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SOCIO-DEMOGRAPHIC DETERMINANTS OF KNOWLEDGE OF IMMUNIZATION SERVICES AMONG NURSING MOTHERS IN BENUE STATE, NIGERIA

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ABSTRACT

This study investigated socio-demographic determinants of knowledge of immunization services among nursing mothers in Benue state, Nigeria. Five hypotheses were employed. Descriptive cross sectional survey design was adopted. The sample size of was estimated using Taro Yamene method for large population which was 400. A multistage sampling procedure was used to draw the sample. Self-structured questionnaire titled; knowledge of immunization Service among nursing mothers was the instrument. Demographic data indicated; secondary education was 820 (56%); location of immunization services is higher at the rural areas with 765 (52.2%). The result revealed that nursing mother in rural areas (80.5%) has good knowledge of Immunization than those in urban areas. The result showed significant difference between knowledge of immunization and factors such as education [$F(3,1461) = 18.224$, $p<0.05$], socio-economic status [$F(2,1462) = 85.982$, $p<0.05$], location [$F(2,1462) = 182.673$, $p<0.05$] and religion [$F(2,1462) = 63.431$, $p<0.05$]. Conclusively, there was strong and positive knowledge and attitude regarding the utilization of immunization Service. It was recommended that issues such as location, awareness, and importance of immunization be addressed.

1. INTRODUCTION

The quality of health of the people of any country depends on the effectiveness of its health care services; it is the responsibility of the federal, state and local government to provide all citizens with the best health care services. In this regard, all the three tiers of government should provide immunization services at both rural and urban centers. Immunization is one of the most successful and cost effective public health interventions in the constant effort of human beings against disease. Immunization has prevented more deaths than any other health interventions globally (Awosika, 2012). According to World Health Organization (WHO) Immunization is a process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. In the word of Plotkin *et al*., (2008) Vaccines exception of safe water, no other modality, not even antibiotics, has had such an effect on mortality. Saroja (2011) views vaccines as preparations which when given evoke immune responses, which lead to the production of antibodies that help combat infectious agent. Immunization is one of the cheapest and safest methods of primary prevention. It ensures well-being of children below five years of age and therefore remains the cornerstone for achievement of Millennium Development Goals.

Vaccine preventable diseases are responsible for high child mortality in Nigeria, about 22% of child mortality occurs due to childhood infectious diseases. This fears seems to be due to poor knowledge and attitude of nursing mothers towards utilization of immunization which could be negative or positive. The situation is alarming and could be worsened by some demographic characteristics such as poor education, low socioeconomic status, wrong religious doctrines and location of immunization centers. The Center for Disease Control (CDC, 2011), has placed vaccination as one of the top ten achievements in the field of public health in the twentieth century. Through herd effect, it not only protect, it not only protects both the individual and the community and thus hinder circulation of the infectious agent. In doing this, effects of vaccination are seen much rapidly, as evident by the eradication of small pox. Thus, vaccine helps healthy individuals stay healthy and therefore aid human development (CDC 2013).Vaccines are the most effective tools available for prevention and control of infectious diseases. Widespread use of vaccines has prevented millions of premature deaths, paralysis, blindness, and neurological damage (Halsey 2002).

Immunization is a modern miracle; it has saved millions of lives worldwide and its origin dates back ancient Greece. In the 14th century the Chinese discovered and used a primitive form of vaccination called viriolation. The aim was to prevent small pox by exposing healthy people tissue from the scabs caused by the disease. This is the first recorded attempt at vaccination. The British physician, Edward Jenner in 1776 discovered vaccination in its modern form and proved to the scientific community that is worked He was considered the founder of vaccinology in the west after he inoculated a 13 year old boy with vaccine of a virus (cowpox) and demonstrated immunity to small pox. By 1798, the first small pox vaccine was developed. Immunization is the most cost effective method of preventing infectious diseases. Wide spread immunity due to vaccination is largely responsible for the eradication of small pox and the restrictions of diseases such as polio, measles and tetanus. Generally, immunization involves stimulating immune responses with infectious agent that is priming the immune system with an immunogenic with the intention of creating specific resistance to an infectious disease. Simply put a process by which an individual's immune system becomes fortified against an agent (Park, 2017).

Knowledge can be defined as an acquisition of information, facts and skills that brings about permanent change of behavior. Achalu (2019) view knowledge as facts, information, and skills acquired through experience or education, it is also the practical understanding of subject. Knowledge is also referred to as awareness or familiarity gained by experience of a fact or situation, knowledge is a term that refers to the collection of facts, information and experience that a person has acquired throughout their life and education that they are able to use and apply to new lives experience.

Religion influences decisions on vaccination, and religion objection is often used by parents as an excuse to avoid the vaccination of their children. In the Netherland religion is a predictive factor of children's vaccination status. Hindus and Muslim children had greater chance of being under immunizeed or unimmunized compared with the immunized children. A number of immunization refusals based on religious exemption is increasing. The question is whether religion freedom is a threat to public health, in the case of immunization system (Kahn, 2016).

Omer *et al.*, (2004) affirmed that parental knowledge and practices regarding immunization are the major factors that contribute to their vaccination decisions. There are many barriers against immunization, including misinformation about vaccine, adverse effects of vaccines, vaccines preventable diseases, and diseases development after the administration of vaccines. Differences in parent knowledge about the adverse effect and contraindication of vaccines often lead to many immunization errors. Many parents believed that mild illness is considered to be reason for not giving their children up to date immunization. To improve awareness good knowledge regarding vaccination is required. Therefore, physicians, pharmacists, nurses and other health care providers should provide parents with correct information about the risk and benefits of vaccines. Good parental attitude regarding immunization will be able to reduce the incidence of infectious diseases. Parental attitude towards immunization is related to appropriate source of information and the way the information is received by parents.

The source of information provided by maternity clinics, the media, literature and the internet covers immunization benefits and the risk of vaccine preventable diseases. The most important factor affecting parental attitude is communication between parents and the sources of information or immunization providers. Improving communication will improve parent perception of the benefits and risk of vaccines. Parents will be more likely to continue with their Child's immunization, although at the same time they may still be doubtful about vaccination. In addition, parents may agree to proceed with their child's vaccination, but they are also vulnerable to competing sources of information from anti immunization proponents. This does not always mean that parents possess the knowledge and attitude that constitute informed consent prior to assenting to immunization. Most of the previous studies found a strong relationship between pediatric immunization coverage and parental knowledge and vaccination practices. This relationship showed a positive correlation between these factors. In other words, any increase in parental knowledge and attitude will lead to increase in vaccination rates of children. They study will provide a clear information regarding immunization in Iraq and parental knowledge, practice on pediatric immunization. WHO maintained that information could play a vital role in determining the knowledge and attitude of an individual toward utilization of any health services including immunization? Lack of access to information among nursing mothers increases the likelihood of poor utilization of immunization services for the children; public awareness about immunization especially among nursing mothers from poor socioeconomic background is very low some nursing mothers may not have knowledge of preventive benefits of immunization. Hence, they may not realize the importance of the completion of immunization schedule. Therefore, government, nongovernmental organizations and donor agencies incorporate enlightenment campaign during each round of National immunization days to increase the level of awareness and motivation about timely completion of the immunization process for children and misconception about immunization risks. They exhibit fears about over loading the immune system with multiple antigens. They further stated that lack of knowledge of the importance and adverse effect of immunization prevents mothers from playing an effective role in the eradication of vaccine preventable diseases. Further findings showed that the main reasons for not immunizing or completing the immunization schedule were literary level. Other factors include information concerning immunization; the mass media are the major sources of awareness regarding utilization of immunization services. Park (2007) reveal that the advent of immunization globally is a landmark achievement toward the prevention of children from been infected with six childhood killer diseases namely: tuberculosis, poliomyelis, measles, diphtheria, pertussis and hepatitis, immunization is an age long practice that is sustained for several decades ago. The care about the well-being of children prompted United Nations Children's Emergency Fund (UNICEF) to initiate the programme for the survival and protection of children in 1947.This happened as a result of the suffering that children encountered at the end of the Second World War in1939. Initially immunization was restricted to the developed countries in recognition of United Nation to the survival and protection of children, the United Nations General Assembly in an interim decision in 1950 extended UNICEF mandate to concentrate on the needs of children in developing countries.

Immunization is perhaps one of the most cost effective and successful public health initiative designed to enhance the survival of children worldwide against debilitating childhood illnesses. About one third of childhood illnesses are prevented by administration of vaccines through immunization, a child acquires protection, or resistance to infectious diseases. The administration of vaccines results in the stimulation of the body's immune system to protect the child against subsequent infections or diseases. Vaccines protect more children than any other health interventions, almost one third of children's death are prevented through vaccination. Immunization has greatly reduced the burden of infectious diseases; it prevents illness, disability and death from vaccine preventable diseases.

Wide spread use of vaccines has prevented millions of premature deaths, paralysis, blindness, and neurologic damage. Although immunization has recorded a remarkable success as far as public health is concern but a lot need to be done. According to the World Health organization (2015) over 22million children die every year globally from childhood vaccine preventable diseases, including Benue State, the situation is alarming .It is in this regard that the researcher is spurred to carry out this study on knowledge of immunization services among nursing mothers in Benue State.

AIM AND OBJECTIVES OF THE STUDY

The aim of this study was to investigate socio-demographic determinants of knowledge of immunization services among nursing mothers in Benue State.

Hypotheses

The following hypotheses were tested at 0.05 level of significance to guide the study.

1. There is no significant difference between level of knowledge of immunization services base on socio-demographic characteristics such as level of education, religious affiliation, location, source of information, and socioeconomic status among nursing mothers in Benue State.

2. There is no significant difference between level of knowledge of immunization services base on socio-demographic characteristics such as level of education, religious affiliation, location, source of information, and socioeconomic status among nursing mothers in Benue State.

3. There is no significant difference between level of knowledge of immunization services base on socio-demographic characteristics such as level of education, religious affiliation, location, source of information, and socioeconomic status among nursing mothers in Benue State.

4. There is no significant difference between level of knowledge of immunization services base on socio-demographic characteristics such as level of education, religious affiliation, location, source of information, and socioeconomic status among nursing mothers in Benue State.

5. There is no significant difference between level of knowledge of immunization services base on socio-demographic characteristics such as level of education, religious affiliation, location, source of information, and socioeconomic status among nursing mothers in Benue State.

METHODOLOGY

Research Design: Descriptive cross-sectional design was adopted for this study.

Population of the Study: The population of this study comprised all nursing mothers in Benue State. The total population of woman age 15-39 years is 935,801 according to National Bereau of Statistics (2015).

Sample and sample technique: The sample size for this study is 1500 nursing mothers. The sample size was estimated using Taro Yamane method for large population. A multistage sampling procedure was adopted for this study.

Instrument for Data Collection: The instrument for data collection for his study is self -structured questionnaire titled utilization of immunization services among nursing mother. The questionnaire consisted of two sections namely: section A and B, section A dealt with information on demographic characteristics of the respondents. Section B contained questionnaire items on utilization of immunization services.

Validity of the Instrument: The instrument was given to the researcher's supervisors and three other experts in the department of Human Kinetics, Health and safety studies Ignatius Ajuru University of Education Port Harcourt for thorough scrutiny. This was to ensure face, construct, and content validity of the research instrument. The corrections and suggestion were made and in-cooperated, thereby making the instrument valid for the study.

Reliability of the Instrument: A reliability co-efficient at 0.72 was attained by the instrument using Cronbach Alpha

Method of Data Analysis: Data collected was analyzed using Statistical Product for Service Solution Version 23.0 with the use of mean and percentage score as descriptive statistical tools while analysis of variance (ANOVA), t-test, z-test were used to test hypotheses at 0.05 level of significance.

2. RESULTS

Results are presented in table 1-3

Research Question 1: What is the level of knowledge of immunization among nursing mothers in Benue State?

Table 1: Level of Knowledge of immunization among nursing mothers in Benue State

SN	Items	Responses	
		Correct	Incorrect
		F(%)	F(%)
1	Vaccination is recommended for all infants	1008(68.8)	457(31.2)
2	Infants can be vaccinated at any time in life	1345(91.8)	120(8.2)
3	Vaccination programme can be completed at any time	530(36.2)	935(55.5)
4	Dose of vaccination to be administered has nothing to do with the health status of the child	1014(69.2)	451(30.8)
5	BCG is the only vaccine to be given at birth	875(59.7)	590(40.3)
6	OPV-O and Hepatitis B vaccine can be given any time as the first dose	755(51.5)	710(48.5)
7	At 6 weeks pentavalent vaccine, OPV-1 and PCV are to be given to the infant	825(56.3)	640(43.7)
8	PCV, Rotavirus, meningococcal conjugate vaccine may not be given at 10 weeks	760(51.9)	705(48.1)
9	4 doses of poliovirus vaccine should be given only at age 2-4 months of infant age	1227(83.8)	238(16.2)
10	The second dose of HBV can be given at any point in time	585(39.9)	880(60.1)
11	Unvaccinated children are 2-3 times more likely to contract pertussis (whooping cough)	1125(76.8)	340(23.2)
12	Unvaccinated children at 5-6 times more likely to contract pneumococcal infections	1214(82.9)	251(17.1)
13	Children should be given several doses of vaccines against 15 different infection by age 5 years	1140(77.8)	325(22.2)
14	Children who are immunized often develop fever	563(38.4)	902(61.6)
15	Not following the vaccination schedule put children at increased risk of infections	701(47.8)	764(52.2)
	Average	912(62.2)	553(37.8)

Table 1 shows the level of knowledge of immunization among nursing mothers in Benue State. The result shows that on the average 912(62.2%) were knowledgeable about immunization while 553(37.8%) were not.

Research Question 2: What is the knowledge of immunization among nursing mothers in Benue State based on socio-demographic characteristics (educational status, socio-economic status, location and religion)?

Table 2: Knowledge of immunization among nursing mothers in Benue State based on socio-demographic factors

Socio-demographic factors	Knowledge of immunization		Total
	Good	Poor	
	F(%)	F(%)	
Education			
Primary	312(75.7)	100(24.3)	412(100)
Secondary	450(54.9)	370(45.1)	820(100)
Tertiary	132(66.0)	68(34.0)	200(100)
None	18(54.5)	15(45.5)	33(100)
Total	912(62.3)	553(37.7)	1465(100)
Socio-economic status			
Employed	275(73.3)	100(26.7)	375(100)
Unemployed	150(100)	0(0.0)	150(100)
Self-employed	487(51.8)	453(48.2)	940(100)
Total	912(62.3)	553(37.7)	1465(100)
Location			
Urban	146(63.5)	84(36.4)	230(100)
Rural	616(80.5)	149(19.5)	765(100)
Semi-urban	150(31.9)	320(68.1)	470(100)
Total	912(62.3)	553(37.7)	1465(100)
Religion			
Christianity	762(68.7)	347(31.3)	1109(100)
Islam	150(47.8)	164(52.2)	314(100)
Others	0(0.0)	42(100)	42(100)
Total	912(62.3)	553(37.7)	1465(100)

Table 2 shows the knowledge of immunization among nursing mothers in Benue State based on socio-demographic characteristics. The result shows that good knowledge of immunization was found among those with primary education (75.7%) followed by those with tertiary education (66.0%) and secondary education (54.9%). Based on socio-economic status, all the respondents who were unemployed had good knowledge followed by those who were employed (73.3%) and self-employed. Based on location, those at the rural areas (80.5%) were more knowledgeable followed by

those in urban (63.5%) and semi-urban (31.9%). Also, based on religion good knowledge was found more among the Christians (68.7%) compared to those in other religion.

Testing of Hypotheses

Hypothesis 1: There is no significant difference between knowledge of immunization services and socio-demographic characteristics (educational status, socio-economic status, location and religion) of nursing mothers in Benue State.

Table 3: Analysis of Variance (ANOVA) showing difference between knowledge of immunization and socio-demographic characteristics of nursing mothers in Benue State

Sources of variance	Sum of squares	Df	Mean sum of squares	F-value	p-value	Decision
Education						
Between group	12.418	3	4.139	18.224	.000	Rejected
Within group	331.839	1461	.227			
Total	344.257	1464				
Socio-economic status						
Between group	36.231	2	18.115	85.982	.000	Rejected
Within group	308.026	1462	.211			
Total	344.257	1464				
Location						
Between Groups	68.828	2	34.414	182.673	.000	Rejected
Within Groups	275.428	1462	.188			
Total	344.257	1464				
Religion						
Between Groups	27.487	2	13.744	63.431	.000	Rejected
Within Groups	316.770	1462	.217			
Total	344.257	1464				

*Significant. $p<0.05$

Table 3 shows the ANOVA of significant difference between knowledge of immunization and socio-demographic characteristics of nursing mothers in Benue State. The result shows that there was a significant difference between knowledge of immunization and factors such as education [$F(3,1461) = 18.224$, $p<0.05$], socio-economic status [$F(2,1462) = 85.982$, $p<0.05$], location [$F(2,1462) = 182.673$, $p<0.05$] and religion [$F(2,1462) = 63.431$, $p<0.05$]. Therefore, the null hypothesis which states that there is no significant difference between knowledge of immunization services and socio-demographic characteristics (educational status, socio-economic status, location and religion) of nursing mothers in Benue State was rejected.

Discussion of Findings

The findings of this study provided insight into knowledge of immunization services by nursing mothers in Benue state which were discussed.

The result of this finding showed that on the average 912(62.2%) were knowledgeable about immunization while 553(37.8%) were not. Good knowledge of immunization is required for increase uptake of immunization which helps to reduce the prevalence of childhood vaccine preventable diseases. The good of immunization among nursing mother obtained from this study was due to proper dissemination of information about immunization service and its benefit to children and mothers to improve good health. This is consistent with the report of others studies conducted on knowledge of immunization of Deyese *et al.,* (2014). The result of this study corroborated with studies of Chris-Otubor et al (2015) that showed though there is seemingly good knowledge about immunization among mothers, their being available for these vaccines close not reflect this knowledge. Yousif,et al (2013)added that the good knowledge of mother's immunization (92%) was due to their first time visit to antenatal clinic. The result of the study also conform to the studies of Fauzia et al (2015), Alshamaari et al (2017),and Hirumalai et al (2018) among others, which revealed that knowledge of nursing mothers regarding immunization have significant effect on increase immunization coverage and is the key factor responsible for increased utilization of immunization services. The general perception of respondents towards immunization showed that the respondents have positive outlook towards immunization as they understood the importance and benefits of getting their children immunized which led to the requisite knowledge of immunization. This study is in credence to the findings of Milda,et al (2014) and Niederhause et al (2007), Wilson et al (2008), that though knowledge of immunization was high among educated nursing mothers in this study a lot need to be done with regard to identification of the various childhood illnesses contained in the immunization schedule as majority of nursing mothers who carry their children for immunization did not know the various diseases they are immunizing their children against. It was noted that lack of awareness of the schedule of the next appointment for further doses of immunization can be a hindrance for the uptake of immunization. There was no previous studies that contradict the findings of this study but the level of knowledge varied among mothers.

The result of this study depicted that the socio-demographic characteristics of the respondents was level of education, socio-economic status, location, and religion. The result of the study showed that the good knowledge of immunization service was found among those with primary education (75.7%) followed by tertiary education (66.0%) and secondary education (54.9%). One-way ANOVA test showed there was significant difference between knowledge of immunization and level of education of nursing mothers ($F(3,3461) = 18.224$, $P<0.05$). This is clear that good proportion of nursing mother and attain atleast primary level of education has basic knowledge of immunization. The results of this study is in consonance with studies of Becker, Peter, Gody, Gultiano, and Black (2013) that formal education is a strong factor that influence full child immunization, this study also agreed with the report of World Health Organization (2015) that 50% these mothers with primary education know about immunization of children.

The findings of this study is in credence with those of Olumuyiwa, Towan, Franciois and Vincent (2008); Antai (2009) that education empowered women to access relevant health services, interact effectively, and assimilate information relating to prenatal care, childhood immunization and nutritional needs. Furthermore, Mugada et al. (2017) affirmed that mothers education had no significant association with immunization status of children with the knowledge score ($P<0.05$). This study held that the overall knowledge of immunization centered on educational attainment among nursing mothers surveyed was good, that significant gap still exist.

Based on the socio-economic status of nursing mothers regarding the knowledge of immunization of children the results of this study illustrated that all of woman who were unemployed has good knowledge of immunization followed by 73.3% of employed and self-employed mothers. Based on location, 80.5%of mother who lived in rural areas had good knowledge accompanied by 63.5% of urban mothers and 31.9% of semi-urban. The rise in the level of knowledge about immunization among rural woman emanated government effort concerning the door to door campaign of immunisation at the community or grassroot level which must time neglected by the urbanizers. Unemployed mothers may not necessary meant that they are not educationally empowered. The results of the one way ANOVA test showed socio-economic status and location had significant difference in the knowledge of immunization services ($F(2,1462) = 85,982$, $p<0.05$), ($F,(2,1462) =182.673$, $p<0.0$) respectively. Both variables had influence of the level of knowledge about immunization service because been unemployed does not matter the awareness and association of information. the results of this study is in time with study of Deyese et al (2014)that participants receiving vaccination in accordance with the vaccination schedule was hindered by the impossibility of attending the health care service due to their working hours. Rural areas are the catchment areas of immunization programme to ensure everyone or family at the local areas have access to healthcare service. Studies of Kimani-Murage and Sffarnrh (2011), Takum (2014) affirmed mothers who had access to health facility are more likely to vaccinate their children and antenatal clinic is a means for women to be aware of immunization. Becker et al (2011) concord that socio-economic status plays a major role in developing good or positive behaviour of mothers with regard to immunization the results of this study is in corroboration with Yousif et al (2013) that residence of mothers were found significantly with mothers; knowledge about immunization with regard to the rural resident. Wu, et al (2008) contradict with findings of the study that mothers with low income status are not quality and cannot be trusted for vaccination ($P<0.03$). Also Raji (2013) reported that high socioeconomic status occurred either maternal education or the rich were most times more likely to complete immunization schedule than the poor (OR = 1.81, 95%).That socioeconomic status is a significant predictor of immunization coverage among mothers ($P<0.05$). Wodele et al (2010) also regard with this study that socio-economic status has a significant relationship with immunization knowledge ($P<0.05$). Mojoyiola et al (2012) buttressed that location to immunization service was significant regarding the knowledge and compliance to vaccination. The study held that the knowledge of the survey was good but significant gap still remain because of the variation with related studies due to area of study.

In regard to the level of knowledge about immunization based on religion of nursing mothers, the result showed that good knowledge was found among those professing Christian (68.7%) as compared with Islam. Religion revealed that there was a statistically significant different between knowledge and immunization service among others ($P<.005$). This study is in time with studies of Ghinaja, Chris, Ibratim and Heidi (2013) that Muslims has feared in minds against the vaccination of polio that the campaign is political. It also agreed with the report provided by World Health Organization (2012) that the OPV was lowered among female Muslim in Nigeria from 2002 = 2003. This is because parents usually treat their health condition with faith and religious affiliation; myths that may defer the level of knowledge regarding immunization studies of Enwonwu et al (2018) buttressed that good immunization of knowledge was based on their Christians. This is because most Christian parent exposed their female ones to western education in which turn empowered them towards good standard of having unlike Islam who said positive reasons with westernized education.

3. CONCLUSION

Based on the report of this study it is deduced that the knowledge of immunization among nursing mothers in Benue State was high.

Recommendations

Based on the findings from this study, the following recommendations were made;

1. Importance of immunization to both the child, community and the general public should be fully discuss during community dialoque.
2. Effort should be made by government to site immunization centers close to the people especially the hard to reach areas.
3. Vaccines should be readily available at immunization centers at all times especially BCG and HBV that are given at birth.

REFERENCES

[1] Alshamari, T. M., Subaiea,G. M., Hussain, T., Moin, A. & Yusuf, K. B. (2017). Parental perceptions, attitudes and acceptance of childhood immunization in Saudi Arabia: A cross sectional study. Vaccine, 2;36 (1):23-28. doi: 10.1016

[2] Antai, D. (2009). Inequitable childhood immunization uptake in Nigeria: A multilevel analysis of individual and contextual determinants. BMC Infectious Diseases, 9:181.

[3] Awosika D. (2012) Access to immunization and other public health interventions through the pharmacists. West African Journal of Pharmacy 23 (1):3 -11

[4] Becker, S., Peter, H., Gray, H., Gultiano, C., & Black, E. (2013). The determinants of use of maternal and child health services in Metro Cuba. The Philippines Health Transition Review, 3:77-89.

[5] Center for Disease Control and Prevention (2013). For parents vaccines for your children. National centre for Immunization and Respiratory Diseases.

[6] Centre for Disease Control and Prevention (2011) General Recommendations on Immunization.

[7] Chris-Otubor, G. O.., Deangiwa, D. A., Ior, L. D. & Anukum, N. C. (2015). Assessment of knowledge, attitudes and practices of mothers in Jos North regarding immunization. IOSR Journal of Pharmacy, 5 (6):34-45

[8] Deyese, R. S. A., Elisiane, L. & Eveline, F. S. (2014). Mothers' knowledge regarding the vaccination program and factors which lead to delays in infant vaccination. Cogitare Enferm, 19(1):96-102.

[9] Ghinaia, I., Chris, W., Ibrahim, D. & Heidi, J. L. (2013). Listening to the rumours: What the northern Nigeria polio vaccine boycott can tell us ten years on. Global Public Health, 8(10): 1138-1150.

[10] Halsey, N. A. (2002). The science of evaluation of adverse events associated with vaccination. Elsevier 13(3):205-214.

[11] Kahn, J. A. (2016). Substantial decline in vaccine-type human papillomavirus (HPV) among vaccinated young women during the first 8 years After HPV vaccine introduction in a community. Clinical Infectious Diseases, 63(10): 1281–1287.

[12] Milda, S., Egle, T. & Giedra, T. (2014). Knowledge and attitudes of postpartum mothers towards immunization of their children in a Lithuanian Tertiary Teaching Hospital. Medicina, 54, 2; doi:10.3390/medicina54010002

[13] Mojoyinola, J. K. & Olaleye, B. A. (2012). Physical and psychological factors influencing maternal non-compliance with immunization schedule. Continental Journal of Nursing Science, 4 (2): 37 - 51

[14] Mugada, V., Chandrabhotla, S., Kaja, D. S. & Machara, S. G. K. (2017). Knowledge towards childhood immunization among mothers & reasons for incomplete immunization. Journal of Applied Pharmaceutical Science, 7 (10): 157-161.

[15] Niederhauser, V. P., & Markowitz, M. (2007). Barriers to immunizations: Multiethnic parents of under- and unimmunized children speak. Journal of the American Academy of Nurse Practitioners, 19(1), 15-23. doi: 10.1111/j.1745-7599.2006.00185.x

[16] Olumuyiwa, O., Towan, A., Franciois, P. & Vincent, I. (2008). "Determinants of vaccination coverage in rural Nigeria," BMC Public Health, 8:381–388.

[17] Omer, S., Qutaiba, B., Al-lela, H. K., Mohd, B. B. & Ramadan, M. E. (2014). Are parents' knowledge and practice regarding immunization related to pediatrics' immunization compliance? A mixed method study. BMC Pediatrics, 14: 20.

[18] Park, K. (2007). Park's Text book for Preventive and social Medicine. M/S Banarsidas Bhanot Publishers.

[19] Plotkin, S. A., & Vidor, E. (2008). Poliovirus vaccine-inactivated. In S. A. Plotkin, W. A. Orenstein, and P. A. Offit (ed.), Vaccines, 5th ed. Elsevier-Saunders, Philadelphia, PA.

[20] Raji, M. O. (2013). Assessment of the knowledge of fathers, uptake of routine immunization, and its associated factors in a rural community of North West Nigeria. Annals of African Medicine, 18:97-102

[21] Saroja, B. (2011). Neonatologist and paediatrician, Can my baby still have her vaccinations if she has a cough or cold?[online], Available from :URL:http://www.babycenter.in

[22] Takum, T. (2014). Programmatic and beneficiary-related factors for low vaccination coverage in Papum Pare District. Journal of Tropical Pediatric, 3(57), 251-257

[23] WHO (2015). Summary WHO SAGE conclusions and recommendations on Vaccine Hesitancy.

[24] Wilson, F. L., Baker, L. M., Nordstrom, C. K., & Legwand, C. (2008). Using the teach-back and Orem's self-care deficit nursing theory to increase childhood immunization communication among low-income mothers. Issues in Comprehensive Pediatric Nursing, 31(1), 7-22. doi: 10.1080/01460860701877142

[25] World Health Organization (WHO) (2013) Immunization. www.who.int/topics/immunization/en Assessed February 19th 2013

[26] Yousif, M. A., Albarraq, A. A., Abolallah, M. A., & Elbur, A. L., (2013). Parents knowledge and attitude on childhood immunization Taif, Saudi Arabia, Vaccines and Vaccination; 5. (1): 10. 4172.