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RESEARCH ARTICLE

INDIGENOUS USES AND PHYTOCHEMICAL CONTENTS OF PLANTS USED IN THE TREATMENT OF MENSTRUAL DISORDERS AND AFTER- CHILD BIRTH PROBLEMS IN ABEOKUTA SOUTH LOCAL GOVERNMENT AREA OF OGUN STATE, NIGERIA

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ABSTRACT

A survey of plants used for the treatment of menstrual disorders and after-child birth problems was conducted in Abeokuta South Local Government. Hundred (100) questionnaires were administered using multi stage sampling method on traditional herbal practitioners. Ethnobotanical information such as, plants and plant parts used, methods of extraction used and mode of administration of the herbal preparations of these plants were requested. Also, phytochemical contents of the most frequently mentioned plants were determined. Data were subjected to Analysis of variance (ANOVA) with probability set at $p<0.05$ and descriptive statistics. Results revealed that a total of fifty-six (56) plants belonging to 37 families were mentioned. The most frequently mentioned families are Euphorbiaceae, Leguminoceae, Anacardiaceae, Apocynaceae, Araceae and Combretaceae. *Sesamum indicum*, *Dioclea sarmentosa*, *Clausena anisata*, *Anogeissus leiocarpus*, *Alafia barteri*, *Tetrapleura tetraptera*, *Daniella oliveri*, *Lannea egregia* and *Alstonia boonei* were the most frequently mentioned plants used in the treatment of menstrual disorders and after-childbirth problems. Leaves (34%), fruits (7%), flowers (3%), tubers (2%), stem-barks (28%), seeds (11%) , roots and barks (2%) and roots (13%) were the plants reported being used for the remedy of these disorders. Decoction (54%), squeezing (9%), grinding/squeezing (14%), paste (4%), exudation (4%), cooking (4%), soaking/ decoction/infusion (4%), and heating to ashes (4%) were the methods of extracting the bioactive principles of the plants using water (79%) as major solvent. Significant difference ($P < 0.05$) was observed in the quantities of tannins recorded in the leaves of *Sesamun indicum*, *Dioclea sarmentosa*, *Clausena anisata*, *Anogeissus leiocarpus* and *Alafia barteri*. Similar observations were found in the quantities of saponnins, alkaloids, flavonoids and phenol. Highest values of tannins (0.32mg/g), saponnins (1.07mg/g), alkaloids (5.16mg/g), flavonoids (3.12mg/g) and phenol (0.09 mg/g) were determined in the leaves of *Clausena anisata*, *Sesanum indicum*, *Dioclea sarmentosa* and *Alafia barteri*. Across the roots of these plants, similar amount of tannins and saponnins were quantified. This observation varied significantly when compared with alkaloids, flavonoids and phenol quantified in the roots of plants. Highest tannins (1.67mg/g) and saponnins (3.33 mg/g) were recorded in the roots of *Dioclea sarmentosa*, alkaloids (4.33 mg/g) and flavonoid (6.33 mg/g) in *Anogeissus leiocarpus* while phenol (1.33 mg/g) was recorded in roots of *Sesanum indicum*.

Key words: Menstrual Disorders, Childbirth Problems, phytochemical contents, Traditional practitioners, Indigenous plants

INTRODUCTION

Menstrual disorder and after problems such as amenorrhea, dysmenorrhea, menorrhagia, oligomenorrhea, after child birth pains, achy muscles, constipation, hemorrhoids and sore breasts (Nitta *et al.*, 2002) are among some of the major challenges in various maternity homes and hospitals in Nigeria since majority of people are poor -famers and middle- men who in their local communities are poorly served with modern health facilities even at their pregnancy state and could not afford the exorbitant prizes of modern drugs. Disturbances of menstruation, either actual or perceived, are the most common presenting complaint of adolescents attending gynecology clinics. Problems associated with menstruation actually affect 75% of adolescent females and are a leading cause of such visits to physicians (Hajaratu *et al.*,2014**).** Also, postpartum depression has been reported to adversely affect mothers, their newborn infants, their partners and the society. The prevalence of postpartum depression among mothers was 30.6% at an Edinburgh Postnatal Depression scale (EPDS). Ukaegbe *et al.*, *2012.*

To avert this health challenge, plants play significant roles during pregnancy, birth and postpartum care in many rural areas of the world most especially developing country such as Nigeria. This is because Nigerian ecosystems are naturally endowed with arrays of floristic composition of different plant forms and resources (Olajide, 2003), thus enabling them to

increase interest in traditional practices of health care as a complement to biomedical health care and part of primary health care delivery system in Nigeria (Sheldon *el al.*, 1997).

Numerous botanicals with medicinal properties suitable for control and management of women's health related conditions such as, menorrhea, birth control, pregnancy, birth (parturition), postpartum, lactation and infant care, have been documented for various ethnic groups.

The postpartum period is important in many cultures, and is regarded as a period of recovery and confinement ranging from 10 up to 45 days. In accordance with humoral medicine, pregnancy is described as a hot state. During this parturition, heat is lost and the woman comes into a state of excess cold, Confinement as a treatment such as staying inside and near heat, washing only with hot water, drinking hot drinks, eating hot food, steam bath and bathing and staying away from draughts have been reported as measures of managing the situation(Davis, 2001).

This study was carried out to identify and characterize botanicals used for management of menstrual disorders and after childbirth problems. Also, Phytochemicals contents of most prioritized plants were evaluated.

MATERIALS AND METHODS

STUDY AREA

Abeokuta is the capital of Ogun state and traditionally home of Egbas stratified into Abeokuta North and Abeokuta south Local Government Area. The Egbas have been traditionally divided into four (4) namely Egba Ake, Oke-Ona,Gbagura and Owu. Three types of religion are widely practiced by the people. The religion includes Christianity, Islam and traditional religion. The Christian religion is predominant (Adekunle and Oluwalana, 2000). Geographically, Abeokuta lies on latitude $7^{o}15N$ and longitude $3^{o}25E$. The town is about 81 km south- west of Ibadan, the Oyo State capital and 106km North of Lagos, former Nigerian capital city. Abeokuta has humid weather with an average temperature of about 27.4^{o} C and an annual rainfall of 128 cm in the southern part of the city to 105 cm in Northern part. The Ogun river transverses through the town from the south to the western part.

The main occupation of the Egba people is farming, local textile,(Tie and dye), trading, pottery and industry.

STUDY SITE

A total of five (5) markets; Omida, Itoku, Adatan, Kuto and Panseke were visited. During the survey various shops of herbal practitioners were visited and the indigenous people were also interviewed to elicit information on the plants used for the treatment of menstrual disorders and after childbirth problems.

Methodology of the study

The study was carried out in the following stages:

Stage 1: Collection and review of published and unpublished literatures on plants used for treatment of menstrual disorder and after birth problems in Abeokuta, Ogun State, Nigeria

Stage 2: Questionnaire administration

Sampling procedure and data collection

A three stage design was adopted to collect data during this study.

Stage 1: Selection of Abeokuta south Local Government areas to represent primary collection unit;

Stage 2: Purposive selection of 5 markets in the selected Local Government Area

Stage 3: Random selection of 20 respondents (herbal practitioners comprising herbal sellers and herbal and traditional healers) in the Local Government

Table 1: Sampling design

Markets	Number of respondents selected
Kuto	20
Adatan	20
Panseke	20
Itoku	20
Omida	20
Total population of the study	100

A total of 100 questionnaires administered were validated and reliability test of the questionnaire was also carried out.

Table 2: Reliability Statistics

Cronbach's Alpha[a]	Number of Items
0.77	20

Quantitative phytochemical screening of leaves and roots of most frequently mentioned plants

Phytochemical contents such as tannins, saponnins, alkaloids, flavonoids and phenol of leaves and roots of the most frequently mentioned plant were carried out using methods of Ojewumi and Kadiri, 20014

Statistical Analysis

Data were subjected to Analysis of variance (ANOVA) and separation of means by Duncan's multiple ranges Test (DMRT) at $P<0.05$.

RESULTS

Larger number of the respondents 71 (72.4%) were females. Majority of the respondents (traditional practitioners) 44(44.45) were between the age 21-40years while least of them 11(11.1%) were less than 21 years. Islam was the predominant religion of the respondents. Also, Majority of the respondents (83.8%) acquired formal education (Table 3).

Fifty-six (60) plant species belonging to 37 families were collated out of which Euphorbiaceae, Leguminoasae, Anacardiaceae and Apocynaceae were the most frequently mentioned families. The most frequently mentioned plants were *Sesamun indicum, Dioclea sarmentosa, Clausena anisata, Anogeissus leiocarpus* and *Alafia barteri*(Table 4). The life forms of plants collated during this study ranged from trees to herbs out of which trees were the most mentioned (Table 5).

Largest number of traditional practitioners 42(43.8%) were herb sellers with more than ten (10) years work experience in the business. They obtained their herbal knowledge mainly by training as denoted by 51.1 percent. 82.2 percent of them claimed to treat either of disorders on weekly basis. Fifty four percent (54%) of the herbal practitioners reported that the plants were cultivated at home gardens (Table 7).

The plant collated during this survey were reportedly being used indifferent forms such as dry (28%), fresh (65%) and combination of dry and fresh (7%) depending on the availability of the plants and severity of the diseases. Several plant parts such as leaves (34%), fruits (7%), flower (3%), tuber (2%), stem-bark (28%), seeds (11%) , roots and barks (2%) and roots (13%) were reported (Figure 2).Decoction(54%), squeezing (9%), grinding/squeezing (14%), paste (4%), exudation (4%), cooking (4%), soaking/ decoction/infusion (4%), and heating to ashes (4%) were the methods of extracting the bioactive principles of the plants using water (79%) as major solvent (Figure 3 and 4). Preparations from these plants were reported to be taken 2-3times daily (Figure 5).

Largest number of the traditional practitioners indicated that most of the plants used were cultivated in their home gardens (55.1%), followed by forest plants (26.5%) while the least of them indicated swampy areas (4.1%) as the sources of the plants used as remedies for menstrual disorders and after birth problems(Table 7).

Table 8 revealed the mean values of phytochemical contents of the leaves of plant commonly used for treatment of menstrual disorders and after childbirth problems in Abeokuta south Local Government Local Area, Abeokuta. There was significant difference ($P<0.05$) in the quantities of tannins recorded in some of the leaves of *Sesamun indicum, Dioclea sarmentosa, Clausena anisata, Anogeissus leiocarpus and Alafia barteri.* Similar observations were recorded in the quantities of saponnins, alkaloids, flavonoids and phenol. Also, except sesanum indicum, no significant ($P>0.0$) amount of saponnins wasa recorded in *Dioclea sarmentosa, Clausena anisata, Anogeissus leiocarpus and Alafia barteri.* Highest values of tannins (0.32mg/g), saponnins (1.07mg/g), alkaloids (5.16mg/g), flavonoids (3.12 mg/g) and phenol (0.09 mg/g) were determined in the leaves of *Clausena anisata, Sesanum indicum, Dioclea sarmentosa, Alafia barteri* (Table 8).

Across the roots of these plants, similar amounts of tannins and saponnins were quantified. This observation varied significantly when compared with alkaloids, flavonoids and phenol quantified in the roots of plants. Highest tannins (1.67mg/g) and saponnins (3.33 mg/g) were recorded in the roots of *Dioclea sarmentosa,* alkaloids (4.33 mg/g) and flavonoid (6.33 mg/g) in *Anogeissus leiocarpus* while phenol (1.33 mg/g) was recorded in roots of *Sesanum indicum* (Figure 9)

Table 3: Demographic profile of respondents of the study area

Variables	Frequency	Percentage frequency	Mode
Sex			
Male	27	27.6	
Female	71	72.4	72.4
Age (years)			
less than 21	11	11.1	
21-40	44	44.4	44.4
41-60	29	29.3	
More than 60	15	15.2	
Religion			
Christianity	15	15.5	
Islam	59	60.8	60.8
Traditional	22	22.7	
Educational status			
Primary	34	34.3	34.3
Secondary	33	33.3	
Tertiary	16	16.2	
No formal education	16	16.2	

Table 4: Plants commonly used for control and management of menstrual disorder and after birth problems in Abeokuta south Local Government Local Area, Abeokuta, Ogun State.

Scientific name	Local name	Common name	Family	Habitat	Part used
Abelmoschus esculentus	Ila pupa	Red okra	Malvaceae	Shrubs	Seeds
Aframomum melegueta	Atare	Alligator peper	Zingiberaceae	Herbs	Seeds
Alafia barteri	Agbari etu	Guinea fowl's crest	Apocynaceae	Climbing shrubs	Leaves
Allium ascalonicum	Alubosa elewe	Shallot	Liliaceae	Herbs	Leaves
Alstonia boonei	Awun	Stool wood	Apocynaceae	Tree	Stem barks
Anogeissus leiocarpus	Orin dudu	African birch	Combretaceae	Tree	Stem bark
Aristolochia repens	Akogu	Dutchman's pipe	Aristolochiaceae	Herbs	Leaves
Basella alba	Amunututu	Indian spinach	Basellaceae	Herbs	Leaves
Bridelia ferruginea	Ira	Bridelia	Euphorbiaceae	Tree	Stem bark
Calotropis procera	Bomu bomu	Giant milk weed	Asclepidiaceae	Shrubs	Leaves
Capsicum frutescens	Ata ijosi	Hot pepper	Solanaceae	Herbs or Shrubs	Seeds
Carica papaya	Ibepe	Pawpaw	Caricaceae	Shrubs	Roots
Ceiba petandra	Araba	Silk cotton tree	Bombacaceae	Tree	Roots
Cissampelos mucronata	Jenjoko/Jokoje	Ivy vine	Menispermaceae	Climbers herbs	Leaves
Cissus quadrangularis	Olowomefa	Edible stemmed vine	Vitaceae	Herbs	Stem barks
Citrus medica	Osan ijaganyin	Citron	Rutaceae	Shrubs or Tree	Fruits
Clausena anisata	Ata pari obuko	Horse wood tree	Rutaceae	Tree	Root
Cocos nucifera	Agbon	Coconut palm	Arecaceae	Tree	Fruits
Costus afer	Teteregun	Common ginger lily	Costaceae	Herbs	Seeds
Croton lobatus	Eru alamo	Garden croton	Euphorbiaceae	Herbs	Fruits
Culcasia scandens	Agunmonu	Climbing arum	Araceae	Climbing herbs	Leaves
Daniella oliveri	Iya	Balsam tree	Leguminoceae	Tree	Stem barks
Dichapetalum toxicarium	Ewo	West African rats bane	Chailleriaceae	Shrubs	Roots
Dioclea sarmentosa	Dasha	Sea beans	Leguminosae	Climbers herbs	Leaves
Dioclea sarmentosa	Dasa	Sea beans	Leguminoasae	Herbs	Leaves
Euphorbia hirta	Emi-ile	Asthma-weed	Euphorbiaceae	Herbs	Leaves
Garcinia kola	Orogbo	Bitter kola	Guttiferae	Tree	Stem barks
Hibicus acetosella	Akese	African rose mallow	Malvaceae	Shrubs	Leaves
Hunteria umbellata	Abeere	Demouan	Apocynaceae	Tree	Roots and barks
Irvingia gabonensis	Oro	African mango	Irvingiaceae	Tree	Stem barks
Jatropha curcas	Botuje	Physic nut	Euphorbiaceae	Shrubs	Leaves
Jatropha gossypifolia	Botuje pupa	Wild cassava	Ephorbiaceae	Shrubs	Leaves
Lannea egregia	Ekudan	False marula	Anacardaceae	Tree	Stem bark
Lannea egregia	Epo ekudan	Woodier wood	Anacardiaceae	Tree	Stem bark
Lawsonia inermis	Laali	Henna plant	Lytheraceae	Tree	Flowers
Lophira lanceolata	Paran pupa	Dwarf red ironwood	Ochnaceae	Tree	Stem barks
Mangifera indica	Mangoro	Mango	Anacardiaceae	Tree	Fruits
Momordica charantia	Ejirin	Bitter gourd	Cucurbitaceae	Herb	Leaves
Morus alba	Aye	White mulberrry	Moraceae	Tree	Stem barks
Ocimum basilicum	Efinrin wewe	Sweet basil	Labiateae	Herb	Leaves
Olax subscopioidea	Ifon	Olax	Olacaceae	Shrubs or Tree	Roots
Parinari spp	Abeere	Hissing tree	Rosaceae	Tree	Seeds
Phyllanthus muellerianus	Asasa	Leafflower	Euphorbiaceae	Shrubs or Herbs	Stem barks
Piliostigma thonningii	Abafe	Kargo	Caesalpiniaceae	Tree	Stem barks

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Piper guineense	Iyere	Black pepper	Piperaceae	Shrubs or Herbs	Leaves
Piper guineense	Iyere	Black pepper	Piperaceae	Herbs	Stem barks
Pistia stratiotes	Oju oro	Water lettuce	Araceae	Herbs	Leaves
Plumbago zeylanica	Inabiri	Ceylon leadwort	Plumbaginaceae	Shrubs	Roots
Pterocarpus osun	Osun	Blood wood	Leguminosae	Tree	Leaves
Rauvolfia vomitoria	Asofeyeje	Serpent wood	Apocynaceae	Shrubs or Tree	Roots
Scleria racemosa	Labelabe tutu	Sword grass	Cyperaceae	Herbs	Roots
Senna alata	Asuniwon	Craw-craw plant	Caesalpinaceae	Shrubs	Flowers
Sesamum indicum	Ekuku	Sesame	Pedaliaceae	Herbs	Leaves
Sorghum bicolor	Poroporo	Sorghum	Poaceae	Herbs	Seeds
Spondias mombin	Ikika/Iyeye	Yellow mombin	Anacardiaceae	Tree	Stem barks
Stephania abyssinica	Gbejedi		Menispermaceae	Climbing shrubs	Leaves
Pentaclethra macrophylla	Apara	African oil bean	Leguminosae	Tree	Leaves
Terminalia avicennioides	Idin	Bauche	Combretaceae	Tree	Stem-barks
Tetrapleura tetraptera	Aidan	India laburnum	Leguminoceae	Tree	Seeds
Xanthosoma sagittifolium	Koko funfun	White cocoyam	Araceae	Herbs	Tuber
Xylopia aethiopica	Eru	Negro pepper	Annonaceae	Tree	Stem barks

Table 5: Life forms of plants collated in Abeokuta South Local Government

Life forms	**Frequency**	**Percentage frequency**
Trees	24	40.0
Shrubs or tree	3	5.0
Shrubs	9	15.0
Herb or shrubs	3	5.0
Herbs	16	26.67
Climbing shrubs	5	8.33
Total	60	

Table 6: Recipes used in the treatment of menstrual disorders after birth problems

Diseases	**Recipes**	**Traditional solvent of choice**	**Method of preparation**	**Method of administration**
Menstrual disorder				
Painful menstruation	*Dioclea sarmentosa, Sesamum indicum, Aloe barteri*	Water	Decoction	Take decoction 2-3 times daily
Menorrhahia (excessive menstrual bleeding)	*Dioclea sarmentosa*, potash/alum	Water	Decoction	Oral consumption of decoction of Leaves
Irregular menstrual flow	*Jatropha gossypifolia* and *Dioclea sarmentosa*	Water	Squeezing	Oral consumption of juice from squeezed leaves
Heavy menstruation	*Jatropha curcas*	Water	Decoction	Bath private part with decoction
Foul smell of menstrual discharges	*Sesamum indicum Pterocarpus osun, Plumbago zeylanica, Piper guineensis, Sulphur, Citrus medica,*	Local gin	Grinding/ Squeezing	Take orally (200-250ml once daily)
Ceased menstruation	*Abelmoschus esculentus*	Local gin	Heating to ashes	Take orally
Painful menstruation	*Hibiscus acetosella, Dioclea sarmentosa, Sesamum indicum*	Water	Decoction	Take orally
Abdominal pain	*Sorghum bicolor, Scleria racemosa, Pterocarpus osun, Dichapetallum toxicarium*, potash, *Pterocarpus osun*, Potash, *Phyllanthus muellerianus, Dioclea sarmentosa, Stephania*	Water	Decoction	Take orally every night

	sarmentosa small quantity of salt			
Dysmenorrhea	*Momordica charantia*	Water	Decoction	Take orally
	Lawsonia inermis	Water	Paste of leaves and flower	Take orally
Blackish colour in menses	*Senna alata*, Potash, Pap	Water	Grind flower to powder	Take orally
Menorrhagia	*Ceiba petandra*	Water	Exudation from the trunk	Take as tonic
Premenstrual syndrome	*Cissus quadrangularis*	Water	Cooking	Drink
Black menses	*Phyllanthus muellerianus*	Water	Decoction	Drink
Antiperiodic problem	*Rauwolfia vomitoria*	Water	Grinding	Drink
After childbirth problems				
Stomach pain	*Capsicum frutescens, Afromamomum melegueta, Aframomum melegueta, Capsicum frutescens Pterocarpus osun, Sorghum bicolour, Lannea egregia Daniellia oliveri, Lannea egregia, Anogeissus leiocarpus, Piliostigma thonningii*	Local gin	Soaking/ Decoction	Taken orally
Bleeding after delivery	*Basella alba, Cissampelos mucronata, Stephania sarmentosa*	Water	Decoction	Drink 2-3 times daily
Bleeding after delivery	*Spondias mombin, Irvingia gabonensis*	Fermented maize water	Decoction	Drink hot after cooking
Breast infection	*Olax subdcopioidea, Costus afer, Pistia stratiotes, Ocimum basilicum, Xylopia aethiopica, Tetrapleura tetraptera, Anogeissus leiocarpus, Terminalia avicennioiodes, Xylopia aethiopica*	Local gin	Decoction	Bathe affected part
excessive uterine bleeding	*Stephania sarmentosa, Cissampelos mucronata, Basella alba*	Water	Squeezing	Drink
Pain in the breast	*Garcinia kola, Astonia boonei, Clausena anisata, Culcasia scandens, Alafia barteri*	Water	Decoction	Drink
Stomach ache	*Lophira lanceolata, Aristolochia repens, Hunteria umbellate*	Water	Decoction	Take orally
Bleeding after delivery	*Irvingia gabonensis, Allium ascalonicum, Gnetum africanum*	Water	Decoction	Take orally
Lactation problem	*Calotropis procera Carica papaya Euphorbia hirta*	Water	Grind leaves with local soap/decoction/infusion	Wash breast thrice daily, oral application

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Table 7: Experience of herbal practices of the traditional practitioners of the study area

Parameter	Frequency	Percentage frequency	Mode
Herbal Practice specification			
Herbalist	5	5.2	
Herb sellers	42	43.8	43.8
Traditional Medical practitioner	13	13.5	
TMP/Herb sellers	22	22.9	
Trained Medical Practitioner	14	14.6	
Source of knowledge			
Ancestral	26	28.3	
Training	47	51.1	51.1
Divination	7	7.6	
Ancestral/ Training	12	13.0	
Years of herbal practice experience			
1-5 years	21	21.2	
6-10 years	37	37.4	
More than 10 years	41	41.4	41.4
Duration of treatment			
1 week	60	82.2	82.2
2 weeks	8	11.0	
More than 2 weeks	5	6.8	
Sources of plants			
Forest alone	26	26.5	
Cultivated at home garden	54	55.1	55.1
Swamp	4	4.1	
Market	7	7.1	
Forest and cultivated around house garden	3	3.0	
Swamp and cultivated herb garden	4	4.1	
Accompanied verbal instruction			
Yes	2	2.1	
No	92	97.9	97.9

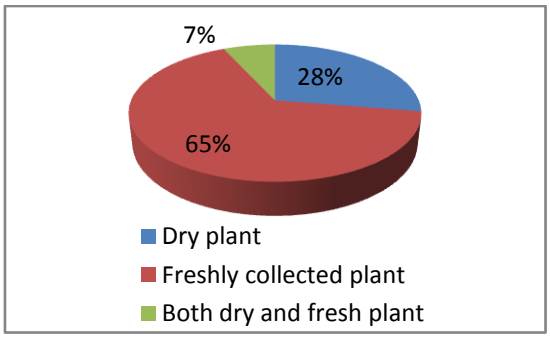

Figure 1: Forms of plants collection

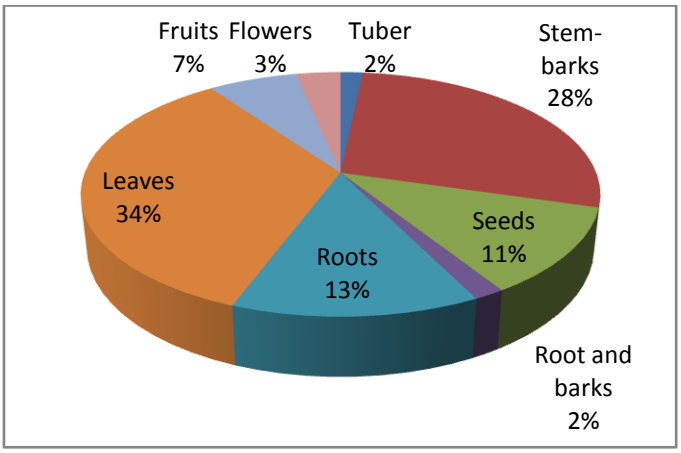

Figure 2: Plant parts used

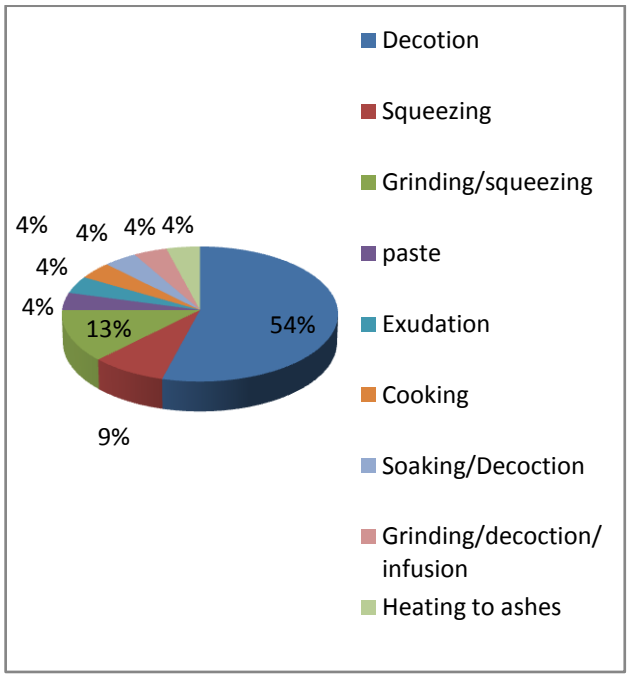

Figure 3: Methods of preparation

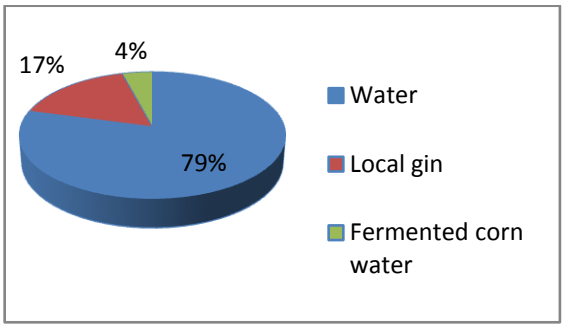

Figure 4: Solvents used

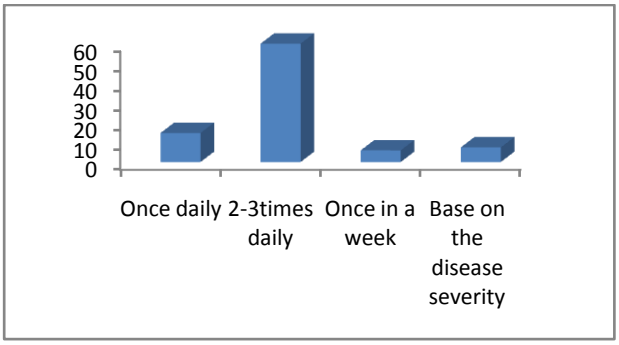

Figure 5: Frequency of usage of herbal preparation

Table 8: Mean values of phytochemical contents of the leaves of plant commonly used for treatment of menstrual disorders and after childbirth problems in Abeokuta south Local Government Local Area, Abeokuta, Ogun State.

Plants/parts(leaves)	Phytochemicals				
	Tannins (mg/g)	Saponins (mg/g)	Alkaloids (mg/g)	Flavanoids (mg/g)	Phenol (mg/g)
Sesanum indicum	0.043 ± 0.02^{c}	1.07 ± 0.03^{a}	3.15 ± 0.07^{d}	1.13 ± 0.06^{d}	0.03 ± 0.013^{b}
Dioclea sarmentosa	0.23 ± 0.01^{ab}	0.89 ± 0.04^{b}	5.16 ± 0.09^{a}	2.69 ± 0.03^{b}	0.06 ± 0.02^{b}
Clausena anisata	0.32 ± 0.03^{a}	0.72 ± 0.03^{b}	3.79 ± 0.26^{c}	1.86 ± 0.03^{e}	0.05 ± 0.01^{b}
Anogeissus leiocarpus	0.14 ± 0.07^{bc}	0.68 ± 0.16^{b}	2.31 ± 0.15^{e}	2.01 ± 0.05^{c}	0.05 ± 0.03^{ab}
Alafia barteri	0.19 ± 0.02^{ab}	0.69 ± 0.12^{b}	4.12 ± 0.29^{b}	3.12 ± 0.02^{a}	0.09 ± 0.02^{a}

Means followed by the same letters on the same columns are not significantly different according to Duncan's Multiple Range Test at $p<0.05$.

Table 9: Quantitative phytochemical screening of the roots of plants mostly used in the treatment of menstrual disorders and after-childbirth problems.

Plants/parts(roots)	Phytochemicals				
	Tannins (mg/g)	Saponins (mg/g)	Alkaloids (mg/g)	Flavanoids (mg/g)	Phenol (mg/g)
Sesanum indicum	0.74 ± 0.74^{a}	1.33 ± 0.33^{a}	2.33 ± 0.33^{bc}	2.33 ± 0.33^{c}	1.33 ± 0.33^{a}
Dioclea sarmentosa	1.67 ± 0.33^{a}	1.67 ± 0.67^{a}	1.67 ± 0.34^{c}	2.01 ± 1.01^{c}	1.00 ± 0.01^{ab}
Clausena anisata	1.01 ± 0.58^{a}	2.67 ± 1.20^{a}	2.33 ± 0.33^{bc}	1.00 ± 0.58^{c}	0.33 ± 0.33^{b}
Anogeissus leiocarpus	0.67 ± 0.33^{a}	3.33 ± 1.2^{a}	4.33 ± 0.33^{a}	6.33 ± 0.33^{a}	0.67 ± 0.33^{ab}
Alafia barteri	1.67 ± 0.67^{a}	1.67 ± 0.66^{a}	3.30 ± 0.29^{b}	4.42 ± 0.31^{b}	0.89 ± 0.11^{ab}

Means followed by the same letters on the same columns are not significantly different according to Duncan's Multiple Range Test at $p<0.05$.

DISCUSSION

The present study reveals that people of Abeokuta are well versed with the nature and natural resources around them despite the hash environmental factors being faced by these plants. These people in an attempt to get rid of various diseases such as menstrual disorder and after birth problems depend on plant products found in their immediate environment due to no or poor health facilities that were made available for them.

The observation that majority of the traditional practitioners claimed to treat either of the diseases on

weekly basis could be an indication that the diseases are very rampant in the study area.

Prominent plant species mentioned during this study were *Sesamum indicum, Dioclea sarmentosa, Clausena anisata, Anogeissus leiocarpus, Alafia barteri*.

Various parts of plant especially leaves, roots, stem barks, seeds, fruits and whole plants were mentioned to be efficient in the treatment of menstrual disorders and postpartum health challenges among women in Abeokuta South Local Government Area. However, Leaves were reported to be the most frequently used plant parts; this could be an indication that leaves are sites where more phytochemicals are synthesized via photosynthesis (Odutuga *et al*., 2010: Kadiri *et al*., 2014). Although plants were reported to be used in various forms such as dry, fresh and in combination of both but preference was given to the use of the plants when they are freshly collected. This could be an indication that medicinal contents of plants are readily available when the plants are freshly collected and used immediately as some of the medicinal metabolites of some of these plants are volatile. This corroborates the findings of Devi Prasad *et al.,* 2014 who reported that fresh plant material was used to prepare remedies as mixtures of multiple ingredients from different plants.

Some of the recipes are prepared from a single plant specie, for example, *Momordica charantia, Ceiba petandra, Cissus quadrangularis, Phyllanthus muellerianus* while *Capsicum frutescens, Afromamomum melegueta, Aframomum melegueta, Capsicum frutescens Pterocarpus osun, Sorghum bicolour, Lannea egregia Daniellia oliveri, Lannea egregia, Anogeissus leiocarpus* and *Piliostigma thonningii* are used in combinations with other common plants, as the combination of the plants was claimed to have higher medicinal effects on the treatment of the diseases although the respondents could not provide scientific reason for this findings. However, this observation could be justified with findings of Kadiri *et al.,* 2013 who reported that malaria herbal preparations work better if two or more plants parts are prepared, as the phytochemicals of one part enhance the activities of the other.

Method of preparation varies; decoctions and grinding into powder are the most frequently used methods, this may be due to the type of plant part used and the choice of solvent in preparing the herbal remedies. Most of the herbal preparations collated during this study were reported to be used by oral application and bathing. It was found out from the practitioners that the plants administered as decoctions were characterized with tough leaves, bark and even the roots. They therefore had to be boiled longer to soften their parts before being administered. This method however, may not be most appropriate since the subjection of the plant material to high temperature is highly likely to alter the chemical composition of the plant, especially the very volatile ones as reported in past research studies (Okach, 2013**;** Jeruto *et al.,* 2011).

Infusion method was used to administer the herbs that had delicate soft parts where plant leaves or the whole plant were dipped in hot water and left for some time for the active ingredients to be extracted. The plants that were macerated were found also to have highly soluble chemical components that would easily dissolve in cold water when left overnight in a covered container, as has also been reported in the past (Okach, 2013).

The result of this survey showed that majority (96%) of the respondents claimed no occurrence of side effects following patients' use of herbal preparations. It could be that, the herbal preparations do not have any undesirable effects when used.

Quantitative phytochamicals studies on the most frequently mentioned plants helped to understand the pharmacological actions of the active compounds in these plants.

It has been proved scientifically that environmental factors and agricultural practices may significantly influence productivity, oil content and chemical composition of plant species (Daniel *et al.,* 2011). The phytochemicals analysis conducted revealed that all the plant species collected contained tannins and saponins, alkaloids, saponnins and phenol.

The observation that plants such as *Sesamum indicum Pterocarpus osun, Plumbago zeylanica, Piper guineensis, Sulphur, Citrus medica* reported in this study were used for the management of these diseases is a clear indication that such plants have active medicinal values. The various medicinal properties exhibited by the various phytochemicals are useful in the treatment of most common ailments more importantly menstrual disorder and possible health challenges women do experience at postpartum.

These phytochemicals according to the literatures help in the purification of blood and excessive vaginal discharge and fight uterus infection (Tarun Chandra Taid *et al* 2014). Also, Shadma and Naheed, 2014 reported that plants were used to treat menstruation problems, for infant care and postpartum recovery. In the similar trend, Tarun Chandra Taid *et al* 2014 reported that herbal preparation during and after pregnancy help fight uterus infection, restore menstruation irregularity, stop excessive bleeding during menstruation, heal wound caused by contraction in relation of pelvic girdle experienced during parturition and act as energy stimulants which provide stamina to women after giving birth. Findings of Owu, 2004 revealed that the expectorant property of medicinal plants is attributed to the presence of saponins due to their ability to produce form which act as cleansing agent.

The observation that the metabolites of the plants were found both in the leaves and roots of these plants is a clear indication that the two parts under consideration are rich in phytochemicals that are active in the treatment of these aiments. The study also revealed that some plants collated are characterized by phytochemical contents active in the treatment of menstrual disorders and after-childbirth problems. Ikeyi and Omeh, 2014 in their work on a review of the Ethno-therapeutics of medicinal plants used in traditional/alternative medicinal practice in Eastern Nigeria reported that plants collated were observed to

contain potential chemo preventive agents, viz: Alkaloids, Glycosides, and Saponins, Phytosterol, flavonoids and phenol compounds in varying quantities. The observation of tannins in these plants could have oxidation inhibiting activity and confer good flavour on leaves (Nwauzoma, *et al.*, 2013). The presence of saponin is well reported in plants (Belewu *et al*., 2009), where they served as expectorants and emulsifying agents. Saponins are glycosides with distinctive foaming characteristics (Nwauzoma, *et al.*, 2013).

CONCLUSION

It could be concluded that although few people can still afford the financial demands of modern drugs for simple and complicated diseases yet majority of people in Abeokuta South Local Government depend on medicinal plants for the treatment of menstrual disorders and after childbirth problems. Also, considering the undisputed role played by these medicinal plants in the modern day world in the health care system of rural populace, it is of outmost importance that these plants are cultivated, propagated and protected. Younger generation should be encouraged towards tapping wealth from what they regarded as wastes.

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