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UTILIZATION OF FRESH-WATER FISH SPECIES FOR TRADO-MEDICINE AND HEALTH CARE SERVICES AMONG RURAL HOUSEHOLDS IN OGUN STATE, NIGERIA

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ABSTRACT: *Fish resources have been identified as the most valuable natural food resources for mankind due to its importance as a veritable protein and other mineral resources, which are important for normal functioning of the body system. It was on this basis that the study was carried out to investigate the utilization of fresh-water fish species for trado-medicine and health care services among rural households in Ogun State. It also described the socio-demographic characteristics of the respondents, types of fresh-water fish species used for trado-medicine and health care services, factors influencing the utilization of fresh-water fish species for trado-medicine and effects of the utilization of fish medicine on their socio-demographic characteristics. A well-structured interview schedule was used to elicit information from 80 respondents from two Local Government Areas of Ogun State using a multi-stage sampling procedure. The data collected was analysed using descriptive statistics, a 3-points Likert scale and Chi-square analysis. It was found that majority of the respondents were male, married, with mean age of 49 years with average household size of 7 people. Most of them belonged to one or more social association and had low educational background. The most common occupation of the people was herbal trading and fishing with average years of experience of 23.6 years. About 88.75 percent of the respondents were aware of the utilization of fresh-water fish for trado-medicine and health services. The common freshwater fish species used for trado-medicine were Clarias spp, Malapterurus electricus, Barilius niloticus, Gymnachus spp, Tetraodan fahaka, Heterobranchus bidorsalis, Hepsetus spp, Tilapia spp, Mormyrus spp, Calamoichthys calabaricus (Eel fish), Polypterus spp, Chrysichithys nigrodigitatus. The most common methods of administering these fish medicines were: herbal porridge (aseje), herbal bath mixture with local soap, skin incision (gbere) and lotion to be rubbed on the skin. Hence, this study revealed that the potency of fish medicine and its health benefits are the most influential factors in utilizing freshwater fish species for trado-medicine among the rural households. Age, sex, primary occupation, household size, educational background and marital status have significant relationship with the utilization of fish medicine in the study area.*

KEYWORDS: Freshwater fish, health care services, rural households, trado-medicine, utilization

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INTRODUCTION

Health status is increasingly affecting rural households, farm labour as well as agricultural productivity in developing countries. Health as a capital good can either improve or reduce farmers' productive ability. Illness and death from malaria, tuberculosis, cancer, hypertension, heart disease, skin disease, brain disease, brain cognitive problem, HIV/AIDS, and other diseases reduce agricultural productivity through the loss of labour, availability of productive adults and assets to cope with illness (World Bank, 2007). In agricultural communities, poor health reduces income and productivity, further decreasing people's ability to address poor health and inhibiting economic development (Hawkes, and Ruel, 2006).

However, agriculture is one of the most important sectors in Nigeria, because the country has highly diversified agro-ecological condition which makes possible the production of a wide range of agricultural products (Hartmann, 2005). Nigeria economy is still predominantly agrarian and farmers are the key players in the business of agriculture in the country, especially within the rural communities. Farmers contribute over 80% of all the hours spent in agricultural production, processing and also undertake about 60% - 70% of the rural agricultural products marketing, thus providing more than two-third (2/3) of the workforce in agriculture (Mafimisebi, Adegboyega and Oguntade, 2010). Agriculture remains the fundamental sustainability to economic growth, poverty alleviation, improvement in rural livelihood and environmental sustainability (World Bank, 2007). Three-quarter of the world's poor people live in the rural areas, particularly Asia and Africa (Ravallion *et al.,* 2007). Fisheries and livestock are not left out because the large expanse of land that the farming household do not utilize for cropping activities are put to use in either free range system of livestock or as water areas for fishing.

Fishing plays crucial roles in boosting rural development, food security, social well - being and employment opportunity for about 8.23 million people in the rural areas and 18.27 million people in the urban areas, reduction of poverty and hunger and also contributes about 4.0% to the GDP in the developing countries (FAO, 2000; Aminu, 2007 and FDF, 2007). Fisheries resources have been identified as the most valuable natural food resources for mankind due to its importance as a veritable protein and mineral source, which are important for normal functioning of the body system. As a measure for solving the problem of insufficient protein intake, steps have been taken to increase the supply of fish to the individual which was based on the fact that fish is one of the cheapest sources of high quality protein. Among vertebrates, fish has the closest relationship with humans and the relationship is not only phylogenetic but also religious, cultural and socio-economic. Fish is a symbol of abundance and faith in Christianity. Christ and his disciples were described as "fishers of men." Jesus also fed 5,000 people with fish and bread (Matthew 14:15-21; Luke 9:12-17). Even before Christianity fish was seen as a symbol representing several goddesses. In Buddhism, fish symbolizes happiness and freedom. Some pagan traditions also recognized fish as a symbol of fertility and attribute of the goddess. According to Sikoki (2013), ancient Celts believed that Salmon, a fish, derived its wisdom from consuming the sacred hazel nuts from the well of knowledge. Fish symbolically meant wisdom, knowledge, inspiration and prophesy. Similarly, the ancient Eastern Indian mythology regarded the fish as a symbol of transformation and creation. In China, fish is regarded as a symbol of unity and fidelity. It derives from the fact that the fish

(particularly Koi) swim in pairs. For this reason, fishes are often given as wedding presents in form of charms to newly wedded couples for fertility and abundance due to its high reproductive potential.

In Nigeria, the first trace of fish farming was practiced by some missionaries in the early 1920's in Ilora, Oyo state, where fish was raised to supplement the protein intake of pregnant women (Ekor, 2014). Fish like any other lower member of the animal kingdom are important to man, in fact man cannot live without fish, as they always provide man supportive services. Fish as a staple food is highly favoured by man right from its history. Fish utilization dates back to the ancient era when fish were used extensively. Uses of fish by man are limitless since people use fish for food, ceremonies, recreation, educational purpose, traditional medicine, settlement of dispute, naming of children, religious, cosmetic production, gifts, traditional initiation into certain cult group or society and pets. Apart from the use of fish as basic ingredients in stew and soup preparations, it is also included in traditional recipes in different forms. Fish have been shown to prevent asthma, as children who eat fish more than once in a week are 70% less likely to suffer from asthma. Fish eyeballs, associated muscle tissue and guts have been scientifically found to contain high content of brain invigorating and cholesterol reducing substances (Newsmax, 2017). Consumption of oily fish at least twice a week reduces development of prostate cancer and some dying diseases. Fish is used in treatment of hypertriglyceridemia, prevention of brain from cognitive problem, lupus disease (especially in the skin and joint) and heart disease, treatment of clinical depression, slow histopathological progression and increase survival in genetically engineered mice (Berquin *et al.,* 2007). Fish is also used in the production of cold-liver oil and flesh of the escolar or castor oil fish; *Ruvettus spp* acts as a purgative. Variation in utilization of freshwater fish is common worldwide, varying according to culture and custom of the people involved. There is unorthodox use of fish in traditional medicine and health care services in which Clarias species has been found in more than fifteen different herbal remedies (Balogun, 1997).

It is with this background that the study was carried out to investigate the utilization of freshwater fish species for trado-medicine and health care services among rural households in Ogun State. Specifically the study describe the socio-demographic characteristics of the respondents; identified the types of fresh-water fish species used for trado-medicine and health care services, factors influencing the utilization of fresh-water fish species for trado-medicine and the relationship between the demographic characteristics of the respondents and the utilization of freshwater fish species for trado-medicine and health care services in the study area.

MATERIALS AND METHODS

Study Area

This study was carried out in Ogun State, Nigeria. The State is mainly dominated by the Yoruba ethnic group which is the largest ethnic group in the West African coast and one of the largest and longest established ethnic groups in the African continent (Ayinde, 2005). The total population of this area is approximately 3,658,098, covering an area of 16,762km^2, and density per km^2 of 222, with twenty (20) Local Government Areas (National Bureau of Statistics. 2008). The study area is the humid tropical zones with the major part being in the fresh-water swamp forest and rain forest to the south. The rainforest gradually gives way to the woodland

savannah towards the north. It lies between Latitude $4^0 21^1$N and $9^0 23^1$N of the equator and Longitude of $2^0 25^1$E and $6^0 31^1$E (NPC, 2006).
The study area experiences both dry and rainy season. Raining season commences from March to October while dry season commences from November to February. The state is characterized by an annual rainfall of about 2,000mm - 2,500mm and high humidity of 80% - 95% at rainy season and 60% or less at dry season. The soil type in the zone is well drained but highly leached. These elements favour the cultivation of crops such as cassava, maize, sorghum, yam, rice, cocoyam and beans. The major languages spoken in the study area is Yoruba (Egba) Languages while the major occupations of the people are fishing and herbal trading. The study area was purposively chosen due to high concentration of fishermen and traditional healers with the exertion of rescuing people from illness and untimely death.

Sampling Procedure and Sample Size: A total of 80 respondents from two Local Government Areas were selected using a multi-stage sampling procedure and a well-structured interview schedule was used to elicit information for this study. Data were collected on socio-demographic characteristics of the respondents such as age, marital status, educational level, sex, household size, membership of social association and awareness of the utilization of freshwater fish for trado-medicine. Information was also collected on the types of freshwater fish species used for trado-medicine and health care services, factors influencing the utilization of freshwater fish for trado-medicine and the effect of the utilization on the socio-demographic characteristics of the respondents.

Methods of Data Analysis: Data were analyzed using descriptive statistics such as frequencies distribution, mean and percentage to describe the socio-demographic characteristic and the types of freshwater fish species used for trado-medicine and other usage. A 3-points Likert scale was used to determine the factors influencing the utilization of freshwater fish for trado-medicine and health care services. Also, Chi-square analysis was used to determine the relationship between the socio-demographic characteristics of the respondents and the utilization of fish medicine in the study area.

A 3-points Likert Scale: In analysing the factors influencing the utilization of freshwater fish species for trado-medicine and health care services in the study area, a 3 points Likert scale was developed and ranked. The choice of the influential factor was expressed by using a 3 points Likert scale and was accorded 3, 2, and 1 for Agree, undecided and disagree respectively.
$LS = (N_1X_3 + N_2X_2 + N_3X_1) / (N)$
Where:
LS = Likert Scale
N = Total number of respondents.
N_1 = Number of respondents who agree to the statement.
N_2 = Number of respondents who did not decide on the statement
N_3 = Number of respondents who disagree with the statement
Any weighted score below two points was considered as less important and vice versa

Chi Square Analysis

$$X^2 = \frac{(O-E)^2}{E}$$

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Where;
O = the observed relationship of the demographic characteristics of the respondents and utilization of fish medicine.
E = the expected relationship of the demographic characteristics of the respondents and utilization of fish medicine.

RESULTS AND DISCUSSION

Socio-Demographic Characteristics of the Respondents

The result in Table 1 revealed the socio-demographic characteristics of the respondents in the study area. It was found that the mean age of the people was 49 years, while the modal class was more than 50 years. This implies that most of the respondents were within the active age range of 41 – 50 years. They were mostly male, married with average household size of 7 people, practices all the religions practiced in Africa and had low level of education. It was observed that 88.75% of them were aware of the utilization of freshwater fish species for trado-medicine and other purposes with the average of 23.6 years of experience in which most of the respondents learnt this from their parents. The most common occupation of the people was herbal trading and fishing while 86.25% of them belong to one or more social association. Hence, the study reveals that most of the respondents were aware of fish medicine and men were more involved in trado-medicine practices than women.

Table 1. Distribution of Respondents based on their Socio-Demographic Characteristics

Age (Years)	**Frequency**	**Percentage**	**Mean**
Below 31	15	18.75	
31 – 40	18	22.50	
41 – 50	21	26.25	49
Above 50	26	32.50	
Sex			
Male	59	73.75	
Female	21	26.25	
Marital Status			
Married	65	81.25	
Unmarried	15	18.75	
Household size			
1 – 4	17	21.25	
5 – 8	42	52.50	**7**
9 – 12	21	26.25	
Religion			
African Traditional Religion	43	53.75	
Christianity	10	12.50	
Islam	27	33.75	
Primary Occupation			
Herbal Trading	36	45.00	
Farming	16	20.00	
Fishing	19	23.75	

Traditional doctors	9	11.25	
Level of Education			
No Formal Education	19	23.75	
Primary Education	46	57.50	
Secondary Education	15	18.75	
Awareness of Fish Medicine			
Yes	71	88.75	
No	9	11.25	
Membership of Social Association			
Yes	69	86.25	
No	11	13.75	
Year of Experiences			
Less than 11	11	13.75	
11 – 20	16	20.00	
21 – 30	41	51.25	23.6
More than 30	12	15.00	

Source: Field survey, 2018.

Usage of Freshwater Fish Species for Trado-Medicine and other Purposes

The result in Table 2 reveals the type of fresh-water fish species used for trado-medicine and other purposes in the study area. Twelve freshwater fish species were identified by the people and its usage. Firstly, *Clarias* fish were eaten by the women for easy or safe delivery. It was used for stoppage of promiscuity among women, used to restore fertility in women and used to initiate Ifa priest. Secondly, *Clarias* fish was used for money making (‘osole’ in Yoruba Language), customer puller for traders (‘afaero’ in Yoruba Language), used for worshipping of esu deity, and making concoction for not getting old quickly (‘ajidewe’ in Yoruba Language). Thirdly, *Malapterurus electricus* (Electric fish) was used for reviving retentive memory (‘isoye’ in Yoruba Language), to cure leprosy, control of insect larvae in drinking water pots, protective charm (‘Okigbe’ or ‘madarikan’ in Yoruba), healing of stroke, good luck charm and also used for weakening of the opponents during wrestling.

Barilius niloticus was used to restore potency in man and to treat vitality by mixing it with herbs for drinking. *Gymnachus spp* was used for making prosperity concoction, used for praying for the new couple and also appeasement of the gods. *Tetraodan fahaka* (Puffer fish) was used for making drum and also to neutralize poisoning. *Heterobranchus bidorsalis’* skull (Laago in Yoruba Language) was used for prosperity, the alimentary canal with egg sac was used for conception in barren women and it was also used for initiation into secret cults. *Hepsetus spp* bladder was used for buoyancy by the swimmers and also ‘back to sender’ charm while tilapia fish was just for eating and *Mormyrus spp* was used for favour charm by the people in the study area. *Calamoichthys calabaricus* (Eel fish) was dried and milled into powder then mixed with other herbs to stop bleeding especially in pregnant women. *Polypterus* was used to dissolve criminal case in the court of law and also for protection. *Chrysichithys nigrodigitatus* (Silver cat fish known as Obokun in Yoruba Language), was used for buffering sacrifice. The bile and inner parts were used as remedy against diseases that involves swollen up parts/swelling.

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Table 2. Analysis of freshwater fish species used for trado-medicine and other purposes

Freshwater fish species and its utilization	Frequency	Percentage
***Clarias spp* (Cat Fish)**		
Easy/safe delivery	65	81.25
Stoppage of promiscuity in women	52	65.00
Customers puller for traders (Afaero in Yoruba Language)	57	71.25
Used in money making as human parts i.e (Osole)	42	52.50
To restore fertility in women	67	83.75
Worship of Esu	73	91.25
Initiation of an Ifa priest	39	48.75
Not getting old quickly (Ajidewe in Yoruba Language)	41	50.00
***Malapterurus electricus* (Electric fish)**		
Retentive memory (Isoye in Yoruba Language)	57	71.25
Curing leprosy	7	8.75
Control of insect larvae in drinking water pots	14	17.50
Protective charm (Madarikan or Okigbe), cooked with leaves such as *Mormodica spp*	16	20.00
Used in wrestling to weaken the opponents (Aluwo /Aluro)	21	26.25
Healing of stroke patient with black soap	27	33.75
Good luck charm	21	26.25
Barilius niloticus		
To restore potency in man	78	97.50
To treat invalids	23	28.75
For vitality, cooked with herbs for drinking and bathing	56	70.00
Gymnachus		
Head for prosperity (Awure in Yoruba Language)	18	22.50
Smoked and cut into pieces for marriage ceremony	72	90.00
Very big for appeasement for the gods of the land (Etutu Ilu)	37	46.25
***Tetraodan fahaka* (Puffer fish)**		
Skin used in making drum	49	61.25
Used for poisoning	44	55.00
***Heterobranchus bidorsalis* (Laago)**		
Skull for prosperity	32	40.00
Alimentary canal with egg sac for conception in barren women	29	36.25
Initiation into secret cults	48	60.00
Hepsetus		
Swim bladder used for buoyancy by swimmers	30	37.50
Used in sending evil back to the sender i.e Epe lo npa elepe, asasi lo npa alasasi	29	36.25
***Calamoichthys calabaricus* (Eel)**		
Made into powder mixed with other ingredients to stop bleeding especially when a pregnant woman is bleeding	74	92.50
Polypterus spp		
To dissolve a criminal case in the court of law	19	23.75
For protective charm	42	52.50

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***Chrysichithys nigrodigitatus* (Silver Cat Fish or Obokun)**		
Appeasement of the overself in semi smoked form i.e Eja ojuka (Saara)	65	81.25
Buffering sacrifice – Etutu	14	17.50
Sacrifice (Ebo)	15	18.75
Bile and inner part used as remedy against a disease that involves being swollen up, cooked with fish flesh and eaten	32	40.00
Tilapia spp		
Eating	80	100.00
Mormyrus spp		
For favour i.e Iyonu agba	25	31.25

Source: Field survey, 2018. *multiple responses

Factors Influencing the Usage of Freshwater Fish Species for Trado-Medicine and other Purposes

The result in Table 3 shows the factors influencing the usage of freshwater fish species for trado-medicine and other purpose in the study area. The factors were subjected to eighteen variables and efforts were made to classify the variables into their levels of importance using a 3-points Likert Scale. It is important to note that the mean score points for this variable was 2.0 and this was used as the benchmark. Therefore, any variable found to be lesser than the mean point of 2.0 were considered as less important while the variables found to be equal or greater than 2.0 mean score points were regarded as very important and were ranked accordingly.

Thus, fifteen out of the eighteen variables were more relevant to the factors influencing the utilization of fresh-water fish species for trado-medicine in the study area. The potency and effectiveness of fish medicine compared to orthodox medicine influenced its usage by the people in the study area, with mean score point of 2.95 and it was accorded first position. It was followed by, its benefit to pregnant women ($\bar{x}$=2.90), cost effectiveness ($\bar{x}$=2.80), benefit to children's health especially at infant stage ($\bar{x}$=2.76), use for blessing new couple during wedding ceremony ($\bar{x}$=2.75), "it is our family tradition and we are known for the production" ($\bar{x}$=2.74), some inherited the knowledge from their parents ($\bar{x}$=2.59). These were accorded 2nd to 7th positions respectively.

Use of fish medicine as a gift to a new born baby and new bride according to tradition with score points of 2.56 and was accorded 8th position. It was followed by, use during occasions or parties ($\bar{x}$=2.49), availability in the area ($\bar{x}$=2.40), some beliefs that it does not have side effects on health ($\bar{x}$=2.34), it's use to appease the gods or use for sacrifice ($\bar{x}$=2.33), it's favourable taste compared to other traditional medicines ($\bar{x}$=2.31), it's help in developing the health status of the people and increasing their health coverage ($\bar{x}$=2.25), increase in the economic status of the people due to income realized from it ($\bar{x}$=2.20). These were accorded 9th to 15th positions respectively.

Finally, three variables were less significant to the factors influencing the usage of fresh-water fish species for trado-medicine in the study area. The variables were: accessibility to fish species needed for fish medicine in the environment, with mean score points 1.85 and was

accorded 16th position. It was followed by ready-made market or demand for fish medicine products ($\bar{x}$=1.54) and it is a profitable business ($\bar{x}$=1.44). This was accorded 17th and 18th positions respectively. Hence, the study revealed that the potency of fish medicine and its health benefits are the most influential factors in using freshwater fish species for trado-medicine among the rural households.

Table 3. Factors influencing the usage of freshwater fish species for trado-medicine

Variables	A	U	D	Total	Mean	Rank
It is more potent and effective compared to orthodox medicine	234	0	2	236	2.95	1st
It is good for pregnant women	225	4	3	232	2.90	2nd
It is cost effective compared to orthodox medicine	210	8	6	224	2.80	3rd
It is good for children's health	201	14	6	221	2.76	4th
It is one of the requests for marriage ceremony here	201	12	7	220	2.75	5th
We are known for the production	201	10	8	219	2.74	6th
I inherited this knowledge from my parents	186	6	15	207	2.59	7th
It is used as a gift to a new born baby or new bride	162	34	9	205	2.56	8th
It is used for occasions or parties	147	42	10	199	2.49	9th
It is readily available in our area	150	24	18	192	2.40	10th
It does not have side effects	150	14	23	187	2.34	11th
It is used for worship or sacrifice	129	40	17	186	2.33	12th
The taste is favourable compared to other traditional medicines	135	30	20	185	2.31	13th
It develops our health system by increasing the health coverage	114	46	20	180	2.25	14th
It reduces poverty by increasing the economic well-being of communities	117	36	23	176	2.20	15th
We can easily get access to the fish species	81	28	39	148	1.85	16th
There is ready made market for it	45	26	52	123	1.54	17th
It is a profitable business	30	30	55	115	1.44	18th

Source: Field survey, 2018. **Key:** A, U and D represents Agree, Undecided and Disagree, respectively.

Chi-square analysis of the relationship between the respondents' demographic characteristics and utilization of fish medicine in the study area.

The result in Table 4 shows that there was relationship with the respondents' age ($p<0.01$), sex ($p<0.01$), primary occupation ($p<0.01$), household size ($p<0.01$), educational background ($p<0.01$), marital status ($p<0.01$) and the utilization of fish medicine in the study area. This implies that the demographic characteristics of the respondents influence the usage of fish medicine as shown in Table 4.

Table 4. Chi-Square Analysis

Variables	Chi-square value	df	Significant
Age	38.857***	5	0.000
Sex	61.571***	4	0.000
Primary occupation	56.600***	2	0.000
Household size	83.371***	7	0.000
Educational background	27.257***	3	0.000
Marital status	74.972***	5	0.000

Source: Computed from survey data, 2018. *** represent 1% level of probability.

CONCLUSION AND RECOMMENDATION

The study concluded that fresh-water fish species were used for trado-medicine and health care services among the rural households in Ogun State. The twelve freshwater fish species used for trado-medicine were identified. The potency and effectiveness of fish medicine compared to orthodox medicine, its benefits to pregnant women and children especially the infant, cost effectiveness, used for blessing new couple during wedding ceremony, use as a gift to a new born baby and it's use to appease the gods or use for sacrifice were the prevalent factors influencing the utilization of fresh-water fish species. The common methods of administering these fish medicines were: herbal porridge (aseje), herbal bath mixture with local soap, skin incision (gbere) and lotion form. Hence, government and NGOs through the ministry of health, should recognize, support and fund researches for in-depth studies on freshwater fish medicine. Favourable policies should be introduced and implemented for popularization of fish medicine. Information needed regarding market accessibility, fish processing, storage and packaging should be made available through the extension personnel, television and radio for wider coverage.

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