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CONTENTS

Evaluation Of Blood Parameters And Total Cholesterol Of Exotic Chickens Fed Diet Supplemented With Moringa Oleifera Seed Products.
Daramola, O.T., Sola-Ojo, F.E., Annongu, A.A., Ogunsola , F.O and Toye, A.A.....1

Development Of Moringa Value Added Product As Nutritional And Medicinal Supplements For Healthy Living In Nigeria
Abolaji, G. T
.....10

Amino and fatty acid profiles of Moringa oleifera seed flour
Abiodun O.A., Adegbite, J.A., Ojo, A. and Amanyunose, A.A.....24

Performance Of Rabbits Fed *Moringa Oleifera* Lam. Based Diets
Oyedele O. J. and Odeyinka S. M 31

Moringa germplasm collection and screening
Getachew
Mulugeta.....39

Evaluation of the Effect of *Moringa oleifera* Leaf Powder on Digestion of some Nutrients in Weanling Albino Rats
Oladiji, A.T., Omole, O. M., Oloyede, H. O. B. M. T. Yakubu.
.....51

βETA-Lactamase Production and Plasmid Profiling af Penicillins Resistant *Staphylococcus Aureus* Isolated From Food Handlers
Kayode, R.M.O., Adedeji, B.S., Oladoye, C.O., Laba, S.A., and Salami, K.O. 70

The Economics of *Moringa oleifera* use by people living with HIV/AIDS (PLWHA) in Kwara State, Nigeria
Animashaun, J.O., Williams, F.E., Ibrahim, H. and Toye, A.A.....80

THE ECONOMICS OF *MORINGA OLEIFERA* USE BY PEOPLE LIVING WITH HIV/AIDS (PLWHA) IN KWARA STATE, NIGERIA

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ABSTRACT

Despite widespread use and belief in the efficacy and affordability of Moringa plant among users, and anecdotes of its utility in treating HIV in Africa, little is known of the actual economics and attitudes to the use of Moringa oleifera for therapeutic benefits among People Living With HIV/AIDS (PLWHA) in Kwara State, Nigeria. To fill this knowledge gap, the present study randomly sampled 167 respondents comprised exclusively of PLWHA who use the Moringa plant for therapeutic purpose in Kwara State, Nigeria. A questionnaire was designed and administered on the respondents in the study area. Findings revealed that respondents show a positive attitude to the use of the moringa plant, and the part consumed most by users is the leaf (82%). Majority of the respondents (72%) reported not paying money to have access to the plant as it is in most cases obtained free as a gift from friends and grown in the backyard. Among those who incurred cost in accessing the plant, the average amount paid was N1,163.00 (USD 7) per 200g. Respondents with higher monthly income are

more likely to pay higher for the plant (p=0.07). The study concludes by recommending that clinical trials be intensified to examine the claims of the plant's therapeutic value in HIV management which underpin the relatively positive attitude towards its use by PLWHA. Furthermore, purified extract(s) of moringa phytochemicals needs to be isolated and examined for efficacy and affordability as drugs for managing HIV related pathology in PLWHA.

Keywords: *Moringa, HIV/AIDS, Affordability, Nigeria.*

INTRODUCTION

Ever since Nigeria first reported the first HIV/AIDS case in 1986, the country had taken several steps to limit the spread of the disease. In contrast to other African nations like South Africa and Zambia, the rate of prevalence of the disease is low in Nigeria (UNAIDS, 2010; UNDP, 2011) Nevertheless, HIV/AIDS related death and disease has had a significantly negative impact on the national economy; In 2009 alone, AIDS claimed the lives of approximately 220,000 people in Nigeria (UNAIDS, 2010). Furthermore, at an infection rate of 3.6 percent (UNDP, 2011; UNGASS, 2010), an estimated 6 million people lived with the virus in Nigeria as at the end of 2013. With AIDS claiming so many lives and the possibility of claiming many more lives, there may be a need to consider alternative and adjunctive therapies in adopting new strategies for treatment and/or management of HIV/AIDS. Meanwhile, certain plants have been recognized to possess the ability to synthesize a wide variety of phytochemical compounds that are used to perform important biological and defensive functions. Since time immemorial, these phytochemicals have been utilized by humans in the treatment of disease condition, and, according to the World Health Organization (WHO), 80 percent of the populations in the Asian and African countries make use of herbal medicine (ethno-medicine) for some aspect of primary health care (Edgar *et al*., 2002). Advocates of herbal medicines posit that they possess reduced risk of side effects, are effective with chronic conditions, relatively affordable, easily available, culturally acceptable and are known to be relevant and vital in many areas in which there is an absence or inadequate provision of modern medical services (Animashaun *et al*., 2013; Williams *et al*., 2013; Edgar et al., 2002; Kudi and Myint, 1999).

Specifically there are reported cases of the use and benefits of herbal medicines in the context of treating HIV/AIDS related symptoms in Africa (Babb *et al,* 2004; Peters *et al*, 2004). Studies conducted in Malawi document the relative lower cost of use of Moringa for vitamin and mineral sources than any other plant sources (Babu and Chale, 1994). Though there is no clear scientific evidence of its nutrient and phytochemical availability or its effectiveness as a phytomedicine in the context of treating HIV/AIDS conditions for which it is routinely used (Sebit *et al*., 2000), several related studies have, confirmed the use of Moringa for several health benefits and perception among users that it is effective in relieving symptoms of ill

health (Williams *et al.*, 2013; Animashaun *et al.*, 2013). Equally, the same studies showed that such users were willing to pay more than current prices for moringa products in order to enjoy the health benefit they believe it gives.

However, as with other herbal therapies, the use of moringa for therapeutic purposes may not be without some potential adverse effect (Talalay and Talalay, 2001) and cost implications. In relation to this unclear therapeutic and cost effectiveness benefits associated with the use of the moringa plant, specifically by PLWHA, this study is designed to examine the cost implication and the attitudinal disposition to Moringa use by PLWHA. This is purposively done to ascertain the economics of use and perception of efficacy of the plant in its context of usage (HIV/AIDS management). Outcomes of the study will furnish requisite background knowledge for experimental studies on the therapeutic benefits of Moringa in people living with the virus.

This study therefore broadly examines the economics and perceived attitudes of users to the therapeutic benefits of Moringa among People Living With HIV/AIDS (PLWHA) in Kwara State, Nigeria, and specifically;

1. identifies the various forms of medications used by respondents,
2. identifies the Moringa parts used by respondents,
3. examines respondents' attitude and knowledge to the use of Moringa plants, and,
4. estimates the relative cost of Moringa use by respondents.

METHODOLOGY

The study was carried out in Kwara State, Nigeria. Kwara State is located in the North-Central geographical zone of Nigeria within latitudes 7^0 45 N and $9^0$30 N and longitudes $2^0$30'E and 6^0 25E. The State comprises a mixture of urban and rural settlements. The study was descriptive and cross-sectional, and applied a pilot-tested questionnaire. The study population comprised people diagnosed with HIV/AIDS who are registered and receiving treatments across the HIV/AIDS Treatment Centers in the study area. Specifically, a list of registered PLWHA patients was collected from identified HIV/AIDS treatment clinics in the study area, and out of the identified 8 HIV/AIDS clinic, 7 were used for this study and one clinic was used for pre-testing the questionnaire. In the first stage, 1000 respondents which comprised of PLWHA were randomly sampled across the 7 Treatment centers and were administered with a questionnaire that asked whether they consume or use the Moringa plant in addition to their regular medications for the treatment of HIV/AIDS. Because the study targets respondents living with HIV/AIDS that also use Moringa for treating HIV/AIDS, a second sampling stage involved the purposive selection of respondents that use Moringa plant. At the end of the sampling exercises, a total of 170 Moringa user respondents were selected of which 167 provided valid responses.

Data was collected between April and May 2013 by trained enumerators. The survey instrument assessed demographic details including sex, age, ethnicity, income, education, livelihood activity, therapies used for treating HIV/AIDS; Moringa use, perceived effectiveness); quantity and frequency of Moringa purchase per month, parts of Moringa plants used, cost per unit of Moringa used, other therapies used (conventional/herbal medicines)/, and the respondent's attitude toward Moringa use. The survey instrument/questionnaire was designed in English and translated into native languages of the respondents who did not understand English language. Attitudes of respondents to the use of moringa plant were assessed using a 5-point Likert type item questions. Responses generated from the questionnaire were coded and subsequently analysed by use of descriptive and inferential statistical methods.

RESULTS AND DISCUSSION

Socio-Demographic Distribution of Respondents

The result of the demographic characteristics of the respondents is presented in Table 1

Table 1: Socio-demographic Distribution of Respondents

Variables		Frequency	Percentage
Ethnicity	Yoruba	99	61.1
	Hausa	24	14.8
	Igbo	18	11.1
	Other (tribe)	26	16
Sex	Male	43	23.9
	Female	124	76.1
Age	18-38	51	30.5
	39-59	101	60.1
	60>	15	9
Mean Age	43		
Marital status	Single	19	11.4
	Married	122	73.1
	Divorced	24	14.4

	Widowed/Widower	2	1.2
Education	No formal	27	16.2
	Adult	2	1.2
	Primary	24	14.4
	Secondary	46	27.5
	Arabic	23	13.8
	Tertiary	45	27.2
Livelihood	Artisan	67	40.1
	Agriculture	16	9.6
	Private salaried job	17	10.2
	Public service	36	21.6
	Student (tertiary level)	5	3
	No response	26	15.6
Monthly income	< 18,000	51	31
(Naira)	18,000-36,000	64	38
	36,100-54,000	42	25
	54,100-72,000	4	2.4
	72,100-90,000	3	1.8
	91,000-108,000	1	0.6
	>108,100	2	1.2

Source: Field Survey, 2013

As revealed in Table 1, the ethnic composition of the respondents indicates that majority are Yoruba (61%), followed by Hausa/Fulani (14%) and Igbo (11%). The composition of other ethnicities is 16%. The apparent larger representation of the Yoruba ethnicity may be related to the demographic composition of the population characteristics of the study area. In addition, female sex appears to be more represented (76%) than male (23.9%). With regard to the age distribution of the respondents, the age range of 39-59 years (60%) occupied the modal age whilst the average age was 43 years. Majority of the respondents were married (73%) and had

one form of formal education (84%). About 38% of the respondents reported a monthly income in the range of N18,000-N36,000..

Frequency of Respondents' Use of Prescribed Medical Practices for the Treatment HIV/AIDS

The result of the distribution of respondents' frequency of use of prescribed medical practices for the treatment of HIV/AIDS is presented in Figure 1.

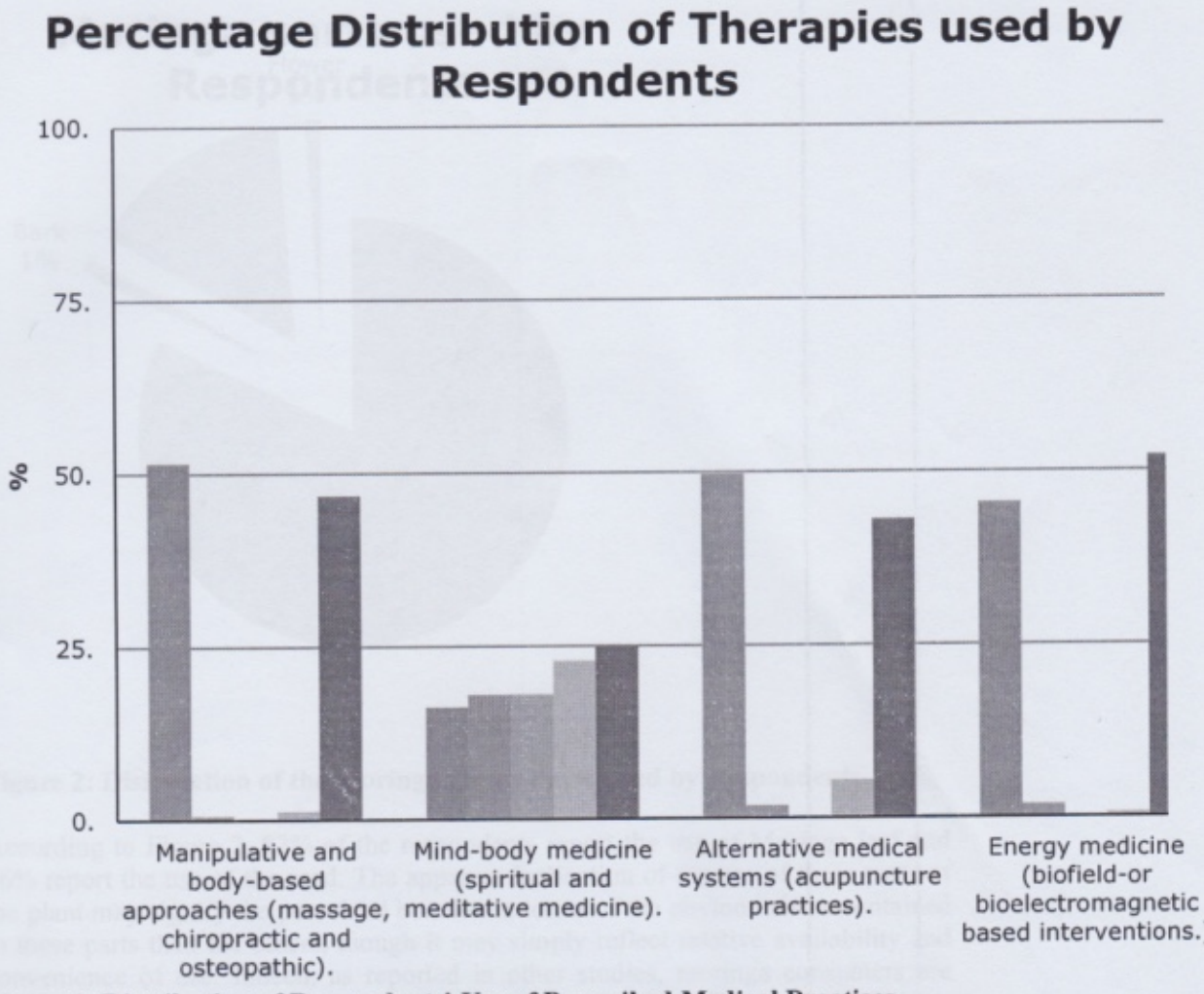


Figure 1: Distribution of Respondents' Use of Prescribed Medical Practices

As shown in the Figure, all of the respondents (PLWHA that also use Moringa) indicate the use of western prescribed medical therapy in the treatment of HIV/AIDS. This is however not unexpected given that the sampling of the respondents was carried out in approved medical HIV/AIDS clinics. The study also showed that 22% of PLWHA that use Moringa and Western prescribed medical therapy did use mind-body spiritual and meditative medicine also.

Unlike observed for Western medicine and Mind-body Spiritual therapy, use of Manipulative therapy, Acupuncture, and Energy Medicine was less frequently represented in the respondents. (Figure 1). This may be due to the relative unavailability of these methods in the study area.

3.3 Moringa Parts Used by Respondents

The distribution of the moringa plant parts used by respondents is presented in Figure 2.

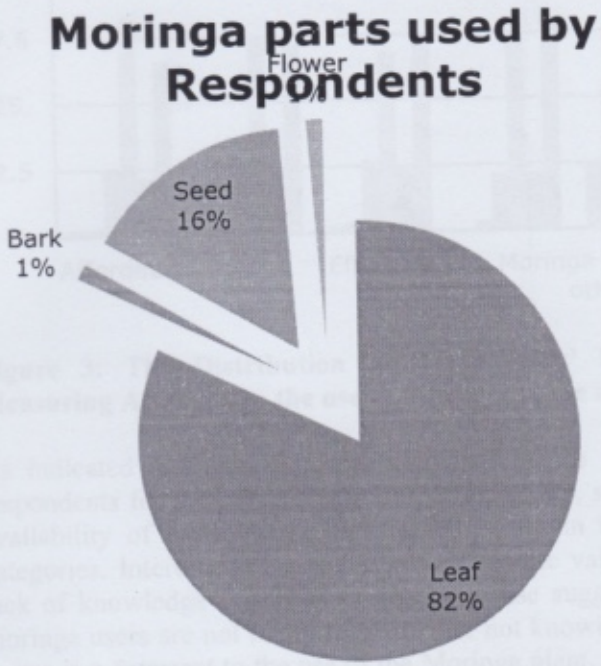


Figure 2: Distribution of the Moringa Plants Parts Used by Respondents

According to Figure 2, 82% of the respondents report the use of Moringa leaf and 16% report the use of the seed. The apparent inclination of the use of these parts of the plant may signify the perceived benefits in terms of the phytonutrients contained in these parts than the others, though it may simply reflect relative availability and convenience of use. Indeed, as reported in other studies, moringa consumers are more likely to consume the moringa leaf than any other part of the plant (Williams et al, 2013). Studies have also investigated and reported that the moringa leaf have the potentials of being a nutraceutical; an immunity booster, fertility and reproductive health booster and can also serve as nutritional supplement (Animashaun *et al.*, 2013; Adejumo *et al.*, 2012; Anwar *et al.*, 2007; Fahey, 2005).

Attitude of Respondents to the Use of Moringa

The distribution of respondents response to item questions measuring attitudes to the use of moringa is presented in Figure 3.

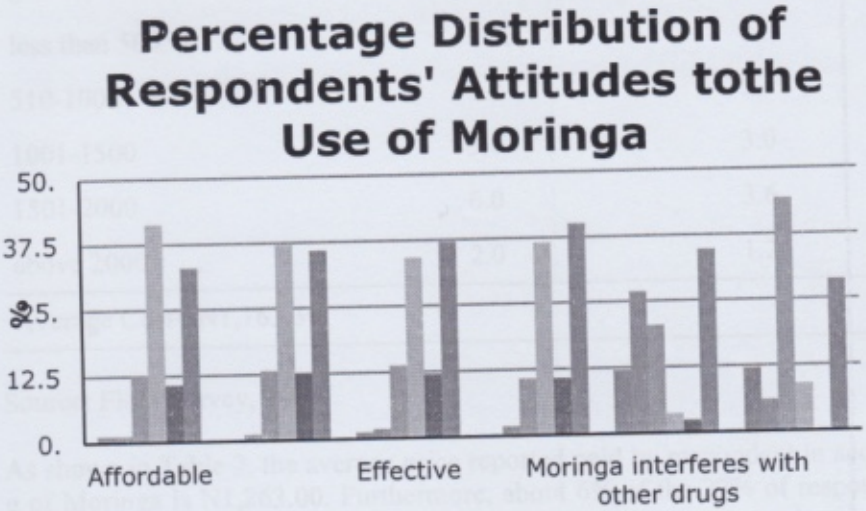


Figure 3: The Distribution of Respondents' Response to item questions Measuring Attitudes to the use of Moringa in the study area.

As indicated in Figure 3, more than half of the valid responses received from respondents for the perception of the affordability, safety, and effectiveness and on availability of the moringa herbal remedy are in the Agree and Strongly Agree categories. Interestingly, however, 44.3% of the valid 77% responses recorded for lack of knowledge of the exact dosage to use suggest that a higher proportion of moringa users are not really sure whether not knowing the exact dosage of moringa to use is a deterrent to the use of the Moringa plant. And more than half of the valid response disagreed that Moringa interferes with the biological functioning of the other prescribed drugs.

The distribution of respondents' attitude to the use of moringa suggests a favorable disposition towards the plant by PLWHA. However, since this study is merely descriptive in nature with no test of significance of the responses, the implication suggested by these results may have to be taken with caution.

Relative Cost Implication of use of Moringa among PLWHA

The ranges of price paid by respondents in accessing a 200g of Moringa powder is presented in Table 2.

Table 2: Distribution of Price Paid by Respondents per 200 g of Moringa

Ranges of Price paid per 200gof Moringa powder (Naira)	Frequency	Percent

Free (Gift, Grown in the backyard garden)	121.0	72.5
less than 500	11.0	6.6
510-1000	9.0	5.4
1001-1500	5.0	3.0
1501-2000	6.0	3.6
above 2000	2.0	1.2
Average Cost= N1,163.36		

Source: Field Survey, 2013

As shown in Table 2, the average price reported paid by respondent in accessing 200 g of Moringa is N1,263.00. Furthermore, about 6% of the 27% of respondents who paid for the moringa used less than N500 to access the moringa plant and 5% paid between N500 to N1,000. However, about 72% of the respondent reported not having to pay to have access to the plant as it is usually grown as a backyard garden or received as a gift from friends and form neighbors.
Furthermore, the study examined the relationship between respondents' monthly income earnings and amount spent on Moringa. The result is presented in Table 3.

Table 3: Correlation Between Respondents' Expenditure on Moringa and Monthly Income

	Monthly Income	Total Cost spent on Moringa purchased
Monthly Income		0.176*

*Significance (2-tailed) level at 10% p value
As revealed in the Table, there is a significant positive linear relationship between respondents monthly income and amount expended on the purchase of moringa (p=0.07). The implication of the relationship between these two variables is that respondents who earn higher income are more likely to pay more to have access to moringa plant.

CONCLUSION AND RECOMMENDATION

This study examined the attitudes and the relative cost implication of the use of Moringa by PLWHA who also use Moringa in Kwara State, Nigeria. The study collected information from Moringa users with the use of a structurally designed

questionnaire. Results showed that the three major ethnicities in the country are well represented in the study, with a majority of them being Yoruba tribe found majorly in the South-West region of the country. Furthermore, majority of the respondents are married, possess a formal form of education and earn at least N18,000 per month. All of the respondents reported using western medical therapies and this is followed by the mind-body spiritual and meditative medicine. However, the use of manipulative therapy, acupuncture, and energy medicine appear relatively rare among respondents.

More respondents reported using moringa leaf than other parts of the plant, and this is followed by use of seeds. More than half of the responses on perception of the affordability, safety, effectiveness and availability of moringa herbal therapy are in the Agree and Strongly Agree categories. And more than half of the responses disagreed that Moringa interferes with the biological functioning of prescribed drugs (Western medicine).

The average cost of 200 g of Moringa was N1,163.00, and about 72% of the respondents reported not having to pay to have access to the plant as it is usually grown as a backyard garden plant or received as a gift from friends and from neighbors. Finally, the study found that a positive correlation exists between amount earned by respondents and expenditure paid for Moringa.
In view of these findings, this study recommends that clinical trials be intensified to examine the claims of the plant's therapeutic value in HIV management which underpin the relatively positive attitude towards its use by PLWHA. Furthermore, purified extract(s) of moringa phytochemicals needs to be isolated and examined for efficacy and affordability as drugs for managing HIV related pathology in PLWHA.

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