Combined Orthodox and Traditional Medicine Use among Households in Orlu, Imo State, Nigeria: Prevalence and Determinants

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Abstract **Introduction:** Traditional Medicine is a widely and rapidly growing health system with economic importance. Globally, about 20-80 percent of the world's population uses various forms of alternative medication and medicine. **AIM:** This study was carried out to assess the prevalence and socio-demographic determinants of combined orthodox and traditional medicine use among households in Imo State, Nigeria. **Methodology:** This was a cross-sectional descriptive study conducted among 422 participants selected from households in communities from orlu, Imo State, using the multi stage random sampling. A semi-structured, pretested, interviewer administered questionnaire was used to collect information from the participants and data was analyzed using EPI INFO version 7.1. A p-value of less than 0.05 was considered significant. **Results:** The prevalence of traditional medicine use and orthodox and traditional medicine combination was 77.5% and 63.7% respectively. Most, (86.3%) of the participants preferred orthodox medicine over traditional medicine and their commonest reason for preference is that it was more effective, (68.2%). Socio-demographic and household characteristics that significantly influenced combined utilization of both when sick were; age, sex, marital status, educational status, occupation, household size, family size, death of an under-five in the last one year, and the cause of death of the under-five, (p=<0.05). **Conclusion:** Our study revealed high use of both traditional medicine and the combination of both. There is need to increase awareness especially to the target groups on the likely dangers associated with combined use of orthodox and traditional medicine.

Keywords: socio-demographic and household, determinants, traditional and orthodox, medicine, Nigeria

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1. Introduction

Healthcare can broadly be divided into modern (conventional, orthodox, western or allopathic) and traditional (indigenous, complimentary, alternative or integrative) groups [1]. Traditional medicine is defined by the World Health Organization (WHO) as the sum total of all knowledge and practices, whether explicable or not, used in diagnosing, preventing and eliminating physical, mental or societal inbalances [2]. Traditional medicine is often referred to as Complimentary Therapy (CT) when used in combination with orthodox medicine, and Alternative Therapy (AT) when used in place of orthodox medicine [2,3,4]. Traditional medicine mainly depends on prevention of illness and development of natural resistance to diseases and thus believes in general promotion of well being[5]. Modern or orthodox system of medicine is based on sound experimental data, toxicity studies and human clinical studies. In modern medicine, knowledge expansion is achieved through scientific research, which can involve global research and commitment [5] while in case of herbal medicine, the pharmacopeia in herbal products is usually not available, and also standardization, quality control parameters for the raw materials as well as finished products are virtually non-existent and herbal industry lacks good manufacturing practices [6]. Before the establishment of orthodox medicine, traditional medicine was the dominant medical system for millions of people in Africa but the arrival of the Europeans was a noticeable turning point in the history of this ancient tradition and culture [7,8,9]. The prevalence of traditional medicine use whether in combination with orthodox or not varies greatly from one place to another even within the same country. Traditional medicine is used widely and is a rapidly growing health system and of economic importance [10]. Globally about 20-28% of the world's populations use various forms of alternative medication and medicine [11]. Nearly half the population in many

developing countries regularly use some form of nutritional supplements and alternative medicine [12,13]. About 42% of adults in the United States of America (USA) use some form of nutritional supplements and alternative medicine; corresponding figures in other countries are: Australia, 48%, France, 49%, Canada, 70%.

There is also a considerably increased use of alternative nutritional supplements and medicines in many developing countries, such as China, 40%, Belgium, 31%, Columbia, 40%, Chile 71%, India, 65% [13]. In Africa up to 80% of the population uses traditional medicine to help meet their health needs [10]. In some West African countries, about 60% of children with high fever resulting from malaria are given herbal medicine as first line treatment. In Nigeria, there is dearth of information about traditional medicine use but available data put the use of conventional nutritional supplements and alternative medicine mostly in the form of herbal products, at an estimate of about 31.9% [11]. The use of traditional medicine among Nigerians has been on the upward trend and varies greatly depending on several factors which span from socio-demographic, economic to pattern, duration and severity of the disease. Prevalence among hypertensive patients in Lagos University Teaching Hospital was, 39.1%, and 65.0% use was reported among cancer patients attending clinics in Enugu, while 28.1% use was reported among medical students in Imo State, Nigeria [14,15,16]. Prevalence rates as high as 79.3% among urban workers in Jos, North Central, Nigeria and 66.8% among Lagos residents has been reported [17,18]. Also in Nigeria, Osemene et al., in a country wide survey reported a prevalence of herbal use of 41% with 31%, combination of orthodox and traditional medicine [19]. A study among out patients in a mission hospital in Nsukka, Enugu State reported a 61.4% prevalence rate of concurrent use of both herbal and synthetic drugs [20]. In many developed countries popular use of complementary and Alternative Medicine is fuelled by concern about the adverse effects of chemical drugs, questioning of the approaches and assumptions of allopathic medicine and greater public access to health, while in developing countries, broad use of traditional medicine is often attributable to its accessibility and affordability [10]. Herbs are thought to be safe because they are "natural", yet herbs may contain hundreds of components that can cause ill effects directly or through interaction with orthodox drugs [15]. The WHO, noted that inappropriate use of traditional medicines or practices can have negative or dangerous effects and advised that further researches are needed to ascertain the efficiency and safety of several medicinal plants and practices used in traditional medicine system. Our worry is that research on efficacy and safety of these medicinal plants are virtually non-existent in most underdeveloped countries like Nigeria where there is high proliferation of herbal drugs. Thus the aim of this study is to assess the prevalence, socio-demographic and household determinants of combined use of orthodox and traditional medicine among persons in households Imo State, Nigeria.

2. Methodology

Study Area and Population: The study was conducted in Orlu Local Government Area (LGA), in Imo State, South-East Nigeria. It is located between longitude $05^0 47^1 47^{11}$N and latitude $07^0 02^1 20^{11}$E. It is the third largest town in the state with an estimated population of 220,000 [21]. The LGA has an urban and rural setting with various health establishments including a teaching hospital, eighteen private hospitals, sixteen functional primary health centers and many traditional healing homes. The study population consisted of household heads or their proxies within the selected communities present as at the time of study.

Study design: It was a cross-sectional descriptive study of the combined use of orthodox and traditional medicines among households in communities in orlu, Imo State, Nigeria. The data collection instrument (the questionnaire) used for the study was administered by the researchers and some trained assistants to the participants that met the selection criteria until the required sample size for the study was completed.

Selection criteria: Only household heads or their proxies who live in the selected communities were enrolled and interviewed.

Sample size and sampling technique: A sample size of 422 participants was used for the study and this was calculated using the Cochrane formula for cross-sectional studies in populations greater than 10,000.

$$n = \frac{Z^2 pq}{d^2}$$

Where n=minimum sample size, Z= standard normal deviate at 95% confidence level (1.96), p= proportion of target population in previous studies combining both orthodox and traditional medicine [20], d=degree of desired accuracy set at 0.05, q=1-p.

The multistage sampling technique was used to select the participants that were studied.

Stage one involved the selection of the communities that were studied. A total of five out of the ten autonomous communities were selected using simple random sampling by balloting.

Stage two involved the selection of study clusters. Enumeration areas which are cluster units delineated by the National Population Commission was used. Two enumeration areas each from the study communities were selected using simple random sampling by balloting.

Stage three involved the selection of the households and participants that were studied. Having chosen a prominent site in the enumeration area, we moved in a clockwise direction until the required number for each enumeration area was obtained. In houses with more than one household, simple random sampling by balloting was used to select the household that was studied.

Data collection and analysis: Data were collected using a pretested, semi-structured, interviewer administered questionnaire. The questionnaire comprised three sections; section A, contains questions on socio-demographic and household characteristics of participants, B, contains questions on awareness and knowledge while section C, contains questions bordering on utilization. The pretest was done to ensure validity and reliability of collected data. Data collected was cleaned and validated manually, while a computer software package (EPI INFO Version 7.1) was used for data entry and analysis. Chi-square test was used to test associations between socio-demographic

variables and combined use of orthodox and traditional medicine when sick. Logistic regression models were used to assess the predictors of combined use and results of multivariate logistic regression were reported as odds ratio and 95% confidence interval. A p-value of <0.05 was considered significant. Descriptive data was presented as simple frequencies and percentages.

Ethical Approved: Ethical approved was obtained from the Department of Community Medicine, Faculty of Medicine, Imo State University Owerri, before proceeding with the study. Written consent and permission was obtained from the rulers of the communities studied. The purpose of the study was well explained to the participants and their verbal consent obtained before proceeding with the interview.

3. Results

The mean age of the participants was 40 ± 3.3 years with most of the participants being within the ages of 25-40 years, (63.4%). There were more males, (59.2%) than females, (40.8%), and most of the participants were currently married, (87.7%), traders (31.5%) and artisans, (28.4%). More of the participants had secondary education, (42.4%). The average household size and number of living children were 5.5 ± 1.73 and 3.5 ± 1.2 respectively, with under-five mortality of 25.3% in the last 1 year prior to study. The commonest suspected cause of death was convulsion (undiagnosed), (52.3%), followed by malaria, (15.9%) and diarrhea, (10.2%). Table 1

All the participants agreed to have been sick at least once in their life time and that all forms of orthodox and traditional care facilities exist in their communities with every cadre of health staff being mentioned to be available in the facilities. The majority of the participants, (77.5%), had used at least one form of traditional medicine when sick in the last 1 year preceding the study though most of the participants, (96.3%) preferred orthodox care and their common reasons for preference were; it was more effective, (68.2%), and because of family/personal belief, (40.9%). In the majority of the participants (73.7%), their first point of care when sick was the chemist shop. The commonest factor that determined where the participants sought care was personal choice/belief, (51.2%), this was followed by spousal influence, (48.3%) and family values, (39.3%). A higher proportion of the participants (63.7%) combined both orthodox and traditional medicine when sick and the commonest reason for this was advice from family members, (71.3%) followed by previous experience, (65.0%). Table 2

Table 3 shows the effect of socio-demographic and household characteristics on the combination of orthodox and traditional medicine. Utilization of both increases with increase in the age of respondents with highest prevalence found among those 65 years of age and above, (80.0%). This finding was statistically significant, (χ^2=13.25, df=4, p<0.0001). Utilization was significantly higher among males, (χ^2=21.77, df=1, p<0.0001), those currently married (χ^2=7.95, df=2, p=0.004), least educated participants, (χ^2=16.35, df=2, p<0.0001), Artisans and farmers, (χ^2=27.42, df=4, p<0.0001), those with household size greater than six people, (χ^2=10.44, df=1, p=0.001), having greater than six living children, (χ^2=35.01, df=2,

p<0.0001), had an under-five death in the last one year, (χ^2=7.53,df=1, p=0.006), and in those whose deaths were caused by convulsion with unconfirmed diagnosis (χ^2=7.46, df=1, p=0.006).

Table 1. Socio-demographic and household characteristic of participants

Variable	Frequency n=422	Percentage
Age (yrs)		
25-30	134	31.8
35-40	132	31.2
45-50	87	20.6
55-60	54	12.8
65-74	15	3.6
Total	**422**	**100.0**
Mean age 40.8±3.3		
Sex		
Male	250	59.2
Female	172	40.8
Total	**422**	**100.0**
Marital Status		
Single	36	8.5
Currently Married	349	82.7
Previously Married	37	8.8
Total	**422**	**100.0**
Level of Education		
None	16	3.8
Primary	111	26.3
Secondary	178	42.2
Tertiary	100	23.7
Vocational	17	4.0
Total	**422**	**100.0**
Occupation		
Traders	133	31.5
Artisans	120	28.4
Civil Servants	80	19.0
Farmers	55	13.0
Unemployed (Students Housewives)	34	8.1
Total	**422**	100.0
Household Size		
1-5	207	49.1
6-10	215	50.9
Total	**422**	**100.0**
Mean House-hold size: 5.5±1.73		
No of Living Children (n=386)		
1-3	224	53.1
4-6	145	34.4
>6	53	12.5
Total	**386**	**100.0**
Mean family size 3.5±1.2		
Lost a Child in the Last 1 Year		
Yes	107	25.3
No	315	74.7
Total	**422**	**100.0**
Suspected disease that killed the child (n=107)		
Convulsion (undiagnosed)	56	52.3
Malaria	17	15.9
Diarrhea	11	10.2
Measles	8	7.5
Pneumonia	5	4.7
HIV	2	1.9
Other (TB, Jaundice, Sepsis, Anemia, chicken pox)	8	7.5
Total	**107**	**100.0**

Table 2. preference, use of traditional and orthodox medicine by participants

Variable	Frequency n=422	Percentage
Current use of Traditional Medicine		
Yes	327	77.5
No	95	22.5
Total	**422**	**100.0**
Combine both when Sick		
Yes	269	63.7
No	153	36.3
Total	**422**	**100.0**
Reasons for Combination ** (n=269)		
Advice from family members	192	71.3
Previous experience	175	65.0
None response to treatment	67	24.9
Cultural belief	27	10.0
Personal choice	2	0.7
Total		
Most Preferred		
Orthodox	362	86.3
Traditional	58	13.7
Total	**422**	**100.0**
Reasons for Choice **		
More effective	288	68.2
Family/personal belief	173	40.9
Cheaper	48	11.3
Proximity	39	9.2
First point of care when sick		
Chemist	311	73.7
Hospital	51	12.1
Laboratory	30	7.1
Church	16	3.8
Native healing house	11	2.6
Shrine	3	0.7
Total	**422**	**100.0**
Factors influencing place of care **		
Personal belief/choice	216	51.2
Spousal influence	204	48.3
Family values	166	39.3
Relatives/friends	138	32.7
Religious belief	49	11.6%
Cultural belief	33	7.8
Satisfaction with care received		
Yes	258	61.2
No	164	38.8
Total	**422**	**100.0**

**= multiple response.

Table 4 reveals that the likelihood of combining orthodox and traditional medicine increases with increase in participants age, with participants within the 65-74 age group being the most likely to combine orthodox and traditional medicine when sick, (OR: 4.50; 1.22-16.70, p=0.015). Females were less likely to combine orthodox and traditional medicine than their male counterparts, (OR: 3.16; 1.56-6.40, p<0.0001) while those with tertiary education were less likely to combined both forms, (OR: 0.27; 0.16-0.48, p<0.0001). Considering participants' type of occupation, farmers were more likely to combine, (OR: 2.74; 1.14-6.60, p=0.021) than others while the unemployed, (OR: 0.10; 0.04-0.26, p<0.0001) and civil servants, (OR: 014; 0.08-0.27, p<0.0001) were the least likely to combine both when sick. Large households with equal or greater than 6 persons living in it, (OR: 1.94; 1.30-2.9, p=0.001), and those with large number of living

children greater than six, (OR: 11.20; 3.91-32.10, p=0.001) were more likely to combine both while households that had no under-five deaths within the last one year prior to study, (OR: 0.2807; 0.11-0.718, p=0.006) and those that the cause of death was not convulsion, (OR: 0.28; 0.11-0.72, p=0.006) were less likely to combine orthodox and traditional treatment when sick.

Table 3. Socio-demographic and household determinants of combined orthodox and traditional medicine use

Variable	Care Combination			χ^2	p-value
	Yes (%)	No (%)	Total (%)		
Age (Yrs)					
25-34	63(47.1)	71(52.9)	134(100)		
35-44	89(67.4)	43(32.6)	132(100.0)	13.25 df=4	0.000*
45-54	64(73.6)	23(26.4)	87(100.0)		
55-64	41(78.8)	13(24.8)	54(100)		
65-74	12(80.0)	3(20.0)	15(100)		
Total	269(63.7)	153(36.3)	422(100.0)		
Sex					
Male	182(72.8)	68(27.3)	250(100)	21.77 df=1	0.000*
Female	87(50.6)	85(49.4)	172(100)		
Total	269(63.7)	153(36.3)	422(100)		
Marital Status					
Never Married	14(38.9)	22(61.1)	36(100)		
Married	233(66.8)	116(33.2)	349(100)	7.95 df=2	0.004*
Previously Married	22(59.5)	15(40.5)	37(100)		
Total	269(63.7)	153(36.2)	422(100)		
Level of Education					
Primary & below	90(70.9)	37(29.1)	127(100)		
Secondary & vocational	139(71.3)	56(28.7)	195(100)	16.35 df=2	0.000*
Tertiary	40(40.0)	60(60.0)	160(100)		
Total	269(36.2)	153(36.2)	422(100)		
Occupations					
Traders	95(71.4)	38(28.6)	133(100)		
Artisans	98(81.7)	22(18.3)	120(100)		
Civil Servants	21(26.3)	59(73.7)	80(100)	27.42 df=4	0.000*
Farmers	48(87.2)	7(12.7)	55(100)		
Unemployed	7(20.6)	27(79.4)	34(100)		
Total	269(63.7)	153(36.2)	422(100)		
Household Size					
1-5	116(560)	91(43.9)	207(100)	10.44 df=1	0.001*
≥ 6	153(71.2)	62(28.8)	215(100)		
Total	269(63.7)	153(36.2)	422(100)		
No of living Children					
1-3	117(52.2)	107(47.8)	224(100)		
4-6	103(71.0)	42(29.0)	145(100)	35.01 df=2	0.000*
>6	49(92.5)	4(7.5)	53(100)		
Total	269(63.7)	153(36.7)	422(100)		
Death of an under-five within the Last 1 year					
Yes	80(74.8)	27(25.2)	107(100)		
No	189(60.0)	126(40.0)	315(100)	7.53 df=1	0.006*
Total	269(63.7)	153(36.2)	422(100)		
Type of illness that caused death					
Convulsion (undiagnosed)	48(85.7)	8(14.3)	56(100)	7.46 df=1	0.006*
Other illness	32(62.7)	19(37.3)	51(100)		
Total	80(74.8)	27(25.2)	107(100)		

*=significant.

Table 4. Predictors of combined use of orthodox and traditional medicine when sick using multiple logistic regression

Variable	Odds Ratio	95% C1	p-value
Age (Yrs)			
25-34	1.000		
35-44	2.333	1.418-3.837	0.000*
45-54	3.136	1.747-5.629	0.000*
55-64	3.554	1.747-7,231	0.000*
65-74	4.508	1.216-16.705	0.015*
Sex			
Male	1.000		
Female	0.382	0.254-0.575	0.000*
Marital Status			
Single	1.000		
Currently Married	3.156	1.558-6.395	0.000*
Previously Married	2.305	0.902-5.888	0.078
Level of Education			
Primary and below	1.000		
Secondary/Vocational	1.020	0.624-1.670	0.936
Tertiary	0.274	0.158-0.477	0.000*
Occupation			
Traders	1.000		
Artisans	1.782	0.982-3.234	0.056
Civil Servants	0.142	0.076-0.266	0.000*
Farmers	2.743	1.140-6.598	0.021*
Unemployed	0.104	0.042-0.258	0.000*
Household Size			
1-5	1.000		
≥ 6	1.936	1.294-2.897	0.001*
No of Living Children			
1-3	1.000		
4-6	2.243	1.438-3.498	0.000*
> 6	11.206	3.911-32.091	0.000*
Death of Under-five			
Yes	1.000		
No	0.506	0.310-0.827	0.006*
Cause of death			
Convulsion	1.000		
Other Sickness	0.281	0.110-0.718	0.006*

* =Significant.

4. Discussion

In this community based study, average household size and family size were 5.5± 1.73 and 3.5± 1.2 respectively. This average family size was lower than the national average of 5.7 but in line with the maximum number of children per family as stipulated in our national population policy [21]. The reason for this could be due to economic hardship and poor standard of living which is prevalent in our country and so families may have to spend a lot of money for food, housing and education. Also, about one quarter of the households have lost at least one under-five in the last one year preceding the study and the commonest cause was convulsion and malaria. This is not an uncommon finding as it is widely noted that under-five mortality rate in Nigeria has been high from 1999 to 2013 NDHS' with only a minimal changes [21,22]. This is caused by a combination of factors ranging from poverty to ignorance, poor disease prevention to lack of political will and manpower. Majority, (77.5%), of the participants used one form of traditional medication or the other when sick. This finding is within the limit reported by WHO in which up to 80% of people in developing countries use

one form of traditional medicine or the other. Similar high prevalence rates have been reported among urban workers in Jos, Nigeria [17] and in some developing countries [13]. However this rate was higher than that reported among Lagos residents, (66.8%) [18], medical students in Imo State University, (28.1%) [16], and in a nationwide survey in Nigeria, (41%) [14]. It was also higher than the rates reported in Nigeria among adult hypertensives, (39.1%) [11], cancer patients, (65%) [15], diabetic patients, (46%) [23] and epilepsy patients, (47.6%) [24]. Similarly lower rates have been reported in some countries such as china, (40%), Belgium, (31%), France, (49%), United States of America, (42%), Columbia, (40%), and India, (65%) [13]. This high use as noticed in our study could be likely connected to lower cost, availability of the products, high presence of dealers in these communities, assumed better effectiveness than orthodox drugs, culture and traditions that were handed from generation to generation. Also in Nigeria, recently most of these drugs have been well packaged and they all claim to have approval from regulatory authorities concerning their safety and effectiveness in a variety of illness. They are also widely advertised in the mass media (both print and electronic) without proper regulations and sold in open places especially in cars with loud speakers with little or no form of restriction. These acts help in giving false impressions to people that they could be better since it was allowed by the relevant authorities. In all these no proper clinical studies as stipulated by the WHO was carried out on any of them to ascertain their safety over long period of use.

A high proportion of the participants (63.7%) agreed that they combined both traditional and orthodox medications when sick. This finding was higher than the prevalence reported by Oseme et al in a country wide survey, (31%) [19] and among hypertensives in Lagos, (39.1%) [14] but lower than that reported among out-patients in a mission Hospital in Nsukka Enugu State, (69.4%) [20], and among cancer patients attending Clinics in Enugu [15]. The main reasons given by them for combining both was advice from family members, (71.3%) and previous experience, (65%). This act may pose a great danger to these individuals owing to the fact that their reasons for combining these medications was based on recommendation from family members and their previous experiences which will not give them basic information on the side effects, dosage and drug interactions. These drugs were taken without proper dosages and also toxicity studies were not carried out, thus putting their vital organs like the liver and kidney in danger. This is one of the reasons why UNAIDS/WHO called for a closer monitoring and collaboration between traditional practitioners in Sub-Saharan Africa and the government [20]. Despite this high use of traditional medicine found in our study, majority of the participants, (86.3%), preferred orthodox medicine to traditional medicine citing more effectiveness, (68.2%), and family/personal belief, (40.9%), as their main reasons for their preference. This was similar to finding in the study among urban workers in Jos where a higher proportion of the participants preferred orthodox medicine over traditional medicine use, despite high use of traditional medicine reported [17]. Also in a similar study in Osun State, Nigeria, majority of the participants, (82.9%), rated efficacy and safety as the most important factor influencing the use of orthodox

medicine and more than half of them preferred orthodox to traditional medicine [25]. In most developing countries, any product coming from the developed nations especially the western world is viewed to be more superior by all standards, and people generally prefer their products for a variety of reasons and this could in part account for their preference of orthodox medicine over the traditional medicine.

Surprisingly in most participants the first point of care when sick was the chemist shop, (73.7%). This is common in our environment where chemist shops are located in the rural areas and they are the closest to the people and could have played a vital role in encouraging the people to combine both treatments simply for assumed quicker response. Also there is likelihood that the chemists sell both drugs in their shops and thus recommend them to buyers. This could likely occur in a country like ours where we have weak enforcement of government regulations and endemic corruption.

Almost all the socio-demographic and household characteristics of those who combine orthodox and traditional medicine differ significantly with that of those who do not combine them. This pattern has been corroborated by some studies while in others some forms of variations exist.

In this study there was a statistically significant association between age of participants and combination of orthodox and traditional medicine and use was found to increase with increase in participant's age. This pattern was consistent with findings in several studies which reported increased use with increasing age of users [17,20,26,27]. This could be partly explained by the fact that majority of the older people may be less educated, less amenable towards change, have less information about the problems of combined use and might have stayed more in the community and having more contact with the traditional healers and other cultural issues.

Males were found to be more likely (2.6 times) to combine both drugs than females. This was found to be consistent with reports from some studies [26,29], while in others, females tend to combine more than the males [17,20] or that no difference ever existed in use [25,27,29]. The settings and types of traditional medicine use differs greatly but generally males are less likely to go to a health facility for a symptom or sign of a disease, but may use other alternative remedies at home than the females. Being currently married is a strong predictor of combined use with participants that were currently married having a higher likelihood (3.1 times) of use than singles. This same pattern was reported by Aderibigbe et al., [25] in Ilorin Nigeria where those currently married used traditional medicine in the majority of cases, but another study done in Osun State, Nigeria showed no difference in use [26]. This could be explained partly by this reason that in our setting, most married people live in the community with their families and are less likely to travel out or get better information about health issues.

Our study revealed that those with tertiary education were the least likely to combine orthodox and traditional medicine when treating ailments. This pattern of use among the educated class was corroborated by reports from Ladele and Bisi-Amosun, [25] in Osun State, Aderibigbe et al [26] in Ilorin, and Banwat et al [17], in Jos, which revealed that those with tertiary education used

less. Another study though it agreed that education affected use significantly, found out that the highly educated and rich class use herbal medication together with synthetic drugs more than the less educated and poor ones [20]. His work was a hospital based study where most of the cases might be those who could afford hospital care. Yet some others found no difference between educational status of participants and combined use [18,27,28]. Our finding could be explained by the fact that most educated people are aware and better informed about health issues than the less educated and are likely to have better paid jobs so they can afford to pay for orthodox drugs when sick. Occupation was found to also affect combined use significantly, with farmers being more likely to combine while the employed and civil servants were the least likely to use. This influence of occupation on orthodox and traditional medicine use has been reported in some studies [18,26]. Occupation is a direct assessment of economic status, and those with low paid jobs like farmers, petty traders are likely to patronize traditional medicine vendors first before seeking care elsewhere only when the illness persist or the medication fails.

Those with large households and family sizes greater than six people were more likely to combine orthodox and traditional medicine use, than those with smaller house hold and family sizes. This is consistent with findings in Osun State, Nigeria [28]. Large household may have lean economy because of their large size and high family demands and therefore may not have enough money for orthodox care, so they are likely to patronize traditional medications which are assumed to be cheap and affordable. Also in households where there were under-five deaths in the last 1 year preceding survey and in those whose cause of death was convulsion, they were more likely to have combined orthodox and traditional treatments than their counter parts. This corroborates with findings in previous studies that herbal medicine are combined more in those that have common ailments like malaria, Typhoid fever, and upper respiratory tract infections in developing countries [18,19,20]. The use of this combination could have dangerous consequences arising from complex reactions between herbal and synthetic drugs and this might have contributed immensely to this high rate of infant mortality noticed in our study.

5. Conclusion

The finding of our study revealed high prevalence of traditional medicine use and concurrent use of orthodox medicine respectively. It showed that most socio-demographic and household characteristics of participants had significant influence of use of both medications. This is of grave public health concern owing to the fact that little is known in our region of the side effects and complex drug–drug interactions that could occur with the combined use. There is need to create awareness on the side effects of these combinations by relevant authorities using the appropriate channels. The regulatory bodies should rise up to wage formidable war against unwholesome, fake, counterfeit, unregistered and adulterated drugs in the Nigerian markets. The mass media should also scrutinize all information on health

using the appropriate professionals in order to give the right information to the public and strictly follow the ethics of their profession to avoid giving wrong information to the public.

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Competing Interests

The authors hereby declare that there are no competing interests.

Authors' Contributions

Author CBD, KAU, and KCD were involved in the design and implementation, analysis of data, interpretation of results, write up of this study and editing of the main paper, while the other authors were involved in the design and editing of the main paper. All authors read and approved the final manuscript.

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