ORIGINAL ARTICLE

NON-VACCINATION OF CHILDREN UNDER FIVE YEARS OF AGE

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ABSTRACT

Objectives: To identify the reasons for non-vaccination of children under five years of age coming to tertiary care hospital from various districts of KPK and FATA.

Material and Methods: This observational, cross sectional study was conducted from January 2012 to December 2014 at inpatient and outpatient setting, department of child health, Khyber teaching hospital Peshawar through a questionnaire prepared according to objectives of the study. Convenience sampling was employed, as the parents coming with children 1-5 years ages were interviewed regarding reasons fornon-vaccination of their children.

Results: Total 432 children ages 1-5 years were included in the study. 276(63.8%) were male and 156(36.1%) were female. Most of the children i.e.373(86.3%) were from rural areas while 59 children (13.6%) belonged to urban areas.Out of 432 children only 205(47.4%) were fully vaccinated, 227(52.6%) children were under vaccinated (non-vaccinated + partially vaccinated). The main reason given by most of the parents 128(56.4%)was lack of knowledge about vaccination and its benefits followed by accessibility to vaccine centers 76(33.5%). The third common reason[58(25.6%)] was inability of the parents to take out time from their busy schedule and lastly 53(23.3%) was non-availability of vaccines in nearest center.

Conclusion: The most common reason of Pediatric under-vaccination is 1) Decrease awareness of parents about the preventive benefits of vaccination followed by; 2) Decrease accessibility to health facility (and vaccination centers); 3) Parents could not spare time from busy schedule and 4) Non-availability of vaccines in the nearest center.

Key Words: vaccine, vaccination, pediatric, children, inpatient, outpatient.

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INTRODUCTION

The morbidity and mortality caused by infectious diseases and the rising cost of treating them necessitate focusing more on their prevention which is the need of the day. Vaccination is among the most successful components of preventive medicine. It is a cost effective public health intervention that has had the greatest impact on health of the people[1]. A healthy community provides a healthy work force, which contributes to economic growth. Long-term and sustainable community health begins with the health of its children. Of the available disease prevention interventions, immunization is the most cost effective and successful[2].

Expanded program of immunization (EPI) was launched by World Health Organization (WHO) in 1974 to make vaccines available to all children for prevention of six childhood infectious diseases; tuberculosis, diphtheria, pertussis, polio and measles[3]. Pakistan has launched its EPI program in 1978 with support, guidance and recommendations of WHO[4]. The main objectives of initiating EPI were eradicating polio by 2012, eliminating measles and neonatal tetanus by 2015 and minimizing the incidence of other vaccine preventable diseases[5]. Later on more vaccines were added to EPI program, including vaccine against hepatitis B (2002), Haemophilus influenzae type b (2008), pneumococcus (2012) and injectable polio vaccine (2016) with support from the government and development partners. Rota virus vaccine has recently been added in 2018[5]

Vaccination of children has significantly decreased the morbidity and mortality from dangerous

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vaccine preventable infectious diseases worldwide[6]. Nowadays as a result of immunization, around 2-3million childhood deaths due to measles, tetanus, diphtheria and pertussis are avoided worldwide[7]. Deaths from measles have been lowered by almost 74% globally[8]. However, around 22.6 million children worldwide are still not immunized[7]. The number of children not vaccinated is highest in developing countries. More than one fifth of children worldwide, particularly those living in poor countries are not fully vaccinated[8]. As found in the literature, factors such as demography, socioeconomic factors and infrastructure contribute to the immunization status of a child. Factors such as parental poverty, literacy and education level of parents, mother's lack of access to information, the absence of antenatal care, large family size, father's occupation and location of residence are found to be significantly related to low vaccination coverage in Pakistan[9].

Vaccine hesitancy appears to be linked with low vaccination coverage worldwide when parents have fear and doubts about immunization[10,28]. Due to anti-vaccination campaigns, public confidence in vaccination is decreasing worldwide and, as a result vaccine hesitancy is receiving a great deal of attention on future planning of public health program[10]. Evidence also suggests that vaccination coverage has a positive correlation with improved and increased services offered at health centers[11]. Conditions of child health in Pakistan are poor and infant mortality rate is among the highest in the world, i.e. around 80/1000 live births[12]. According to Pakistan Institute of Legislative Development and Transparency, only 47% of children in Pakistan received full vaccine coverage[13]. In KPK and FATA the vaccination coverage is much behind than Punjab, which is socioeconomically more developed[14].

The poor immunization coverage in KPK and FATA provided the basis for this study. The rationale of this study was that little number of studies has been done in this province and FATA regarding identification of causes of under vaccination, the objective of this study was to determine the reasons for non-vaccination of children less than five years of age coming from various districts of FATA and KPK to Khyber teaching hospital Peshawar.

MATERIAL AND METHODS

This was observational, cross sectional study through questionnaire from January 2012 to December 2014 at inpatient and outpatient setting, department of child health, Khyber teaching hospital Peshawar, which is one of the largest public sectors, tertiary care hospital of the KPK province, located in Peshawar city. This hospital provides health care to pediatrics patients most of whom belong to poor community and low socioeconomic class. In addition to local community, many of them come from far-flung areas of KPK and FATA. We interviewed the parents coming with children 1-5 years age. Thus convenience sampling was employed. Those children who were not accompanied by either of their parents were excluded from the study. Children having age below 1 year and above 5 years and those when parents have not given consent were also excluded from the study. After taking informed consent parents were interviewed either at bed side in ward or in outpatient department. The vaccination status was determined first by asking for vaccination card. If vaccination card would not be available, then parents were inquired by asking relevant questions about age, route and site of vaccination.

Approval has been taken from ethical review committee of Khyber medical college Peshawar. Confidentiality of the data was maintained throughout the study. Vaccination status was determined in following order i.e. fully vaccinated, non-vaccinated, partially vaccinated or under vaccinated. After determining the vaccination status then further question were asked from parents of under vaccinated children regarding reasons for non-vaccination or partial vaccination. Questionnaire attached. Parents were allowed to choose more than one reason if these were genuine.

At the end of each interview, the parents were counselled on the need and benefits of vaccination and attempts were made to satisfy them against a false belief. Data from questionnaire was entered in SPSS version 17 for analysis and results were compared. In addition to descriptive statistics, p-values were calculated to determine the significance of association between variables.

OPERATIONAL DEFINITION

1. Fully vaccinated: Children who had received full course of vaccination including BCG vaccine, 3 doses of Pentavalent vaccine and at least 3 doses of oral polio vaccine, 3 doses of pneumococcal conjugate vaccine (PCV) and at least one dose of measles vaccine according to WHO/EPI schedule. Previous published studies have defined complete vaccination in a similar way,[15]

2. Non-vaccinated: Children who had never been vaccinated.

3. Partially vaccinated: Children who had been immunized at least once, but had failed to complete the vaccination course according to EPI schedule.

4. Under Vaccinated: Non vaccinated + partially vaccinated.

All children from 1 to 5 years of age coming with both or either of their parents to OPD or admitted in department of child health, Khyber teaching hospital Peshawar whose parents have given consent were included in the study. While Children less than 1year or more than 5years of age, children not accompanied by either of their parents and children whose parents have not given consent were excluded from the study.

RESULTS

A total of 432 children were included in the study. Two hundred seventy six(63.8%) patients were male, whereas 156(36.1%) were female. Most of the children 373(86.3%) belonged to the rural areas while 59 children (13.6%) were from urban areas. Out of 432 children only 205(47.4%) were fully vaccinated, 107(24.8%) partially vaccinated, and 120(27.8%) were non-vaccinated, hence 227(52.6%) children were under vaccinated (non- vaccinated + partially vaccinated).

Among 276 male children, 127(46.01%) and among 156 female children 78(50%) were fully vaccinated; (P-value 0.4256); 149(53.9%) male and 78 female (50%) were under-vaccinated. Vaccination vs. gender is given in table 1. The percentage of children vaccinated fully was more from the urban areas as compared to rural areas (61% vs. 45.3% with P-value 0.02475). Out of 59 children from urban areas, 36(61.01%) were fully vaccinated, while only 169(45.3%) were fully vaccinated from rural areas. Twenty three(38.9%) from urban and 204(54.69%) from rural areas were under-vaccinated. Area wise vaccination status is given in table 3. The main focus of this study was to determine the reasons for non-vaccination of children.

Highest number of parents 128(56.4%) have given reasons of A i.e. no knowledge about vaccination and its benefits. Followed by E, 76(33.5%) i.e. accessibility (i.e. vaccination center far-away from home). The third common reason was F, 58(25.6%) because they could not spare time from household and family commitments, (i.e. unable to spare time from busy schedule) Frequency and percentages of reasons are given in table (3). Other reason in descending order of frequency are D, 53(23.3%) i.e. non-availability of vaccines in nearest center; C, 47 (20.7%)i.e. peer/mullah/religious taboos pressure; B, 31(13.7%) i.e. Family pressure not to vaccinate, and H, 7(3.1%)i.e.any other reason (most of which are due to security reasons) and finally G, 5 (2.2%) i.e. fear of adverse effects with vaccines or previous bad experience with vaccines in present or other offspring. Comparison of frequency of reasons in rural vs. urban areas are mentioned in table 4.

Of 128 parents who gave reason A (no knowledge about vaccination and its benefits) 120 belongs to rural areas vs. 8 parents who belongs to urban areas (p-value 0.02752), of 76 parents who gave the reason E (accessibility problem) 71 belongs to rural vs. 5 who belongs to urban areas (P-value 0.2085) while out of 58 parents, 46 in rural vs. 12 parents in urban areas have given the excuse F, that they could not spare time from the busy schedule of household and family commitments or business. Sex wise comparison of frequencies of reasons is mentioned in table 5.

Table 1: Vaccination vs. Gender

Vaccination	Sex		P-value
	Male	Female	
Vaccinated	127	78	0.4256
Under-vaccinated	149	78	
Total	276	156	

Table 2: Area wise. Vaccination

Vaccination	Address		Chi Sq.	P-Value
	Urban	Rural		
Vaccinated	36	169	5.04	0.024
Under-vaccinated	23	204		
Total	59	373		

Table 3: Reasons for Pediatric Under vaccination.

Parameters	Yes (no %)	No (no %)
A	128(56.4)	99(43.6)
B	31(13.7)	196(86.3)
C	47(20.7)	180(79.3)
D	53(23.3)	174(76.7)
E	76(33.5)	151(66.5)
F	58(25.6)	169(74.4)
G	5(2.2)	222(97.8)
H	7(3.1)	220(96.9)

Table 4: Frequency of reasons in rural vs. urban areas.

Parameters	Urban		Rural		P-value
	Yes	No	Yes	No	
A	8	15	120	84	0.02752
B	1	22	30	174	0.1704
C	2	21	45	159	0.1338
D	3	20	50	154	0.2183
E	5	18	71	133	0.2085
F	12	11	46	158	0.002014
G	0	23	5	199	
H	1	22	6	198	0.7114

Table 5: Sex wise comparison of frequencies of reasons.

Parameters	Male		female		
	Yes	No	Yes	No	
A	89	60	39	39	0.1604
B	21	128	10	68	0.7907
C	33	116	14	64	0.4584
D	34	115	19	59	0.7945
E	52	97	24	54	0.5312
F	35	114	23	55	0.3252
G	4	145	1	77	0.4941
H	4	145	3	75	0.6307

DISCUSSION

Immunization is one of the most cost effective health interventions worldwide which helped in prevention and eradication of a number of serious childhood infectious diseases. Eradication of small pox is one example which was achieved through an effective immunization campaign carried out from 1967 to 1977 by the World Health Organization (WHO)[16].

Due to non-immunization about 2-3 million children are dying annually from easily preventable diseases, and many more with high morbidity[16]. Under-vaccination of children is one of the major child health problems in developing countries like Pakistan. In our study complete vaccination coverage was low in various districts of KPK and FATA (47.4%), as compared to Punjab (53%) but was better than that in Sindh (37%) and Baluchistan (35%)[15]. Better vaccination coverage in Punjab may be due to high literacy rate, development and better accessibility of health facilities and increased awareness about immunization than other provinces. In this study (52.6%) children were under-vaccinated (comprising 24.8% partially vaccinated and 27.8% non-vaccinated.

The main purpose of this study was to determine the reasons of under-vaccination. Among eight reasons asked highest number of parents (56.4%) has given reason of no knowledge about vaccination and its benefits. Unawareness of parents about vaccination being the most common reason has also been cited by other studies[17,18,19,27]. According to one study done in England regarding knowing the reasons about not vaccinating their children against influenza vaccine, most interviewees were not convinced about the need to vaccinate their children against the said vaccine[28]. Decreased awareness of parents regarding vaccination may be due to decreased parental education level and decreased education facilities in rural areas and lack of media campaign for improving vaccination in these areas.

Like our study, in a study done in Ethiopia it was pointed out that lack of awareness about immunization contributed to low immunization coverage in Ethiopia[20]. Another study done in Ambo Woreda, Central Ethiopia in 2011shows that maternal knowledge at the time when the child's vaccination begins was significantly associated with complete immunization status[21].

So without improving maternal knowledge through mass media, campaigns and health education during visit to health institutions it is difficult to improve immunization coverage. Various studies done in Karachi, Bangladesh, and Ethiopia have shown that improving maternal knowledge about vaccination and interaction with health care system, enhance vaccination uptake, for example if a pregnant mother has antenatal visits, maternal visits for TTvaccine or taking her child for 1st time to a health faculty, she may get health education including information about immunization[14,21,22]. Mass campaigns have been successful in increasing parent's awareness and improve vaccine coverage[23].

Other reasons of pediatric non-vaccination in our study in descending order of frequency were accessibility 33.5%(i.e. vaccination center is far away from home), could not spare time from busy schedule of house and family commitments (25.6%), on availability of vaccine in the nearest center (23.3%), peer/mullah/religious taboo's pressure (20.7%), family pressure not to vaccinate (13.7%) and, security reasons (3.1%).

Similar to our study, a study conducted at civil hospital National institute of child health (NICH) Karachi has pointed out almost same reasons including lack of knowledge of vaccination followed by lack of time due to busy schedule,non-compliant spouse (i.e. family pressure), security conditions and religioustaboos (i.e. peer/mullah pressure) and other factors including accessibility[18]. In our study gender was not a statistically significant factor for preferring either sex for vaccination. It is consistent with other studies which also found no association of pediatric vaccination with either sex,[19, 22] the reason could be that parents may not be aware of the preventive benefits of vaccination. Hence they may not feel the importance of the completion of vaccination for their children regardless of their sex.

In our country and especially in KPK and FATA most of the population is living in rural areas (67.5%, 83.1%, and 97.3% respectively)[24]. In this study more children from urban areas were fully vaccinated as compared to rural areas (61% vs. 45.3% with P-value of 0.0247).This is consistent with previous studies on vaccination status in Pakistan[25, 26].

Better immunization status in urban areas may be due to increase proportion of educated community, increased number of health facilities, including with private sector hospitals, easy approach to nearly situated vaccination centers as shown by second common reason of inaccessibility of vaccination center in our study.

CONCLUSION

The most common reason of Pediatric under-vaccination is decrease awareness of parents about the preventive benefits of vaccination followed by decrease accessibility to health facility and vaccination centers, parents could not spare time from busy schedule and non-availability of vaccines in the nearest center.

Recommendations

1: To increase the awareness of parents about the preventive benefits of vaccination through health education in health faculties antenatal clinics, schools, colleges, through religious scholars and through electronic and print media.

2: To construct more health facilities in far flung rural areas.

3: To improve outreach system for door to door vaccination.

4: To ensure timely availability of all EPI vaccines along with cold chain to remote areas.

5: To improve literacy rate.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Khan S: Main idea article writing.

Muhammad Z: Data collection.

Shah SII: Literature search

Sher J: Data Analysis

Ahmed I: Review literature Search

Haider Z: Article typing ,data collection

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.