

ORIGINAL ARTICLE

INEQUITY IN CHILDHOOD IMMUNIZATION BETWEEN URBAN AND RURAL AREAS OF PESHAWAR

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Background: Purpose of this study was to find coverage of vaccines in EPI and compare the factors related to vaccine failure or missed vaccination in urban and rural areas of Peshawar. **Methods:** This cross-sectional survey was conducted in Urban and rural of Peshawar from 20th to 31st of June 2010. A questionnaire was used to interview parents of 548 children, aged 1 year and below, about demographics, vaccination status, reasons for missed vaccination and views on immunization. Results from both urban and rural areas were compared to find the impact of different factors on immunization failure. **Results:** The immunization coverage in urban areas was 76.5% while in rural areas it was 48.8%. Causes for non immunization were different in urban and rural areas. In urban areas, lack of awareness and care takers/parents being busy were the main reason for non immunization. In rural areas, in addition to formers, lack of accessibility to health centres and misconceptions about vaccination were major reasons for non-immunization. Parents were more educated in urban areas than rural areas. **Conclusion:** Rural areas had a lower immunization rates due to lack of awareness, low accessibility and much lower education of parents.

Keywords: EPI Pakistan, children, immunization, urban, rural

INTRODUCTION

The overall situation regarding the health sector in Pakistan still causes a great concern to all involved authorities. The under 5 years child mortality rate of approximately 87 deaths/1,000 live births (2009 est.) is very high in Pakistan and raises questions as what issues must be addressed to decrease it.¹

The Expanded Programme on Immunization (EPI) in Pakistan was launched in 1979 after Alma Ata's Declaration of 'Health for All by the Year 2000' The overall objective of this programme was to reduce morbidity and mortality resulting from the six EPI targeted diseases (Polio, Diphtheria, Whooping Cough, Tetanus, Measles and Tuberculosis). It focused at immunization of children less than one year of age and tetanus immunization of all women of childbearing age. Public awareness and health education were major activities carried out in order to boost the immunization coverage of the target groups.

Despite various interventions and significant inputs from donors, the EPI continued to perform low. New cases of Polio, Tetanus and other diseases which are no more prevalent in developed countries, are emerging each year. There has been increasingly low vaccination coverage in the past few years which has added to the huge backlog of un-vaccinated children. The total coverage was best in AJK (84%) followed by Punjab (76.2%), Sindh (59.8%) and Khyber-Pakhtunkhwa (52%), and was worse in the country in Balochistan (32%) and FATA (25%).² These figures mask a great variation between immunization in urban and rural areas. Urban areas have achieved a high

immunization status, rural areas are continuously being ignored and a clear picture cannot be shown without a contrast study. This difference between urban and rural areas has undermined the efforts to eliminate certain disease like polio and tetanus.

This study highlights the difference in coverage of immunization between urban and rural areas of Peshawar, the provincial capital, already having low immunization coverage. The study highlights issues causing the difference in coverage rates and will pave the way for future health policies and priorities in EPI Programme.

MATERIAL AND METHODS

This cross sectional study was conducted from 20th June 2010 to 30th June 2010 to determine the coverage of EPI vaccines and compare factors associated with non-immunization in urban and rural areas. The study area was urban and rural areas of Peshawar. A questionnaire was used to interview parents. They were given a choice to end the interview anytime they wished. All data was collected through informed consent. Sample size was derived through confidence level of 95% and confidence interval of 4. Through stratified random sampling, parents of 548 children, aged 1 year and below were interviewed in urban areas and rural areas of Peshawar district. Children above 1 year and those who spent the first 9 months of life outside Peshawar were excluded. Parents were asked about the immunization status of all vaccines included in EPI programme. Children who had vaccinated all doses of all vaccines were marked completely vaccinated, those who missed

one or more were labelled as incompletely vaccinated and those who were not vaccinated at all were labelled as not vaccinated. Reasons for non-immunization were also noted.

Data regarding demographics, education, occupation, health education of mothers, accessibility of EPI centre in terms of distance estimated in Kilometres was recorded. Parents' views on immunization whether it was useful or not was asked. In case of negative views, they were asked as why they considered immunization detrimental. They were asked whether the EPI workers visited their houses or not. Their frequency of visits was also asked, i.e., (None, seldom, often): none for no visits ever, seldom for 2 or less visits a year, often for a visit at least once every two months. Vaccinators visiting homes during National immunization days (NIDs) were also included in this.

Their access to media was also asked (TV, Radio, Newspaper, or no access). Immunization record was collected by cards or mother's recall. Both urban and rural areas data was compared to find the main factors that could have been associated with low immunization.

Data were analysed using SPSS-16. Pearson's chi-square test was used for statistical testing, and $p < 0.05$ was considered significant.

RESULTS

Out of 548 children, 306 (55.8%) belonged to urban areas and 246 (44.2%) to rural areas. The immunization coverage overall was 64.2% completely vaccinated, 22.4% incompletely vaccinated, 13.2% not vaccinated. The immunization coverage in urban areas was 234 (76.5%) completely vaccinated, 52 (17.0%) incompletely vaccinated and 20 (6.5%) not vaccinated at all. Immunization coverage in rural areas was 118 (48.8%) completely vaccinated, 71 (29.3%) incompletely vaccinated and 53 (21.9%) not vaccinated. Out of 548 children, 291 (53.1%) were females and 257 (46.9%) were males. Causes for not vaccinating were different in urban and rural areas (Table-1).

Cross-tabulation between education of parents and the immunization status showed high immunization among educated families. Immunization status for different levels of education were: higher education (93.1%), matric (76.6%), middle (81.2%), primary (48.5%) and none (47.1%) ($p < 0.001$). Urban areas had a much higher educated population than rural areas (Figure-1).

Knowledge of mothers regarding immunization was positively associated with immunization. (Enough 89.2%, moderate 58.5%, little 54.5%, none 28.1%) ($p < 0.001$). Mothers' knowledge on immunization in urban areas was much better than rural areas (Figure-2).

Most parents (90.5%) answered 'Yes' when asked whether EPI programme was useful. In rural areas, 16.3% answered with negative views while in urban areas 3.9% did not consider it useful. Relationship with immunization is given in Table-2. Reason for negative views in urban areas were: 'thinks not effective' (n=5) and 'fear of reaction' (n=5) while in rural areas having wrong ideas about vaccine (n=13), 'thinks not effective' (n=10), 'fear of reaction' (n=9) and 'bad experience' (n=4).

Households, where EPI workers visited often, had a high (81.02%) rate of immunization than areas where health workers had seldom (50.0%), and no visits 38.1% ($p < 0.001$). In urban areas, 85.3% had often visits, 9.5% had no visits and 5.2% had seldom visits from health workers. In rural areas, 52.5% had often visits, 22.7% had no visits and 24.8% had seldom visits from health workers.

The distance had no significant effect on immunization status of the children below 7 Km but it had a clear effect on immunization of the children above 7 Km. Immunization rate for less than 1 Km was 64.1%, 1-4 Km (75.7%), 4-7 Km (80.7%), 7-10 Km (58.2%), 10+ Km (41.5%) ($p < 0.001$). Urban population had easier access to immunization centres than rural areas (Figure-3).

Mothers who had access to TV/Radio had higher immunization rate (68.2%) than those who did not (45.3%) ($p < 0.001$). Mothers in urban areas had much better information access (93.2%) than rural areas (79.3%) ($p < 0.001$).

Table-1: Reasons for not vaccinating in Urban and Rural areas ($p=0.003$)

Reason for no vaccination in routine immunization	Rural		Urban	
	Number	(%)	Number	(%)
No awareness/ Didn't know importance	29	24.4	15	23.4
Centre too far	34	28.6	4	6.2
Busy/family problems	19	16.0	20	31.2
Wrong ideas	14	11.8	5	7.8
Child ill	5	4.2	6	9.4
others	18	15.1	14	21.9

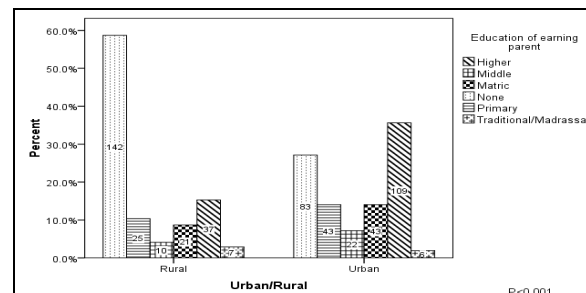


Figure-1: Comparison between education of earning parent in urban and rural areas

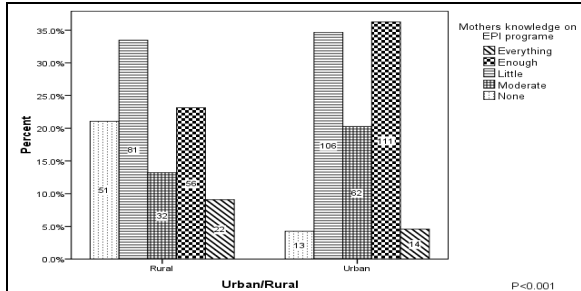


Figure-2: Comparison of knowledge about immunization in urban and rural mothers

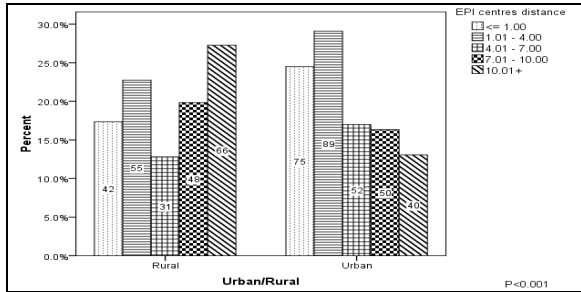


Figure-3: Accessibility to EPI centres in urban and rural areas

Table-2: Relationship between immunization, mothers' beliefs and urban/rural areas (p=0.04)

Immunization status	Is EPI beneficial?	Rural		Urban	
		No.	%	No.	%
Complete	Yes	3	2.5	1	0.4
	No	115	97.5	233	99.6
Incomplete	Yes	21	29.6	7	13.5
	No	50	70.4	45	86.5
Never	Yes	16	30.2	4	20.0
	No	37	69.8	16	80.0

DISCUSSION

The purpose of the study was to assess and compare the situation in urban and rural areas. Our study found a considerable difference between the immunization coverage in urban (76.5%) and rural areas (48.8%). This finding is not uncommon and has been found in different studies across the world.³⁻⁵

The main causes for non-immunization in urban and rural areas were different. In rural in addition to lack of awareness, lack of access to health centres, care takers being busy and wrong ideas were main reasons for non-immunization. In urban areas in addition to lack of awareness, parent being busy was main reason for non-immunization. These findings are similar to other studies.⁶⁻⁸ Lack of access to health centres was not a factor in urban areas. In rural areas, the accessibility was less not merely due to absence of centres but also the poor services provided to people by the existing centres. Therefore, parents miss their children's vaccination and that too is not unusual keeping in mind the level of health education given to them. In addition, significant number of parents did not

immunize their parents due to either fear of reaction or misconception regarding immunization. These findings are of concern but are not unexpected. Many studies indicate that even today different misconceptions are present among people especially in rural population.^{9,10}

High immunization status was seen among educated families than uneducated families. Family earners education and mothers having knowledge about immunization and its importance were directly associated with immunization. Urban areas had much higher number of educated families (Figure-1 and 2) and thus, a much higher immunization rate. This was consistent with other studies conducted in Pakistan. One of the reasons for difference in immunization between urban and rural areas is education of families. The family earner's education and mothers' knowledge on immunization is important determinant. This is in agreement with other studies conducted in Peshawar and elsewhere.^{6,11-13}

One of the main causes of non-immunization was distance of health centre from the users. Generally, low immunization was seen when distance of centre for immunization increased beyond 7 Km. In rural areas, a significant number of families had immunization centres beyond 7 Km. Therefore, this was quoted as the main cause of non-immunization by the parents in rural areas. This is consistent with other reports and studies.^{3,5,14}

Most of parents considered immunization useful; however, a significant number thought it was not beneficial. The number was considerably higher in rural areas. This points out to the fact that extensive work has to be done in rural areas on educating the parents. One of the reasons especially in rural areas, for such views was misconceptions regarding immunization, e.g., sterility and fear of reactions. Despite continuous efforts, the government has been unable to resolve such misconception. Such doubts, on part of care takers, undermine the importance of immunization, resulting in lower immunization. This problem is global and has been found in many studies.^{15,16}

The relationship between the vaccinator visiting the families and vaccination was also very evident with about 38% for never and seldom and above 81% for often. The reason behind this is high awareness among people about vaccination when health workers visited the homes. Higher frequency of visits was found in urban areas compared to rural areas indicating that urban are preferred target for health workers. One of the reasons for such high frequency of visits in urban areas is the introduction of National Immunization Days (NIDs). As urban areas see more frequent visits from them, they recorded a higher frequency of health worker visits. Similar results were found by others indicating the importance of health workers and Lady Health Workers in vaccination, especially in improving vaccination in rural areas.^{17,18}

Most respondents had access to TV/radio but few had no access at all, especially in rural areas. Mothers having access to electronic media, in general, had a high immunization status for their children than mothers having no access at all. Thus, lack of access to mass media tools could be one of the reason for misconception and low awareness in rural areas. Role of media in immunization is well appreciated all around the world but currently it is insignificant in Pakistan.¹⁹⁻²¹

Several limitations have to be considered regarding this study. The cross-sectional nature of the study makes it difficult to establish a clear causal relation between the associated factors found in urban and rural areas and lack of immunization. The study was conducted in Peshawar which being the provincial capital has a relatively better health system than rural areas of the country.

CONCLUSION

Immunization in rural areas is much lower than urban areas due to many factors like lack of accessibility to health centres, lack of awareness and misconceptions. Parents in rural areas have a much lower education status and knowledge regarding immunization.

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