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Ethnobotanical Survey of Plants used in the Management of Pregnancy-Related Illnesses in Parts of Edo State, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Short Research Article

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ABSTRACT

Aims: For many centuries before the invention of conventional drugs plants were the drugs used for the treatment of many illness, till now it has been proven by a lot of researchers that many persons still prefer the use of herbal drugs including pregnant women. This study was carried to find out the plants used for management of pregnancy-related illnesses.
Study Design: This was a cross-sectional study
Place and Duration of Study: The study was carried out between January and May, 2019 within five local government areas of Edo State, Nigeria, which make up Benin City.
Methodology: Ethnobotanical data were gathered through general conversations with informants in the field. Fifty people were interviewed during the course of the research. An oral interview was used to gather information, which was led by a semi-structured open-ended questionnaire within five local governments in Edo State.
Results: Respondednts identified sixteen plants for management of pregnancy-related ailments. These sixteen plants' leaves, stems, and roots were primarily used. In the Amaryllidaiea family, *Allium sativum,* fruits and bulbs were used, whereas in the Euphorbiaceae family, *Phyllantus*

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amarus, all plant components were utilised. The Oredo local government had the highest percentage of responders who use *Alchornia cordifolia* from the Euphorbiaceae family for the treatment of pregnancy-related disorders, with 80 percent agreeing to use the plant.
Conclusion: Among the 16 plants identified, the most-used were *Jatropha curcas*, *Alchornea cordifolia*, and *Secamone afzelii.*

Keywords: Ethnobotany; phytomedicinals; preeclampsia; pregnancy-related ailments; Jatropha curcas; Alchornea cordifolia; Secamone afzelii.

1. INTRODUCTION

Pregnancies are susceptible to a variety of lhealth problems. Every day, 830 women die from pregnancy-related complications that may have been avoided, according to the World Health Organization. According to the report, emerging countries account for the majority of these deaths [1]. Nigeria has the world's second-highest rate of maternal and perinatal fatalities [2]. Pregnancy-related illnesses are the cause of many of these deaths. Maternal mortality has increased in Nigeria as a result of a rise in the number of pregnancy-related disorders, such as anemia, urinary tract infection, hypertension, preeclampsia, gestational diabetes, obesity, and preterm labor. In most cases, these ailments also pose grave risks not only to the pregnant mothers but for the foetus as well [3,4]. This will decrease the rate of the fetus growth and place the mother at the risk of other health implications such as preterm labor or preeclampsia [4, 5].

One of the most important pregnancy-related illnesses is preeclampsia, which is condition characterized by hypertension and proteinuria that develops throughout the second and third trimesters of pregnancy, both globally and in the health care delivery system. It can induce disseminated intravascular coagulation, vasospasm, salt retention, and seizures; seizures in a pre-eclamptic woman signal the beginning of eclampsia. Although eclampsia is more common in women who have severe pre-eclampsia, there is no reliable test for predicting its development. Management of the condition is the best way. Although preeclampsia is presently a serious clinical concern, its prevalence is expected to rise as diseases that put a woman at risk for preeclampsia, such as diabetes and obesity, become more common. Together with other hypertension disorders of pregnancy, is a significant cause of maternal, fetal, and neonatal death and morbidity, particularly in resource-limited settings when diagnosis and obstetric management are lacking [5,6].

Preeclampsia affects between 2% and 10% of all pregnancies worldwide. It also affects African countries with rates ranging from 1.8 percent to 7.1 percent including South Africa, Egypt, Tanzania, and Ethiopia [7]. Pre-eclampsia affects between 2.0 and 16.7 percent of pregnant women in Nigeria. This high prevalence is attributable to either a lack of access to health care owing to a variety of reasons, including absence of health centres in affected localities, lack of financial capabilities to undertake antenatal care or visit the antenatal clinic for medical advise or intervention. Therefore, this has sparked the chase for herbal alternatives. However, Adams [8] opined that the use of herbal medications during pregnancy poses a significant problem for health care professionals because the majority of them are unaware of their usage [8]. Traditional herbal treatments are generally safe when used as directed, with just a few cases of life-threatening complications [9]. Inappropriate use of herbs, or interactions between these herbs and prescription medicines, might have unanticipated consequences in pregnancy or create significant problems in the fetus [10]. Herbal drugs do not have rigorous restrictions like contemporary pharmaceuticals, and with their use on the rise, the use of these items, particularly during pregnancy, is a cause for worry. Although there is little research on the use of specific herbs in the therapy of preeclampsia, there is a potential that herbs exist that control the problems of preeclampsia, such as high blood pressure and proteinurea. However, in order to start such a research intervention, with a view to developing herbal products with capacities for anti-preeclampsia. This is the bane of the current study.

2. MATERIALS AND METHODS

2.1 The Study Area

The study area covered four local government areas within Benin City in Edo State (Fig. 1). These included Oredo, Egor, Ikpoba –Okha and Uhunmwode Local Government Areas respectively.

2.2 Ethnobotanical Information

Between August 2018 and January 2019, ethnobotanical data were gathered through general conversations with informants in the field. The major aim was to identify plants of benefit in the management of pregnancy-related illnesses within the study locations. A total of fifty people were interviewed during the course of the research. An oral interview was used to gather information, which was led by a semi-structured open-ended questionnaire (Appendix 1). Informants were chosen based on their knowledge of medicinal plants, which they could use for self-treatment or to help others. Only individuals who were in the business of selling herbal combinations or phytomedicinals, as well as herbal traditional doctors, were chosen for this poll to be certain.

2.3 Plants Identification

The locals only knew the local common name of the plants used for their treatments, so there was need for the various plants listed by the locals to be identified scientifically and grouped into their various families. Identification was done on the spot [11] and confirmed at the Herbarium Unit, Department of Plant Biology and Biotechnology, University of Benin, Nigeria.

2.4 Data analysis

The knowledge on medicinal plants used in the treatment of pregnancy related illness in the different local governments area and the different respondents was analyzed using frequency of citation, frequency occurrences across the five local governments areas; plant parts used, age of the different respondents, illness treated by respondents and the preparation of the plant extracts.

2.5 Relative frequency of citation *(*RFC*)*

Relative frequency of citation was calculated to show the importance of each plant species [12]. The RFC was calculated as follows:

Number of respondent who mentioned the use of the species (n), divided by total number of respondents (N).

RFC= n/N

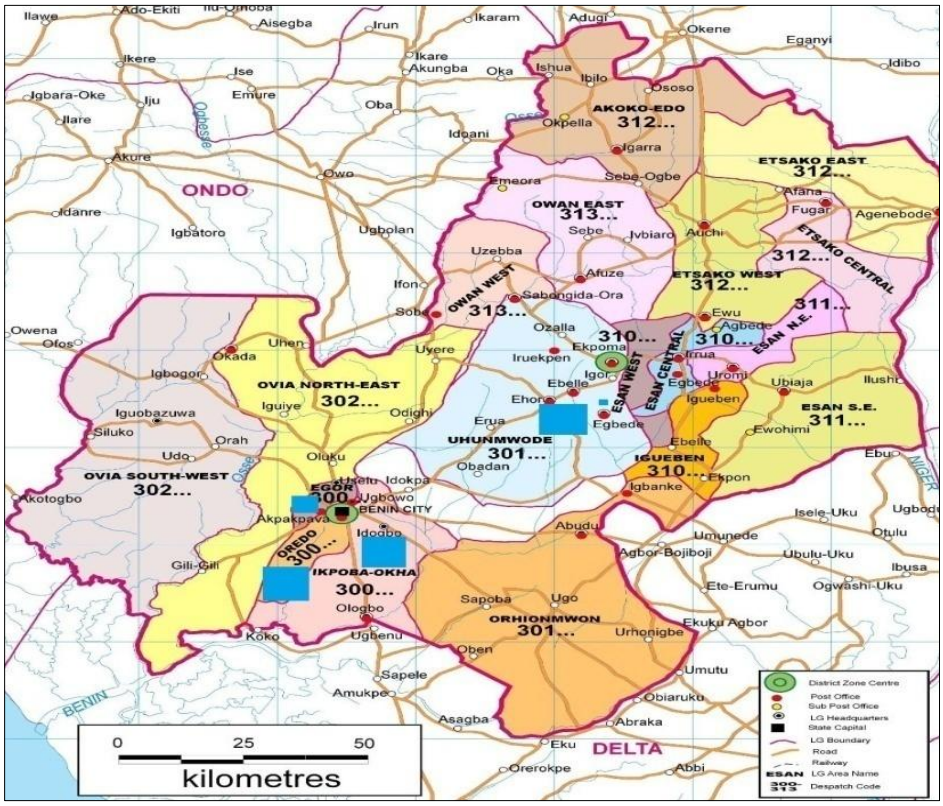

Fig. 1. Map of the study area (marked in blue squares

Source:https://nigeriazipcodes.com/wp-content/uploads/2012/07/Edo-State-postcode-Map.jpg

3. RESULTS

The responses of the survey participants are shown in Table 1. was an attempt to prove that cases of pregnancy-related disease were dealt with or handled by respondents, who had previously been described as people whose primary role was the management of illness through the use of herbs. Cases of edema during pregnancy were reported among the cases they handled, according to 79.9% of all respondents. 63.3 percent said that using herbs to control blood pressure was a common practice in their community. Only 12.2 percent confirmed that convulsions were not among the cases they treated in pregnant women, while 87.8% confirmed that convulsions were not among the cases they treated. Only 24.5 percent claimed they did not manage cases of convulsion in pregnant women, while 75.5 percent stated they did. Only 8.2 percent of the respondents claimed they were knowledgeable with the use of herbs for prenatal care, while 91.8 percent stated they were not.

Table 2 shows assessment of information on the treatment of pregnancy-related illnesses. Table 2 shows that 20% of the respondents in Ikpoba Okha were between the ages of 30-39 years, 20% between the ages of 40-49 years, 30% between the ages of 50-59 years, and 10% between the ages of 70 years and above. In Oredo, 10% of the population was between the ages of 30 and 39, 30% was between the ages of 50 and 59, and 20% was between the ages of 60 and 69. In Uhunmwonde, 11.1 percent were between the ages of 30-39, 40-49, and 70 years and up, 44.4 percent were between the ages of 50-59, and 22.2 percent were between the ages of 60 – 69.

100% in each of the local government agreed to the used of herbs in convulsion and blood pressure. 100% agreed to the use of herbs in improving the outcome of pregnancy. 70% in Ikpoba Okha, 60% in Oredo, 30% in Egor, 80% in Ovia North East and 100% in Uhunmwonde agreed to reported cases of convulsion during pregnancy.

Table 3 shows a list of plants that have been used to treat high blood pressure and other pregnancy-related issues. A total of sixteen (16) plants from thirteen distinct families were found in the list. The leaves, stems, and roots of these sixteen plants were mostly used. Fruits and bulbs were employed in Allium sativum from the Amaryllidaiea family, whereas all plant components were used in Phyllantus amarus from the Euphorbiaceae family. The response of the plant utilized by respondents in the various local government areas is also included in Table 3. In Ikpoba 0kha, 30% of respondents agreed that Solanum nigrum, a member of the Solanaceae family, might be used to treat pregnancy-related problems. A total of 26.5 percent of all local governments approved to the use of Solanum nigrum in pregnancy-related disorders, with a Reference frequency of citation (RFC) of 0.27. The treatment was done using the leaves and stem.

In Ovia North East, 80 percent of respondents agreed that Sycamone alfzelii, a member of the Apocyanaceae family, may be used to treat pregnancy-related illnesses. Sycamone alfzelii is used by 57.1 percent of local governments for pregnancy-related disorders, with an RFC of 0.57. For the treatment, only the leaves were employed.

The biggest number of respondents who utilize Alchornia cordifolia from the Euphorbiaceae family for the treatment of pregnancy-related ailments came from the Oredo local government, with 80 percent consenting to use the plant. The usage of Alchornia cordifolia in the treatment of pregnancy-related disorders was approved by 65.3 percent of all local governments. For the treatment, only the leaves were employed. We had the fewest respondents who use Carica papaya, which belongs to the Caricaceae family. Only 2% of all responders in various local governments used it for the treatment of pregnancy-related illnesses. The fruits were chosen as the plant portion to be used.

Table 4 was an attempt to evaluate the locals' method of preparing plant extracts for the treatment of pregnancy-related diseases. Table 4 shows a list of the sixteen (16) plants listed in Table 3 together with six (6) different extract preparation methods. In the case of *Solanum nigrum*, The use of decoction as a method of preparing plant extracts for the treatment of pregnancy-related disorders is endorsed by 84.6 percent of the 13 respondents who consented to its use. Maceration was chosen by 53.8 percent of respondents as a method of creating plant extracts. Nobody said the plant could be eaten raw, that the juice could be squeezed out in the heat, or that the plant could be pulverized or ground into powder.

Table 1. Presentation of responses of participants in the survey study (01)

Respondents (N=49)	Yes		No	
	(n)	(%)	(n)	(%)
Reported cases of Edema during pregnancy	39	79.6	10	20.4
Management of BP with herbs is a common practice in y6our community	31	63.3	18	36.7
Use of herbs for improvement of pregnancy outcome	34	69.4	15	30.6
Reported cases of convulsion related to pregnancy	6	12.2	43	87.8
Reported cases of management of convulsion in pregnant women	37	75.5	12	24.5
Respondents are knowledgeable in use of herbs for pregnancy care	4	8.2	45	91.8
The use of herbs in the general management of pregnancy is a common feature	19	38.8	30	61.2

Table 2. Assessment of information treatment of pregnancy-related ailment by the extracts

Group	Group	LGA of survey				
		IKO	ORD	EG	OVNE	UH
Respondent Number (n)		10	10	10	10	9
		-	-	-	-	-
Age bracket (%)	30 - 39 yrs	20.0	10.0	0.0	0.0	11.1
	40 - 49 yrs	20.0	10.0	40.0	50.0	11.1
	50 - 59 yrs	30.0	30.0	30.0	0.0	44.4
	60 - 69 yrs	20.0	20.0	10.0	40.0	22.2
	≥70 yrs	10.0	30.0	20.0	10.0	11.1
Management of BP with herbs	Yes	100.0	100.0	100.0	100.0	100.0
	No	0.0	0.0	0.0	0.0	0.0
Improving pregnancy outcome with herbs	Yes	100.0	100.0	100.0	100.0	100.0
	No	0.0	0.0	0.0	0.0	0.0
Cases of convulsion managed with herbs	Yes	100.0	100.0	100.0	100.0	100.0
	No	0.0	0.0	0.0	0.0	0.0
Respondent has treated convulsion related to pregnancy	Yes	70.0	60.0	30.0	80.0	100.0
	No	30.0	40.0	70.0	20.0	0.0
Responden9t has maneged pregnancy related edema	\\	20.0	70.0	40.0	70.0	100.0
	No	80.0	30.0	60.0	30.0	0.0

IKO Ikpoba Okha , ORD Oredo, EG Egor, OVNE Ovia Northeast, UH Uhunmwonde Local Governmnet Areas respectively

Table 3. List of plants used in the management of blood pressure and pregnancy-related ailments in the study area as suggested by the study participants (n=49)

	Family	Parts used	No. of respondents (n)					Total (n=49)	Relative frequency of citation(RFC) (or n/49)
			Ikpoba Okha (n=10)	Oredo (n=10)	Egor (n=10)	Ovia NE (n=10)	Uhun-mwonde (n=9)		
Solanum nigrum	Solanaceae	L,S	3 (30)	4 (40)	4	1 (10)	1 (11)	13(27)	0.27
Garcina kola	Guttiferae	L	3 (30)	2 (20)	2	5 (50)	1 (11)	13(27)	0.27
Spondiamombin	Anacardiaceae	L,R	6 (60)	3 (30)	4	2 (20)	2 (22)	17(35)	0.35
Jatropha carcass	Euphorbiaceae	L,R	7 (70)	7 (70)	5	8 (80)	6 (66)	33(67)	0.67
Alchornia cordifolia	Euphorbiaceae	L	6 (60)	8 (80)	6	7 (70)	5 (55)	32(65)	0.65
Ocimumgratissimum	Labiatae	L	3 (30)	2 (20)	0	3 (30)	1 (11)	9 (18)	0.18
Allium sativum	Amaryllidaiea	F,B	1 (10)	0 (0)	2	0 (0)	4 (44)	7 (14)	0.14
Musa paradisiacal	Musaceae	L	0 (0)	3 (30)	0	0 (0)	0 (0)	3 (6)	0.06
Boerhaaviarepens	Nyctaginaceae	L	1 (10)	2 (20)	3	0 (0)	1 (11)	7 (14)	0.14
Zingiberofficinale	Zingiberaceae	B	0 (0)	1 (10)	1	0 (0)	0 (0)	2 (4)	0.04
Astoniaboonei	Apocyanaceae	L	1 (10)	2 (20)	1	0 (0)	0 (0)	4 (8)	0.08
Sycamone alfzelii	Apocyanaceae	L	4 (40)	6 (60)	5	8 (80)	5 (55)	28 (57)	0.57
Vernoniaamygdalina	Asteraceae	L	2 (20)	0 (0)	0	1 (10)	0 (0)	3 (6)	0.06
Bryophyllumpinnatum	Crussulaceae	L	0 (0)	1 (10)	0	3 (30)	0 (0)	4 (8)	0.08
Phyllantus amarus	Euphorbiaceae	All parts	1 (10)	0 (0)	0	2 (20)	0 (0)	3 (6)	0.06
Carica papaya	Caricaceae	F	0 (0)	0 (0)	0	0 (0)	1 (11)	1 (2)	0.02

L leaves, B bulbs, F fruits, S stem, R root

Table 4. Assessment of methods of preparation of plant extracts by the locals

Species	Number of individuals (n)	Method of preparation					
		Percentage response (%)					
		Decoction	Maceration	Eaten raw	Squeeze out juice in heat	Pulve-rization	Ground to powder
Solanum nigrum	13	84.6	53.8	0	0	0	0
Garcina kola	13	92.3	38.5	46.2	0	0	0
Spondiamombin	17	82.4	52.9	0	0	0	0
Jatropha carcass	33	54.5	75.8	0	9.1	6.1	0
Alchornia cordifolia	32	81.3	56.3	0	0	12.5	6.3
Ocimumgratissimum	9	33.3	44.4	0	44.4	33.3	0
Allium sativum	7	71.4	42.9	0	0	42.9	0
Musa paradisiacal	3	0	0	0	100	0	0
Boerhaaviarepens	7	57.1	71.4	0	0	0	0
Zingiberofficinale	2	0	0	0	0	100	0
Astoniaboonei	4	0	100	0	0	0	0
Sycamone alfzelii	28	50	60.7	0	0	0	0
Vernoniaamygdalina	3	0	66.7	0	33.3	0	0
Bryophyllumpinnatum	4	0	0	0	100	0	0
Phyllantus amarus	3	100	0	0	0	0	0
Carica papaya	1	0	0	0	0	100	0
Total (N=247)	179	706.9	663.4	46.2	286.8	294.8	6.3
Percentage citation (%)	-	286.19	268.58	18.70	116.11	119.35	2.55

For the plant *Ocimum gratissimum* 33.3 percent of the 9 respondents who agreed to the use of plants said the plant extracts could be prepared by decoction and pulverization, while 44.4 percent said the plant extracts could be prepared by maceration and squeezing out juice under heat. *Zingiber officinale* pulverization was the only procedure employed for the manufacture of the plant extract, according to 100 percent of the two respondents.

For *Alchornia cordifolia*, 81.3 percent of the 32 respondents agreed to decoction, 56.3 percent to maceration, none agreed that the plant can be eaten raw or that the juice can be squeezed out in heat, 12.8 percent agreed to pulverization, and only 6.3 percent agreed to grinding the plant to powder as a method of extract preparation. Under general, decoction can be used to prepare 10 of the 16 plants, maceration can be used to prepare 11 of the 16 plants, squeezing out the juice in heat can be used to prepare 5 plants, and pulverization can be used to prepare 6. The only plant that could be ground into powder was *Alchornia cordifolia*.

4. DISCUSSION

Most pregnancy-related ailments are a serious threat to both the mother and the baby. The study successfully addressed the problem that plant materials used in the management of pregnancy-related diseases may only include those for the management of preeclampsia because most of the ailments controlled have symptoms and complications that are comparable to those of preeclampsia. This is compounded by the difficulties encountered while using conventional medicine to treat the medical state. As a result, more research into possible therapies in humans may be required.

Jatropha curcas, *Alchornea cordifolia*, and *Secamone afzelii* were among the plants identified based on their citation index. These plants have previously been shown to have the ability to reduce blood pressure and proteinuria, both of which are preeclampsia symptoms [13,14]. According to a study by Eliakim-Ikechukwu and Riman [15], A. corifolia can induce elastogensis in the aorta; this property of the plant may help increase elastic recoil of the aortic wall and lower blood pressure. Alchorneine, anthranilic acid, gentisinic acid, isoalchorneine, yohimbine, and alkaloids are among the phytochemicals [16].

Herbs/plants are utilized in their natural state for disease treatment in herbal therapy. *Alchornea cordifolia* is a plant that is commonly used in Africa, either alone or in combination with other plants, to treat a variety of ailments [14]. A. cordifolia has long been prized by several Nigerian ethnic groups for its ability to treat haemorrhoids and high blood pressure. Anti-inflammatory, antimicrobial, and analgesic activities have been discovered [14, 17]. In traditional medicine, *Secamone afzelii* is used for stomach disorders, diabetes, colic, dysentery, and kidney difficulties. Flavonoids, triterpenoids, diterpenoids, and caffeic acid derivatives in *Secamone afzelii* have also been documented to have anti-inflammatory and antioxidant activities [18, 19, 20].

According to the findings, traditional health beliefs continue to hold sway in disease treatment, with many pregnant women believing in the use of herbs to cure ailments that arise during pregnancy. In the study, the herb merchants named sixteen plants that they used to treat pregnancy-related disorders. A total of 27% indicated that *Solanum nigrum* could be utilized to treat pregnancy-related illnesses. Despite the fact that the trial did not include pregnant women, scientists determined that *S.nigrum* can be used to treat seizures and diabetes, which are also commonly associated with pregnancies [21].

5. CONCLUSION

According to the current study, the majority of the botanicals utilized by traditional practitioners to treat pregnancy-related diseases have been eed. This could be due to trial and error on the part of the practitioners over time. The mechanisms of action of these plants against the ailments are unknown; additional research would be required to elucidate these mechanisms after discovering specific chemicals implicated in their efficacious application.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX

QUESTIONNAIRE

ETHNOMEDICINAL SURVEY ON PLANTS USED IN THE MANAGEMENT OF PRE-EMCLAMPSIA IN THREE LOCAL GOVERNMENT AREA IN BENIN CITY, EDO STATE. NIGERIA

1. Date…….. Respondent no.----------
   Age..... Locality …… Habitat ……
   Sex ……..

2. Do you manage blood pressure in this community using plants or herbs?
3. Do you improve health status of pregnancy using plant or herbs?
4. Have there been any cases of convulsion managed within this community with the aid of herbs?
5. Have there been any cases of convulsion during pregnancy in this community?
6. How is it managed within the community?
7. Has there been any caseof edema during pregnancy?
8. Do you involve the use of herbs in the management thereof?
9. Provide a list of plants used in the management of the listed complications (provide description and local names as well as samples for botanical identification).

S/N	Scientific names of plant	Local names	Parts used	Ailments used	method of preparation	Dosage	Mode of administration
1							
2							
3							

10. Other comments and information ……..

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