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KNOWLEDGE, ATTITUDE AND PERCEPTION ON POLIO IMMUNIZATION AMONG CAREGIVERS OF UNDER-FIVE CHILDREN

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ABSTRACT

Polio is a crippling infectious disease which causes irreversible paralysis within hours or days of infection, with children under the age of five being the most vulnerable to the disease. While not everyone infected with the disease will become paralyzed, there is no cure once infected. The only way to prevent polio is through immunization.The study was designed to determine the knowledge, attitude and perception on polio immunization among caregivers of under-fives in Maraban Jos, Igabi local Government Area of Kaduna state. A cross-sectional, descriptive studywas carried out between December 2016 and January, 2017 using 322 semi-structure interviewer administered questionnaire, FGD and KII. Data collected was analyzed using SPSS version 16.0 software and then the result was presented using Suitable frequency Distribution tables and charts. The results revealed that majority (74.2%) of the respondents were mothers within the age of 16 to 25 years. The content of polio vaccine is not known to many (83.4%) of the respondents and some (44.6%) agreed that prayer can be substituted with polio vaccine. But majority of the respondent disagreed that polio is caused by witchcraft or evil spirit (80.9% and 69.7% respectively). The study concluded that the caregivers have good knowledge of polio immunization, as well as positive attitude and perception. Even though a small group of respondent, exhibited some negative attitudes and perceptions that could translate to a likelihood of rejection which have been influenced by both traditional and religious practices. Therefore,all educational and support programs must focus onIncreasing awareness among care givers in the community of the link between personal behavior and personal risk of contracting polio which should be the responsibility of community leaders.

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INTRODUCTION

Polio is a crippling infectious disease which causes irreversible paralysis within hours or days of infection, with children under the age of five being the most vulnerable to the disease. While not everyone infected with the disease will become paralyzed, there is no cure once infected. The only way to prevent polio is through immunization (Ayene, 2014). The oral polio vaccine (OPV) developed by Albert Sabin and Mikhail Chumakov in 1952 has proved to be the most effective public health approach to eradicate the scourge of polio epidemics on global scale. It follows the world health assembly's declaration and commitment to rid humanity of all cases of polio infection, begun 1988, led by World Health Organization, UNICEF and Rotary Foundation. The assembly passed a resolution to end polio by the year 2000. This effort has reduced the number of annual diagnosed cases from the hundreds of thousands to fewer than hundred in 2015 (Cooke and Tahir, 2012).

Despite the progress made by this long run to end polio by the said deadline (of year 2000) the world is now caught between attempts to eradicate wild polio as even the third deadline of 2012 was missed. This resulted from so many challenges faced by the eradication program at national and international scale (Soumy, 2014). Among the greatest challenge to global polio eradication are the lack of basic health infrastructure, which limits vaccine distribution and delivery, the crippling effects of civil war and internal strife, community perceptions of vaccine safety and efficacy, inadequate mobilization of community groups (WHO/CDC/UNICEF, 2014).

In Nigeria, the National Primary Health Care Development Agency (NPHCDA) has developed a comprehensive program to eradicate polio through series of Immunization-Plus Days (IPDs) and Sub-national Immunization-Plus Days ensuring every child has access to immunization services. Alongside the immunization program the NPHCDA has developed better data capture and information system to monitor progress. This includes the specialist laboratory which was developed to provide active surveillance on instances of wild polio virus (WPV). The program helped Nigeria in making major progress towards achieving polio-free status. The decrease in global cases is largely associated with the progress achieved in Nigeria. Achieving control over Nigeria is of utmost importance because it is the only infective focus in the whole of Africa by recent years (Soumy, 2014).

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It is an alarming situation for the country as the new wave of polio has hit the north eastern state of Borno which has been the issue of concern as it has the potency of spreading to other northern states (Oyebuchi, 2013) including Kaduna State.

Tackling polio in these northern states has been a continuing priority for the government. However, logistical barrier, especially in the north eastern states; management challenge; uncertain funding; insurgency: anti-vaccine rumor and misconceptions have arrayed against the effort of polio eradication. Therefore public acceptance of vaccine remains important(Oyebuchi, 2013). Negative communication about polio vaccine in Nigeria resulted in decrease acceptance of vaccine in northern state. This particularly serious and well documented set of refusals occurred due to the endorsement of rumors by religious and political leaders as they consider it as an American conspiracy to spread HIV and infertility in the local population. The boycotts proved a huge setback for polio eradication in Nigeria as the number of cases jumped from 202 in 2002 to 1143 in 2006 (Jegede, 2007). Political motivation was another prompter of public health concern as in the case of polio vaccination boycott in northern Nigeria, where marginalized communities where mobilized to challenge government-derive initiatives (Soumy, 2012).

Notwithstanding, it has been documented that vaccination demands and acceptance depend largely on a number of factors that are quite broad and complex. Some research linked immunisation acceptability to the type of interaction that exists between vaccinators and mothers, emphasising the attitude of health care providers when being immunised. approached by mothers for their children vaccination. Unfortunately, some children miss vaccination opportunity as a result of the parents' misconception on the competence of some the vaccine and vaccinators (Akande and Akande, 2006).

RESEARCH METHODOLOGY

INTRODUCTION

This chapter presents background of the study area, the research design used in the study, population sampling, method of data collection, and the proposed data analysis techniques.

STUDY DESIGN

The study was cross-sectional descriptive in nature carried out between December, 2016 and January, 2017.

SAMPLE SIZEAND SAMPLING TECHNIQUE

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Epi info software was used to calculate the needed sample size using the 2006 National Population Commission figure of 12,472 of Maraba Jos community. From this figure 3,118 are of child bearing age, (24.89% of the total population of women according to CIA World fact book) from which 322 respondents (sample size) were drawn, using the Epi-info software at 95% confidence level and 5% margin of error. Households were numbered and selected using balloting, then from each house caregiver was also selected by balloting.

DATA COLLECTION TOOLS

The tool used for data collection was pretested,semi-structured, interviewer administered questionnaire. The questionnaire consists of 6 sections (A-F) and 35 items.In addition, Focus Group Discussion (FGD) and Key Informant Interview (KII) were conducted using the necessary developed guides.

DATA ANALYSIS

The collected data were cleaned and entered into SPSS version 16.0 software for analysis and Microsoft excel and then analyzed. The result was presented in frequency tables and charts.

DATA PRESENTATION AND ANALYSIS

DATA PRESENTATION

Table 1: Socio-demographic Characteristics of the Respondents (n=312)

Variable	Frequency	Percent
Age (in years)		
16-25	148	47.1
26-35	125	39.8
36-45	39	12.4
46-55	2	0.6
Sex		
Male	81	25.8
Female	233	74.2
Occupation	62	
Civil Servant	23	19.7
Trading	18	7.3
Farming	189	5.7
House wife	22	60.2

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Others		7.0
Educational Status		
No formal education	12	3.8
Quranic	78	24.8
Primary	34	10.8
Secondary	135	43.0
Tertiary	55	17.5
Marital Status		
Single	15	4.8
Married	267	85.0
Widow	14	4.5
Divorced	18	5.7
Number of Children		
1-2	181	57.6
3-4	50	15.9
5-6	65	20.7
≥7	18	5.7

Majority of the respondents (47.1%) were within the age range of 16-25 years and females (74.2%). More than half were housewives 60.2% and 43% get secondary education. More than ¾ (85%) were married and about 57% had 1-2 children (Table 1).

Table 2: Knowledge of the respondents on Polio and Polio vaccine (n=312)

Variable	Strongly agree(%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree
Polio is a disease caused by a virus	17 (5.4)	142 (45.2)	109 (34.7)	30 (9.6)	16 (5.1)
Polio is a disease common in under-fives	84 (26.8)	181 (57.6)	14 (4.5)	35 (11.1)	0.0 (0.0)
Polio is a problem in Nigeria	68 (21.7)	186 (59.2)	48 (15.3)	6.0 (1.9)	6.0 (1.9)
There is polio in Nigeria	90 (28.7)	173 (55.1)	51 (16.2)	0.0 (0.0)	0.0 (0.0)

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Polio vaccine is known by oral drop	36 (11.5)	234 (74.5)	24 (7.6)	20 (6.4)	0.0 (0.0)
Polio vaccine is available	88 (28.0)	207 (65.9)	9 (2.9)	5.0 (1.6)	5.0 (1.6)
Polio vaccine is accessible	73 (23.2)	202 (64.3)	28 (8.9)	11 (3.5)	0.0 (0.0)
Polio vaccine offers protection against polio	71 (22.6)	205 (65.3)	28 (8.9)	9.0 (2.9)	1.0 (0.3)
The content of vaccine is weaken pathogens	21 (6.7)	31 (9.9)	143 (45.5)	44 (14.0)	75 (23.9)
The storage temperature of vaccine is cold	49 (15.6)	210 (66.9)	50 (15.9)	5.0 (1.6)	0.0 (0.0)
Only children below the age of five receive polio vaccine	116 (36.9)	150 (47.8)	36 (11.5)	12 (3.8)	0.0 (0.0)
Polio vaccine is given free	59 (18.8)	212 (67.5)	43 (13.7)	0.0 (0.0)	0.0 (0.0)

Majority of the respondents (45.2%) agree that polio is caused by virus, while (57.6%) agree that Polio is a disease common in under-fives. Polio is a problem in Nigeria was agreed by (59.2%) of the respondent and 51.5% agree that there is polio in Nigeria. About 74.4% agree that polio vaccine is given orally and 65.9% agree that polio is available and accessible 64.3%. About polio vaccine protectiveness more than half 65.3 agree but as many as 45.5% are neutral on the content of vaccine as weaken pathogen. 66.9% of the respondents agree that cold atmosphere is the storage temperature. 47.8% agree that only children below the age of five receive polio vaccine. Some majority 67.7% agree that polio vaccine is given free(Table 2).

Table 3: Attitude of respondents toward Polio immunization (n=312)

Variable	Strongly agree(%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree
Polio vaccine should be made mandatory	47 (15.0)	159 (50.6)	33 (10.5)	72 (22.9)	3.0 (1.0)
Healthy child should be given polio	39	216	18	6.0	35

vaccine	(12.4)	(68.8)	(5.7)	(1.9)	(11.1)
House to house immunization is disturbing	41 (13.1)	49 (15.6)	38 (12.1)	171 (54.5)	15 (4.8)
Vaccinated child should be isolated	28 (8.9)	61 (19.4)	110 (35.0)	89 (28.3)	26 (8.3)
Even your child is susceptible to polio, so need to be vaccinated	57 (18.2)	168 (53.5)	48 (15.3)	37 (11.8)	4.0 (1.3)
Prayer can serve as substitute to polio vaccine	26 (8.3)	114 (36.3)	53 (16.9)	100 (31.8)	21 (6.7)
Traditional medicine can serve as substitute to polio vaccine	0.0 (0.0)	47 (15.0)	75 (23.9)	160 (51.0)	32 (10.2)
I will take my child for polio immunization	64 (20.4)	190 (60.5)	13 (4.1)	35 (11.1)	12 (3.8)
I will also advise other people to take their children for polio immunization.	73 (23.2)	157 (50.0)	70 (22.3)	4.0 (1.3)	10 (3.2)

Half of the respondents (50.6%) agree that polio vaccine should be made mandatory and some majority (68.8%) agree that Healthy child should be given polio vaccine. Another majority (54.5%) disagree that house to house immunization is disturbing. 35% of the respondent are neutral on weather vaccinated child should be isolated. Slightly more than half (53.5%) of the respondent agree on the view that even your child is susceptible to polio, so need to be vaccinated. 36.3% agree that Prayer can serve as substitute to polio vaccine and 51% agree on Traditional medicine can serve as substitute to polio vaccine. Majority 60.5% agree on taking their child for polio immunization and half of the respondent 50% agree to advise other people to take their children for polio immunization(Table 3).

Table 4: Perception of the respondents toward Polio immunization (n=312)

Perception on Polio immunization	Strongly agree(%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree
Polio is caused by witchcraft	5.0 (1.6)	10 (3.2)	45 (14.3)	199 (63.4)	55 (17.5)
Polio is caused by evil spirit	0.0	27	68	159	60

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	(0.0)	(8.6)	(21.7)	(50.6)	(19.1)
Polio is caused by dirty environment	36 (11.5)	178 (56.7)	21 (6.7)	59 (18.8)	20 (6.4)
Polio is caused by drinking unsafe water	24 (7.6)	185 (58.9)	75 (23.9)	24 (7.6)	6.0 (1.9)
Polio eradication initiative is preventive in nature	34 (10.8)	90 (28.7)	164 (52.2)	11 (3.5)	15 (4.8)
Benefits from polio vaccine outweighs its adverse effects	31 (9.9)	168 (53.5)	68 (21.7)	12 (3.8)	35 (11.1)
Content of polio vaccine is safe and effective	57 (18.2)	182 (58.0)	66 (21.0)	7.0 (2.2)	2.0 (0.6%)
Vaccinators are competent and skilled	46 (14.6)	169 (53.8)	43 (13.7)	50 (15.9)	6 (1.9)
Polio vaccine makes children fall sick	17 (5.4)	38 (12.1)	76 (24.2)	168 (53.5)	15 (4.8)
Polio vaccine causes infertility for population control	6.0 (1.9)	3.0 (1.0)	89 (28.3)	189 (60.2)	27 (8.6)
The frequency of polio vaccine is too much	15 (4.8)	41 (13.1)	74 (23.6)	180 (57.3)	4.0 (1.3)
Polio vaccine is to reduce the population of Nigerians	30 (9.6)	5.0 (1.6)	55 (17.5)	187 (59.6)	37 (11.8)

The above table presents the perception of caregivers of under-fives toward polio immunization, where the majority of the respondent (63.4%),disagreed that polio is caused by witchcraft. On same vain half of the respondent 50.6% disagreed with the view that polio is caused by evil spirit. On dirty environment as a cause of polio (56.7%) agreed. Polio eradication initiative is preventive in nature got neutral response from most 52.2% of the respondents. 53.5 of the respondent agreed that benefit from polio vaccine outweighs its adverse effect. (58.0%) agreed, content of polio vaccine is safe and effective. The view that vaccinators are competent and skilled got (53.8%) respondent agreed. Most (58.3%) of the caregivers disagreed that polio vaccine makes children fall sick. The perception that polio

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vaccine causes infertility for population control was disagreed by the majority (60.2%). The view that the frequency of polio vaccination is too much was agreed by many(57.3%).At the same time the view that polio vaccine is to reduce the population of Nigerians was disagreed by majority (59.6%) of the respondent(Table 4).

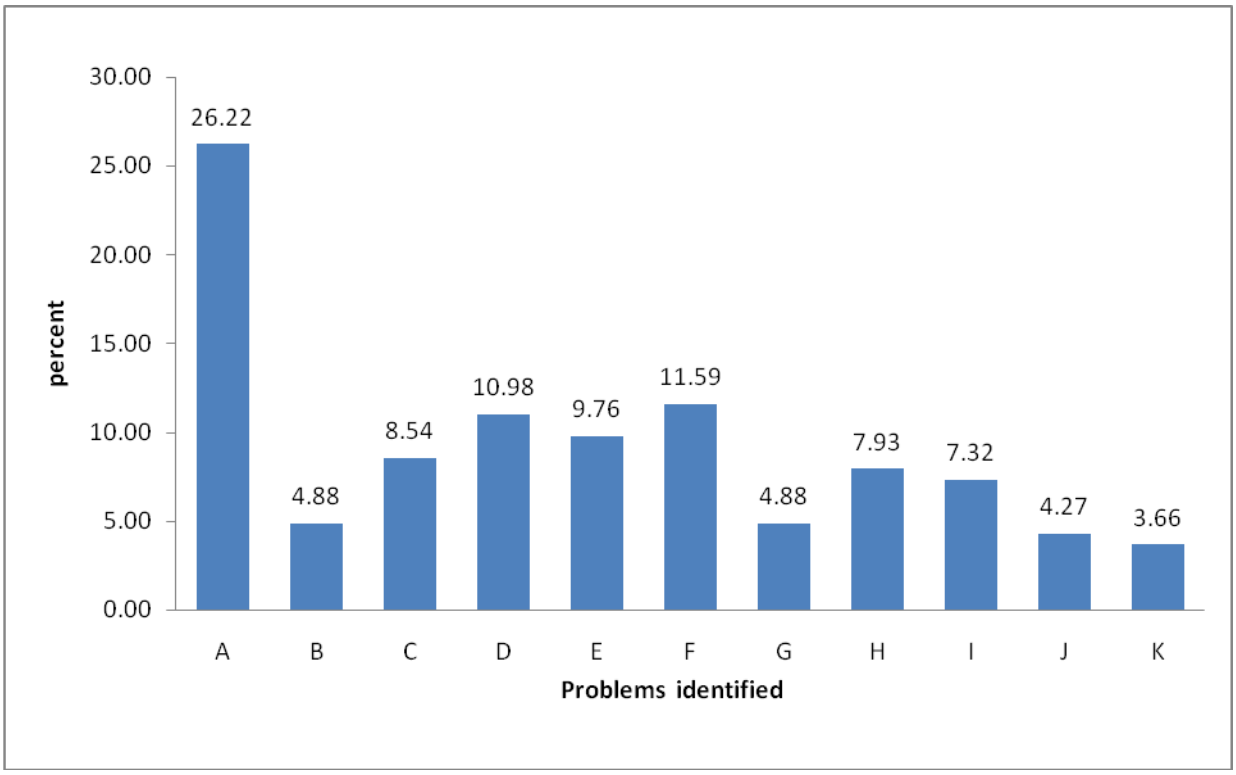

Figure 1: Problems of polio immunization in Nigeria (n=164)

KEY

A	Lack of knowledge
B	Poor campaign strategy
C	Erroneous belief
D	lack of trust on quality of vaccine
E	Non compliant spouse and harassment of vaccinators
F	Misconceptions and misinformation
G	Inadequate funding
H	Lack of political will and commitment
I	Corruption
J	Fear of side effect
K	Inadequate manpower and poor logistics

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Figure 2above was derived from section E of the questionnaire where only 164 (52.5%) people responded out of the total 312 respondents. Their total opinion was categorized into the above listed as the problems affecting polio immunization in Nigeria.

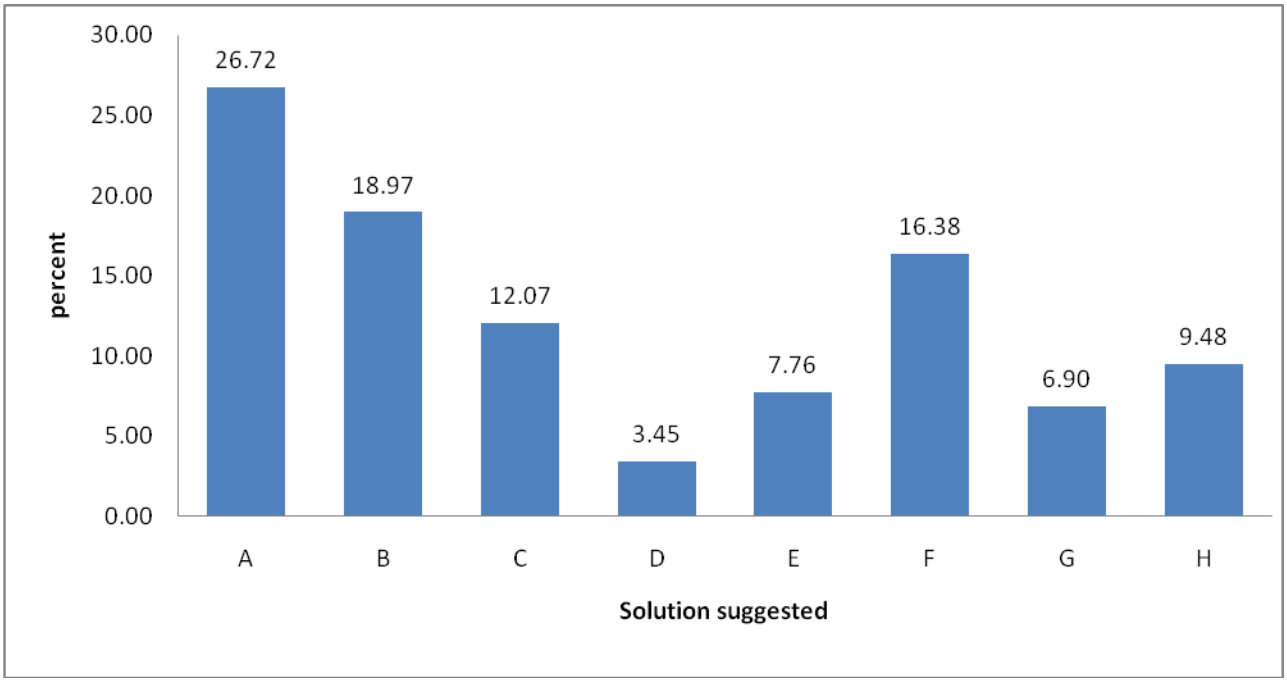

Figure 2: Suggested solutions to problems of polio immunization in Nigeria (n=118)

KEY

A Educating people about the protectiveness of polio immunization
B Creating awareness program through mass media
C Government should provide adequate funding
D Community outreach by community base organizations and youth clubs
E Provision of incentives by NGOs to elicit participation
F Involving community leader and persons of influence
G Immunization workers should be given adequate training
H Government should make it mandatory for every child

Variable	Score	Frequency	Percent
Knowledge Score			
Good	≥30	264	84.6
Poor	<30	48	15.4
Attitude Score			
Positive	≥25	178	57.0

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Negative	<25	134	43.0
Perception Score			
Positive	≥30	203	65.0
Negative	<30	109	35.0

Table 5: Knowledge, Attitude and Perception Score (n=312)

Table5 This is a scoring system adopted by Khan et al. (2015) in Pakistan shows the overview of The whole parameter that indicates the knowledge, attitude and perception of the care givers of under-five toward polio immunization among caregivers. This result was obtained from the questionnaires marked against a score of 5 against any strongly agree right question and the score of 4 to agree, 3 to neutral, 2 disagree and 1 to any strongly disagree wrong question answered. Based on this the total knowledge score was 60 marks and those consider with good knowledge score 30 and above. On the attitude scale, 45 was the total mark score and those with 25 and above were considered having positive attitude while those below were negative. In addition to this the total perception score was 60 all that score 30 and above were considered with positive perception while below that are those with negative perception.

Based on this result the caregiver have good knowledge of polio vaccine as 264 (84.6%) have the score of 30 and above. About half of the caregivers178 (57%) scored >25/45 and the other 134 (43%) scored <25/45 on attitude scale. In addition to this the perception of the respondent was good as 203 (65%) of the respondent scored 30 and above.

DISCUSSION AND CONCLUSION

DISCUSSION

The socio-demographic data obtained from the study reveals that the majority of the respondents were young caregivers at the age range of 16-25, which can be attributed the practice of early marriage and low birth control in the area. In addition majority of respondent were females,and married at the same time. This is in agreement with a study conducted by Ahmad et al. in Gaya Local Government Area of Kano State. This can be attributed to the tradition in the region where mothers are the ones staying and taking care of the children at home.

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It is interestingly relevant that significant number of the respondents are knowledgeable about the causative agent of polio disease and the under five children as the most vulnerable group to the infection.This is a finding similar to thatof Al-Zahrani in the Kingdom of Saudi Arabia which he attributed the literacy level of the respondent and high campaign programs even with the disease completely eradicated out of the country. This is also applicable to another majority that agreed that there is prevalence of polio in the country, in addition to their awareness on the protectiveness on polio vaccine which is a strong determinant for prevention. Study by Osowole and Obute (2014) conforms to the result of this research which when assessing the knowledge, attitude and perception of caregivers toward polio immunization in Gombe. Overwhelming number of the respondents had no knowledge about what the content of polio vaccine is, since all campaigns are toward the mode of transmission and method of prevention. Participants showed positive attitude by identifying appropriate storagetemperature for polio vaccine.Worthy of note that greater numbers of the respondents have free access to polio vaccine as it is available and free mostly during National Immunization Days (NIDs) which is the integral part of Polio Eradication Program (PEP) in the country.

About the attitude of the respondents toward polio immunization, more than half of them are of the opinion that polio vaccine should be made mandatory to every child, which could be against the wish of many incompliant spouses. This finding agreed with that conducted in Peshawar,Pakistan where half of the participants strongly agreed or agreed to the statement that all children should be vaccinated against polio, which could serve as a milestone toward eliminating the disease completely (Khan, 2015). Majority of the respondents agreed that healthy child should be given polio vaccine which agrees with the global policy.
But in reverse there exist negative behavior among some of the respondents who have the feeling that house to house immunization is disturbing which indicates tendency for rejection. Because many feel that attention should not be given too much on polio only, while there are other diseases to contend with. In addition of many who are with view of isolating children who received polio vaccine.

Also from the study, many agreed that without polio immunization their child is susceptible to polio infection. This is a good attitude as it encourages parent to take their children out for immunization in fair of being infected.

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Furthermore religious and traditional beliefs also contributed to negative attitude among the respondents as many respondent agreed that prayer can serve as substitute to polio vaccine and another group agreed the same on using traditional medicine as substitute to the vaccine. Tendency for rejection still exist within the community as quarter of study group declined to take their children for vaccine in addition of another that disagreed to advice other people to take their children for immunization.

Misperception that polio is cause by evil spirit has some traditional ground as morethan one quarter of the respondent subscribe to that view in addition of some that don't see dirty environment and drinking unsafe water as a contributing factor, which has serious negative effect on prevention efforts. The motive behind polio eradication initiative is not known by many for some respondent disagreed with it preventive measures. It's noteworthy that majority of the respondent agreed that the benefit of the polio vaccine out weight its adverse effect as well as the safety and effectiveness.

There were some of the respondent that disagreed with the competency and skill of the vaccinators in addition of some that have the feeling that polio vaccine makes children fall sick which can be a marker for rejection. This agreed with a research made in Egypt by Monteseer et. al which revealed that fear of vaccination side-effects may be a barrier for immunization. When inquired about the side effects of the polio vaccine, many opined that it was harmless.

Furthermore there exist a promising change in perception as only few of the respondent related polio vaccine and population control. But a significant number have the feeling that polio vaccination round is too much. This is consistent with a study from Khybar by Mehmood 2014. Polio vaccine is given too much attention more than necessary which prompt frequent home visit that calls for great concern.

Focus Group Discussion (FGD) and Key Informant Interview (KII)

The Focus Group Discussion was conducted by the researcher and two trained assistants, which included some nine care givers as participants, and confirmed the Result collected by the questionnaire where the participant showed adequate knowledge with regard to the polio infection. They dispel the opinion that polio is caused by witchcraft or evil spirit but agreed

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that dirty environment is a contributing factor. One participant told that she refused to vaccinate her kidsin fear of their fathers who is in contempt with the process.

Then the Key Informant Interview (KII) with a ward headand a religious leader is also in agreement with the collected data that the community had good knowledge on polio immunization.

Based on the Focus Group Discussion and Key Informant Interview, the following was observed:

i. Failures of the government to fulfill its promise which make the people lose confidence and reject intervention programs such as polio immunization.

ii. Lack of incentives (in form of immunization plus) to elicit participation

iii. Lack of awareness programs that covers all parts of the community.

These findings are consistent with that conducted by Ahmad et. al (2015) in Gaya Local Government of Kano State, which states that parent/caregivers have high knowledge about polio vaccine and immunization exercise. However they have poor belief that OPV confers protection against poliomyelitis and hence about 20% reject the vaccine which shows negative attitude towards uptake of oral polio in the communities.

Another finding from a research made by, Osowole and Obute (2014), in Gombe Local Government Area revealed that parent are reluctant to release their children due to many rounds of national immunization days, fear of vaccine overdose and polio contamination with harmful pathogens.

Research conducted in Jos North Local Government Area by Chris-Otubor et al (2015) also confirmed that there seems to be a high knowledge among mothers in Jos North generally, and this knowledge is not reflected in their practices. Knowledge among mothers in Jos North was also found to be significantly affected by education and religion and cultural belief.

A finding in Pakistan by Khan et al stated that religious belief was the major barrier toward polio immunization. Hence special attention should be given to educate people about polio to enhance their acceptability of polio vaccine. Intervention should be customized to target participants more likely to be associated with poor knowledge and negative attitudes toward polio immunization.

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CONCLUSION

In general the study revealed that the caregivers have good knowledge of polio immunization, as well as positive attitude and perception. Even though a small group of respondent, exhibited some negative attitudes and perceptions that could translate for a likelihood of rejection which have been influenced by both traditional and religious practices.

References

[1]. Abidoye, A.O. and Adeyemi, K.A. (2013). Knowledge, attitude and practice of mothers to children immunization in Kosofe Local Government Area of Lagos State, Nigeria. *International Journal of Basic, Applied and Innovative Research*. Vol. 4 pp. 23.

[2]. Ahmad I.M., Yunusa I., Wudil A.M,.Gidado Z.M., Sharif A.A., Kabara H.T. (2015). Knowledge attitude, perception and belief of parent/caregivers about polio immunization in Gaya Local Government Area of Kano State. *International Journal of Public Health Research*. Vol. 3, No. 5, 2015 pp. 192-199.

[3]. Akande A.A., Akande T.M. (2006*).* Polio Eradication in Nigeria-Controversies and way forward. *African Journal of Clinical and experimental microbiology*. 7th ed. pp 172-179. Ibadan. Nigeria.

[4]. Al-Zahrani, J., (2013). Knowledge, Attitude and Practice of Parents towards Childhood vaccination among caregivers in Arish, Kingdom of Saudi Arabia. *Majmaah Health Science*. Vol. 1, No. 1.

[5]. Atkinson, W., Hamborsky J., Wolfes, S. (2013*).* Epidemiology and Prevention of Vaccine Preventable Diseases 10th ed. *Public Health Foundation*. Washington D.C.

[6]. Jegede A. S. (2007). What led to the Nigerian boycott of the polio vaccination campaign*?PLOS med Journal. Pmed 73rd ed*. Ibadan Nigeria.

[7]. Kaprowski H., (2010). Historical Aspect of the Development of live virus vaccine in Poliomyelitis.*College of Physicians of Philadelphia. On interview with BBC World. 11th Oct. 2010.*

[8]. Khan M.U., Ahmad A., Aqeel T., Salman S., Ibrahim Q., Idrees T., Khan U.M., (2015). Knowledge, attitude and perception towards polio immunization among residents of two highly affected regions of Pakistan. *DMC Public Health.*

[9]. Mehmood K., Hashmi I. J., Rashid A.Z., Bashir RA, Khosa ZA, Khalid S, Hashmi KT (2014) Polio vaccination; knowledge, attitude, and practice about in District Abbottabad, Khyber Pakhtunkhwa, *Pakistan. Professional Medical Journal;*21(5):000-000.

[10]. Mohan, H. (2010), textbook of pathology 6thed (p67-73), Jaypee brothers, New Delhi India.

ISSN: 2454-9665

[11]. Robertson, S., (2014). The immunological Basis of Immunization Series, *World Health Organization. Geneva Switzerland*. Module 6. pp 17.

[12]. Sinhal, A. (2014). Poliomyelitis Epidemiology and Current Status. RD Gardi Medical College. Ujjain, India.

[13]. Soumy B., (2012). Polio eradication: current status and challenges. *Journal of Family Medicine and Primary Care*. Vol. 9. pp. 12.

[14]. Tripathi K.D. (2008), Essentials of medical pharmacology. 6th ed (pp767-776), Jaypee Brothers medical publishers, New Delhi, India.

[15]. Vanguard newspaper, (2016). WHO sad over new polio cases in Nigeria. 6th September 2016.

[16]. WHO/CDC/UNICEF/Rotary. (2014). *Global Polio Eradication Initiative Annual Report 2014.* On the threshold of a polio-free world. Geneva Switzerland. pp. 13-15.

[17]. WHO/UNICEF/CDC/Rotary (2014*). On the threshold of polio-free world*. Annual Report. pp 8-10. WHO Press. 20th Avenue Apia, Geneva, Switzerland.