether.

Conclusion: The EPI coverage in Nurpur Shahan is quite well established, but still left room for improvement. Factors that encouraged higher immunization rates were more educated mothers, better awareness and availability of door-to-door services.

Keywords: EPI, Mother education, Maternal immunization, Door to door services (JPMA 61:415; 2011).

Introduction

The World Health Organization (WHO) identified the need for public health intervention and in 1974 initiated the Expanded Programme of Immunization (EPI), which aims to immunize, and thus protect, mothers against Tetanus and their children against the following six deadly diseases: Childhood Tuberculosis, Poliomyelitis, Diphtheria, Pertussis, Measles and Tetanus.[1] Along with hoping to decrease the incidence of these diseases, one of the objectives of this programme was complete eradication of polio by 2000, a goal which unfortunately was not achieved.[2] Further development of the EPI led to the inclusion of Hepatitis B vaccine in 2001.[3] Immunization is the most cost-effective method of protecting children from these preventable diseases and therefore a vital part of community healthcare.

It is essential for the Expanded Programme of Immunization (EPI) to be examined thoroughly from all angles and continually improved to better serve the needs of the community. "The Program has significantly progressed in terms of immunization coverage and disease reduction and has developed its own surveillance system, cold chain system, field supervisory mechanism, regular monitoring system [and] evaluation strategy."[4] There have also been increases in trained workers throughout the country, as required, towards the aim of achieving full coverage. A survey conducted by the ministry of health in 2006, noted that 76.2% of children in Punjab were fully immunized. This result, while significant, shows that there is still room for improvement in order to achieve a target of 100%. In past research studies, lack of motivation on the part of EPI staff, absence of vaccinators, inconvenient locations and problems with the cold chain have been cited as common reasons for obstruction of immunization.[5,6] A study conducted in Peshawar in 2007 found that only 37.6% of children were fully immunized.[7] Therefore, not only is it necessary to evaluate the EPI as a whole, its implementation must be studied in specific communities in order to pinpoint weaknesses, identify their cause and most importantly find a solution. This survey was conducted to determine the immunization status of children under the age of 5 in Nurpur Shahan, to document their current immunization status and follow up through community specific suggestions to make EPI delivery more efficient.

Methods

This survey was carried out in Nurpur Shahan village to assess the immunization status of children under the age of

5 years. It was a cross-sectional community based study for which a questionnaire was prepared and administered in an interview style. Systematic random sampling was done and mothers who had children less than or equal to 5 years of age were questioned in every 6th house. If there were no children within that age group the next 6th house was surveyed. The sample size was calculated using EPI Version 3.5. Out of a population of 35,000 the expected number of under 5 population was 35%. The sample size after applying 95% confidence interval and precision of +/- 2% was 349 but only 204 could be gathered due to time constraints. The variables that were assessed included the age and educational background of the mother, the gender of the child, place where the vaccine was administered (primary, secondary or tertiary care unit) as well as the reasons for either partial or non-administration. The current health status of the child and the presence of any communicable diseases in the household were inquired about. In the end the respondents gave their opinion regarding the most convenient place to get their children vaccinated. The collected data was entered into, and analyzed by SPSS Version 10.0.

Results

The results from the survey were found to be highly informative of the immunization services in the area. Of the children surveyed, 96.6% had received some form of vaccination, with 58.3% up to date with the EPI course and 19.1% having completed it. Only 3.4% children had received no immunization at all. Of the children who received no immunization, the most frequently cited reason was lack of awareness followed by facilities being too far away. During follow up 19.1% children had discontinued the programme before completion. Again, lack of awareness was the predominant reason, followed by facilities being too far away. Furthermore, seven children cited having had a reaction to previous vaccines as a discouraging factor. There was no difference in immunization status between male and female children.

A special focus was given to the mothers of the children. It was found that certain aspects of the mother's lifestyle had a definite influence on whether she vaccinated her child or not. Most of the mothers were educated below matriculation level with almost half having received no formal education (47.5%). The children who had not received any vaccinations all had mothers with no formal education.

Figure-1-3: Trends Related to Location of Immunization.

	Immunized at Home	Immunized at Hospital or Clinic
Immunization Rate	49.5%	27.9%
Discontinuation Rate	15.1%	54.0%
Satisfaction with Services	97.5%	91.3%

As the educational status of the mother increased, so did the rate of vaccination of her children, with all mothers who studied until Intermediate or higher achieving 100% vaccination, and none having discontinued the programme ($p = 0.012$). The majority of mothers were immunized during their pregnancy (68.6%) and their children not only had a greater rate of immunization, but the trend showed that they were less likely to discontinue or abstain from the immunization programme as compared to the children whose mothers were not immunized ($p = 0.001$).

The immunization rate was significantly higher, at 49.5%, when vaccinations were provided at home as compared to 27.9% for children who had to be taken to a hospital or clinic to receive vaccinations. On enquiring 95% of respondents said that immunization teams reached their homes but only had provision for administration of polio drops. The rate of discontinuation was decreased in households who were receiving the vaccinations at their doorsteps (15.1%), whereas this was much higher in those who had to travel away from their homes (54.0%) ($p < 0.001$) (Figure-1-3).

According to surveys, 92% of respondents preferred immunization services to be provided at home. Of those who preferred vaccinations at home, 63.3% did receive vaccinations at home but 33.0% had to go to a facility and 3.7% had not been vaccinated at all ($p < 0.001$). Those who were immunized in accordance with their preference had an 84.9% immunization rate, whereas households who preferred to be immunized at home, but were not, had an immunization rate of only 63.8%.

Overall, 93.6% of respondents were satisfied with the facilities available for immunization of their children. Respondents who were not satisfied with the immunization services were more likely to leave the programme (38.5% compared to 17.8% in satisfied respondents). The overall rate of immunization was twice as high (80.1%) in satisfied respondents, as compared to those who were not satisfied (38.5%) ($p < 0.001$). Of those who were not satisfied, only 38.5% had immunization campaigns conducted in their locality, compared to 99% among those who were satisfied. 61.5% of mothers in the unsatisfied group had received no formal education. Only 46.6% of mothers in the satisfied group were unschooled. 46.2% of unsatisfied mothers were immunized during pregnancy, as opposed to 70.2% of satisfied mothers. Reasons given for no or partial immunization were the same as in the satisfied group and the incidence of preventable diseases was also similar.

There were four cases of measles and one of polio among the children surveyed. When history of preventable diseases was taken, 7.8% families had at least one member affected by preventable diseases. There was no significant

change in immunization rate in children who had, or whose families had, any history of preventable diseases.

Discussion

Studies conducted in NWFP, Pakistan found immunization rates of 37.6% in a hospital setting and 65% in a rural setting.[5,7] Immunization rate in this study was comparable to that found by the study done in a rural setting, at 77.4%. The Ministry of Health's survey reported a 76.2% immunization rate for Punjab in 2006,[4] which also tallies closely with this finding. The hospital study reported that 22.0% children had discontinued the programme,[7] against findings of 19.1% discontinuation rate amongst the children of Nurpur Shahan. It seems that discontinuation is a constant problem, despite changes in circumstances. The study reported that 40.4% children had received no immunization. This number was much lower in Nurpur Shahan (3.8%), perhaps because facilities were more readily available, seeing as it was situated close to the capital. The change of immunization rate over different regions of the country has been documented by the Ministry of Health and this seems to account for the large difference in these statistics. Various studies in Karachi found that mothers with higher levels of education had a higher percentage of immunization among their children,[8,9] a finding that is supported by the results of this study. Another study to assess mothers' knowledge of vaccination found that educational status co-related to awareness rather than socioeconomic status.[10]

A 2003 study used focus group discussions with parents and service providers to evaluate the common obstacles in administering vaccines. They found that lack of awareness was one major factor and that parents were not strongly motivated to take out time and energy to have their children vaccinated, especially if facilities were not close at hand.[11] Another study also cited lack of motivation as the major factor.[12] Awareness and improper funding were the predominant reasons cited by a clinic-based survey. Most respondents suggested educating the mother as the most effective way to promote immunization.[13] Another study, conducted in a community in Karachi, demonstrated this practically, and was able to raise the immunization rate of the community by educating mothers.[14] In Nurpur Shahan, it was found that lack of awareness was the foremost reason given for incomplete or no vaccination, followed by lack of facilities close by. This result matches that recorded by other studies conducted across the country, suggesting that these are common areas where maximum focus needs to be given to improve overall immunization status. A study done in selected villages across Pakistan found that immunization coverage increased from 48% to 90% at the end of five years of continuous monitoring and education, and that the awareness levels of mothers was above 90% at the end of the study.[15] This further supports the argument in favour of awareness being the most important step towards complete nationwide immunization. Although primary focus should be on education, it cannot be forgotten that the second concern was always a lack of facilities, and to this end, government and global agencies still have to improve policies for provision of vaccines.

The results of this study were reflected by similar results achieved internationally. An Indian study conducted in Rajasthan found similar factors influencing immunization, including awareness and availability of facilities close by. This was reflected in the fact that children living in urban areas were more likely to be better vaccinated than those in rural areas. The authors noted that there was no difference in vaccination of male and female children.[16] Education of mothers was identified as a major factor for increased immunization of Nigerian children in a rural area.[17] An Ethiopian study found mother's education to have a positive effect on children's immunization and also found that mothers who had received better antenatal care were more likely to have their children immunized.[18] Studies of rural slum areas in India found that the rate of immunization among children was higher if facilities were close by.[19] It was found in a study conducted in Uganda that the major reasons for children not being immunized was lack of awareness about the EPI schedule as well as not considering it important enough. The authors further suggested education, especially of mothers and childbearing females, as a method for improvement of coverage.[20]

Limitations:

Shortcomings of this study include a generality imposed upon immunization status, where immunization against individual diseases was not assessed. Nurpur Shahan seemed to have an ample Polio Campaign but there was no mention of any other door-to-door vaccination service, and it was uncertain as to how those who reported home vaccination had proceeded to receive it. Many respondents were satisfied with immunization services in their area, despite only receiving Polio drops at their home and having to provide for the others themselves. This suggests that either they do not see immunization as a vital part of their children's healthcare or they consider administration of Polio drops comprehensive immunization. Education about proper administration of the full EPI course would motivate parents to seek better facilities for the immunization of their children, and if such effort was met with corresponding support from service providers, Pakistan would fulfill its commitment towards an ultimate goal of global immunization.

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