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Prevalence Of Worm Medication Use Among Preschool Children In Nigeria

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Abstract

Objectives: To evaluate the prevalence and demographic factors associated with worm medication use among preschool children in Nigerian.

Method: The study was based on data drawn from the Nigeria Demographic and Health Survey (NDHS) 2008 on the administration of worm medicines within six months preceding the survey. A total of 22,100 children between 6-59 months were included in the study. The chi square test for independence was performed to determine association between de-worming and demographic variables.

Results: The prevalence of worm medication use among preschool children was 21.3% (95% Confidence Interval of 20.8 % – 21.8%). Worm medication use was found to be significantly associated ($P < 0.05$) with child's age, child's residence, geographical zone, mother's education, mother's age at birth, and wealth quintile. There was no association between worm medication use and the sex of a child. Worm medication use was found to be high in urban children and children in the southern part of Nigeria.

Conclusion: The use of worm medications in preschool children in Nigeria is low. There is need for health education on the importance of de-worming among high risks group and the implementation of a national de-worming programme for preschool children.

Key words

worm medicine, preschool children, prevalence, demographic factors

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Introduction

Infections with worms affect over two billion people worldwide and cause about 150,000 deaths annually. Pre-school children defined as children below the age of 5, accounts for between 10-20% of worm infections worldwide. Total disability-adjusted life years lost annually is between 4.7 to 39 million. Worm infections are more common in low and middle income countries where hygiene and sanitation are poor, such as Latin America, China, East Asia and Sub-Saharan Africa [1,2]. In Nigeria, the prevalence of worm infections ranges between 2.4% in low endemic areas to as high as 83.3% in high endemic areas [3,4]. A geohelminthiasis study among preschool children in Akoko-Edo Local Government Area of Edo State, Nigeria reveals high prevalence of *Ascaris lumbricoides* (85.7%) and hook worm (65.7%) [5].

Acute infection with *Ascaris* causes intestinal obstruction in children with an incidence of up to 0.25 cases per year per 1,000 population in endemic areas, and a mean case fatality rate greater than 5% [6].

Chronic worm infections causes anemia in preschool children. The predominant worms that cause anaemia in children are hook worms and schistosoma species [3]. A study in East Africa, demonstrated that there is a significant correlation between hook worm infection and anaemia. In addition, a study in Zanzibar also showed a significant association between hookworm infections and iron deficiency indicators [2]. Iron deficiency in children affects their mental and motor development [3].

Infections with soil transmitted helminth causes malabsorption and/or reduced appetite which affect the nutritional status of infected individuals. This affects the growth and development of the individual. Ascriasis and Trichuriasis impair Vitamin A absorption and as a result affect serum vitamin A concentration which can cause Vitamin A deficiency [2,7]. The prevalence of xerophthalmia—the ocular manifestation of vitamin A deficiency—was found to be three times higher in *Ascaris*-infected children aged 6–120 months than in an uninfected group in Nepal [8].

Infections with soil transmitted helminths impaired motor and language development [2]. A decrease in cognitive score tests compared with matched controls was

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observed in children between 17 and 72 months of age affected by *Trichuris* Dysentery Syndrome , a severe form of trichuriasis [9].

Infections with helminthes have also been shown to affect immune response. They cause helminth-induced immunomodulation which reduces host response allowing the parasite to survive in its host. This may results to impaired responses to immunization and infections [10].

Three major interventions are used to control or eliminate worm infections. These interventions include chemotherapy which is the most practical and cost-effective intervention in developing countries; improved sanitation and health education. Although these interventions have been carried out in Nigeria in different regions and by different interest groups, there is no national policy backed approach for the control of worm infestation [11].

Regular de-worming in high risk group keeps the infection low and this reduces the health consequences associated with worm infections. De-worming among high risks group should be done 2-3 times annually [1].

This study was aimed at evaluating the prevalence and demographic factors associated with de-worming in preschool children in Nigeria.

Materials and Methods

Study Design

The study was based on data drawn from the Nigeria Demographic and Health Survey (NDHS) 2008. In the survey, women aged 15-49 years from selected households were interviewed. The survey collected data on demography and administration of worm medicine to preschool children within six months preceding the survey.

Study Population

A total of 10,724 women aged 15-49 years participated in the survey. Data from 22,100 children between 6-59 months were included in this study.

Sampling Procedure

The respondents for the 2008 NDHS were obtained through stratified two-stage cluster design. Nigeria is divided into states. Each state is subdivided into local government areas (LGAs), and each LGA is divided into localities [12]. The 2008 NDHS subdivided each locality into convenient areas called census Enumeration Areas (EAs) which constitutes the primary sampling unit referred to as a cluster. In the first stage, 886 clusters, consisting 286 and 600 clusters from urban and rural areas respectively were selected from localities in each LGA of the country. The second stage involves selecting an average of 41 households per cluster [12].

Data Analysis

Data drawn from the NDHS were entered into GraphPad Prism version 5 statistical software and the chi square test was performed to show association between de-worming and demographic variables. The prevalence of worm medication use was calculated as the percentage of preschool children de-wormed within six months preceding the survey.

Results

The study reveled that the prevalence of worm medication use among children of 6-59 months was 21.3% (95% Confidence Interval of 20.8 % – 21.8%). Worm medicine use in children was found to be significantly associated ($P < 0.05$) with child's age, child's residence, geographical zone, mother's education, mother's age at birth, and wealth quintile. There was no association ($P > 0.05$) between worm medicine use and the sex of a child. The use of worm medicine was much higher in children above 1 year. The use of worm medicine was more common among children in urban areas than those in rural areas. Higher prevalence of worm medicine use was reported in children in the southern part of the country. The results also revealed that the higher the educational level of mother and family wealth quintile, the high the probability of de-worming of child (Table 1).

Discussion

De-worming has been shown to have a number of benefits in children. It has been shown to improve iron status and prevent moderate to severe anaemia [13]. Stoltzfus *et al*., 1997 demonstrated that de-worming improves child's growth especially in younger children [13]. De-worming has been shown to improve serum vitamin A and beta carotene concentrations in preschool children in Bangladesh [14].

The overall prevalence of worm medication use (21.3%) is low considering the high prevalence (between 2.4% to 83.3%) of worm infestations in Nigeria and the health consequences associated with worm infestation in preschool children [3]. Significantly low prevalence of worm medication use was observed in rural-Nigeria and the northern part of the country. This is of pubic health concern and calls for increase awareness on the importance of de-worming in these parts of the country. In addition, the low national prevalence of worm medication use demonstrates the need for a national programme on de-worming of preschool children.

Studies have shown that worm infestations thrive in poor socioeconomic conditions such as poor sanitation and hygiene, improper disposal of human faeces, insufficient supply of portable water, substandard housing and lack of education [4,15]. The results of this study showed a significant association between worm medication use and socioeconomic factors such as educational level and wealth quintile of parents; and place of residence (urban versus rural). However, this study showed an inverse relationship between worm infection prevalence and worm medication use. The low use of worm medication among high risks groups in Nigeria is of public health concern. Hence interventions such as mass de-worming of preschool children, health education and promotion of hygiene and sanitation should be directed towards these high risk groups.

This study supports other studies that demonstrated that the use of medicines in the prevention of diseases in children is influenced by socioeconomic factors. A study among mothers in peri-urban Karachi showed that mother's educational status was significantly associated with child's vaccination coverage [16]. Bhuiya *et al*., also demonstrated that children from households with better

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socioeconomic conditions have two times chances of being immunized [17].

The use of single dose medicine for the treatment of worm infections have been shown to be cost effective [1,2] . We recommend that mass de-worming of preschool children should be integrated into their immunization programmes (especially in areas of high endermicity) as this would serve as an effective delivery strategy. This recommendation is based on the premise that about 50 million preschool children worldwide have been successfully de-wormed for soil-transmitted helminths in 2006 through large scales interventions such as immunization campaigns, child health days, routine health delivery service, schools, nurseries, and community-based interventions [2].

Conclusion

The use of worm medications in preschool children in Nigeria is low. There is need for health education on the importance of de-worming among high risks group and the implementation of a national de-worming programme among preschool children. The study also demonstrated that socioeconomic factors are associated with de-worming medication use among preschool children in Nigeria.

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Table 1: Prevalence of worm medication use in preschool children in Nigeria

Demographic Variable	Number of Children	Prevalence (%)	χ^2-value	P-value
Age				
6-8	1543	6.8	330.6	< 0.05
9-11	1312	14.4		
12-17	2894	17.6		
18-23	2051	24.8		
24-35	4633	25.2		
36-47	5013	23.3		
48-59	4653	22.9		
Sex				
Male	11154	21.5	0.4919	>0.05
Female	10946	21.1		
Residence				
Urban	6809	33.9	308.3	< 0.05
Rural	15291	15.7		
Geographical zone				
North Central	3045	9.4	4946	< 0.05
North East	3488	5.7		
North West	6770	4.0		
South East	2152	42.5		
South South	2910	48.4		
South West	3735	43.8		
Mother's Education				
No formal education	10081	5.1	9154	< 0.05
Primary	5169	24.4		
Secondary	5551	40.8		
Tertiary	1299	51.9		
Mother's age at birth				
15-19	1006	8.5	175.7	< 0.05
20-29	10526	20.2		
30-39	8240	25.2		
40-49	2329	18.4		
Wealth Quintile				
Lowest	4955	4.6	3255	< 0.05
Second	4935	9.7		
Middle	4247	18.9		
Fourth	4011	32.1		
Highest	3952	48.5		
Overall	**22100**	**21.3**		