



Assessment of the Knowledge of Immunization Services against Infant Killer Diseases among Women of Child Bearing Age in Kano State, Nigeria

¹Muhammed Yusuf, ¹M. A. Suleiman; ¹V. Dashe, ¹A. Dahiru

¹Department of Human Kinetics and Health Education Ahmadu Bello University, Zaria

Corresponding Author: Muhammed Yusuf

Corresponding Email: babamaddi33@gmail.com

Abstract

Background: Immunization is one of the most effective, safe and efficient public health interventions, as it is estimated to have saved at least three (3) million lives from vaccine-preventable diseases. **Aim:** The main aim of this study was to assess knowledge of immunization services against infant killer diseases among women of child bearing age in Kano State Nigeria. **Method:** The study employed a descriptive survey design. Its population was 1,367,916 women of child bearing age. The study was guided by one research question and one null hypothesis. Multi-stage sampling technique was used in selecting 420 women of childbearing age as the sample. A researchers-developed questionnaire, titled "Questionnaire on assessment of knowledge, acceptability and utilization of immunization services against infant killer diseases" was used in data collection from the sample in the selected hospitals in the three (3) senatorial zones of Kano state. Descriptive statistics of frequencies and percentage, mean and standard deviation and inferential statistics of one-sample t-test was used to analyze the gathered data at the alpha level of 0.05. **Result:** The findings of the study revealed that women of child bearing age in Kano State have knowledge of immunization services against infant killer diseases with a p-value of .001. **Conclusion:** In conclusion, it was recommended that the government and non-governmental organizations should organize seminars, conferences and workshops on immunization, especially immunization services in order to help to sustain the knowledge of immunization among women of child bearing age in the state.

Keywords: *Disease, Knowledge, Immunization, Infant, Women*

Introduction

Immunization is one of the most effective, safe and efficient public health interventions, as it is estimated to have saved at least three (3) million lives from vaccine-preventable diseases (Offit, 2020). Immunization is the process of providing the human body with protection against killer diseases, such as poliomyelitis, pertusis (whooping cough), diphtheria, tetanus, measles, tuberculosis and

yellow fever. According to the World health Organization (WHO), United Nations International Children Emergency Fund (UNICEF) and World Bank's State of the world's vaccines and immunization report (2009), these diseases are the major causes of sicknesses and subsequent deaths among children of age 0-5 years. Awodele, Oreagba, Akinyede, Awodele and Dolapo (2010) reported that inducing immunity through

vaccination almost guarantees protection from many major disease. Studies conducted by Sallusto, Lanzavecchia, Araki and Ahmed (2010) and Pulendran and Ahmed (2011) support that protection induced by vaccinations is mediated through a complex interplay between innate, humeral, and cell-mediated immunity.

Childhood immunization prevents two (2)-three (3) million deaths per year worldwide and is widely considered to be overwhelmingly good by the scientific community (WHO, 2019). Nigeria and the United Nations International Children Emergency Fund (UNICEF) have been working together since 1951 on immunization activities to improve the wellbeing of children and potential mothers in the country and the early thrust of this cooperation centred on cash grants and technical support to primary education, social development and immunization activities (Gagare, 2007). Despite this support received by the Nigerian government, it still records a national average of 33% coverage (National Immunization Coverage Survey, 2016/2017) thereby emphasizing the need for improvements across the country.

Knowledge of immunization refers to the ability of mothers to identify the various immunization regiments and when such vaccinations are to be taken. With regards to knowledge of vaccination, Siddiqi, Siddiqi, Nisar, and Khan, (2010) reported that mother's in peri-urban Karachi have low knowledge about the Expanded Program on Immunization (EPI) vaccination, although their knowledge wasn't associated with their children's immunization. Although other factors, such as mother's educational status was significantly associated with immunization coverage of the child, this finding reveals a better health seeking behavior from the more educated mother compared to their non-educated counterparts. According to Angelillio, Ricciardi, Rossi, Pantisano, Langiano, and Pavia (1999), there are several studies on the immunization status of children which have been published across

the world at different times, although it is worthy to note that any comparison with these studies must be made with great caution. Angelillio, *et al* (1999) also stated that since many factors may influence vaccination coverage in children, important differences should be taken into account, the prevalence of vaccine-preventable diseases, knowledge of mothers about vaccination as well as the availability of vaccination centers.

There are many factors that serve as an impediment to low immunization take-up and coverage. Scholarly findings from low - and middle-income countries, which include Nigeria, revealed that low income (Kusuma, Kumari, Pandav, & Gupta, 2010), access to health care facility, high cost of health care and level of education (Adebayo & Oladokun, 2012) as well as delivery not assisted by a professional birth attendant (Canavan, Sipsma, Kassie & Bradley, 2014) remain risk factors that result into low immunization coverage. Identifying the factors that affect childhood immunization is essential for policy makers to establish strategies to increase immunization coverage. Studies indicate that mothers who attend ante-natal care (ANC) and give birth at a health facility are more likely to fully vaccinate their children (Dixit, Dwivedi & Ram, 2013; Maharani, & Kuroda, 2018; McNellan, Dansereau, Wallace, Colombara, Palmisano, Johanns, ... & Iriarte, 2019). Some studies also showed that attendants at birth have an impact on the immunization status of children (Weinberg, Dietz, Potter, Swanson, Miller & McFadden, 2017; Maharani, & Kuroda, 2018). While Xeuatvongsa, Hachiya, Miyano, Mizoue, and Kitamura (2017) in their study pointed out that lack of a traditional birth attendant can also affect the vaccination status of a child.

Kabir, Ilyasu, Abubakar and Gajida (2005) who reported from a study that majority of women were aware of immunization service but that their knowledge of immunization schedule as well as of infant killer diseases was poor, the finding agrees with the report of Abdulraheem, Onajole, Jimoh, and Oladipo (2011), who found that there has been a great

set back in Nigeria, especially in the northern parts who witnessed a pandemonium and commotion with some citizens erroneously agitating that Oral Polio Vaccine (OPV) caused infertility and that barely 10% of children received all of their complete routine vaccines in many parts of the region. The finding here agrees with Diddy (2009), who reported from a study conducted on knowledge of mothers of vaccine preventable diseases and the utilization of immunization services in pastoralist and semi pastoralist areas of Ethiopia. The findings revealed that 79% of the mothers are fully aware that vaccine protects their child from preventable diseases.

Having established that Nigeria still records a low immunization coverage, as reported by the NICS (2016/2017) as well as recorded a staggering 42,000 deaths due to vaccine-preventable diseases, such as pertussis, tetanus and measles in the country (Wonodi, Prindle, Aina, Oni, Olukowi, Pate, ... Levine, 2012), the researchers were moved to assess the knowledge of immunization services against infant killer disease among women of child bearing age in Kano State, Nigeria.

Research Question

1. What is the knowledge of immunization services against infant killer diseases among women of child bearing age in Kano state, Nigeria?

Hypothesis

1. knowledge of immunization against infant killer diseases among women of child bearing age in Kano state is not significantly adequate.

Methodology

The research design adopted for this study is descriptive survey. The population of this study comprised of 1,367,916 women of child bearing age attending clinics and primary healthcare centres in Kano State (Primary Health Care Management Board Kano, 2016). A sample of 420 respondents from 12 primary health care centres was selected. The sample size was determined using the Krejcie and

Morgan (1970) table for determining sample size. Krejcie and Morgan suggested that for a population of 1,000,000 a sample of 384 will be sufficient. Therefore, in other to cover for possible attrition the sample was increased to 420.

Multi-stage sampling technique was used in this study comprising stratified random sampling, simple random sampling, proportionate random sampling and purposive sampling techniques. At the first stage, Kano state was stratified into the three already existing senatorial zones adopted as strata (these are Kano south zone, Kano central zone and Kano north zone). Two local government areas (LGAs) were selected from each stratum, using simple random sampling technique. In this technique, the research wrote all the names of the local government areas per senatorial zone the pieces of paper. Each of the pieces was folded and dropped in a container. The research asked one of his research assistants to pick from the container one piece of paper at a time and the name of the LGA on the paper was written down by the researcher. Each piece of paper was folded and dropped in the container. This procedure was repeated until the required number of LGAs was picked and recorded. Simple random sampling technique was used to select two political wards each from the selected LGAs. The balloting method explained earlier was carried out until a total of (12) wards were selected. To select the participants across the selected wards proportionate random sampling technique was employed. The researcher divided the population of women of child bearing age at each ward by the target population and multiplied it by the sample size. Lastly, purposive sampling technique was used to select women of child bearing age in the state.

The research instrument used for data collection was a researchers-developed questionnaire, titled "Questionnaire on assessment of knowledge, acceptability and utilization of immunization services against infant killer diseases". It was vetted for its face and content validity by three (3) experts

in the Department of Human Kinetics and Health Education in Ahmadu Bello University, Zaria. The research instrument is made up of four (4) sections, A-D. Section A has 6 items on the demographic characteristics of the respondents; Section B-D has eight (8) items each. To score the respondents based on what they feel towards an item, a four point modified Likert scale rating was used: Strongly Agree 4 points, Agree 3 points, Disagree 2 point and Strongly Disagree 1

point. Decision on the mean scores is based on the 2.50 midpoint average. A mean of 2.50 and higher magnitude indicates adequate utilization while a lower mean implies inadequate utilization. Descriptive statistics of frequency and percentage was used to describe the demographic characteristics of the respondents. Mean score and standard deviation were used to answer the research question, and t-test statistics to test the hypotheses.

Results

Table 1: Mean Scores of Responses on Knowledge of immunization Services among Women of Child bearing Age in Kano State, Nigeria

Sn	Knowledge	Mean	Std. Dev.
1	I have ever heard about infant killer disease.	2.65	0.993
2	I am aware of schedules of routine immunization services.	2.86	0.782
3	I am aware of the disease that my child is immunized against infant killer diseases.	3.02	0.950
4	I know the vaccines are made for the prevention against infant killer diseases.	2.85	0.839
5	I know that vaccine preventable diseases are not caused by spirit.	2.69	0.845
6	I know that Children who receive the complete doses of routine immunization live healthier than children who do not receive the complete doses of the vaccine.	3.11	0.699
7	I have ever heard about infant killer disease.	2.40	1.012
8	I am aware of schedules of routine immunization services.	2.38	0.807
9	I am aware of the disease that my child is immunized against.	2.71	0.895
10	I know the vaccines are made for the prevention of infant killer diseases.	2.79	0.763
11	I know that vaccine preventable diseases are not caused by spirit.	3.03	0.759
12	BCG once	2.72	0.767
13	Hepatitis B 3 times	2.39	1.110
14	DPT 3 times	2.35	0.925
15	Polio 4 times	2.30	0.942
16	Measles once	2.13	0.829
	Aggregate mean	2.65	0.444

Observation of Table 1 reveals an average mean score of 2.66, implies that women of child bearing age in Kano state could be said to have adequate knowledge of immunization services against infant killer diseases. This knowledge is demonstrated across awareness of infant killer diseases, schedules of routine immunization services and that there are vaccines made for the prevention against such infant killer diseases. The women were aware that infant killer diseases are not caused by

spirits and that they could be prevented with the use of vaccines. They therefore agreed that children who receive the complete doses or routine immunization live healthier than children who do not receive the complete doses of such vaccinations. The women exhibited a good knowledge of BCG, which they acknowledge is taken pre the prevention of infant killer disease.

The exhibited knowledge of the women did not seem to have extended to the number some of the vaccines are to be taken, as shown for Hepatitis B, DTP, Polio and Measles in the table. Their mean scores are all lower than the midpoint average of 2.50. This could be a clear indication of lack of knowledge of those vaccines and the corresponding routines for effective immunization against them. However, the aggregate mean score of 2.66 shows that the women have adequate knowledge of immunization services against infant killer diseases in the state.

On the sources of information on immunization services routinely carried out in the health care centres, Radio and Television were the highest rated media. 39.0% each of the total respondents are of the view that they got such information on immunization against

infant killer diseases from radio or the television. But 13.7% and 8.3% said they became aware of such information through Newspaper and Friends or relation respectively. The observation here is that the women have knowledge of immunization services in the state and acquired their information through radio and television. Their opinions on the selected item used to assess the level of their knowledge of immunization against infant killer diseases are scored in means and standard deviation in Table 1. The midpoint average for decision on the item and the variable is 2.50, which would indicate whether the women knowledge is adequate or not. The mean score of 2.50 and above implies adequate knowledge while lower mean score implies inadequacy in knowledge of immunization.

Hypothesis I

There is no significant knowledge of immunization against infant killer diseases among women of child bearing age in Kano state.

Table 2: One sample t-test on knowledge of immunization against infant killer diseases among women of child bearing age in Kano state

Variables	N	Mean	Std. Deviation	t-value	DF	P-value
Knowledge	410	2.65	.444	7.440	409	.000
Test mean	410	2.50	.000			

(Critical value of $t=1.96$, $P < 0.05$ **H0 rejected**)

The mean score on knowledge of immunization services by the women assessed in Table 2 were tested here to determine the extent of significance statistically. The one sample t-test was used for the test to enable the observed means to be compared with the fixed mean score of 2.50. The result of the test is summarized in Table 2 and revealed that the respondents have significant knowledge of immunization against infant killer diseases in the state. This is indicated in the Table with a mean score of 2.65, which is significantly higher than the test mean of 2.50 and an observed t-value of 7.440 obtained at 409 degree of freedom. The observed P-value for the test is 0.000 ($P < 0.05$). This observation provides sufficient evidence for rejecting the

null hypothesis. The null hypothesis that there is no significant knowledge of immunization against infant killer diseases among women of child bearing age in Kano state is therefore rejected.

Discussion

The result revealed that women of child-bearing age have the knowledge of immunization services against infant killer diseases in Kano State, Nigeria. It was revealed that they have adequate knowledge of the vaccines for the six infant killer diseases and were well aware of the effects of vaccination against the diseases. This implies that women of child bearing age in Kano state Nigeria are aware of the advantage of having

healthy children through effective vaccination. The findings of this study agree with the findings of Chris-Otubor, Dangiwa, Ior and Anukam (2015), who conducted a similar study that assessed the knowledge, attitudes and practices of mothers in Jos North regarding immunization. The study revealed that 89.6% had an overall good knowledge of vaccine preventable diseases. It revealed that education of the mother, marital status, religion, and the geopolitical zone of the parents of the child being immunized had a significant influence of the knowledge of mothers. This finding implies that there is an urgent need for health promotion programmes within the state so as to educate all mothers of under-five children regardless of their socio-demographic status. The findings of this study is not in sync with the findings of Birhanu, Anteneh, Kibie and Jejaw (2016) that assessed the knowledge, attitude and practice of mothers towards the immunization of infants in health centres at Addis Ababa, Ethiopia. They reported that the knowledge of mothers towards childhood immunization was good (55.0%). Birhanu, *et al* (2016) attributed this significant knowledge to maternal education and the age of infants (>3-12 months) as well as the number of children (>2). This implies that the higher the level of education of mothers the greater their chances to immunize their children. This also implies to the number of children the women have. The findings of this study is in contrast with the findings of a study conducted by Sharma, Kaur, Pun, Shukla, Thakur, Sharma, Kaur, Sonowal, Kaur & Gupta, (2018), which assessed the knowledge of under five children's mothers regarding the six killer diseases in India. They reported that majority of the mothers of under-five children had average knowledge (66%) of the six killer diseases. It was also reported that the mothers were not fully aware about the six killer diseases. This finding implies that there is an urgent need for the education of mothers of under-five children as well as women of child bearing age in the country so as to close the gap of ignorance and educate them on immunization and the six killer diseases children are exposed to as well

as the importance of immunizing them. This would help in reducing infant mortality as a result of vaccine preventable diseases.

Conclusion

Based on the findings of this study, it was concluded that women of child-bearing age have the knowledge of immunization services against infant killer diseases in Kano State, Nigeria.

Recommendations

Based on the conclusions drawn, it was recommended that the state government and non-governmental organizations should organize seminars, conferences and workshops on immunization, especially immunization services, in order to help to sustain the knowledge of immunization among women of child bearing age in the state

References

- Abdulraheem, I. S., Onajole, A. T., Jimoh, A. A. & Oladipo, A. R. (2011). Reason for incomplete vaccinations and factors for missed opportunities among rural Nigerian children. *Journal of Public Health Epidemiology*, (4)2, 194-203
- Adebayo, B. E., & Oladokun, R. E. (2012). Immunization coverage in a rural Community in South-western Nigeria. *Journal of Vaccines & Vaccination* 3(4), 1-6.
- Angelillo, I. F. Ricciardi, G. Rossi, P., Pantisano, P., Langiano, E., & Pavia, M. (1999). Mothers and vaccination: knowledge, attitude and behavior in Italy. *Bulleting of the World Health Organization* 77.3 (1999), 224-229.
- Awodele, O., Oreagba, I. A., Akinyede, A., Awodele, D. F., & Dolapo, D. C. (2010). The knowledge and attitude towards childhood immunization amongst mothers attending antenatal clinic in Lagos

- University Teaching Hospital. *Tanzania journal of Health research*, 12(3), 172-177.
- Birhanu, S., Anteneh, A., Kibie, Y., & Jejaw, A. (2016). Knowledge, attitude and practice of mothers towards immunization of infants in health Centres at Addis Ababa, Ethiopia. *American Journal of Health Researches*, 4(1), 6-17.
- Canavan, M.E., Sipsma, H.L., Kassie, G.M., & Bradley, E.H. (2014). Correlates of complete childhood vaccination in East African countries. *PLoS One*. 9(4), e95709.
- Chris-Otubor, G.O., Dangiwa, D.A., Ior, L.D, Anukam, N.C. (2015). Assessment of Knowledge, Attitudes and Practices of Mothers in Jos North Regarding Immunization. *IOSR Journal Of Pharmacy* (e) 5(6), 34-45.
- Diddy, A. (2009). *Inequitable childhood immunization uptake in Nigeria: Analysis of individual and contextual determinants*. *BMC infectious disease* 9(181), 31-37.
- Dixit, P., Dwivedi, L. K., & Ram, F. (2013). Strategies to improve child immunization via antenatal care visits in India: a propensity score matching analysis. *PloS one*, 8(6), e66175.
- Gagare, A. A. (2007). *Evaluation of the implementation of National program on immunization (NPI) in Jalingo Local Government Area of Taraba State*. Unpublished Master Degree Thesis, University of Maiduguri.
- Jegade, A. S., Idemudia, S. E. & Madu, S. N. (2001). Public Health in Nigeria: From cure to care. *IFE psycholog IA*, 9(1), 35-46.
- Kabir, M., Iliyasu, Z. & Abubakar, J. S. (2005). Immunization coverage among children below two years of age in Fanshekara, Kano: Nigeria, *Journal of Basic and Clinical Sciences*. 3(2), 1-13.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, 30(3), 607-610.
- Kusuma, Y.S., Kumari, R., Pandav, C.S., & Gupta, S. K. (2010). Migration and immunization: determinants of childhood immunization uptake among socioeconomically disadvantaged migrants in Delhi, India. *Trop Med Int Heal*. 15(11), 1326–1332.
- Maharani, A., & Kuroda, Y. (2018). Determinants of immunization status among 12-to 23-month-old children in Indonesia (2008–2013): A multilevel analysis. *BMC public health*, 18(1), 288.
- McNellan, C. R., Dansereau, E., Wallace, M. C., Colombara, D. V., Palmisano, E. B., Johanns, C. K., ... & Iriarte, E. (2019). Antenatal care as a means to increase participation in the continuum of maternal and child healthcare: an analysis of the poorest regions of four Mesoamerican countries. *BMC pregnancy and childbirth*, 19(1), 66.
- National Immunization Coverage Survey, (2016/2017). *National Immunization Coverage Brief: Progress Towards GVAP Goals*. Retrieved online on 15th May 2020 at <https://jhsph.edu>
- Offit, P. A. (2020). Global Immunization: Worldwide Disease Incidence. Retrieved online at <https://www.chop.edu/centers-programs/vaccine-education-center/global-immunization/diseases-and-vaccines-world-view> on 19th May, 2020
- Primary Health Care Management Board Kano, (2016). *Population of Women of Childbearing age Attending Antenatal care in Primary Healthcare Centres in Kano State, Nigeria*. Retrieved from the board on 7th June 2020.
- Pulendran, B., & Ahmed, R. (2011). Immunological mechanisms of vaccination. *Nature immunology*, 12(6), 509.
- Sallusto, F., Lanzavecchia, A., Araki, K., & Ahmed, R. (2010). From vaccines to

- memory and back. *Immunity*, 33(4), 451-463.
- Sharma, M. Kaur, G., Pun, J. D., Shukla, J., Thakur, L., Sharma, M., Kaur, M. M., Sonowal, M. Kaur, M., & Gupta, R. D. (2018). Knowledge of under five children's mothers regarding the six killer diseases. *Asian Journal of Nursing Education and Research*. 8(1), 159-162.
- Siddiqi, N., Siddiqi, A. E., Nisar, N., & Khan, A. (2010). Knowledge about EPI and its relation with age appropriate vaccination of infants in peri-urban Karachi. *The Journal of Pakistan Medical Association*. 60(11), 940-4.
- Weinberg, M., Dietz, S., Potter, R., Swanson, R., Miller, C., & McFadden, J. (2017). Vaccine shot-limiting: Estimating the prevalence, indicators, and impact on vaccination status—Michigan, 2012. *Vaccine*, 35(7), 1018-1023.
- WHO, UNICEF, World Bank, (2009). *State of the world's vaccines and immunization*, 3rd ed. Geneva, World Health Organization.
- Wonodi, C., Prindle, C., Aina, M., Oni, G., Olukowi, T., Pate, M., ... Levine, O. (2012). *Landscape analysis of routine immunization in Nigeria: Identifying barriers and prioritizing interventions*. Baltimore, MD: John Hopkins Bloomberg School of Public Health, International Vaccine Access Centre. Retrieved online at www.jhsph.edu/research/centers-and-institutes/ivac/projects.
- World Health Organization, (2019). *Immunization coverage*. December 2019. Accessed January 23, 2020. At <https://www.who.int/news-room/fact-sheets/detail/immunization-coverage>
- Xeuatvongsa, A., Hachiya, M., Miyano, S., Mizoue, T., & Kitamura, T. (2017). Determination of factors affecting the vaccination status of children aged 12–35 months in Lao People's Democratic Republic. *Heliyon*, 3(3), e00265.