

Original Research Article

# Impact of Rabies Education on the Knowledge of the Disease among Primary School Children in Samaru, Zaria, Nigeria

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## Abstract

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Rabies education has been proposed for prevention of the disease especially among children who are a high-risk group. This study was carried out to assess the impact of rabies education among primary school children in Samaru Zaria, Nigeria. Pupils (228) were selected from six primary schools representing public and private schools. Questionnaires were designed, marked and matched (pre and post) for each participant with a maximum of 22 marks obtainable. The scores were categorized as very good (15-22), good (11-14), fair (8-10) and poor (<7). Most of the respondents (103, 45.2%) were between the ages of 12-13 years and majority (130, 57%) were females. The children's parents were mainly civil servants (56.1%) with up to tertiary level of education (104, 45.6%). Up to 40% of the respondents said they never heard of rabies and those who had heard about it were taught by their parents (44, 32.5%) and teachers (42, 30.3%). The pre-test result indicated only 8 (3.5%) had very good knowledge and the majority (127, 55.7%) had poor knowledge. Post intervention, however, 207 (90.8%) had very good knowledge of the disease while none (0%) had poor knowledge about rabies. There was a statistically significant difference in the knowledge about rabies pre and post intervention among the study population ( $p < 0.05$ ). Prior knowledge about rabies and whether or not the respondents like dogs significantly affected their mean knowledge scores ( $p < 0.05$ ). This shows that rabies intervention by educating pupils about the disease is a very viable tool towards rabies prevention and should be employed for this purpose.

**Keywords:** Children, Education, Impact, Knowledge, Nigeria, Rabies

## INTRODUCTION

Rabies is an acute viral zoonosis characterized by encephalomyelitis and a very high case fatality rate (Radostits *et al.*, 1995). The aetiologic agents are members of the genus *Lyssavirus* belonging to the family *Rhabdoviridae* (Tordo *et al.*, 2006). An estimated 55,000 people die from this disease annually majority of which occur in the developing countries, with about 54% in Asia and 46% in Africa (WHO, 2005). The domestic dog *Canis familiaris* is the primary reservoir of the disease in this region and most human cases occur following a bite from an infected dog (Lai, 2005; WHO, 2005).

Over 30% of rabies cases in humans occur in children less than 15 years of age (Chhabra *et al.*, 2004; Surdarshan *et al.*, 2007, Bata *et al.*, 2011). This could be attributed to the curious nature of children and the potentials for provoking dogs while playing (Briggs and Mahendra, 2007). Even though the disease is invariably fatal, it could be prevented by appropriate first aid which includes prompt washing of the bite site with soap and water, followed by complete regime of vaccination (Rupprecht *et al.*, 2006).

Every year, it is estimated that not less than 10,000

persons are potentially exposed to rabies as a result of dog bite injuries in Nigeria (Okoh, 2007). The actual number of people who die from the disease annually is not clear because of the poor reporting system. It is, however, established that rabies is endemic among the dog population in Nigeria and voluntary vaccination of dogs is declining (Adeyemi *et al.*, 2005.). There is currently no mass vaccination of dogs in the country and dog ownership practice is poor, with dogs allowed to roam freely on the street in search of food. These conditions prevail despite the fact that there are existing laws regarding dog ownership in Nigeria because these laws lack enforcement (Dzikwi *et al.*, 2012).

It is therefore logical to educate people about rabies prevention especially children who are likely to get exposed (Dzikwi *et al.*, 2012). Since education is potentially a useful tool in rabies prevention, the effectiveness of this intervention however needs to be assessed.

This study was therefore carried out to assess the usefulness of rabies education on the knowledge about the disease by determining if the knowledge of the pupils about rabies improved after a rabies education programme.

## DESIGN AND METHODS

The study population comprised primary school pupils from public and private schools in Samaru, Zaria. Six schools were selected from the 17 schools in the area. The schools were stratified into public and private schools. The five private schools were further stratified into Christian-modelled schools, Muslim-modelled schools and general schools. Three schools were randomly selected from the strata to ensure representation of each group in the final study population. The remaining three schools were selected by balloting from the 12 public schools. Participants were drawn from final year classes and where more than one arm of a class existed, the participating class was selected by balloting. The study populations had both male and female pupils aged between 8 and 15 years.

### Permission and consent

Permission was sought and approval obtained for the study from the authorities of the selected schools. Only pupils who were willing to participate and who happened to be selected were included in the study.

### Rabies Educational Materials (REMs)

Pamphlets were specially designed for rabies education among school children in the Department of Veterinary

Public Health and Preventive Medicine, Ahmadu Bello University, Zaria. It contained basic information on definition, aetiology, clinical signs (saliva from the mouth, running around and biting everything, refusing to drink water, dog cant walk well ie paralysed etc), mode of transmission (through dog bite), prevention (report to parents/teachers who will wash bite wound immediately with soap and water and go to hospital) and control of rabies (by vaccinating dogs) in simple language for easy comprehension by school-age children.

### Questionnaire design

Questions on basic knowledge of rabies were developed from the information contained in the REMs. In addition, the questionnaire sought information on demographics such as age, sex, educational level and occupation of respondents' fathers. Each school was visited twice for a pre-test and post-test.

### Pre-test

This was conducted to assess the knowledge about rabies among the pupils before any intervention. Respondents were instructed to indicate their schools and names for ease of comparison with the post-test and to complete the questionnaires without any assistance. Upon completion, the questionnaires were collected and verified to ensure the pupils complied.

### Intervention

Immediately following the pre-test, a short and concise talk on rabies was given and the REMs were clearly read out in the class. Thereafter, questions arising after the talk were answered and the REMs were distributed to the pupils. They were instructed to study the REMs with their parents and teachers, and participate in the post-test.

### Post-test

Two weeks after the pre-test, the selected schools were visited and the same questionnaires were administered to the same pupils who participated in the pre-test.

### Data analysis

Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 16. The responses to the questions for both the pre and post-tests were marked and graded with a maximum of 22 marks and four grades as follows: 15-22 was graded as very good, 11-14 as

**Table 1.** Distribution of respondents by type of schools in Samaru, Zaria, Nigeria

School type	Number of participants	%
<i>Public</i>		
Kallon Kura	49	21.5
Saidu LEA	53	23.2
Amina LEA	36	15.8
<i>Private</i>		
2 <sup>nd</sup> ECWA	32	14.0
God's Time	41	18.0
Nurul Huda	17	7.5
<b>Total</b>	<b>228</b>	<b>100</b>

**Table 2.** Demographics of the pupils in the study, Samaru, Zaria, Nigeria

Variable	Number	%
<b>Age in years</b>		
8-9	18	7.9
10-11	64	28.1
12-13	103	18.9
14-15	43	
<b>Gender</b>		
Male	98	43
Female	130	57
<b>Fathers' educational level</b>		
Primary	42	18.4
Secondary	82	36
Tertiary	104	45
<b>Fathers' occupation</b>		
Trader	19	8.3
Farmer	50	21.9
Civil servant	128	56.1
Others	31	13.6

good, 8-10 as fair and 0-7 as poor. Paired t test was used to compare the mean scores of the pupils in the pre- and post-tests. One way analysis of variance (ANOVA) or independent t test was used to compare the distribution of mean scores by the schools and demographic variables.

## RESULTS

A total of 248 questionnaires were recovered from the first visit comprising of 158 from public schools and 90 from private schools based on the proportion of the pupils in the participating schools. After the second visit, 228 questionnaires were recovered. Twenty students were not present at school during the second visit and they were excluded from the analysis.

Table 1 shows the distribution of the participants

based on their school type with 138 from public and 90 from private schools. The demographics (Table 2) indicates that most of the participants (103, 45.4%) were aged between 12-13 years, while the age-group 8-9 years had the least (18, 7.9%). Majority (130, 57%) of the participants were females. Most of the respondents (104, 45.6%) said their fathers had up to tertiary education and 128 (56.1%) were civil servants. Attitudes of the participants to dogs (Table 3) indicates that majority (108, 51.3%) like dogs and 160 (70.17%) said they play with dogs, while 89 (39%) stated that they play only with their dogs. Twenty six respondents (11.4%) indicated that they play with all dogs they like, 14 (6.1%) play with all dogs they see and 31 (13.6%) play with only dogs they know. When asked if they had ever heard of rabies, 92 (40.4%) said no. Those who have heard about the disease were informed mainly by their parents (44, 32.5%) and teachers (42, 30.3%). The mass media (television and

**Table 3.** Rabies awareness and attitude of pupils in Samaru to dogs

Items	Frequency (%)
<b>Do you like dogs?</b>	
Yes	108 (51.3)
No	117 (47.6)
Not stated	3 (228)
<b>Which dogs do you play with?</b>	
All dogs I like	26 (11.4)
Only my dog	89 (39.0)
All dogs I see	14 (6.1)
Only dogs I know	31 (13.6)
None at all	68 (29.8)
<b>Have you ever heard of rabies?</b>	
Yes	136 (59.6)
No	92 (40.4)
<b>How did you hear about rabies?</b>	
Parents	44 (32.5)
Teachers	42 (30.3)
Friends	19 (14.0)
TV	14 (10.5)
Radio	10 (7.5)
Others	7 (5.3)

**Table 4.** Distribution of categorised knowledge scores before and after rabies education among primary school children in Samaru

Category of score	Before Number (%)	After Number (%)
15-22 (very good)	8 (3.5)	207 (90.8)
11-14 (Good)	24 (10.5)	17 (7.5)
8-10 (Fair)	69 (30.3)	3 (1.3)
0-7 (Poor)	127 (55.7)	0 (0.0)
<b>Total</b>	<b>228</b>	<b>288</b>

**Table 5.** Distribution of mean scores by gender, and by whether they have heard about rabies and whether they like dogs

Variables		Mean scores	Before t value	p value	Mean scores	After t value	p value
Gender	Males	8.18	1.712	0.09	19.08±2.3	2.460	0.015
Heard about rabies	Females	7.57	4.697	0.00	18.20±2.9	0.857	0.39
Like Dogs	Yes	8.49	3.25	0.001	18.73±2.5	1.704	0.09
	No	6.86			18.41±2.9		
	Yes	8.39			18.88±2.7		
	No	7.25			18.26±2.7		

radio) informed only 10.5 % (14) and 7.5% (10) respectively.

The categorized scores of the children before the rabies education intervention shows that only eight (3.5%) had very good knowledge of the disease with a score of between 15-22 marks, while 24 (10.5%) had good knowledge with scores of 11-14 marks. The majority (127, 55.7% and 69, 30.3%) of the children had

fair to poor knowledge about the disease with 8-10 marks and < 7 marks respectively. After the educational campaign, however, there was a remarkable improvement in the scores of the participants. Over 90% (207) had very good knowledge of rabies and only three (1.3%) had fair knowledge. None (0%) had poor knowledge about rabies (Table 4). There was a statistically significant difference in the knowledge of

**Table 6.** Distribution of mean scores by school, age, fathers' education and occupation, and playing with dogs.

Variable	Before Mean score	After Mean score
<b>SCHOOL</b>		
2 <sup>nd</sup> ECWA	10.13±2.485 <sup>c</sup>	20.63±1.16 <sup>d</sup>
Kallon kura	6.57±2.327 <sup>a</sup>	17.39±2.73 <sup>a</sup>
Saidu LEA	6.38±1.213 <sup>a</sup>	18.17±2.87 <sup>ab</sup>
Amina LEA	8.64±2.696 <sup>b</sup>	17.50±3.14 <sup>a</sup>
God's time	9.37±2.782 <sup>bc</sup>	19.71±1.74 <sup>cd</sup>
Nurul huda	6.29±1.532 <sup>a</sup>	19.00±1.97 <sup>bc</sup>
<b>AGE</b>		
8-10yrs	8.50±3.382 <sup>a</sup>	19.06±2.73 <sup>a</sup>
10-11	7.52±2.663 <sup>a</sup>	18.11±2.86 <sup>a</sup>
12-13	7.83±2.686 <sup>a</sup>	18.88±2.49 <sup>a</sup>
14-15	7.95±2.468 <sup>a</sup>	18.33±2.95 <sup>a</sup>
<b>FATHERS' EDUCATION</b>		
Primary	7.36±2.634 <sup>a</sup>	18.21±3.3 <sup>a</sup>
Secondary	7.04±2.225 <sup>a</sup>	18.04±2.6 <sup>a</sup>
Tertiary	8.65±3.030 <sup>b</sup>	19.15±2.5 <sup>b</sup>
<b>FATHERS' OCCUPATION</b>		
Trader	7.26±2.684 <sup>a</sup>	19.42±2.0 <sup>a</sup>
Farmer	7.26±2.406 <sup>a</sup>	18.74±2.5 <sup>a</sup>
Civil ser	7.95±2.740 <sup>a</sup>	18.37±2.9 <sup>a</sup>
Others	7.86±2.813 <sup>a</sup>	18.68±2.8 <sup>a</sup>
<b>PLAY WITH DOGS</b>		
All I like	8.81±3.57 <sup>c</sup>	19.15±2.4 <sup>b</sup>
Only my dog	8.13±2.739 <sup>bc</sup>	18.84±2.6 <sup>b</sup>
All dogs I see	6.50±1.829 <sup>a</sup>	16.86±3.1 <sup>a</sup>
Only known	7.87±2.306 <sup>abc</sup>	19.13±2.5 <sup>b</sup>
None	7.32±2.409 <sup>ab</sup>	18.12±2.8 <sup>b</sup>

For each variable, column means with the same superscript are not significantly different (Duncan's multiple comparison test,  $p \leq 0.05$ )

rabies pre- and post-intervention among the primary school children in Samaru following paired t-test ( $p=0.01$ ). There was no statistically significant difference before but there was after the education and males had higher scores. Based on whether or not they had heard about rabies, there was no statistically significant difference before but there was after the intervention because the rabies education made them to know about the disease. Based on whether or not respondents liked dogs, before the rabies education there was a statistically significant difference but not after (Table 5). Duncan's multiple range test following ANOVA shows that the mean scores in *Nurul Huda*, and *Kallon Kura* primary schools were the same ( $p>0.05$ ) with low scores while *Amina* LEA and *God's Time* primary schools were also the same. 2<sup>nd</sup> *ECWA* and *God's Time* primary schools had the highest scores (Table 6).

## DISCUSSIONS

It is commendable to see that girls were enrolled and very well represented in this study in the northern part of the country where it is generally believed that girls are disadvantaged with respect to schooling opportunities. Possibly, the presence of the many institutions of learning in the locality influenced the presence of girls in schools. This, in addition with on-going campaigns for girl-child education could also explain the high enrolment of girls in these schools. Children are generally fond of dogs and there is a tendency for them to approach and play with unfamiliar dogs (Briggs and Mahendra, 2007). This practice could predispose them to dog bite and potential exposure to rabies especially since vaccination of dogs is very low and rabies is endemic in this area (Dzikwi *et al.*, 2011). It is below expectation for this proportion of

children to be unaware about rabies. It also appears that the mass media is under-utilized for rabies education. This is a potentially useful means of educating children since they are generally drawn to entertainment and educational messages could be packaged and passed in a children-friendly way.

The highest scores were from the category which included *God's Time* and 2<sup>nd</sup> ECWA primary schools. This implies that though two of the private schools had the highest scores, the third fell in the lowest category, and the private school pupils' scores were at the extreme ends of the spectrum. The scores of the public schools were consistently in the middle. Based on age, even though the least scores were by the oldest children aged 14-15 years and the highest scores by the youngest children (8-9 years), the mean scores of all the ages were not different ( $p>0.05$ ), therefore, age was not a determining factor of the children's scores: and so was gender ( $p>0.05$ ). Children whose fathers had only primary and both primary and secondary educations had scores that were not significantly different ( $p>0.05$ ) while those whose fathers had up to tertiary education had significantly better scores. Fathers' education might have influenced the children's knowledge about rabies and consequently their scores.

The categories of the mean scores of respondents did not differ based on their fathers' occupation, meaning that father's occupation had little or nothing to do with the children's scores. There was a statistically significant difference in the performance of students and whether or not they like dogs ( $t=3.25$ ,  $p=0.001$ ). This is probably because children who like dogs are generally more interested about issues concerning dogs and probably had better knowledge prior to the rabies awareness education. The mean scores of children based on their attitudes regarding playing with dogs demonstrated an overlap within the three categories of the means implying that this has little or nothing to do with their scores. The difference between the mean scores of children who had prior knowledge of rabies and those who did not have prior knowledge of rabies was significant ( $p<0.01$ ). There was a significant increase ( $p=0.01$ ) in the level of knowledge before and after rabies education (mean score before  $7.83\pm 2.69$  and after  $18.58\pm 2.71$ ).

## CONCLUSION AND RECOMMENDATIONS

A large proportion of the study population had poor knowledge about rabies prior to the awareness campaign. The participants' knowledge increased significantly following this intervention. Rabies education and sensitization is therefore meaningful and will be useful for rabies prevention. The electronic media should also be employed to reach a larger population with the message of rabies prevention.

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