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**RESEARCH ARTICLE**

# STRATEGIES TO IMPROVE THE USE OF MEDICINAL PLANTS AMONG RURAL WOMEN IN KOGI STATE, NIGERIA

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**ABSTRACT**

This paper takes a look at the various roles of rural women in the use of medicinal plants in Kogi State, Nigeria. This is with a view to fashioning out strategies that can help to improve the involvement of rural women in the use of medicinal plants in the Study area. Five local government areas (LGAs) out of twenty one LGAs in the study area were randomly selected. Four villages were randomly selected from each of the selected LGAs to make a total of 20 villages. Ten rural women were randomly selected in each village to make a total of 200 respondents. Pre-tested semi-structured questionnaire were used to obtain information from the randomly selected women. The results of the study showed that rural women are involved in the collection, preparation, dispensing and sale of medicinal plants. Chi-square test ($p< 0.05$) shows that educational qualification of rural women has a significant association with their involvement in the use of medicinal plants. However chi-square test ($p>0.05$) shows that the income level of rural women has no significant association with their involvement in the use of medicinal plants. In view of this the following strategies were fashioned out to improve the roles of rural women in the use of medicinal plants in the study area. They include enforcement of improved ethical practices, dissemination of information to medicinal plants practitioners, promoting branding and labeling of medicinal plan**ts** and **o**rganizing workshops for medicinal plants practitioners.



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## INTRODUCTION

Health related issues are very important. Every society worldwide does not joke with the health of its citizens. This is because the health of a person is essential to his survival, long life and the totality of his welfare. It is however sad to note that the health situation in most tropical African countries is far below the acceptable minimum standard set by the World Health Organisation (WHO). Adekunle (2005) noted that Nigeria is yet to meet the WHO recommendation of the ratio of one medical Doctor to one thousand people. Adedayo (2007) noted that many indigenes of Nigeria and other African countries sought alternative medical care through the use of medicinal plants in order to maintain their health and cope with the rigours of daily struggle for survival and hard work. He noted further that for millions of the poor people in tropical African countries forest plants are well cherished and sought for medicinal use. As a matter of fact, the use of medicinal plants has been on the increase in the past few years among the indigene of tropical African countries. At the dawn of a new millennium it seems the people of the continent have recognized more than ever before the importance of medicinal plants to their primary health care (Adedayo, 2007). WHO (2000) noted that traditional medicine ( use of medicinal plants) is the total knowledge, skills and practices based on the theories, belief and experiences of indigenous people to different people to different cultures used in the maintenance of health as well as in the prevention of, diagnosis, improvement or treatment mental and physical illness. Health care in most part of sub- Sahara Africa is largely a forest based service. Forests and trees are valued by agrarian communities for their supply of medicinal products even more than orthodox drugs. WHO (2000) noted that though it has not been scientifically proven but it has been observed and locally proven that traditional medicine are well known to be used in the treatment of various human ailments especially by the rural people in developing countries. They also provide the necessary nutrients for the growth and development of the human body. Despite the fact that the use of medicinal plants seems to be gaining increasing popularity in the country, its use has been plagued with many problems.

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These include unhygienic preparation methods, seasonal variation in the availability of medicinal plants, lack of quality control in the use of medicinal plants, lack of proper safety measures and no proper documentation. For instance poor documentation on the use of medicinal plants has led to loss of knowledge and information on the use of medicinal plants in the country. Transfer of knowledge on the use of medicinal plants is being lost from one generation to another due to lack of proper education and no proper scientific certification. This has not helped to improve the use of medicinal plants. In addition, there is no enough information on the use of medicinal plants by rural women in the country. Most researches in Nigeria have been based on the general use of medicinal plants especially on the parts of the plants that are used and the ailments they cure. The roles and involvement of rural women have been largely ignored. Moreover, a great variation exists in the use of medicinal plants among the various ethnic groups in the country. Odugbemi (2007) noted that there is no uniform system of traditional medicine in the country. There are wide variations with each variant strongly bound to the local culture and beliefs. Harmonizing these variations among the various ethnic groups has not been easy. It has posed a problem to the use of medicinal plants in the country and it has also posed a problem to the improvement in the use of medicinal plants in the country.

Rural women are known to play prominent role in the use of medicinal plants among rural households in Nigeria and all over Africa. This is because in Africa rural women have always had a close relationship with the forest. FAO (2001) noted that rural women are often referred to as the 'real forest workers' because of the vast relationships between them and the forest environment. This close relationship has provided them with the basis on how trees, tree parts and other plants can be collected and used for medicinal purposes and also for food and fuel. Adedayo *et al* (2010) noted that rural women in Nigeria as a result of their close relationship with the forests provide medicinal materials for the use of their households. They went further to state that the close relationship between rural women and the forest enables them to know the different plant plants and their medicinal values. Rural women through their access to tree barks, tree leaves and herbs provide medicinal materials to their households which enable them to be in good health and a state of good welfare. The provision of medicinal plants materials by rural women to their households is particularly important to the welfare of their households. Adedayo *et. al*. (2010) noted that the provision of medicinal plant materials by rural women to their household is particularly important judging by the fact that rural communities in Africa face many health problems. This is in terms of frequent occurrence of diseases, high cost of orthodox drugs together with scarcity of heath facilities and personnel. They maintained that the provision of medicinal plant materials by rural women to their household has therefore helped to provide solution to the health problems of rural households. In addition it is noted that some plants or their parts are poisonous. Only those that knows these plants very well and can identify them very well should be involved in their collection and preparation.

As noted by www.ethnobotany.co.za (2012) it is very important to realize that many plants look alike, one medicinal plant can look similar to a poisonous plant, and furthermore one plant can have parts that can be used and parts that must not be used (poison) Rural women are among the group of people that knows and can identify the different medicinal plants very well It is therefore essential that a scientific study of this nature should be conducted in order to examine the various ways rural women are involved in the use of medicinal plants in Kogi State, Nigeria, to identify common medicinal plants use by rural women in the study area, to examine the specific roles of rural women in the use of medicinal plants in the study area and to identify problems faced by rural women in the use of medicinal plants in the study area. This is with a view to fashioning out strategies that can help to improve the roles of rural women in the use of medicinal plants in Kogi State, Nigeria. This no doubt will help to improve the contributions of rural women to the maintenance of rural household heath in particular and rural household welfare in general. It should be noted that the contribution of rural women to household health and nutrition in Nigeria is important and cannot be toyed with. The reason for this might not be unconnected with the fact that rural women are known to be hard working. They are very skillful in the act of collecting and processing medicinal plant materials for the use of their family members. They are also known to be naturally endowed with the ability to take care of their family members. Abdulwahid (2006) noted that women are naturally predisposed to serve their families or communities either because of their caring nature or because their gender roles embed them more than men in family or neighborhood ties. This study will also help to provide proper documentation on the use of medicinal plants not only by rural women but by the generality of rural dwellers which have been lacking in many rural communities in the country. This will eventually help to promote the use of medicinal plants among the people and also help to improve the health status of rural dwellers in the country. It is important to note that many rural dwellers are naturally tied to the use of medicinal plants. The high cost of orthodox drugs and the increasing economic recession in the country has more or less made the use of medicinal plants mandatory among the rural dwellers in the country. It is therefore important that strategies that can help to improve the use of medicinal plants especially among rural women be critically examined.

**Research Questions**

- In what forms or ways are rural women involved in the use of medicinal plants in the study are/
- What makes rural women better placed in the preparation of medicinal plants for their households in the study area?
- What is the class or group of rural women that are involved in the use of medicinal plants in the study area?
- What are the problems rural women faces in the use of medicinal plants in the study area?
- How can the involvement of rural women in the use of medicinal plants be improved in the study area?

**Hypotheses Tested**

- Ho-there is no significant association between educational qualification of rural women and their involvement in the use of medicinal plants in the study area.
- Ho – the use of medicinal plants by rural women is independent of their income level in the study area

## MATERIALS AND METHODS

### Study area

The study was carried out in Kogi State, Nigeria. The state is located in North central region of Nigeria, and it lies between latitude7° 30[1]N and 8° 50[1]N and longitude 6° 42[1]E and 8°12[1]E (Fig. 1) . It occupies 29,833 square kilometers. It is popularly called the confluence state because the confluence of river Niger and river Benue is at its capital Lokoja (Okafor 2001).

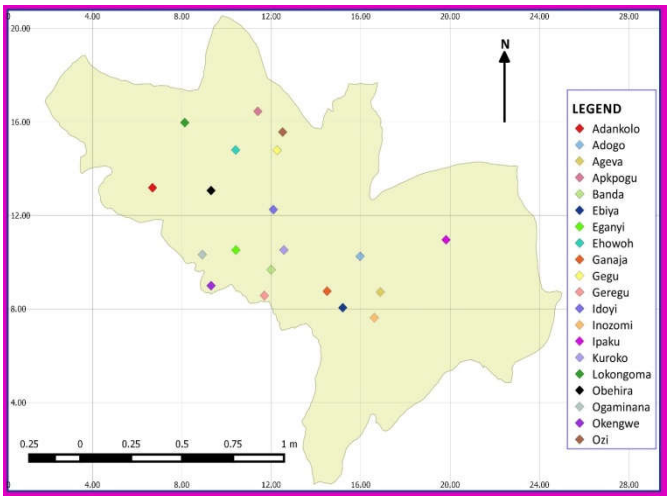


**Fig. 1a. Map of Kogi State (The Study area)**

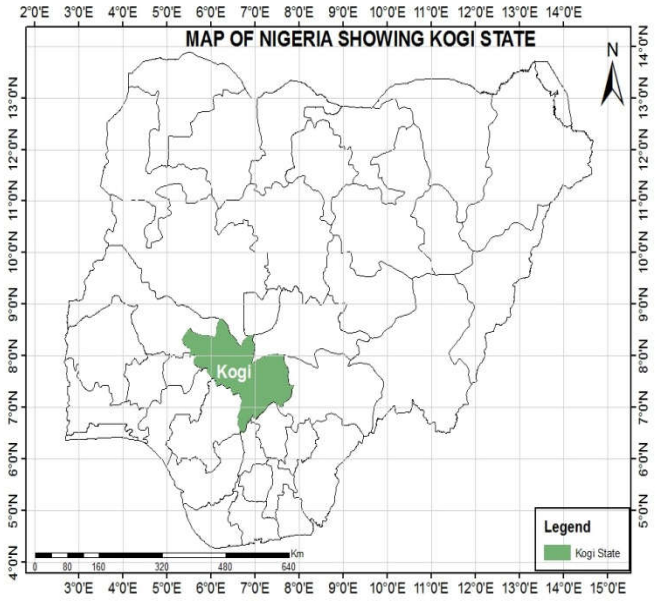


**Fig. 1b. Map of Nigeria showing the location of Kogi state**

### Method of Data Collection

Five local government areas out of twenty one local government areas were randomly selected. Four rural villages were randomly selected from each of the selected Local Government Areas to make a total of 20 villages. Ten rural women were then randomly selected in each village to make a total of 200 respondents (Table 1). Pre-tested and validated semi-structured questionnaire was then used to obtain information from the randomly selected women. In addition interview schedule was used to get information from 2 key informants in each sampled village.

**Data Analysis:** Data collected for this study was subjected to descriptive statistic. This is in form of frequency, percentage distribution tables and bar charts. In addition; chi-square was used to test stated hypothesis.

## RESULTS AND DISCUSSION

### Socio- economic Characteristics of the Respondents

Fig 2 shows that 50% and 40% of the respondents in Lokoja and Okene LGA's respectively have no formal education, 33% of the respondents in Ajaokuta LGA had primary education while 12% of the respondents in Adavi LGA had secondary education. 5% and 3% of the respondents in Lokoja and Ajaokuta LGAs respectively had tertiary education. From what is stated above it will be seen that educational qualification of rural women in the study area does not differ significantly from other parts of the country. It shows that majority of the rural women in the study area just like other parts of the country are uneducated or had only primary education. Adedayo *et. al.* (2010) also noted that majority of the rural women in North Central Nigeria had no formal education or had only primary education. Vitta (2003) noted that education plays a very important role in the development of any society. He stated further that there is a positive relationship between the average level of education and the degree of development. The high level of illiteracy among rural women in the study area can therefore be said to be responsible for lack of development and high level of poverty among the rural women in particular and the entire rural areas in general. With high illiteracy level, women lack access to information and new technology. It is therefore difficult for them to adopt new innovations that can bring development to them and their households. It is therefore not a surprise that education has a significant association with the use of medicinal plants among rural women in the study area (hypothesis1). Figure 3 shows that 80% and 60% of the respondents in Kotonkarife and Ajaokuta LGAs respectively earn less than ₦ 100,000.00 per annum in the study area. 10% and 3% of the respondents earn between ₦ 120,000.00 - ₦ 140,000.00 and ₦ 141,000.00 - ₦ 160,000.00 per annum respectively. This also shows that the level of poverty among rural women in the study area is high.

Common medicinal plants used by rural women in the study area includes *Vernonia amygdalina, Azadirachta indica, Cassia alata, Moringa oleifera, Garcinia kola*, *Aloe barteri* e.t.c Table 2 shows that 25% and 28% of the respondents in Lokoja and Kotonkarife L.G.A respectively use *Vernonia amygdalina* as medicinal plants, 30% of the respondents in Ajaokuta L.G.A use *Azadirachta indica* as medicinal plants, 10% of the respondents in Okene L.G.A use *Moringa oleifera* as medicinal plant, while 18% of the respondents use *Garcinia cola* as medicinal plant in Adavi L.G.A. A close study of Table shows that many of the medicinal plants used by rural women are plants that can be found growing in the ecological area of the study area. Plants such as *Vernonia amygdalina, Azadirachta indica, Cassia alata, Moringa oleifera, Jatropha curcas, Moringa oleifera, Parkia biglobossa* and *Piliostigma thonningii* are commonly found in thestudy area. However there are some plants that are not common in the study area yet they are used as medicinal plants by rural women. These plants are brought from other parts of the country. Plants such as *Garcinia cola, Chrysophullum albidium, Aloe barteri* and *Allium cepa* are not common in the study area. By virtue of their importance to the health of the rural dwellers they are brought to the study area by purchase.

**Table 1. Questionnaire Administration in the Study area**

| S/N | Name of village | No of question naireadministered | No of questionnaires returned | Percentage of Questionnaire returned | Latitude | Longitude |
|---|---|---|---|---|---|---|
| 1 | Lokongoma | 12 | 10 | 83.3 | $7^0 47^1$N | $6^0 43^1$E |
| 2 | Adankolo | 10 | 10 | 100 | $7^0 47^1$N | $6^0 44^1$E |
| 3 | Banda | 10 | 10 | 100 | $7^0 53^1$N | $6^0 45^1$E |
| 4 | Ganaja | 12 | 10 | 83.3 | $7^0 44^1$N | $6^0 44^1$E |
| 5 | Ozi | 11 | 10 | 90.91 | $8^0 18^1$N | $6^0 51^1$E |
| 6 | Gegu | 11 | 10 | 90.91 | $8^0 09^1$N | $6^0 48^1$E |
| 7 | Apkpogu | 10 | 10 | 100 | $8^0 20^1$N | $6^0 53^1$E |
| 8 | Ehowoh | 12 | 10 | 83.3 | $8^0 10^1$N | $6^0 44^1$E |
| 9 | Eganyi | 10 | 10 | 100 | $7^0 32^1$N | $6^0 31^1$E |
| 10 | Ebiya | 11 | 10 | 90.91 | $7^0 33^1$N | $6^0 40^1$E |
| 11 | Geregu | 11 | 10 | 90.91 | $7^0 34^1$N | $6^0 42^1$E |
| 12 | Adogo | 12 | 10 | 83.3 | $7^0 30^1$N | $6^0 28^1$E |
| 13 | Obehira | 13 | 10 | 76.92 | $7^0 32^1$N | $6^0 12^1$E |
| 14 | Ageva | 11 | 10 | 90.91 | $7^0 32^1$N | $6^0 11^1$E |
| 15 | Okengwe | 10 | 10 | 100 | $7^0 31^1$N | $6^0 11^1$E |
| 16 | Idoji | 12 | 10 | 83.3 | $7^0 33^1$N | $6^0 10^1$E |
| 17 | Ogaminana | 13 | 10 | 76.92 | $7^0 36^1$N | $6^0 12^1$E |
| 18 | Kuroko | 11 | 10 | 90.91 | $7^0 56^1$N | $6^0 45^1$E |
| 19 | Inozomi | 10 | 10 | 100 | $7^0 37^1$N | $6^0 13^1$E |
| 20 | Ipaku | 10 | 10 | 100 | $7^0 38^1$N | $6^0 40^1$E |

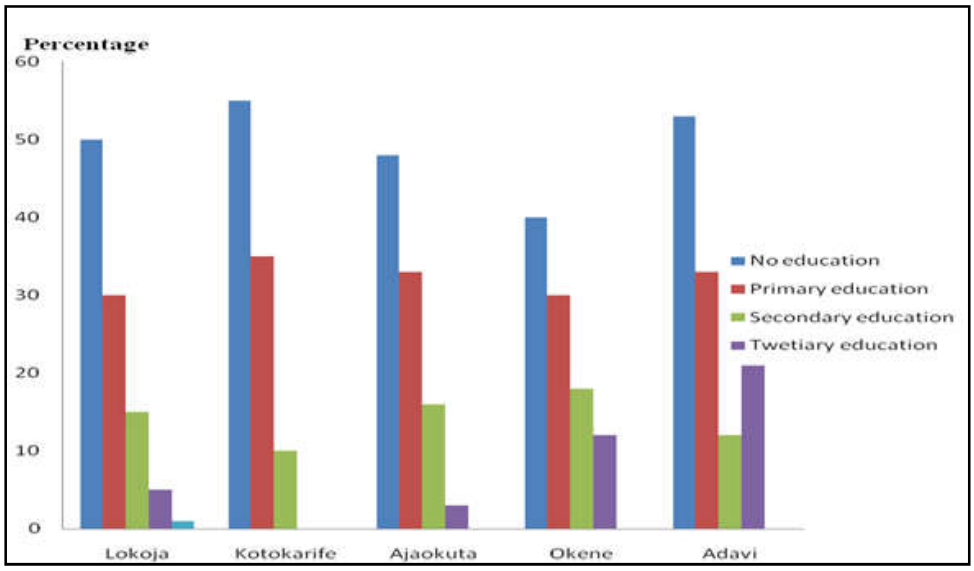


**Figure 2. Educational levels of the respondents in the study area**

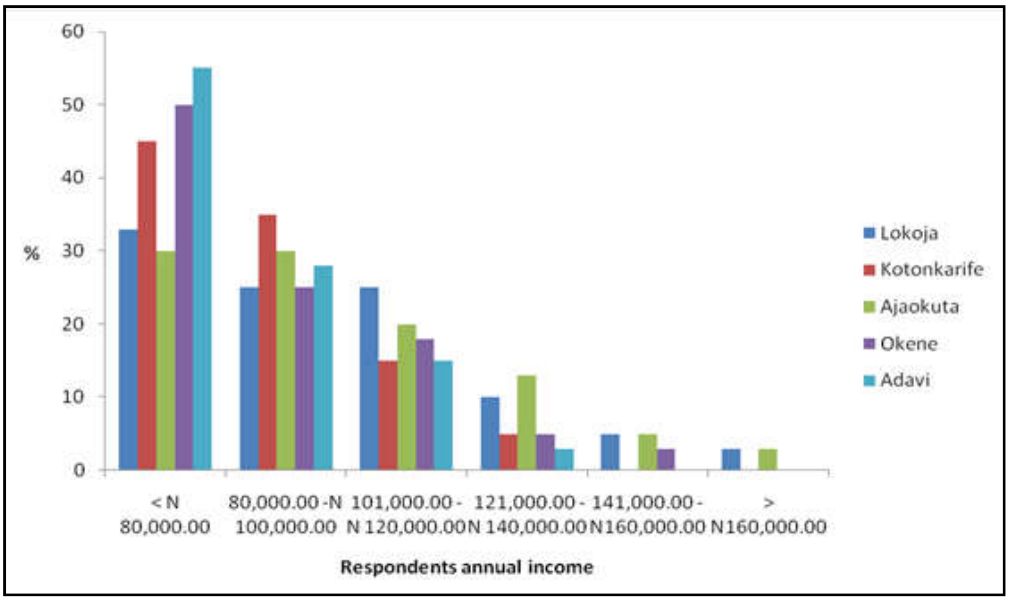


**Fig. 3. Estimates of respondents annual income in the study area**

**Roles of Rural Women in the Use of medicinal Plants**

The result of the study showed that the roles of rural women in the use of medicinal plants in the study area include; collection of medicinal plants, preparation of medicinal plants and dispensing medicinal plants for use. Table 3 shows that 10% and 20% of the respondents in Lokoja and Kotonkarife L.G.A's respectively are involved in the collection of medicinal plants. In Okene and Adavi L.G.A's 5% and 23% of the respondents respectively are involved in the collection of medicinal plants. In Kotonkarife and Okene LGAs 10% and 8% of the respondents respectively are involved in the preparation of medicinal plants. 20% and 25% of the respondents in Kotonkarife and Adavi L.G.As respectively are involved in the dispensing of medicinal plants. 5% of the respondents in both Lokoja and Okene LGAs are involved in the sale of medicinal plants while 65% and 78% of the respondents in Lokoja and Ajaokuta L.G.A's respectively are involved in all the methods already mentioned (i.e. collection, preparation, sale and dispensing of medicinal plants).

From the foregoing it therefore follows that rural women play important role in the use of medicinal plants in the study area. Many of them are involved in the collection of medicinal plants. This is mainly because they know many of these medicinal plants. It is easy for them to identify these medicinal plants without making mistake.

In addition many of the rural women know the type of medicinal plants to collect, the parts to collect, when to collect them (time of collection) and the quantity to collect. Agbogidi *et al* (2005) noted that women are more knowledgeable on the type of plant species that are useful to their family health care. This virtue no doubt help women in ensuing availability of medicinal plants to the people either through collection of medicinal plants or through processing of medicinal plants. Some rural women are involved in preparation of medicinal plants. These are those that after collection are involved in the preparation of medicinal plants. They prepare medicinal plants into forms that people can use and it will not harm them and at the same time cure the ailments it is intended to cure.

**Table 2. Common Medicinal Plants used by respondents in the Study area**

| Name of plant | Lokoja | N% | Kotonkarife | N% | Ajaokuta | N% | Okene | N% | Adavi | N% |
|---|---|---|---|---|---|---|---|---|---|---|
| *Vernonia amygdalina* | 10 | 25 | 11 | 28 | 10 | 25 | 13 | 33 | 10 | 25 |
| *Azadirachta indica* | 7 | 18 | 8 | 20 | 12 | 30 | 11 | 28 | 8 | 20 |
| *Psidium guajava* | 3 | 8 | 00 | | 3 | 8 | 1 | 3 | 3 | 8 |
| *Carica papaya* | 5 | 13 | 25 | | 3 | 8 | 8 | 20 | 3 | 8 |
| *Cassia alata* | 5 | 13 | 13 | | 6 | 15 | 3 | 8 | 5 | 13 |
| *Moringa oleifera* | 1025 | | 513 | | 4 | 10 | 4 | 10 | 7 | 18 |
| *Mangifera indica* | 10 | 25 | 410 | | 2 | 5 | 10 | 25 | 10 | 25 |
| *Garcinia cola* | 25 | | 6 | 15 | 00 | | 6 | 15 | 7 | 18 |
| *Spondias mombin* | 13 | | 5 | 13 | 25 | | 3 | 8 | 4 | 10 |
| *C. albidium* | 00 | | 00 | | 00 | | 3 | 8 | 6 | 15 |
| *Aloe barteri* | 10 | 25 | 513 | | 38 | | 9 | 23 | 7 | 18 |
| *Allium cepa* | 25 | | 38 | | 38 | | 38 | | 4 | 10 |
| *Annona seneganensis* | 8 | 20 | 718 | | 9 | 23 | 5 | 13 | 00 | |
| *Calotopis procera* | 00 | | 1 | 3 | 00 | | 1 | 3 | 25 | |
| *Daniellia oliveri* | 13 | | 1 3 | | 00 | | 2 | 5 | 2 | 5 |
| *Zingiber officinale* | 4 | 10 | 2 | 5 | 00 | | 2 | 5 | 2 | 5 |
| *Piliostigma thonningi* | 00 | | 0 | 0 | 0 | 0 | 25 | | 8 | 20 |
| *Vitex doniana* | 13 | | 4 | 10 | 1 | 3 | 25 | | 4 | 10 |
| *Cola nitida* | 13 | | 2 | 5 | 0 | 0 | 2 | 5 | 13 | |
| *Terminalia ivorensis* | 4 | 10 | 3 | 8 | 8 | 20 | 6 | 15 | 9 | 23 |
| *Jatropha curcas* | 5 | 13 | 12 | 30 | 3 | 8 | 4 | 10 | 8 | 20 |
| *Momordica charantia* | 9 | 23 | 1 | 3 | 2 | 5 | 25 | | 25 | |
| *Anthocleista djalonensis* | 3 | 8 | 0 | 0 | 0 | 0 | 13 | | 13 | |
| *Khaya senegalensis* | 00 | | 0 | 0 | 0 | 0 | 00 | | 2 | 5 |
| *Adansonia digitata* | 513 | | 9 | 23 | 0 | 0 | 3 | 8 | 5 | 13 |
| *Parkia biglobosa* | 00 | | 25 | | 0 | 0 | 13 | | 00 | |
| *Piper guineense* | 5 | 13 | 38 | | 0 | 0 | 00 | | 25 | |
| *Waltheria indica* | 00 | | 00 | | 1 | 3 | 00 | | 00 | |
| *Musa paradisiaca* | 00 | | 25 | | 3 | 8 | 3 | 8 | 3 | 8 |
| *Pupalia lappacea* | 2 | 5 | 00 | | 1 | 3 | 00 | | 1 | 3 |
| *Morinda lucida* | 00 | | 13 | | 13 | | 13 | | 3 | 8 |
| *Dacryoides edulis* | 00 | | 4 | 10 | 00 | | 00 | | 7 | 18 |
| *Cassia siamea* | 2 | 5 | 2 | 5 | 00 | | 00 | | 13 | |
| *Alstonia boonei* | 00 | | 13 | | 00 | | 2 | 5 | 00 | |
| *Xylopia aethiopica* | 6 | 15 | 4 | 10 | 1 | 3 | 1 | 3 | 1 | 3 |
| *Ocimum gratissium* | 5 | 13 | 13 | | 4 | 10 | 3 | 8 | 6 | 15 |
| *Afzelia africana* | 15 | | 3 | 8 | 00 | | 1 | 5 | 1 | 5 |
| *Fagara zanthoryloides* | 00 | | 2 | 5 | 13 | | 00 | | 3 | 8 |

Source: Field Survey, 2013

**Table 3. Roles of Rural Women in the Use of Medicinal Plants in the Study area**

| Roles in the use of medicinal plants | Lokoja | | Kotonkarife | | Anjaokuta | | Okene | | Adavi | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N% | | N% | | N% | | N% | | N% | |
| Collection | 4 | 10 | 8 | 20 | 3 | 8 | 2 | 5 | 9 | 23 |
| Preparation | 3 | 8 | 4 | 10 | 1 | 3 | 3 | 8 | 6 | 15 |
| Dispensing | 5 | 13 | 8 | 20 | 4 | 10 | 7 | 18 | 6 | 15 |
| Sale | 2 | 5 | 3 | 8 | 1 | 3 | 2 | 5 | 1 | 3 |
| All of the above | 26 | 65 | 17 | 43 | 31 | 78 | 26 | 65 | 19 | 48 |

Source: Field Survey 2013.

**Table 4. Statistical Test (Chi-square) for hypotheses tested**

| Hypothesis | Chi-square calculated | Chi-square Tabulated | DF | Remark |
|---|---|---|---|---|
| 1. Educational qualification of respondents v/s involvement in the use of medicinal plants | 30.83 | 21.00 | 12 | * |
| 2. Income level of respondents v/s involvement in the use of medicinal plants | 12.98 | 31.40 | 20 | ns |

NB: * -means significantns- not significant

**Table 5. Plant parts used by respondents and the ailment cured in the study area**

| S/N | Medicinal Plant | Parts used | Ailment Cured |
|---|---|---|---|
| 1 | *Vernonia amygdalina* | Leaves | Malaria |
| 2 | *Azadirachta indica* | Leaves and bark | Fever |
| 3 | *Psidium guajava* | Leaves | Fever |
| 4 | *Carica papaya* | Leaves, Fruits, Exudates | Malaria, Typhoid |
| 5 | *Cassia alata* | Flowers and roof | Fever |
| 6 | *Moringa oleifera* | Leaves | Malaria |
| 7 | *Magnifera indica* | Leaves, bark | Malaria |
| 8 | *Garcinia cola* | Seed | Cough |
| 9 | *Spondias mombin* | Leave | Blood replacement |
| 10 | *Allium sativum* | Bulb | Cough, Hypertension, Worms |
| 11 | *Aloe barteri* | Leaves | Constipation, Intestinal Ulcer |
| 12 | *Allium cepa* | leaves | Fever and Pile |
| 13 | *Annona senegalensis* | Leave | Low sperm count |
| 14 | *Calotropis procera* | Leave | Rashes |
| 15 | *Daniellia oliveri* | Bark | Malaria, Diabetes |
| 16 | *Zingiber officinale* | Leaves and root | Back pain |
| 17 | *Piliostigma thonningii* | Leave, Bark | Malaria |
| 18 | *Vitex doniana* | Leaves | Fever |
| 19 | *Cola nitida* | Bark | Low sperm count |
| 20 | *Terminalia ivorensis* | Leave, Bark | Cough, Diaorhea |
| 21 | *Jatropha curcas* | Exudate, Root | Mouth diseases, Sore |
| 22 | *Momordica charantia* | Whole plant | Gonorrhea, Fever, Pile |
| 23 | *Phyllanthus amarus* | Leave and seed | Fever, high blood pressure |
| 24 | *Anthocleista djalonensis* | Leave | Cough. Malaria |
| 25 | *Khaya senegalensis* | Bark | Pile, malaria |
| 26 | *Adansonia digitata* | Bark, Leaves | Control of heart beat |
| 27 | *Parkia biglobosa* | Bark | Skin Rashes |
| 28 | *Piper guineense* | Seed | Rotting teeth |
| 29 | *Waltheria indica* | Leave | Dysentery |
| 30 | *Musa paradisiaca* | Green Fruit | Diabetes |
| 31 | *Pupalia lappacea* | Leave, Seed | Women sterility |
| 32 | *Morinda lucida* | Leaves, bark | Malaria, Diabetes |
| 34 | *Zingiber officinale* | | Cough, Asthma, Jaundice |
| 35 | *Spondias mombin* | Leaves | Malaria |
| 36 | *Alstonia boonei* | Bark | Rashes, Fever |
| 37 | *Xylophia aethiopica* | Seed | Teeth Rotting |
| 38 | *Ocimum gratissium* | Leaves | pile |
| 39 | *Afzelia africana* | Root | Hypertension |
| 40 | *Fagara zanthoryloides* | Root | Rheumatism |

Field Survey, 2015

This category of rural women uses different methods in the preparation of medicinal plants. These methods include; boiling, smoking, pounding or grinding and soaking in water or alcohol. The underlining fact in all these methods is the release of active ingredient in the plant parts for the use of the people. For instance boiling of plant parts will help the plants to release the active ingredients present in the plants into the water which people can drink to cure their ailments. The same thing applies to soaking in alcohol. According to the respondents the plant materials that are pounded or grinded are usually dried before it is grinded. Such materials can then be used with pap or soaked in water for some time to allow the active ingredient be released into water. Talkmore *et. al.* (2015) noted that most of the plant parts used to treat malaria are stored as dried powders in closed bottles. The powders are soaked in hot or cold water and the water extract is taken as the active medicine. Those that are smoked are usually added with Shea butter before use. All these methods are all activities that rural women are involved in not only in the study area but all over the country.

Rural women find it easy to boil medicinal plants in water, soak medicinal plants in alcohol or smoke medicinal plants.

After preparing medicinal plants some of the respondents are involved in dispensing medicinal plants. These are group of rural women that either hawk prepared medicinal plants or have a stall where they dispense medicinal plants to people according to their ailments. These groups of women are well known in the community and people patronize them because of the efficacy of their medicinal plants. Some of the respondents are involved in the sale of medicinal plants. These are rural women that sell raw or unprepared medicinal plants. These rural women usually have a stall where people that knows about the preparation of medicinal plants buy plant parts used in the preparation of medicinal plants. These rural women also buy medicinal plants that are not available in the study area from other parts of the country. Majority of the respondents are involved in all the above mentioned methods of use of medicinal plants in the study area. This means that they are involved in the collection, preparation, dispensing and sale of medicinal plants. This really showed the indebt involvement of rural women in the use of medicinal plants and through this

involvement they have helped to maintain the health of their households and that of other community members. Adedayo *et. al.* (2010) noted that rural women in Nigeria as a result of their close relationship with the forests provide medicinal materials for the use of their households. Their close relationship with the forest enables them to know the different plant plants and their medicinal values and through this means provide medicinal materials to their households which enable them to be in good health and a state of good welfare. The provision of medicinal plant materials by rural women to their household is particularly important judging by the fact that rural communities in Africa face many health problems. These problems varies from frequent occurrence of sickness and diseases to lack of health institutions in the rural areas and where there are heath facilities there are no health personnel to attend to people. Chi-square test shows that educational qualification of rural women has a significant association ($p< 0.05$) with their involvement in the use of medicinal plants in the study area. (Hypothesis 1 and chi-square value in Table 4). Adedayo (2007) also noted that educational qualification of urban dwellers has a significant association with the use of medicinal plants. The implication of this is that the uneducated rural women and some of those that had only primary education are more involved in the use of medicinal plants (either in the collection, preparation or dispensing of medicinal plants) than those that had secondary or tertiary education. This means that rural women with higher educational qualification are not so much involved in the collection or preparation of medicinal plants. They prefer the use of orthodox drugs than medicinal plants. The reason for this might not be unconnected with some of the problems that is associated with the use of medicinal plants that tend to limit its use by educated people or elites of the society. According to Adedayo (2007) some of these problems include unhygienic preparation methods and unknown chemical composition of most of the medicinal plants.

Chi-square test also shows that the income level of rural women has no significant association with their involvement in the use of medicinal plants. This means the involvement of rural women in the use of medicinal plants in the study area is independent of their economic status. Unlike the educational status of rural women in the study area which influence the use of medicinal plants, the income level of rural women does not have any significant association with their involvement in the use of medicinal plants. Both the rich, the middle class and the poor rural women are involved in the use of medicinal plants in the study area. Table 5 shows that common plant parts used for medicinal purpose include leaves, fruits/ seeds barks, roots, flowers and exudates. However the commonest part used is tree leaves and the commonest ailment cured is malaria and fever.

**Problems faced by Rural Women in the use of Medicinal Plants in the study area**

Table 6 shows that the problems faced by respondents in the use of medicinal plants in the study area. These problems include; exposure to danger, bitterness, risk of overdose, unpleasant smell, no expiry date, seasonal variation and unethical practices. 50% of the respondents in Ajaokuta LGA and 63% of the respondents in Adavi LGA said they face the problem of exposure to danger in the use of medicinal plants. The dangers they are exposed to are the dangers of snake bite or attack by bees and ants on the field when they are collecting medicinal materials. This is particularly so when women have to collect medicinal plant materials very early in the morning. 45% and 80% of the respondents in Lokoja and Kotonkarife LGAs respectively stated that bitterness of medicinal plants is the problem they face in the use of medicinal plants. This category of respondents stated that many members of their households do not want to take medicinal plants because of bitterness. According to them this is a problem because having gone through the process of preparing medicinal plants it becomes highly discouraging and frustrating when members of their households refuse to take the prepared medicinal plants due to bitter taste. They also believe that bitterness together with unpleasant smell have reduced the level of patronage of medicinal plants by other people. 45% of the respondents in Okene LGA face the problem of seasonal variation in the availability of medicinal plant. This variation occurs due to the occurrence of dry season. During the dry season many of the medicinal plants are either dead or they are bunt off by bush fire. This therefore makes it difficult to get many of these medicinal plants. Women waste lots of time in search of medicinal plants during the dry season. Adedayo (2015) noted that annual bush fire has made availability of many medicinal plant materials such as *Ocimumm gratissimum, Momordica charantia, Euphorbia hirta* and *Sida acuta* difficult in Oyo State, Nigeria. Kogi state also experience annual occurrence of bush fire which makes availability of medicinal plants difficult. 50% and 45% of the respondents in Lokoja LGA and Adavi LGA respectively stated that the problem they face in the use of medicinal plants is unethical practices. This is a problem because some unpatriotic herbal practitioners have been found to deceive people. They claim their drugs can cure so many ailments which have been proved to be false. This has therefore reduced the level of patronage of medicinal plants. Genuine medicinal plant practioners are therefore faced with the problem of low patronage. Attempts made at convincing the people have not been very successful.

**Strategies to improve involvement of rural women in the use of medicinal plants**

**Introduction and enforcement of improved ethical practices among medicinal plant dealers:** Introducing ethical code of conduct among medicinal plant dealers is a strategy that can help to improve the involvement of rural women in the use of medicinal plants. Enforcing a strict code of ethical behavior will help to bring sanity into the practice of herbal medicine. Hitherto herbal medicine has been plagued with so many unethical; practices like quakes or false claims of herbal remedy and poor hygienic conditions. This condition no doubt has reduced patronage and the income earned from the sale of medicinal plants. It has therefore discouraged the involvement of some rural women in the use of medicinal plants. Odugbemi (2007) noted that there is a need to have standardized and effective, ethical quality controlled practices in observing or propagating medicinal plants in whatever ways they are to be used. The enforcement can be made effective in the following ways.

- Government should form an agency that will be overseeing the activities of medicinal plant dealers and the use of medicinal plants generally. This agency will be established in all the local government areas of the study area. This will give the agency the ability to be able to monitor the activities of medicinal plant dealers in villages and other rural communities of the study area.

**Table 6. Problems faced by respondents in the use of Medicinal Plants in the Study area**

| Problems | Lokoja | | Kotonkarife | | Ajaokuta | | Okene | | Adavi | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N% | | N% | | N% | | N% | | N% | |
| Exposure to danger | 1025 | | 2255 | | 2050 | | 1845 | | 2563 | |
| Seasonal variation | 17 | 43 | 14 | 35 | 15 | 38 | 18 | 45 | 13 | 33 |
| Unethical practices | 20 | 50 | 12 | 30 | 10 | 25 | 15 | 38 | 18 | 45 |
| Bitterness | 18 | 45 | 32 | 80 | 20 | 50 | 27 | 68 | 19 | 48 |
| Risk of overdose | 2 | 5 | 18 | 45 | 14 | 35 | 2 | 5 | 5 | 13 |
| No expiry date | 4 | 10 | 8 | 20 | 9 | 23 | 6 | 15 | 7 | 18 |
| Unpleasant smell | 6 | 15 | 12 | 30 | 2 | 5 | 5 | 13 | 8 | 20 |

NB: There is multiple choice by respondents

- The agency should be properly supported with funds and the personnel should also be adequately mobilized with vehicles. Enforcing ethical values will involve constant visits to herbal practitioners. This can only be done where there are funds and vehicles.
- A form of policing squad should be formed by the enforcing agency. This policing squad will see to the arrest of violators of laid down ethics. For the policing squad to be effective some prominent and respectable members of the community with in-depth knowledge about medicinal plants should be co-opted into the squad. This people will help to point out cases of wrong use of plant parts or species which might be injurious to the health of people.
- Community leaders like Obas and Chiefs should be carried along by the agency. As a matter of fact the Obas and Chiefs will help to propagate the mission of the agency to all medicinal plants practitioners in their community. It should be noted that rural dwellers all over the country have great respect for their traditional leaders. They always follow their orders and instructions.

**Easy dissemination of information to Medicinal Plants Practitioners:** Information dissemination is very important in the promotion of any profession or practice. This is because information will make innovation available to the people which will help to improve their professional practice. Information on medicinal plants released by research institutes or international organizations can help to improve the practice or the use of medicinal plants if such information gets to them. For instance information like the document released by the World Health Organization (2003) entitled WHO guidelines on good agricultural and collection practices (GACP) for medicinal plants need to be made available to medicinal plant practitioners in order to improve their practice and prevent wrong use. As noted by Odugbemi (2007) the WHO document will help to prevent inadvertent use of the wrong plant species, adulteration, contamination by chemical, microbiological or unwanted foreign substance and other factors that may induce overdose, inappropriate use by health providers/ customers and undesirable interaction of medicinal plants. It therefore follows that proper information dissemination of innovations to medicinal plant practitioners will help to improve the use of medicinal plants in the study area.

**Establishment of Adult Literacy Centres:** State government and Local Governments in the study area should establish adult literacy centres in the study area. This research and some others (Adedayo *et al*. 2010) have shown that level of literacy among rural women in northern Nigeria is low. This will give rural women the opportunity to learn how to read and write. Improving the literacy level among rural women can help to improve their involvement in the use of medicinal plants. It will help them to be able to access information and innovations on the use of medicinal plants which will bring improvement on the use of medicinal plants.

**Promoting Branding and Labeling of Medicinal Plants:** One of the ways by which the use of medicinal plants can be promoted is by promoting branding and labeling of medicinal plant products. Hitherto only a few medicinal plant dealers label or brand their products. As such it is often difficult to trace poorly prepared or low quality medicinal plants to the producers. However labeling medicinal plants products will help practitioners to be careful because such products can be traced to them and they can be punished. In addition labeling can help to reduce the danger of overdose in the use of medicinal plants. Ordinarily most medicinal plant practitioners don't label their products and there is no instruction about usage and dosage. There is therefore the danger of overdose. As a matter of fact 45% and 35% of the respondents in Kotonkarife LGA and Ajapkuta LGA respectively in the study area stated that the problem they face in the use of medicinal plants is the risk of overdose. This problem can be minimized by labeling. Instructions on dosage and method of use can be placed on the label. As such branding and labeling of medicinal plant products can help to improve the use of medicinal plants.

**Organizing Workshops for Rural Women on Preparation of medicinal plants :** Either the state government or the Local governments should organize workshops for rural women that are involved in the preparation of medicinal plants. This workshop will help to enlighten them on how to improve the preparation methods of medicinal plants. Specifically the workshop will help them to improve on the hygienic conditions of preparing medicinal plants, on how to properly label their medicinal plant products including putting the active ingredient of the medicinal plants and the dosage on the labels. This no doubt will help to improve the use of medicinal plants among the elites not only in rural communities but also in the cities.

## Conclusion

This study has shown that the use of medicinal plants is well cherished and sought after by rural community dwellers in Nigeria. The study showed that the roles of rural women in the use of medicinal plants in the study area include; collection of medicinal plants, preparation of medicinal plants and dispensing medicinal plants for use. Common plants collected and processed as medicinal plants by rural women in the study area include *Vernonia amygdalina, Azadirachta indica, Garcinia cola, Spondias mombin, Piper guineense* e.t.c. Rural women are however faced with some problems in the use of

medicinal plants. These include; exposure to danger, bitterness, risk of overdose, unpleasant smell, no expiry date, seasonal variation and unethical practices. However the following strategies can be used to improve the use of medicinal plants among rural women in the study area. They include introduction and enforcement of improved ethical practices among medicinal plant dealers, easy dissemination of information to medicinal plants practitioners, establishment of adult literacy centres, promoting branding and labeling of medicinal plants and organizing workshops for rural women on preparation of medicinal plants.

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