



RESEARCH ARTICLE

IMMUNIZATION COVERAGE FOR OBLIGATORY VACCINATIONS AMONG CHILDREN OF ARAR, NORTHERN SAUDI ARABIA

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ABSTRACT

Background: Immunization against childhood diseases is one of the most cost-effective public health interventions available, and has saved the lives of millions of children in the last 3 decades.

Objective: To estimate the level of immunization coverage for obligatory vaccinations, Among children of Arar, Northern Saudi Arabia.

Methods: The study was a community based cross-sectional survey. The study was conducted within communities in six randomly chosen departments in Arar city. The study population comprised of households with children under preschool age. Data was collected with a pretested, interviewer administered questionnaire. The questionnaire comprised 2 sections; section one: the socio-demographic characteristics and section two; the immunization status of the children.

Results: The total coverage of "at birth" vaccination is 99.2%. 2nd month's vaccination was totally covered. 4th months vaccines were 99.2% covered. 6th month vaccines were totally covered. 9th month was 99.2% covered. 12th month was 98.3% covered (higher in females than males). 18th month was 99.1% covered. 24th month was 95.6% covered and pre-school age was 92.3% covered (higher in males). Subsequently it was revealed that 89.7% of children were fully immunized, one missed vaccine (6.9%), two missed vaccines (1.7%), three missed vaccines (0.9%) and four missed vaccines (0.9%) among the studied children, Arar, Saudi Arabia, 2016.

Conclusion: The immunization coverage in the study population is high compared to that of other studies. Policy makers should hold health education campaigns to rise parents and general public awareness to avoid dropout doses, and hence encourage them to complete the immunization of their children.

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INTRODUCTION

Immunization against childhood diseases is one of the most cost-effective public health interventions available, and has saved the lives of millions of children in the last 3 decades. Immunization also prevents many more millions from suffering debilitating illness, and lifelong disability (World Health Organization, 2002). Though vaccination coverage globally has been stable with immunization preventing 2- 3 million deaths yearly, it has been estimated that about 19 million infants are not accessing basic vaccines due to peculiar regional challenges such as inadequate funds and manpower for vaccine procurement, distribution, monitoring and supervision

activities, and also the poor state and management of health care facilities (World Health Organization, 2016). Vaccines are used worldwide though the types of vaccines, indications, contraindications and immunization schedules vary substantially (Fritz, 2009). Most developing countries follow a schedule promulgated by the World Health Organization's EPI. According to this schedule, all children should be vaccinated at birth against tuberculosis with BacilleCalmette-Guérin (BCG) vaccine. Many children also receive a dose of the live attenuated oral polio vaccine (OPV) at this time. Immunization visits are scheduled for 6, 10, and 14 weeks of age when DTP vaccine and OPV are administered. Measles vaccine is given at 9 month of age. Many developing countries have implemented hepatitis B vaccination (Fisher, 2007 and Daley, 2007). Because of increased accessibility of health care services in both urban and rural areas, an increase is expected in the

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utilization of the services. A previous study was conducted in Aden, Yemen to evaluate the immunization status among children (Huda, 2010), found that 83.1% had complete, 10.4% had partial, and 6.5% were never immunized. The immunization coverage was 92.9% for Bacillus-Calmette-Guérin, 89.6% for Oral Polio Vaccine-3, 86.6% for Diphtheria, Pertussis and Tetanus-3 and Hepatitis-B vaccination, and 89.1% for measles. Another study in a peri-urban area of Kenya found that; complete immunization coverage was 76.6%. Coverage for specific antigens was; BCG (99.5%), OPV0 (97.6%), OPV 1(98.7%), OPV2 (96.6%), OPV3 (90.5%), Penta 1(98.9), Penta 2 (96.6%), Penta 3 (90.0%), Measles (77.4%). The drop-out rate between the first and third pentavalent vaccine coverage was 8.9%. Predictors (Malkar, 2013).

Objectives

To estimate the level of immunization coverage for obligatory vaccinations (BCG, HBV, IPV, DTaP, Hib, PCV, Rota, IPV, OPV, Measles, MVC4, MMR, Varicella, HAV, DTaP), Among children of Arar, Northern Saudi Arabia.

PARTICIPANTS AND METHODS

The study was a community based cross-sectional survey. The study was conducted within communities in six randomly chosen departments in Arar city. The study population comprised of households with children under preschool age, during 6 months period from 1st March to 31 August 2016. The sample size was calculated using the sample size equation: $n = z^2 p (1-p) / e^2$. The study included 517 children aged from 1 month to preschool age. Data was collected with a pretested, interviewer administered questionnaire. The questionnaire comprised 2 sections; section one: the socio-demographic characteristics and section two; the immunization status of the children. Five data collectors were trained for 3 days and they helped in data collection. Data was collected from the mothers by face to face interview and information about child immunizations were collected from immunization cards and the mother's verbal report with the verification of the presence of a BCG scar.

Statistical analysis

Data was cleaned and validated manually, and analyzed using Statistical Package for Social Sciences (SPSS-Inc) version 20. Descriptive statistics (frequency tables) were generated.

Ethical considerations

Permission to conduct the study was obtained from the Research and Ethics Committee at the College of Medicine, Northern Border University, Arar, Saudi Arabia. Data collectors gave a brief introduction to mothers by explaining the aims and significance of the study. Written consent was obtained from all children's mothers. Confidentiality of data was maintained throughout the study.

RESULTS

Table (1): illustrates the Socio-demographic characteristics of studied children, northern Saudi Arabia, 2016. The table showed that 51.1% of studied children were females and 48.9% were males. Regarding mother educational level, primary education constitutes 3.1%, 6.4% had Preparatory education,

14.9% had secondary education, 72.1% university education or more and 3.5% were illiterate, working to non-working mother ratio was 45.8 to 54.2. Regarding father educational level, primary education constitutes 3.1%, 4.3% had Preparatory education, 31.5% had secondary education, 58.2% university education or more and 2.9% were illiterate, as regard the father work 8.1% had no job, 1.7 were retired and 90.2% working in different sectors.

Figure (1): Percentage of fully immunized (89.7%), one missed vaccine (6.9%), two missed vaccines (1.7%), three missed vaccines (0.9%) and four missed vaccines (0.9%) among the studied children, Arar, Saudi Arabia, 2016

Table (2): shows vaccination coverage of the studied children. The total coverage of "at birth" vaccination is 99.2%. 2nd month's vaccination was totally covered. 4th months vaccines were 99.2% covered. 6th month vaccines were totally covered. 9th month was 99.2% covered. 12th month was 98.3% covered (higher in females than males). 18th month was 99.1% covered. 24th month was 95.6% covered and pre-school age was 92.3% covered (higher in males).

Table 1. Socio-demographic characters of the studied children, Arar, Saudi Arabia, 2016

Sex	No. (n=517)	%
Male	253	48.9
Female	264	51.1
Mother Education		
Illiterate	18	3.5
Primary	16	3.1
Preparatory	33	6.4
Secondary	77	14.9
University or more	373	72.1
Father Education		
Illiterate	15	2.9
Primary	16	3.1
Preparatory	22	4.3
Secondary	163	31.5
University or more	301	58.2
Mother's Work		
Employed	237	45.8
Housewife	280	54.2
Father's work		
Non	42	8.1
Teacher	160	30.9
Policeman	148	28.6
Professional	142	27.5
Private	6	1.2
Skilled Worker	8	1.5
Retired	9	1.7
Other	2	.4

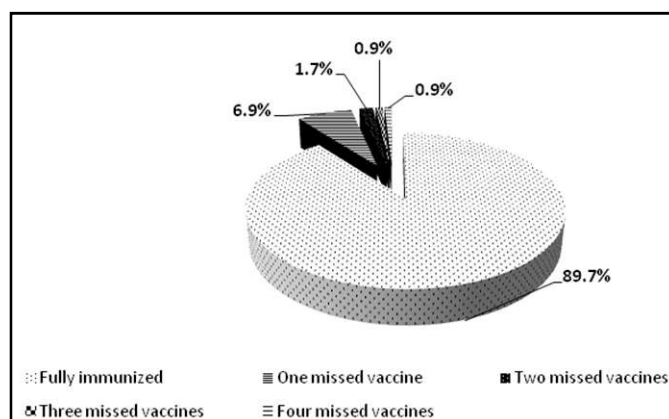


Figure 1. Percentage of fully immunized, one missed vaccine, two missed vaccines, three missed vaccines and four missed vaccines among the studied children, Arar, Saudi Arabia, 2016

Table 2. Vaccination coverage of the studied children, Arar, Saudi Arabia, 2016

	Male children			Female children			Total		
	Targeted children	Vaccinated children	Vaccination coverage	Targeted children	Vaccinated children	Vaccination coverage	Targeted children	Vaccinated children	Vaccination coverage
At Birth (BCG, Hepatitis B1)	249	247	99.2	264	262	99.2	513	509	99.2
2 nd month (IPV1, DTaP1, Hepatitis B2, PCV1, Rota1)	253	253	100.0	262	262	100.0	515	515	100.0
4 th month (IPV2, DTaP2, Hepatitis B3, PCV2, Rota2, Hib1)	253	249	98.4	250	250	100	503	499	99.2
6 th month (OPV1, IPV3, Hepatitis B4, Hib2, PCV3)	247	247	100.0	246	246	100.0	493	493	100.0
9 th month (Measles, MCV4)	235	235	100.0	244	240	98.4	479	475	99.2
12 th month (OPV2, MMR1, PCV4, MCV4)	229	223	97.4	238	240	99.2	469	461	98.3
18 th month (OPV3, DTaP3, Hib3, MMR2, Varicella1, Hepatitis A1)	217	213	98.2	220	220	100.0	437	433	99.1
24 th month (Hepatitis A2)	203	191	94.1	202	196	97.0	405	387	95.6
Preschool age (1 st kindergarten) (OPV4, DTaP4, MMR3, Varicella2)	111	103	92.8	122	112	91.8	233	215	92.3

DISCUSSION

This study determined the immunization coverage of children below pre-school age among the children in Arar, Northern Saudi Arabia. Subsequently it was revealed that 89.7% of children were fully immunized, 6.9% had one missed vaccine, 1.7% had two missed vaccines, 0.9% had three missed vaccines and 0.9% had four missed vaccines. In Baghel *et al.* study (Prabhat Singh Baghel, 2016), it was observed that about 64.2% of the children were fully immunized, 30.1% partially immunized and 5.7% were unimmunized among the study group. This was comparable to Malkar *et al.* study (Malkar, 2013), which showed 78.6% full immunization, 20.5% partial and 0.95% unimmunized children. Sharma *et al.* (Sharma, 2013), showed 81%, 17.6% and 1.4% respectively. This was higher than results of a study conducted in Bareilly District (Joshi, 2011), which found that; only around 50% of children were fully immunized while 27.5% were partially and 22.5% were not immunized at all. In the Al-Mukalladistrict, Ba'Amer's (Ba'Amer, 2010), findings were almost similar to those reported in this study, where 82.4% of children of the same age had complete, 12.4% had partial, and 5.2% were never immunized.

It should be pointed out from our findings that this coverage goal has already been achieved for IPV1, DTaP1, Hepatitis B2, PCV1, Rota1 and Hib1, OPV1, IPV3, Hepatitis B4, Hib2, PCV3 vaccines (all 100%), but approaching the goal with BCG (99.2%), Varicella1, Hepatitis A1 (both 99.1%), Measles, MCV4 (both 99.2%) and MMR1 (98.1%). Those results didn't agree with Basaleem *et al.* study in Aden (Huda, 2010), which found that immunization coverage was achieved with BCG only (92.9%), but approaching the goal with 89.6% for OPV3, 89.1% for measles vaccines, and 86.6% for DPT3 and Hepatitis B3.

Almost similar figures for all vaccines were reported by Ba'Amer (Ba'Amer, 2010), except for 88.1% reported for the BCG vaccine. In Joshi *et al.* study (Joshi, 2011), immunization coverage was highest for BCG (62.5%) and lowest for measles (39.2%). Dropout rates were 37.3%, 19.7% and 18.2% for BCG to measles, DPT1 to DPT3 and OPV1 to OPV3 respectively. Baghel *et al.* study (Prabhat Singh Baghel, 2016), showed maximum coverage for BCG and minimum for measles. Other studies Sharma *et al.* (Sharma, 2013), Chhabra *et al.* (Chhabra, 2007), Singh *et al.* (Singh, 1992) and Bhatia *et al.* (Bhatia, 2004) had similar results. Good access to immunization service as evidenced by a high DTaP1 coverage of 100% was found in the present study. Lower access to immunization services was also reported in Al-Mukalla (Ba'Amer, 2010), with DPT1 coverage of 90.5%, and 85% by the routine administrative report in Yemen (Ministry of Public Health, 2008), Higher rates (97% and more) were reported in Egypt (El-Zanaty, 2002), and Bangladesh (Khan, 2005).

Conclusion

The immunization coverage in the study population is high compared to that of other studies. There are still opportunities for improving its coverage; improving father's education, health personnel orientation and enhancing the efficiency of immunization service delivery.

Also, rising parents and the general public awareness to avoid dropout doses, and hence encourage them to complete the immunization of their children. Special focus should be devoted to younger mothers, mothers who married early and gave birth to their first babies at younger age.

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