



Traditional practices and childhood cryptosporidiosis in Nigeria: A review



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ABSTRACT

Cryptosporidium infection is known worldwide as an important aetiology of chronic diarrhoea that can become fatal in children (below 5 years of age) and immunocompromised individuals. This review was aimed at identifying some traditional practices that may be risk factors for childhood diseases like cryptosporidiosis in a country like Nigeria with different tribes and cultures. Information gathered from literature search and informal sources identified some indigenous practices like birth rituals, special childhood menus, traditional nanny practice, local management of childhood diarrhoea and some myths among others, as factors that may negatively impact childhood health in a multi-cultural population like Nigeria. A proper understanding of these traditional practices will enable the prevention and control of childhood disease like cryptosporidiosis in a multi-ethnic setting.

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1. Introduction

1.1. Nigeria

Nigeria with a population of about 152 million is the most populous country in West Africa.¹ The country has a land mass of 923,768 sq km and lies between Latitudes 4–14° North and

between Longitudes 2°2' and 14°30'.² Nigeria has a rich cultural diversity with over 250 different ethnic groups, all having their unique languages, customs and traditions. However, three main tribes Hausa, Igbo and Yoruba dominate the northern, southern, and western Nigeria respectively³ (Fig. 1). Nigeria has a warm tropical climate with relatively high temperatures throughout the year. There is a rainy season (mid-March to November in the South and from May to October in the north) and dry season during the other months of the year.⁴ Agriculture (crop production, animal husbandry, fishery and forestry) is the major occupation of the people in the rural areas of Nigeria.

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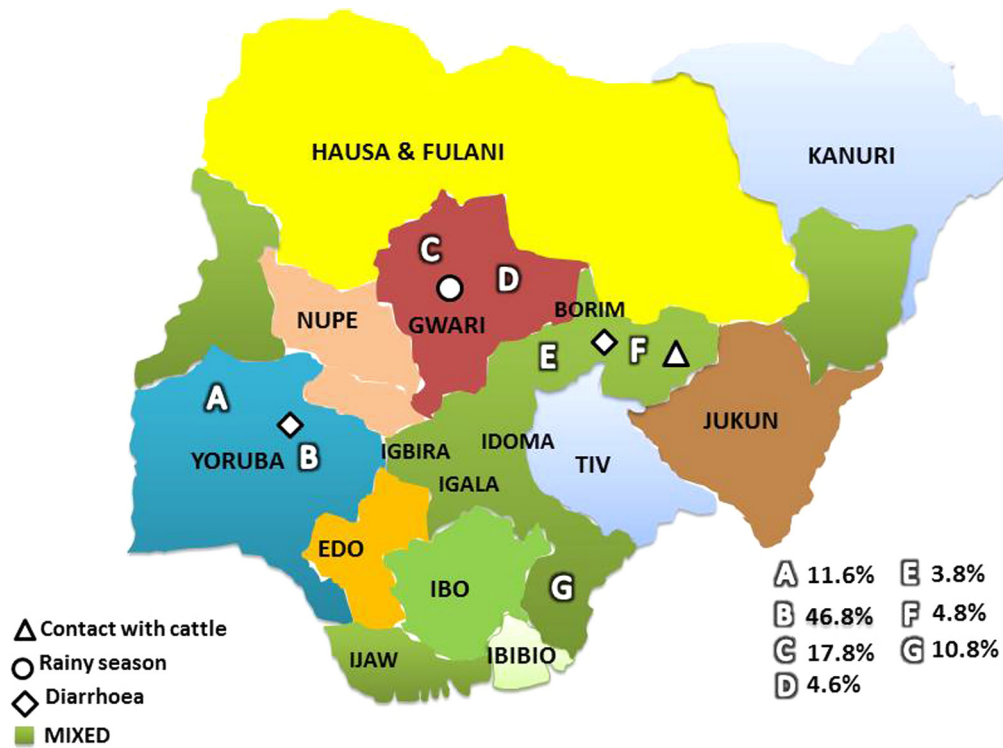


Fig. 1. Major tribes in Nigeria with reported prevalence and risk factors for cryptosporidiosis.

1.2. Cryptosporidiosis

Cryptosporidium infection is known worldwide as an important aetiology of diarrhoea in both immunocompromised and immunocompetent individuals.^{5,6} In the developed and developing countries, cryptosporidiosis occurs more often in infants and children than in adults.^{7,8} The infection is transmitted to the susceptible host via the fecal-oral route from the consumption of food and water contaminated with oocyst from an infected host.⁹ Other suggested sources of Infection include contact with infected humans, animals, and contaminated recreational waters.^{10–12} Cryptosporidiosis is characterised by a self-limited diarrheal illness in healthy individuals but may cause chronic diarrhoea that may be fatal to infants and individuals with compromised immune systems, such as persons with HIV/AIDS.¹³ In children, cryptosporidiosis is mainly characterised by watery diarrhoea that can persist for up to 12 weeks and this condition is usually fatal in malnourished children.^{14–17}

Several published reports are available on the epidemiology of *Cryptosporidium* infection in children and associated risk factors that might influence the pattern and outcome of the disease (Table 1 and Fig. 2).

1.3. Childhood *Cryptosporidium* in Nigeria

There are few available studies on the prevalence of childhood (aged 0–5 years) *Cryptosporidium* infection in children. Three of these studies investigated the infection in both diarrhoeic and non-diarrhoeic children^{33–35}, while the others studied the infection in only diarrhoeic children^{36,19,37} and in malnourished children.³⁸ Methods employed by these studies include Modified Ziehl-Neelsen staining method; enzyme-linked immunosorbent assay technique (ELISA) and molecular methods (Table 2). Few available information on childhood cryptosporidiosis were reported for two states (Oyo and Osun) in south-western Nigeria,^{33,35} two state (Jos and Zaria) in Northern Nigeria^{19,34,37} and only one state in South

Table 1
Data on childhood cryptosporidiosis from some other countries in different continent.

Continents	Country	Methods	Prevalence (%)	Study population	Risk factors	Reference
Africa	Kenya	Molecular	4	Children	13–24 months, persistent diarrhoea	14
	Gabon	Immunofluorescence & microscopy	24	Children	6 and 12 months, malnutrition, rainy season	18
	Nigeria	Microscopy	17.8	Children	Rainy season	19
Asia	Iran	ELISA	5	Children	2–12 months, less breastfeeding, lower birth weight	20
	Indian	Molecular	45	Children	Stunting at 6 months of age, older children	21
Americas	Mexico	Indirect immunofluorescence	**	Children	<1 year, malnutrition, absence of breast feeding	22
	Brazil	Microscopy	7.4	Children	Low-birth-weight, overcrowding, persistent diarrhea	23
Australia	Australia	Case study		6 years old boy	Organ transplant	24
Europe	Spain	**	**	Children	Tap water consumption, gastroenteritis	25
	Italy	Microscopy	1.9	Children	Persistent diarrhea	26

** Not determined.

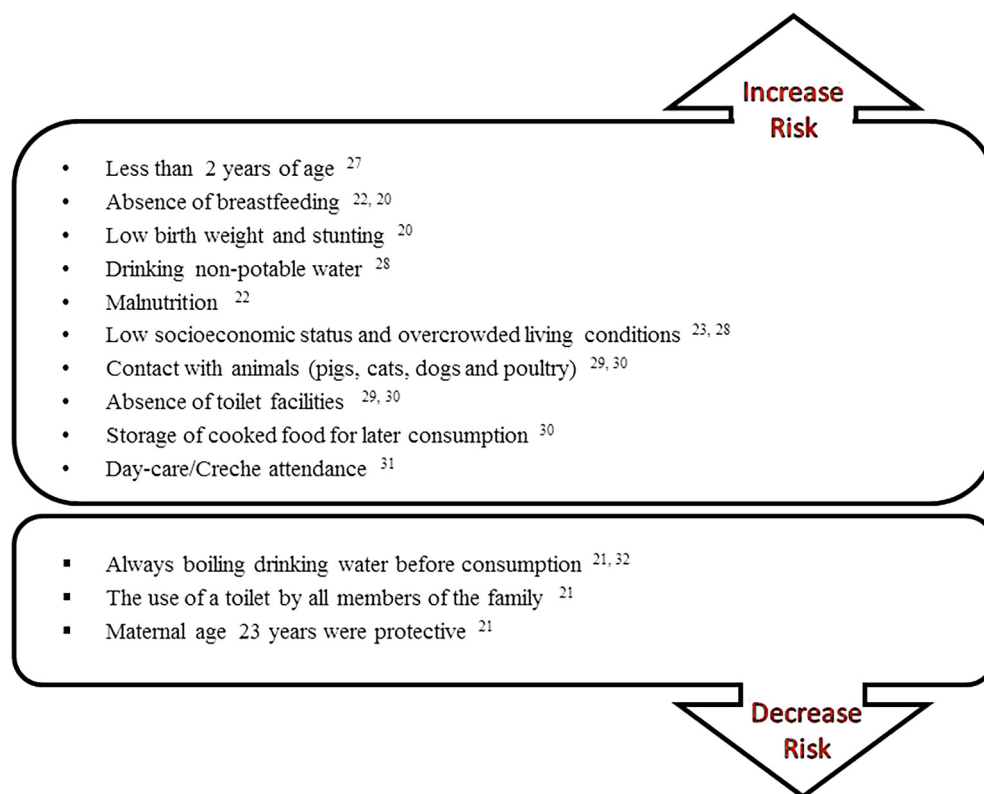


Fig. 2. Some risk factors suggested to be associated with childhood cryptosporidiosis. (See above-mentioned references for further information.).

Table 2

Cryptosporidiosis prevalence in children (0–5 years) in Nigeria.

Location	Method(s)	Prevalence (%)	Study population	Risk factor(s)	Reference
Port-Harcourt	Microscopy	10.8	Diarrheic children	0–2 years of age	36
Jos	Microscopy	3.8	Under-nourished children	Diarrhoea	38
Oyo	Molecular	11.6	Diarrheic & non-diarrheic	**	33
Zaria	Microscopy	4.6	Diarrheic & non-diarrheic	**	34
Zaria	Microscopy	17.8	Diarrheic children	Rainy season	19
Jos	Molecular	4.8	Diarrheic children	Diarrhoea, contact with cattle	37
Osun	Microscopy & ELISA	38.3 & 46.8	Diarrheic & non-diarrheic	Diarrhoea	35

** Not determined.

Eastern Nigeria.³⁶ The overview of these reports according to tribes is represented in Fig. 1.

The control of Cryptosporidiosis in multi-cultural population would require a more holistic approach that would not only depend on modern science but also harness indigenous knowledge for effective prevention and control of the disease. This paper, therefore, aims at reviewing different traditional practices that may impact the prevalence of childhood cryptosporidiosis in Nigeria. Information for this review was obtained through literature search on data bases that include PubMed, ISI, Google Scholar, Scopus and African journal online (AJOL) using key words like diarrhoea in Nigerian children, traditional practices in Nigeria, and cryptosporidiosis in Nigeria. We also gathered information from non-indexed articles from libraries and personal communications.

2. Traditional beliefs and practices that may negatively impact childhood health in Nigeria

Traditional practices associated with cultural belief systems are very important to the care of the new born and children in countries with diverse tribes and cultures like Nigeria. The following practices may directly or indirectly be potential risk factors for

childhood cryptosporidiosis in Nigeria. The probable relationship between identified traditional practices, growth phases of children and risk of cryptosporidiosis is summarized in Fig. 3.

2.1. Breastfeeding and weaning practices

Breastfeeding is known to be one of the simplest, healthiest, least expensive and the oldest feeding practice that satisfies the infant's needs.³⁹ As important as breastfeeding is, there is evidence to show that breastfeeding is deliberately delayed in some places in Southwestern and northern part of Nigeria due to the cultural belief that colostrum is dirty and harmful to the new born.⁴⁰ In such places, mothers expressed and throw away early milk (colostrum), and feed pre-lacteal such as animal milk, honey, boiled water and herbal preparation while waiting for the 'appropriate time' to initiate feeding with the "clean breast milk". This practice may lead to low immunity that could make infant susceptible to cryptosporidiosis and other childhood diseases.

Traditional force-feeding is a popular practice among the Hausas and Yorubas of the Northern and Southwestern, Nigeria respectively.^{41,42} This is a practice where mothers (usually elderly women) feed their babies by force through oral drenching using

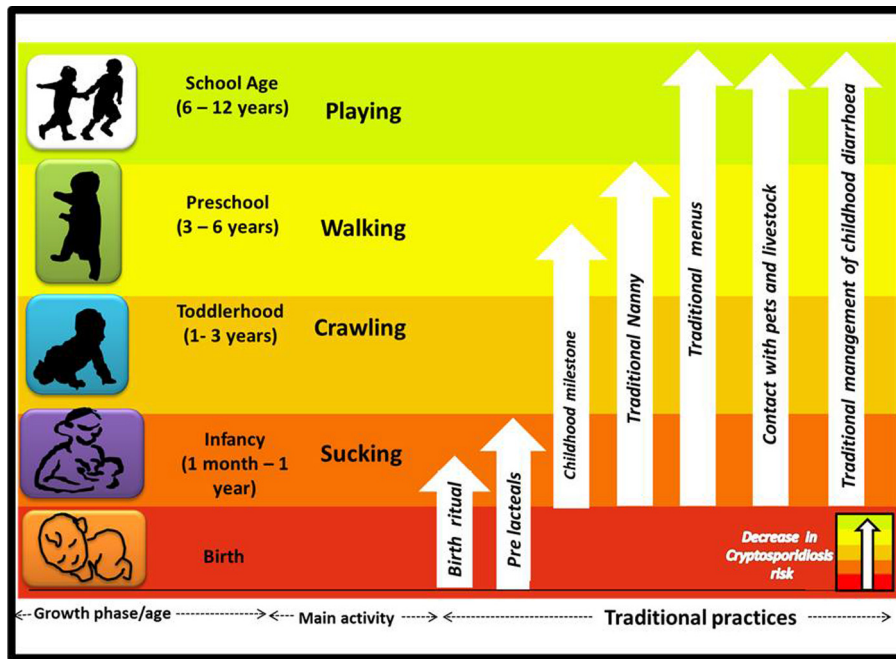


Fig. 3. Coloured chart showing levels of susceptibility with age to *Cryptosporidium* infection in relation to identified traditional practices.

bare hands in order to ensure that the children take in enough food for proper growth. The risk of using bare hands (which in most cases might not be properly washed) for feeding babies may enable the transmission of contaminative infection like Cryptosporidiosis from infected adult to infants' children.

In some traditional settings, the idea of exclusive breastfeeding is considered unsafe for infants because it is believed that infants do get thirsty and require water to "quench" their thirst. In addition, the practice of complementary feeding is popular among some native that believed that ordinary fluid from the mammary gland may not be enough as a meal for an infant. These practices create an opportunity for the ingestion of food and water contaminated with *Cryptosporidium* oocysts shed from infected individuals. Non-compliance with the practice of exclusive breastfeeding could also increase susceptibility to *Cryptosporidium* infection.

2.2. Traditional taboos and childhood nutrition

Most Nigerians wean their infant at about three to four months of age. Although some as early as the first two months of life by giving food like cereals made from maize (*Zea mays*), millet (*Pennisetum americanum*), or guinea corn (*Sorghum* spp) popularly referred to as pap, akamu, ogi, or koko in Yoruba land, and akamu in Hausa. Staple foods such as mashed, thinned, or pre-chewed form of yam (*Dioscorea* spp.), rice (*Oryza sativa*), gari (fermented cassava grits), and cocoyam (*Xanthosoma sagittifolium*) are then gradually introduced. These traditional menus, that are consistently fed to infants are known to be high in carbohydrate and low protein and may not be adequate to support the development of a strong immune system without supplements. However, the effort to encourage the feeding of a balanced diet to children in some cultures in Nigeria is hampered by the myth that described feeding of protein-rich food like meat, fish and eggs as a taboo, because it is believed that children fed on such meal will later become thieves, witches or wizards.^{43–46}

2.3. Traditional perceptions and management of childhood diarrhoea

In some cultures in Nigeria, rural dwellers believe that diarrhoea is a normal occurrence that must accompany a major milestone such

as teething and crawling during the child's development. Many also believe a heavy infant has diarrhoea to shed weight and thus be able to walk while others believe that diarrhoea is associated with the appearance of the anterior fontanel.⁴⁷ All these perceptions about diarrhoea do not allow those inclined to them to seek medical attention. Children infected with *Cryptosporidium* species are usually overwhelmed with chronic diarrhoea that could be fatal due to persistence loss of body fluid and electrolytes.

In many rural communities in Nigeria, childhood diarrhoea is often managed by traditional interventions. In some cultures, diarrhoeic infants are given prescription like burnt corn stalk, raw or partially cooked corn starch, and/or other herbs (concoctions).⁴⁸ While these treatments may have some effect on the severity of diarrhoea, in most cases, they cannot mitigate the causative pathogen, hence result in chronic infection.

2.4. Birth rituals

Bathing for a new born baby is an important event in most traditional settings in Nigeria. A respected individual in the family usually handles the bathing process which is more or less like a ritual in some culture. It is believed that a child's destiny is affected negatively if the process is not well conducted.⁴⁹ In some cultures, herbal concoctions are given to newborn babies for protection from diseases or misfortunes from evil spirits. Furthermore, there is the practice of throwing new born babies into the river as an initiation to the marine life in some traditional settings in the riverine areas of Nigeria. These practices may enable early exposure to water-borne infection through ingestion of water and concoction contaminated with bacteria pathogens, and protozoan agents like *Cryptosporidium*.

2.5. Traditional child care

It is a common practice in some traditional settings in Nigeria for mothers to engage their parents, siblings or non-relative as a caregiver (nanny) in bringing up their children. Unlike the modern daycare centers where children are kept in environment equipped with nursery facilities that include indoor playground for the

maintenance of proper strict hygiene. The situation in the rural setting is, however, different as babies are often allowed to play on bare floor where they could come in contact with food and water that have been contaminated with infected oocyst from animal faeces and other infectious sources of cryptosporidiosis. Direct contact with animals has been implicated as the source of *Cryptosporidium* infection for growing up children.^{50–53} While the indirect contact, faecal matters from animals containing oocyst can contaminate environmental samples such as soil, manure and water^{54–57} thus, serving as infectious sources of cryptosporidiosis.

3. Conclusion

Although this paper has the obvious limitation of the absence of data that links the aforementioned unhealthy traditional practices with the prevalence of cryptosporidiosis in Nigeria. It however, identified some unwholesome practices that may render ineffective control programmes for a disease like cryptosporidiosis in a multi-cultural population like Nigeria. This review, therefore, suggests the need for comprehensive study of cultural beliefs and practices of a population, as well as the promotion of best health practices among the custodians of different traditions for the design of appropriate strategies for disease prevention and control.

Conflict of interest

None.

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