



Original Article



Medicinal Plants Used by Nursing Mothers for the Treatment of Children Diseases (Diarrhea and Malaria) in Bichi Northern Nigeria

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ABSTRACT

Medicinal plants as means of complementary and alternative medical practices. This study examines the use of plant materials as a means of complementary and alternative medicine in treating children's diseases (Diarrhea and Malaria) by nursing mothers in Bichi LGA. **Objective:** To evaluate the use of plant materials by nursing mothers in treating diarrheal and Malaria disease in Bichi LGA, to assess the percentage of nursing mothers that prefer using traditional medicine alone and those that use traditional medicine with orthodox paediatric drugs, to determine common plants in use and their sources used in the treatment of paediatric condition like malaria and diarrhoea. **Methods:** Three research questions were formulated and data was collected using both focused group discussion and structured questionnaires. Based on the analysis of the data, the following findings were discovered. **Results:** Ninety-eight (98%) of Bichi's nursing mothers know Medicinal Plants. 74% of which utilize medicinal plants and 47% use medicinal plants exclusively, while 26% use it in addition to orthodox medication. The primary causes of this high medicinal plant use among these women were: socioeconomic status (45%) of Nursing mothers were unemployed 30% of them lack a formal education) the beliefs that medicinal plants were more effective than orthodox medicine and the availability or easy accessibility of these plants. **Conclusion:** The sources of the plants used by these women were 100% natural and organic from their farmland

INTRODUCTION

The use of Medicinal Plants is a form of Complementary and alternative medicine (the general word for a wide range of treatments that originate from around the world and employ several techniques. "Complementary" refers to a non-mainstream approach that is used in addition to conventional medicine, while "alternative" refers to a non-mainstream practice that is utilized in place of conventional medicine, according to the National Center for Complementary and Integrative Health (NCCIH, 2020) [1]. Globally, almost 80% of people use natural products; in developing nations, that percentage jumps to 95% [2]. Furthermore, studies in Africa and other developing countries have high use of medicinal plants with Nigeria

having 20-80% of the Population practicing it openly or the other, and many of the medicinal plants were proven to have some level of efficacy [3, 4]. Studies connected women's use of medicinal plants as a way of complementary and alternative medicine to their perception of medicinal plants as a secure replacement for conventional/orthodox medicine due to its cheapness and availability and its use by Nursing Mothers to treat children diseases had also been reported [5-8]. Other reasons leading to the wide usage of medicinal plants by women include lack of access to orthodox medical facilities, cultural beliefs, and affordability. Diarrhea and malaria are major childhood diseases in Africa, and Nigeria in general,



and are usually treated using medicinal plants the world over, particularly with herbs using different plants in various form of concoction [9, 10]. The information gathered from this study on the extent to which nursing mothers in Bichi LGA are treating paediatric conditions with complementary and alternative medicine (medicinal plants) has the potential to improve knowledge of regional healthcare practices, guide initiatives to increase healthcare equity and access, strengthen safety and efficacy considerations, ease integration with traditional medicine, raise public awareness and education, and have an impact on healthcare laws and regulation.

The purpose of this study was to evaluate the use of complementary and alternative medicine in treating child diseases (Diarrhea and Malaria) by nursing mothers in Bichi LGA by answering the research question to, evaluate the use of complementary and alternative medicine in treating child diseases diarrhea and malaria by nursing mothers in Bichi LGA. Assess the percentage of nursing mothers who prefer using medicinal plants alone and those that use medicinal plants with orthodox paediatric drugs in Bichi LGA. Determine common medicinal plants in use, their sources, and the method of preparation used in the treatment of paediatric conditions like malaria and diarrheal in Bichi LGA.

METHODS

An investigative cross-sectional study design was used for this study because it was a population-based survey that investigated the use of medicinal plants in treating malaria and diarrhea among infants within a specified group of people within the population which were nursing mothers. All nursing mothers residing in Bichi LGA who attend medical services at B.E.S.H, Badume PHC, or Bichi Excellent Hospital were included while the excluded were non-nursing mothers residing in Bichi LGA. A total of 300 nursing mothers, 170 from Bichi emirates specialist Hospital, 80 from PHC Badume, and 50 from Excellence Hospital Bichi were enrolled for these studies from the different sample areas and simple random sampling was used in selecting sample subjects for 12 weeks. The qualitative sample was arrived at based on data saturation of the Interview while the quantitative data of 300 was arrived at by using Krejcie and Morgan's table of sample size determination with a 95% confidence level with a 5% margin of error. Data were collected through structured questionnaires categorized into; 1-demographic background; 2-the knowledge and use of complementary and alternative medicine. The type of plant material used for the treatment of infant diarrhea and malaria, preparation, co-administration, and frequency of use. In Sections three and four, research questions one and two were discussed respectively. The questionnaires were open-ended and the mothers who couldn't read, the questions were discussed with them in the form of a group discussion to have a better understanding of their views

and medicinal plant use. SPSS version 25.0 was used to analyze the quantitative data regarding demographic parameters and the number of respondents with knowledge of using plants for the treatment while the saturation method was used for the qualitative data of the method of preparation of the plants used for the treatment of the diseases by nursing mothers and the results were then displayed using straightforward proportions and percentages. Ethical clearance and approval to conduct this research were obtained from the Chief Medical Director's office for Bichi Zone, ethical committee National Open University of Nigeria (ETC/2024/04/NOU222077423), and verbal consent from each participant and ethical clearance from NOUN Ethics Department were also obtained for this study.

RESULTS

A total of 300 nursing mothers were used for these studies from 3 health facilities in Bichi LGA, the following were the major findings: From these studies, 242 (80.6%) of nursing mothers in Bichi LGA happened to be Indigenes of Bichi LGA whereas the other 58 (19.4%) were either settlers for business or civil servants. About 205 (70%) of the nursing mothers in Bbichi LGA have at least completed secondary education while 95 (30%) were either not educated or have only completed primary school. In terms of number of children, 49% of these nursing mothers have 3 or more children. From these studies, it was discovered that 269 (88.7%), of nursing mothers in Bichi LGA were full-time housewives (Table 1).

Table 1: Quantitative Variable of Demographic Information of Respondents (n=600)

Variables	B.E.S.H	Badume P.H.C	Excellence Hospital	Percentage (%)
Age				
<20 Years	67	25	8	32.6%
21-35 Years	83	43	30	52.7%
36-55 Years	20	12	12	14.6%
>56 Years	0	0	0	0%
Tribe				
Bichi LGA Indigene	150	60	32	80.6%
Just Residing in Bichi LGA	20	20	18	19.4%
Marital Status				
Married	155	72	42	88.7%
Single	0	0	0	0%
Widow	3	5	2	4.3%
Separated/Divorce	12	3	6	7%
Level of Education				
Not Educated	12	20	5	12.3%
Primary School	20	25	8	17.6%
Secondary School	95	20	24	46%
Tertiary and Above	43	15	13	24.1%
Number of Children				
1-2	57	10	22	30.4%

3-5	83	37	20	48.7%
>5	30	18	8	20.4%

From table 2 below, 298 (98%) of nursing mothers in Bichi LGA have heard of medicinal plants, 207 (68%) of them got their information from family and friends especially their mothers, grandmothers and aunts. Basically 223 (74%) of nursing mothers in Bichi LGA have used medicinal plants to treat paediatric diseases like malaria and diarrhea at least once. In addition, 249 (83%) of the women had moderate to high satisfaction from their use of medicinal plants on their children with 143 (47%) nursing mothers in Bichi LGA said when they use herbs (medicinal plants) to treat pediatric disease they use it exclusively, they also recommend this practice to other women. A total of 80 (26%) of the nursing mothers in Bichi LGA use complementary medicine with orthodox medicine and also recommend this practice to other women.

Table 2: Quantitative Variable Showing Perception and Attitude of Respondents on use of Medicinal Plants (n=600)

Variables	B.E.S.H	Badume P.H.C	Excellence Hospital	Percentage (%)
Knowledge of Medicinal Plants				
Yes	170	80	48	99%
No	0	0	2	2%
Source of Knowledge				
Medical Professionals	28	8	8	15%
Family and Friends	122	55	30	69%
Religious Institutions	12	17	10	13%
Others (Please Specify)	122	55	30	69%
Is Medicinal Plants Effective in Treating Malaria and Diarrhea				
Yes	148	63	38	83%
No	22	17	12	18%
Have You Ever Used Medicinal Plants to Treat Your Child's Diarrhea or Malaria				
Yes	128	65	30	74%
No	52	15	20	26%
Do You Manage Your Children's Paediatric Illnesses like Malaria or Diarrheal only with Traditional Herbs?				
Yes	80	40	23	47%
No	90	40	27	53%
Do You Treat Your Children for Malaria or Diarrheal Using Complementary Medicine in Addition to Orthodox Medicines?				
Yes	48	25	7	26%
No	122	55	43	74%

Table 3 provided a summary of the major plants identified by nursing mothers in Bichi LGA as treatments for childhood diarrhea. Each plant is listed with its local name, botanical name, part(s) of the plant used, preparation method, and reported effectiveness. Additional columns may include the source of the plant (e.g., wild or cultivated), administration method (e.g., oral, topical), and any noted side effects or limitations reported by the mothers. This qualitative data highlights the diversity and cultural significance of plant-based remedies in managing pediatric diarrhea within the community.

Table 3: Qualitative Variable of Major Plants Reported to be used by Nursing Mothers to Treat Diarrhea

Plants Name	Family Name	Vernacular Name	Percentage of Nursing Mothers Using the Plants N (%)
<i>Momordica balsamina</i> (Leaves)	Cucurbitaceae	Garafuni	135 (45%)
<i>Mangifera indica</i> (Stem)	Anacardiaceae	Mangwaro	42 (14%)
<i>Guiera Senegalensis</i> (Leaves)	Combretaceae	Sabara	57 (19%)
<i>Guiera Senegalensis</i> (Roots)	Combretaceae	Sabara	42 (14%)

Nursing mothers in Bichi commonly use these three plants *Detarium senegalense*, *Cassia occidentalis*, and *Azadirachta indica* for treating malaria in infants. The preparation involves boiling the leaves to extract the juice, which is used in a steam treatment with the mother and infant, followed by bathing the baby in the herb infused water (Table 4).

Table 4: Qualitative Variable Showing Major Plants used by Nursing others to Treat Malaria

Plants Name	Family Name	Vernacular Name	Percentage of Nursing Mothers Using the Plants N (%)
<i>Detarium senegalense</i>	Fabaceae	Taura	68 (22.6%)
<i>Cassia occidentalis</i>	Fabaceae	Rai-Dore	83 (27.3%)
<i>Azadirachta indica</i>	Meliaceae	Dogon Yaro	122 (40%)

DISCUSSION

Out of the 300 nursing mothers that were utilized in these investigations, 170 of the ladies were affiliated with B.E.S.H., 80 with Badume Primary Health Facility, and the remaining 50 with Bichi Excellence Hospital. 156 (52.7%) of these women were under the age of 35, while just 44 (14.6%) were over the age of 36. 242 (80.6%) of these women were Bichi LGA indigenes, and the remaining 58 (19.4%) were either commercial settlers or civil servants. About 269 (88.7%) of the women were married, 21 (7%) were separated or divorced, 10 (4.3%) were widows, and none was single. Of these women, 121 (46%) had finished secondary school, 71 (24.1%) had either completed or were enrolled in university education, and 53 (17.6%) had only completed basic school or had no education at all. This was supported by other studies where age, socioeconomic status, and level of education have been linked to higher prevalence of medicinal plants use [11, 12]. However, there was no link between age and use of medicinal plants in this study. This finding was similar to reports from other developing countries where age had no relationship with medicinal plants use [13]. Of these women, 89 (31%) had one or two children, 196 (69%) had three or more this finding was in

conformity with a 2023 study [14]. Of the 300 women included in the study, 298 (99%) admitted to knowing about complementary and alternative medicine (medicinal plants) this was in agreement with a work done in Sokoto Nigeria, while 2 claimed to know nothing about it [15]. Of these women, 207 (68%) obtained their information from friends and family, primarily from their moms; 44 (15%) obtained it from medical professionals; and 39 (13%) obtained it from places of worship. Ten (4%) of the ladies had unclear sources of information. *Mangifera indica* bark (sassaken mangwaro) which was dried and boiled, the use of which was also reported in Kastina, Nigeria and Zimbabwe [16-18]. *Guiera senegalensis* Leaves or Roots (Ganyen sabara) also referred to by the study community as "Sabara" in Hausa, was another plant that nursing women in Bichi LGA primarily used during the study period. Another study reported same in Sudan and Laboratory experiment also confirmed [19, 20]. *Momordica balsamina* Leaves (Ganyen Garafuni) also known as African Pumpkin or Garafuni in Hausa. Earlier on, in-vitro studies have demonstrated its antidiarrheal properties by [21-23]. When questioned about plants used as anti-malaria, *Detarium microcarpum* known locally as "Taura" was brought up during the focused group talks. This study complements of its use in additional research findings on its activity [24, 25]. *Cassia occidentalis* Leaves (Ganyen Rai-Dore) also referred to as Rai-Dore in Hausa, possesses potent anti-malaria and anti-fever properties as reported by a study and confirmed by another study. *Azadirachta indica* Leaves (Ganyen Dogon Yaro) was discovered to be one of the widely regarded Anti-malaria plant used in Bichi LG A. was *Azadirachta indica*, commonly referred to as neem or "Dogon Yaro" in Hausa. These findings were very similar to a report of its use in Benue state Nigeria (north western and south western part of Nigeria) and it's used in North eastern part of Nigeria for the treatment of enteric fever.

CONCLUSIONS

A study was conducted in Bichi LGA, Kano State Nigeria, it was discovered that, 298 (98%) of Bichi's nursing mothers had knowledge of medicinal plants, 223 (74%) of which were using medicinal plants. It was discovered that the common medicinal plants practices and their sources used in the treatment of paediatric condition like malaria and diarrheal in Bichi LGA were 100% natural and organic, medicinal plants from farmlands such as Garafuni (*Momordica balsamina*), Raidore (*Cassia occidentalis*), or wild bushes Sabara (*Guiera senegalensis*). Other medicinal plants sources that these women use were found around the house, such as Mango (*Mangifera indica*) and neem/dogon yaro (*Azadirachta indica*), but neither the herbal nor medication processes used to make them were optimal.

Authors Contribution

Conceptualization: ASU

Methodology: ASU, LCD

Formal analysis: MAB, LCD, SAS

Writing, review and editing: MAB, LCD, SAS

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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