

Awareness of the mothers about Expanded Programme on Immunization and relation of immunization coverage with maternal education and Covid-19 Pandemic Lockdown

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Abstract

Background: Expanded Programme on Immunization (EPI) prevents childhood fatal illnesses, and better coverage will raise herd immunity.

Objective: To assess the knowledge of the mothers about Expanded Programme on Immunization of childhood vaccinations and relationship of the immunization coverage with mother's education and Covid-19 pandemic lockdown.

Methodology: It was a cross-sectional study, conducted by using a pretested questionnaire. Settings: Paediatric outpatient department and EPI centre, Sadiq Abbasi Hospital Bahawalpur from 1st September to 15th November 2021. A total of 200 multigravida mothers having children <5 years, were included by convenient sampling technique. Data were collected through a proforma, containing information about demographic characteristics, EPI coverage of the child, and mothers' knowledge and attitude towards the EPI program. Data were analyzed with the help of SPSS version 21.

Results: Among the total of 200 mothers, more than 90% were housewives and only 20% with more than 12 years of formal education. Only 3% of mothers answered correctly about the exact number of EPI vaccines. The awareness about the individual vaccine was 28% to 33%, except in the polio vaccine it was 70%, and in measles, it was 95%. Half of the mothers answered that EPI vaccines are safe, and half believe that they are effective as well. Working women and mothers with higher education status vaccinated themselves against covid-19 and also vaccinated their children according to the EPI schedule.

Conclusion: Awareness regarding EPI is poor and maternal education status significantly affects EPI knowledge and practices, additionally covid-19 pandemic also affected the EPI practices.

Keywords: Expanded Program on Immunization (EPI), Maternal Education, Covid-19, Vaccination, Awareness.

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Introduction

Vaccine-preventable diseases are the leading cause of death among children under 5 all over the world cause of either incomplete or absent immunization.¹ Childhood immunization is the only cost-effective intervention we can offer to render our children immune and prevent them from morbidity and mortality. The World Health Organization launched EPI in 1974 and it was launched in Pakistan in 1978 to protect children by immunizing them against childhood tuberculosis, poliomyelitis, diphtheria, pertussis, tetanus, and measles. Later, with the support of development partners, hepatitis B in 2002, Haemophilus influenzae type B (Hib) in 2009 and pneumococcal vaccine (PCV10) in 2012, and inactivated polio vaccine in 2015 were

introduced.¹ The Pakistan Expanded Programme on Immunization (EPI) is a large platform for the delivery of immunization and related services. Every year, it targets 7 million children under the age of 1 year, as well as 7 million pregnant women with life-saving vaccines. In recent years, the Pakistan EPI has seen significant successes.^{2,3} New vaccines have been added to the routine immunization schedule, and coverage with the pentavalent vaccine has risen to over 75 percent across the nation. However, despite these successes, EPI is not meeting its full potential. It has been challenging for Pakistan to reach its polio eradication, and measles and neonatal tetanus elimination goals, and there is wide variation and inequities in coverage of routine vaccines across provinces and population groups. Service delivery and demand challenges, which lead to irregular

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access and poor service utilization, are a key reason that performance is suboptimal.² The EPI coverage is best reflected by the Infant Mortality Rate (IMR) of the country and despite all efforts,³ the reported EPI coverage is still way below the herd immunity threshold in developing countries.^{4,5}

There are many factors affecting EPI failure in developing countries, including the problem with the vaccine itself and the problem with the community. In many countries, vaccine delivery is ineffective due to poor cold chain, stock availability, hard-to-reach area, or non-trained staff. If we consider socio-demographic factors, parental knowledge and beliefs have been documented to influence immunization uptake.^{6,7} If we consider the health system of Pakistan, we are facing challenges regarding misleading beliefs of the community, and the main reasons behind all problems are illiteracy and poverty. Usually, elders, and grandparents, in the family make the decision regarding seeking medical care for children and especially about their immunization. As a mother is the first caretaker of the child, if we educate our mothers we can strengthen immunization coverage. Studies report misconceptions about mothers' knowledge about EPI immunization. Mother's educational status and knowledge were clearly associated with coverage of immunization.^{8,9}

Mothers' knowledge can help them to make proper decisions regarding the immunization of their children. As in every developing nation, we are facing the problems of self-beliefs and myths regarding vaccinations, and the educated parents have started showing concerns over too many shots for childhood diseases and they have become so powerful due to lack of intervention from government resources that it is increasing maternal mortality and infant mortality to an alarming level.⁸ There is a lack of data supporting this claim as the majority do not take their children to any health care facility. We need to conduct knowledge, attitude, and practice studies in every union council to get the true picture of the problem.⁹ A knowledge, attitude, and practice study has been conducted all over the world and it is a unanimous consensus that maternal awareness is the key factor for the success of EPI. A KAP study of Northern Pakistan depicted that despite good knowledge and positive attitude of the

majority of parents, vaccination coverage was only 71%. Reasons for not immunizing the children were parents' laziness (72%) and beliefs that vaccination might cause harm to children.^{10,11} In another study in Peshawar, Pakistan, targeted the women of reproductive age about the vaccines given in pregnancy and only 65% knew it correctly and were vaccinated all of them were educated and were influenced by the information delivered by Lady Health Worker, during antenatal visits. A knowledge, attitudes, and practices (KAP) study conducted in China and Italy, confirmed that there are multiple factors affecting the EPI coverage, but the most important factor is maternal education, awareness, and empowerment to make a decision to vaccinate her children.^{7,12,13} As we have reviewed the literature, almost all studies are showing some gap in the maternal knowledge and practice, however, there is a paucity of information from the southern Punjab area of Pakistan which is why we have planned this study to assess the knowledge of the mothers about childhood vaccinations and the immunization coverage of their children, and to assess the effect of Covid-19 pandemic and lock-down on scheduled EPI immunization.

Methodology

A cross-sectional study was conducted at the Paediatric outdoor and EPI Vaccination centre of Sadiq Abbasi Hospital, Bahawalpur. Duration: From 1st September to 15th November 2021. A total of 200 multigravida mothers having children under 5 years were included by convenient sampling technique. Inclusion criteria: Multipara mothers, having children under five years of age. Exclusion Criteria: Mothers having children above five years of age and non-cooperative mothers were excluded from the study. Data were collected through pre-tested proforma, having information about demographic characteristics, socioeconomic status, EPI coverage of the child, and mothers' knowledge and attitude towards the EPI program. Data were analyzed with the help of SPSS version 21. Ethical approval letter No. 114 dated 20-08-2021 from the Research Ethics Committee of Sadiq Abbasi Hospital was taken. Frequencies were calculated and Pearson chi-square test was applied, and P-value less than 0.05 was taken as significant. The main outcome variable, the percentage of knowledge was developed from a set of questions that mothers were required to answer. Mothers were also asked about the coronavirus

vaccine and any delay in vaccination during pandemics and lock-down.

Results

There were 200 mothers included in the study, who visited pediatrics OPD in September and October of 2021 at Sadiq Abbasi hospital Bahawalpur. Their demographic and socio-economic data were analyzed and it showed that the mean age of mothers was 29 ± 7.4 years. Almost 90% of all mothers belonged to lower socioeconomic backgrounds (monthly income <15000 Rs/month) and 10% were from middle socioeconomic class (earning 15001-25000 Rs/month). Again 90% were housewives among the 20 working mothers (10%); only one belonged to the middle class working as a banker, 14 (7%) were housemaids and 5 (2.5%) were tailors. Table-I shows data analysis for the knowledge of mothers regarding vaccination showed that 29%

mothers knew the name of Tetanus Toxoid, although 39% answered that they were aware regarding its importance. The majority of mothers were aware of polio (70%) and measles (95%) vaccines and their mode of admission but less information regarding Pneumococcal and H. Influenzae vaccines and their site of admission. Ninety percent of mothers claimed that despite the lock-down situation in Pakistan due to the covid-19 pandemic, they have vaccinated their children although only 20% of mothers have been fully vaccinated against covid-19 so far. As far as mothers have claimed regarding vaccination, the majority were confused regarding the completion of the vaccination schedule. Data also showed that the mothers of 40 (20%) with more than 12 years of education have more awareness, as compared to mothers with less than 12 years of education. (Table-I) Other positive findings showed that mothers with more children are more knowledgeable than mothers with 1 child.

Table-I: Level of Education of Mothers and EPI Awareness

Questions	Mothers having >12 years of Education (n=40)	Mothers having <12 years of Education (n=160)	Total	P-value
1. Which Vaccine is given in pregnancy?				
a. Correct answer	36 (90%)	22 (13.75%)	58 (29%)	0.000
b. Don't Know	4 (10%)	138 (86.25%)	142 (71%)	
c. Incorrect answer	0 (0%)	0 (0%)	0 (0%)	
2. Is TT important in pregnancy?				
a. Yes	38 (95%)	40 (25%)	78 (39%)	0.000
b. Don't Know	02 (5%)	110 (68.75%)	112 (56%)	
c. No	0	10 (6.25%)	10 (5%)	
3. How many vaccines used in EPI?				
a. Tell Correct number	4 (10%)	2 (1.25%)	6 (3%)	0.1
b. Don't know	26 (65%)	120 (75%)	146 (73%)	
c. Incorrect Number	10 (25%)	38 (23.75%)	48 (24%)	
4. Can name TB Vaccine used in EPI?				
a. Yes	30 (75%)	30 (18.75%)	60 (30%)	0.000
b. No	10 (25%)	130 (81.25%)	140 (70%)	
5. Do you know about Pentavalent Vaccine?				
a. Yes	24 (60%)	32 (20%)	56 (28%)	0.000
b. No	16 (40%)	128 (81.25%)	144 (72%)	
6. Can Name all Vaccines in Pentavalent used in EPI?				
a. Yes	0 (0%)	0 (0%)	0 (0%)	0.000
b. No	40 (100%)	160 (100%)	200 (100%)	
7. Know the correct age for pentavalent vaccine				
a. Yes	21 (52.5%)	19 (11.8%)	40 (20%)	0.000
b. No	19 (47.5%)	141 (88.12%)	160 (80%)	
8. know the site of Pentavalent vaccine				
a. Yes	21 (52.5%)	29 (18.12%)	50 (25%)	0.00
b. No	19 (47.5%)	131 (81.87%)	150 (75%)	

9. Can name Polio Vaccine used in EPI? a. Yes b. No	35 (87.5%) 5(12.5%)	105 (65.6%) 55 (34.3%)	140 (70%) 60 (30%)	0.000
10. Can Name Hepatitis B Vaccine used in EPI? a. Yes b. No	15 (37.5%) 25 (62.5%)	25 (15.6%) 135 (84.3%)	40 (20%) 160 (80%)	0.000
11. Can Name Pneumococcal Vaccine in EPI? a. Yes b. No	7 (17.5%) 33 (82.5%)	3(1.87%) 157 (98.12%)	10 (5%) 190 (95%)	0.000
12. Can Name H Influenza Vaccine in EPI? a. Yes b. No	7 (17.5%) 33 (82.5%)	3(1.87%) 157 (98.12%)	10 (5%) 190 (95%)	0.000
13. Can Name Measles Vaccine in EPI? a. Yes b. No	36 (90%) 4 (10%)	154 (96.2%) 6 (3.75%)	190 (95%) 10 (5%)	0.1
14. Belief about safety of vaccine? a. Safe b. Don't Know c. Unsafe	38 (95%) 0 2(5%)	62(38.75%) 60 (37.5%) 38 (23.75%)	100 (50%) 60 (30%) 40 (20%)	0.00
15. Belief about effectiveness of Vaccination? a. Effective b. Don't Know c. Ineffective	38 (95%) 0 2(5%)	62(38.75%) 60 (37.5%) 38 (23.75%)	100 (50%) 60 (30%) 40 (20%)	0.00
16. Do you think that Covid -19 Pandemic has affected EPI? a. Yes b. Don't Know c. No	38(95%) 0 2(5%)	112 (70%) 40 (25%) 8 (5%)	150 (75%) 40 (20%) 10 (5%)	0.01
17. Have you Vaccinated your child during lockdown? a. Yes b. No	40 (100%) 0	140 (87.5%) 20 (12.5%)	180 (90%) 20 (10%)	0.06
18. Have you been vaccinated against covid-19? a. Yes b. No	35 (90%) 5 (5%)	5 (3.1%) 155 (96.87%)	40 (20%) 160 (80)	0.000
19. Do you think it is safe for you and your children? a. Yes b. Don't Know c. No	38(95%) 0 (0%) 2(5%)	2 (1.25%) 0 (0%) 158(98.75%)	40 (20%) 0 (0%) 160 (80%)	0.000
20. Have you vaccinated all your children? a. Yes b. No c. Don't know	20(50%) 5 (12.5%) 15(37.5%)	0 (0%) 15 (9.37%) 145 (90.6%)	20 (10%) 20 (10%) 160 (80%)	0.000

Discussion

Prevention is better than cure, the old proverb we used to hear all the time is about childhood immunization. As it has a very serious impact on the health of children and their families, we tried to explore the awareness of the mothers regarding EPI, as part of the project already done in 2015.¹⁴ Siddiqi N, et al 2010⁸ showed that 94.7% of mothers were housewives and belong to lower socioeconomic status, while in our study, 90% mothers were from a poor background and were housewives. The reason may be that in our culture, people who can afford private clinics, prefer to go there then visit government outpatient department clinics. Siddique N et al,⁸ also proposed that vaccination coverage was much better if one among the parents is literate. Nisar et al 2010¹⁵ also conducted a study in peri-urban Karachi, but in his study 88% of mothers were housewives and 12% had more than 10 years of education, while in our study 20% of mothers were having more than 12 years of education. Siddique et al also showed similar results.⁸

In our study, only 3% of mothers exactly knew the EPI schedule and the correct age of each vaccination but not a single mother answered how many diseases were being covered by the EPI vaccine. This result also matches with the finding of Siddique et al,⁸ in his study only 4.4% of mothers knew about the EPI program. In 2010 Adilet al 2009¹⁶ showed that 11% of mothers can name EPI vaccines. Nisar et al 2010¹⁵ showed a higher percentage, 54% of mothers knew about the vaccination schedule and for which disease it must be done. The variation in percentages may be due to the site from where the data has been collected, Siddique et al⁸ targeted Gadap Town a rural area in the periphery of Karachi, and in our study, we have collected data from the Outdoor clinics of Sadiq Abbasi Hospital Bahawalpur, which is also situated in a peri-urban area, a government hospital, where majority visitors are from the lower socio-economic background and illiterate.

In our study awareness about the individual vaccine was between 28-33%, which is the same as the study conducted 6 years before by the author, but surprisingly there was 95% awareness regarding the measles vaccine and 70% awareness regarding polio vaccine. The higher percentage of awareness may be due to the recent

polio and measles campaign, conducted by the local and provincial governments to eradicate polio and measles. In a study done by Siddique et al⁸, the awareness was between 27%-43%, and mothers were also lacking the knowledge regarding the polio vaccine, 43.3% despite national polio campaigns after every 3 months. Nisar et al showed that mothers have 15.4% to 40.4% knowledge about EPI, and 75.6% of mothers knew about polio vaccination.

If we compare the international data Joseph et al¹⁷ in India showed that 3% of mothers have the basic knowledge regarding vaccines and childhood immunization and they were able to match the correct vaccine with the disease, against which the vaccine renders immunity, 22% parents were able to tell that polio vaccines prevent polio. Knowledge about all other vaccines was again quite low, as only 16% of parents knew about measles, 6% BCG, and 6% about DPT. The study done by Caingles et al¹⁸ in the Philippines showed the knowledge of mothers on specific vaccines was between 81% to 93%. Masadeh et al¹⁹ also showed a high percentage of vaccinated children, as the awareness rate of mothers was about 87% to 95%.

In our study, only 50 % of mothers believe in the safety and effectiveness of EPI vaccines and amongst them, 95% of mothers with more than 12 years of formal education answered that EPI vaccines are safe and effective and they also believed that covid-19 pandemic has affected EPI schedule badly, as EPI services remained suspended in basic health units and rural centres. If we compare the answers of mothers with less than 12 years of knowledge, the situation is very alarming, 96.8% of mothers believe that the vaccines are not safe and not effective, and they also had the same doubts about covid vaccines as well. But thankfully all agreed on it that the covid-19 pandemic had badly affected the EPI schedule. In a previous study,²⁰ 40% of mothers answered that EPI vaccines are safe but only 37% believed that these are effective. Nisar et al¹⁵ showed that 72.7% of mothers answered that EPI vaccines are effective. This disparity again explains that working women and educated mothers are aware of the vaccinations.

In our study, 95% of mothers with more than 12 years of formal education, answered that due to the Covid-19 pandemic and lock-down situation in the country, the EPI schedule has been badly affected, yet these mothers claimed that they have access to vaccination against childhood diseases during lock-down, which is confusing, and the disparity is present as local

authorities have shown a decrease in the routine vaccine in last year due to covid-19 restrictions many centres were closed, but still parental refusal for the vaccine as the main cause. Although mothers claim that they have completed the vaccination of their children, only 20% of mothers were vaccinated against covid-19. The mothers believe that it is safe for them and their children, but the low vaccination ratio shows different results. These 20% of mothers were all working women. Siddiqui et al⁸ and Subhani et al 2015²⁰ also showed that maternal education status was directly proportional to better EPI coverage. Different studies conducted in Pakistan and other developing countries have shown that there is poor knowledge regarding EPI among the mothers, the sole reason behind this is illiteracy and poverty.

Conclusion

There is insufficient knowledge among mothers regarding the EPI program and childhood vaccinations and over the years it is not improving. The educated mothers had better knowledge and vaccination coverage, with Covid-19 affecting vaccination among children.

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