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Determinants, types and patterns of complementary and alternative medicine use among pregnant women in the South-South Region of Nigeria

Abstract

Complementary and alternative medicine (CAM) are growing aspect of health care that has caught the attention of researchers and medical practitioners. The use of CAM has recorded a very high prevalence globally. In spite of the studies done on CAM, no study has addressed the use of CAM among pregnant women in the south-south region of Nigeria. Hence, the major aim of this study is to identify the determinants, types and pattern of CAM use among pregnant women in the south-south region of Nigeria. This study is a cross-sectional survey that was carried out in twelve communities and among 325 women using the questionnaire and 36 women using an In-depth interview. Data collected for the study were analysed using quantitative methods at the univariate, bivariate and multivariate level, and thematic content analysis for the qualitative data. The study revealed that socio-demographic characteristics of the respondents accept religion significantly influence CAM use, with plants product, animal parts, alternative medicine, and spiritual therapy being the predominant CAM used for morning sickness and warding off evil spirits. Furthermore, CAM used are significantly associated with stage of pregnancy, with pregnant women during their 1st and 2nd trimester having a higher rate of CAM use. The study recommended the incorporation of CAM in health planning and development.

Keywords: complementary and alternative medicine, pregnant women, health belief model, alternative medicine, spiritual healing, stage of pregnancy

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Introduction

Complementary and Alternative Medicine (CAM) and Traditional Medicine (TM) are growing aspects of medicine that have become very important social phenomena in healthcare delivery. National and regional studies in the 'developed' world have shown high usage of CAM, especially for those with chronic diseases, such as cancer.[1] In the 'developing' world, CAM could become the 'mainstay' of health care delivery, particularly in remote or rural areas.[2] What is clear is that these phenomena are socially patterned over time and space. Several scholars have considered the rising popularity of CAM and the need to carefully investigate this issue.[3–5] Any social phenomenon, especially one that generates so much interest in wider society, is appealing to sociologists. In 1999, Siahpush published a review of this emerging field of study highlighting research in three areas – users of CAM, practitioners and the orthodoxy – and stressed the paucity of empirical research in the field.

In developing countries, the prevalence of CAM use has been described by very few studies. Available literature indicates that few studies have evaluated the prevalence of CAM use in the general population.[6] A prevalence rate of 38.5% was recorded among the general population of Indians living in Chatsworth, South Africa with the most common being herbs and spiritual healing.[7] A study on self-reported use of CAM in Jeddah; western Saudi Arabia observed that over 80% of the population depend on CAM products and/or traditional healing modalities, including herbal remedies, for health maintenance and therapeutic management of disease.[8]

Furthermore, most studies examining the use of CAM were carried out in the developed world, including Australia,[9,10] Bolivia,[11] Canada,[12,13] Germany,[14] Portugal,[15] and the UK.[16] Only a few of these studies have been explored among scholars in Nigeria and Africa at large.[7,17,18] Similarly, the few studies that have been conducted in Nigeria were done in the South-west and South-East in Nigeria.[19] This phenomenon of CAM use among pregnant women is yet to be explored in detail among the people of the South-South. Therefore, it is expedient to examine this issue among pregnant women in Bayelsa and Rivers State which are in the South-South part of Nigeria.

Theoretical perspective: the health belief model (HBM)

The Health Belief Model (HBM) was advanced in the 1950s by Social Psychologists at the United States Public Health Service to describe and predict health related behaviours, mainly regarding the uptake of health services. According to this model, being ill could be a horrifying and possibly life – threatening experience. The theory states that when people experience illness, adequate efforts are made, and relevant actions are undertaken to restore the body back to normal health. A process often described as health behaviour. Thus, the HBM averred that people's engagement in health behaviour depends on their belief about their health problems, perceived severity of the illness, perceived benefits of action and barriers to action as well as self-efficacy. A practical example of the application of Health belief model in this study is that a pregnant woman will utilize CAM services if she perceives complications in pregnancy as a threat to her health (Perceived severity) believes she can be ill without using CAM (perceived susceptibility) and that CAM will meet her health needs (perceived benefits). The Model also implies that certain factors may affect the utilization of healthcare services. This includes cost of treatment (perceived barriers) as well as age, sex, personality (modifying variables). Therefore, the HBM explains a pregnant woman's utilization of CAM.

Material and methods

This study was conducted among selected 325 pregnant women in fourteen selected communities in the South-south region of Nigeria. The study adopted both the approach using a cross-sectional survey design. First, the study purposely selected communities with maternity centres where women go for antenatal services. This was because it is at these centres that a huge chunk of the respondents could be found. The purposive sampling technique was further used to select women who were less than 8 months pregnant. This was done in order not to disturb those pregnant women who were very close to putting to bed as the matrons of these maternity centres advice. Finally, the snowball sampling technique was used to locate pregnant women who do not attend maternity centres to capture their experiences in their natural environment and to physically observe the CAM they were currently using.

Data for this study was collected using the questionnaire and an in-dept interview instrument with the assistance of four female research assistants. While most women in the maternity centres were given the questionnaire to fill, those sampled at home were interviewed. In cases where respondents do not have formal education and cannot express themselves adequately using English language, the interviews were conducted in the local dialects of the respondents or the use of pidgin English. While, the questionnaires on the other hand were filled with the help of the research assistants.

Data generated from the research instruments were analysed based on three levels: univariate, bivariate and multivariate using the SPSS. Hence, percentages, tables and charts were used for univariate analysis, chi-square crosstabulations for bivariate and multiple regression for multivariate. This study was approved by the Bayelsa State Health Research Ethics Committee of the Ministry of Health, and ethical clearance certificate granted with approval number: BSHREC/Vol.1/18/119. Permission was also sought from the heads of communities of the study area involved according to their gate-keeping policy. Also, verbal approval was given by the matrons of the maternity centres after presenting the approval letter from the department of sociology. Finally, the consent of individual participants was also sought before they were enrolled for the study.

Results and findings

Socio-demographic characteristics and CAM use

The result of the socio-demographic characteristics of the respondents is presented in table shows that all socio-demographic variables except religion (0.602) was found to be significantly related to CAM us at $p<0.05$. As revealed by the table, there were more users of CAM (88%) than non-users (12%) among pregnant women. Again, majority of the respondents in the study between the ages of 30-34 (28.9%) made use of CAM. Those aged 25-29 (22.8%) had all respondents indicating that they made use of CAM. In the same vein, the least numbers of respondents; those aged 15-19 (5.2%) also had all respondents making use of CAM. Similarly, those aged between 40-44 (5.8%) had all the respondents making use of CAM. Other age group response of CAM use; 35-39 (12.9%), and 20-24 (12.3%). From the above trend, the use of CAM increased with age up to 34 years and starts decreasing from 35 years (Table 1).

In addition, most of the respondents that are using CAM (48%) were pregnant women who have remained married. Those cohabiting had 25.5 percent of their respondents currently using CAM. The categories of those who have never been married and those divorced had 8.3 percent and 6.2 percent using CAM respectively.

With regards to level of education, the table shows that majority of the respondents who have had secondary education (44.6%) made use of CAM, 21 percent of respondents with tertiary education, 10.5 percent with primary education, 7.1 percent of those with technical education, and 4 percent of those with no formal education also made use of CAM respectively.

Religious affiliation as indicated earlier on, had no significant relationship with CAM use. However, those who indicating that they belonged to the Christian religion, had 82.2 percent respondents who made use of CAM. Islam with only one had 0.3 percent making use of CAM, while those with traditional religion had 5.5 percent of her respondents making use of CAM. Furthermore, Table 1 also showed that most of the respondents in the study (68.9%) who claimed to have a monogamous type of family, stated that they were currently using CAM. Those in polygamous families had 12.6 percent using CAM, and pregnant women who were in single parent family had 6.5 percent currently making use of CAM.

Based on the income level, Table 1 indicated that respondents with the least income had the highest numbers of CAM users. For instance, respondents who earned between N5,000 – N15,999 had 29.5 percent of her respondents using CAM). This is followed by those with estimated income of less than N5,000 who had all her respondents (17.8%) making use of CAM. Similarly, those who had an estimated income of between ₦26,000 - ₦ 35,999 (9.5%) also had all respondents making use of CAM. Those who earned N36,000 and above had 14.2 percent respondents using CAM. Thus, we can deduce from the above that CAM use decreases as income level increases. In indicating the numbers of children respondents have, the study shows that majority of them of those with just one pregnancy were making use of CAM (31.7%). This was followed by 21.2 percent respondents who were currently pregnant with their fourth child using CAM. Furthermore, 11.7 percent of the respondents who indicated that they were pregnant with their third child were making use of CAM. Similarly,11.4 percent of the respondents who indicated that this was their second pregnancy were making use of CAM. Additionally, respondents who were with their fifth and above pregnancy had 12 percent of the respondents making use of CAM. Hence, we can construe from this finding that CAM use is high among with their first pregnancy, decreases in the second pregnancy and increases again from the third pregnancy up to the fourth pregnancy before decreasing again.

Types and patterns of CAM use

This section of the study examined the types, extent and patterns of CAM use among respondents. Different categories of CAM were identified which ranged from plant products, animal products, alternative medicine use to spiritual healing. Figure 1 shows the percentage distribution of respondents by plant products used. It was revealed that the most commonly used plant products were bitter kola (29.3%), closely followed by unripe fruits (20.4%), and herbal tea (17.6%). Other products used by the respondents include olive oil (8.6%), ginger (5.8%), garlic (5.0%), morning seed (5.4%) among others. This implies that among the plant products used as CAM by the pregnant women in Ogbia clans, bitter kola, herbal tea and unripe fruits are the three most frequently used CAM.

Table 1 Distribution of Respondents by Socio-Demographic Variables and Use of CAM (n = 325)

Demographic Variables	Currently using of CAM		X^2	DF	P-Value
	Yes (n=286, %=88.0)	No (n=29, % = 12.0)			
Linguistic Sub-groups					
Oloibiri	82(25.8%)	7(2.2%)			
Agholo (Kolo)	51(15.7%)	5(1.5%)			
Anyama	98(30.2%)	26(8.0%)	16.97	4	0.002
Abureni	26(8.0%)	0(0.0%)			
Kugbo	27(8.3%)	1(0.3%)			
Age					
15-19	17(5.2%)	0(0.0%)			
20-24	40 (12.3%)	2(0.6%)			
25-29	74(22.8%)	0(0.0%)			
30-34	94(28.9%)	14(4.3%)	50.83	5	0.000
35-39	42(12.9%)	23(7.1%)			
40-44	19(5.8%)	0(0.0)			
Marital Status					
Ever Married	156(48.0%)	10(3.1%)			
Never Married	27(8.3%)	0(0.0%)			
Divorced/Sep.	20(6.2%)	4(1.2%)	22.50	3	0.000
Cohabiting	83(25.5%)	25(7.7%)			
Education					
No formal education	13(4.0%)	1(0.3%)			
Primary education	34(10.5%)	0(0.0%)			
Secondary education	145(44.6%)	28(8.6%)	10.96	4	0.027
Technical education	23(7.1%)	0(0.0%)			
Tertiary education	71(21.8%)	10(3.1%)			
Religion					
Christianity	267(82.2%)	38(11.7%)			
Islam	1(0.3%)	0(0.0%)	1.602	2	0.602
Traditional Religion	18(5.5%)	1(0.3%)			
Types of family					
Monogamous	224(68.9%)	38(11.8%)			
polygamous	41(12.6%)	0(0.0%)	8.30	2	0.016
Single parenthood	21(6.5%)	1(0.3%)			
Average Income Per Month					
< ₦ 5,000	58(17.8%)	0(0.0%)			
₦ 5,000 - ₦ 15,999	96(29.5%)	11(3.4%)			
₦ 16,000 - ₦ 25,999	55(16.9)	2(0.6%)			
₦26,000 - ₦ 35,999	31(9.5%)	0(0.0%)	55.97	4	0.000
₦36,000 and above	46(14.2%)	26(8.0%)			
Number of times pregnant					
1	103(31.7%)	2(0.6%)			
2	37(11.4%)	26(8.0%)			
3	38(11.7%)	2(0.6%)			0.000
4	69(21.2%)	0(0.0%)	74.58	4	
5and above	39(12.0%)	9(2.8%)			

Another aspect of CAM identified by the respondents is animal products. Figure 2 indicates the percentage distribution of respondents by animal products used as CAM. As the figure revealed, more than half of the respondents used other animal parts (54.3%) as CAM, which included animal fats, skin, and feathers. Additionally, twenty-four per cent of the respondents also signified that they used 'honey' as CAM, while 21.7% of the respondents said they used animal bones as CAM. When the respondents were asked what they use the CAM mentioned to cure, honey was described as useful to ease the delivery of new-borns and the treatment of cough during pregnancy, while animal bones were used to make the baby bones stronger.

When the participants were asked the most commonly used animal products during pregnancy and their uses, only honey was mentioned by a participant from Otuokpoti (Anyama clan) as animal product. And this is used regularly in order to ease the delivery of the baby. Alternative medicine use was also identified by the respondents to be very useful for the development of foetus and the health of the mother during pregnancy. When respondents were asked the alternative medicine used during pregnancy in their respective clans, figure 4.3 shows the percentage distribution of respondents by alternative medicine used. As the figure revealed, three out of every five pregnant women used massaging (64.0%), closely followed by one out of every four pregnant women using traditional birth attendance (26.3%), as well as 8.3% of the respondents indicating the use of bone setting. As they stated the significance of its uses, it was stated the use of massaging ranged from 'to relieve pains', 'position the baby appropriately', 'relieve stresses to 'knowing whether the baby is

stabilized or not. This is indicative that massaging during pregnancy among the study population is significantly important.

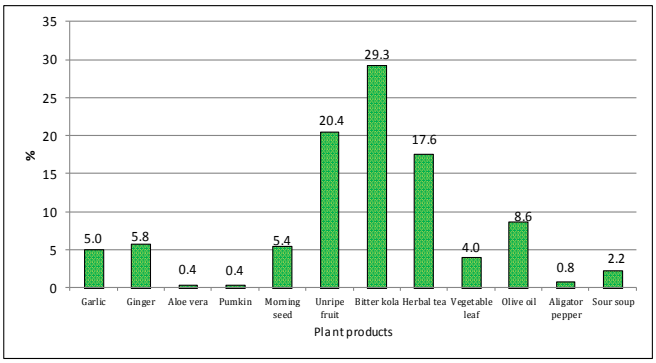

Figure 1 Percentage distribution of respondents by plant products used as CAM (n=325).

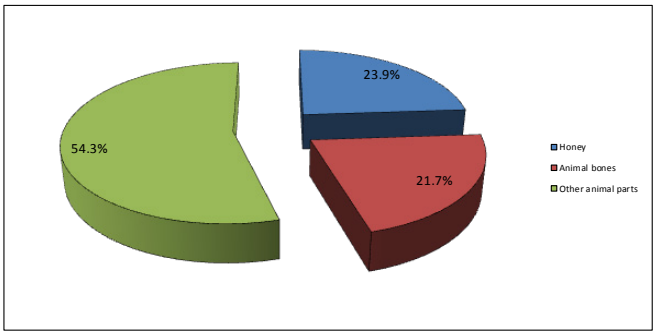

Figure 2 Percentage distribution of respondents by animal products used as CAM (n=325).

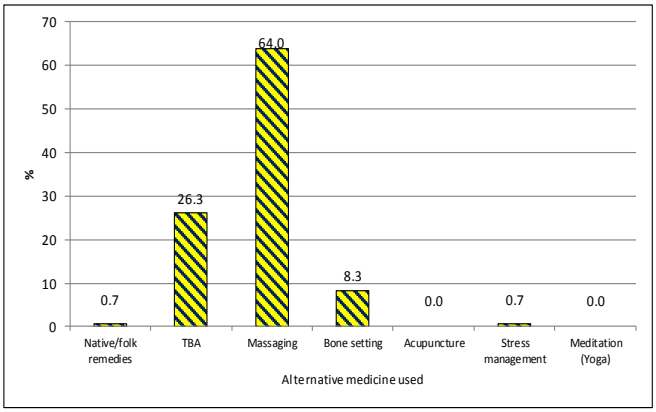

Figure 3 Percentage distribution of respondents by alternative medicine used (n=325).

Similarly, the existing literature has shown that spiritual healing is commonly used as CAM for the treatment of diseases or health disorder. As Figure 4 shows, while nine out of every ten women used 'faith prayer' as a form of CAM during pregnancy, 8.9% of the respondents signified that they used 'vision' as CAM during pregnancy. This also means that spiritual healing is generally critical for pregnant women in Ogbia clans. Elucidating the spiritual healing as CAM used by the respondents, many of the participants illustrated that faith prayers offered by pastors when in pregnancy are important to fight spiritual attacks during pregnancy.

Further analysis revealed that there are patterns of CAM use among the study population. Indeed, the patterns of CAM used are significantly associated with clans, which ranged from number of pregnancies CAMs are used, stage of pregnancy CAM are used to CAM usage patterns. As Table 2 revealed, there is significant association between number of pregnancies CAMs are used and all sub-clans in Ogbia (X^2=79.817, p<0.01). All respondents from the sub-clans except Abureni clan seem to have higher proportions of CAM use when they have had three or more pregnancies. In other words, as the number of pregnancies increases, the more likely respondents use CAM (Table 2).

Furthermore, there is significant association between stage of pregnancy CAMs are used and sub-clans in Ogbia (X^2=54.108, p<0.01). More than half of all sub-clans used CAM at the first trimester of their pregnancies, while the proportions of usage by sub-clans decrease as the stage of pregnancy advances. For example, while 84.6% of Abureni sub-clans respondents (being the highest percentage of users) used CAM at the first trimester of their pregnancies, closely followed by 77.3% of Kugbo respondents, the use of CAM decreased drastically to 0.0% and 4.5% at the third trimesters respectively among the two sub-clans. This suggests that respondents were more likely to use CAM at the early stage of pregnancies than the later stage of pregnancies.

There is significant association between CAM usage patterns and sub-clans (X^2=150.141, p<0.01). While most respondents in Agholo sub-clan (64.6%) always used CAM, followed by 47.6% of respondents from Oloibiri sub-clan, respondents from Abureni sub-clan (100.0%) did not have regular patterns of CAM usage. This is suggestive that while most respondents used CAM in the clans, the specific patterns in terms of dosage and timing of its usage were not given much considerable attention as the case may be in orthodox medicine where timing and quantities of dosages are allotted to patients by health professionals.

The reasons for the use of CAM were examined in this study. Figure 5 reports percentage distribution of respondents by the reasons for using CAM. The highest percentage of the respondents signified that they used CAM 'to relieve morning sickness during pregnancies' (48.9%), followed by 20.9% of the respondents who said they used it 'to ward off evil spirit and people from the unborn child, as well as 'weight reduction of the child' (15.4%). This implies that most respondents found the use of CAM as more effective methods for the prevention of morning sickness, warding off evil spirit and baby weight reduction during pregnancy when compared to other medical help options.

A multiple regression analysis showing the relationship between clans, stage of pregnancy, patterns of CAM use and extent of CAM use

The need to have a comprehensive look at the extent of CAM use by pregnant women was necessitated in this study. This is needed because there could be a number of explanatory variables that could influence the extent of CAM use among pregnant women. As such, a multiple regression was used to predict the influence of sub-group membership, stages of pregnancies CAM are used, CAM usage patterns, and socio-demographic variables of the respondents on the extent of CAM use as shown by Table 3 with models I, II, III and IV. At model I however, there is no significant relationship

between the predictor variable (sub-clan) and the dependent variable (R=0.006, R^2=0.000, $F_{(1, 248)}$= 0.006, Adj. R^2=-0.004, p>0.05), while at the inclusion of the stage of pregnancy at model II, there is joint significant relationship between predictor and dependent variables (R = 0.219, R^2= 0.050, $F_{(2, 247)}$=6.577, Adj. R^2 =0.043, p<0.05). While sub-clan group did not independently influence the extent of CAM use, stage of pregnancies independently determines the extent of CAM use by 23.3%. This suggests that an increase in the stage of pregnancy decreases the extent to which pregnant women use CAM by 23.3%.

Table 2 Distribution of Respondents by CAM use Patterns

	Clans (%)						
Variables	**Oloibiri (*n=91*)**	**Agholo (Kolo) (*n=56*)**	**Anyama (*n=124*)**	**Abureni (*n=26*)**	**Kugbo (*n=28*)**	**X^2**	**p-value**
No. of pregnancies CAM are used							
None	10 (11.0)	8 (14.3)	54 (43.5)	22 (84.6)	7 (25.0)	79.817	0.000
One	34 (37.4)	11 (19.6)	25 (20.2)	0 (0.0)	6 (21.0)		
Two	13 (14.3)	8 (14.3)	10 (8.1)	2 (7.7)	1 (3.6)		
Three and above	34 (37.4)	29 (51.8)	35 (28.2)	2 (7.7)	14 (50.0)		
Stage of pregnancy CAM are used							
Before pregnancy	2 (3.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	54.108	0.000
1st trimester	36 (57.1)	31 (64.6)	75 (76.5)	22 (84.6)	17 (77.3)		
2nd trimester	14 (22.2)	10 (20.8)	5 (5.1)	0 (0.0)	4 (18.2)		
3rd trimester	9 (14.3)	7 (14.6)	18 (18.4)	0 (0.0)	1 (4.5)		
After pregnancy	2 (3.2)	0 (0.0)	0 (0.0)	4 (15.4)	0 (0.0)		
CAM usage patterns							
No regular pattern of usage	12 (19.0)	8 (16.7)	9 (9.2)	26 (100.0)	6 (25.0)	150.141	0.000
One at a time	21 (33.3)	8 (16.7)	69 (70.4)	0 (0.0)	9 (37.5)		
Two or more at a time	0 (0.0)	1 (2.1)	0 (0.0)	0 (0.0)	1 (4.2)		
All at a time	30 (47.6)	31 (64.6)	20 (20.4)	0 (0.0)	8 (33.3)		

n=325
df=degree of freedom
Significant at p<0.05
X^2=chi square
%=percentage
no. represents number

Table 3 Multiple regression analysis showing the relationship between clans, stage of pregnancy, and patterns of CAM use

Model	**Predictor variables**	**F-Ratio**	**Sig. of P**	**R**	**R^2**	**Adj. R^2**	**β**	**T**	**P-value**
I	Sub-group in Ogbia	0.006	0.925	0.006	0.000	-0.004	- .004	-.094	.925
II	Sub-group in Ogbia	6.577	0.002	0.224	0.050	0.043	-.017	-.401	.688
	Stage of pregnancy						-.233	-3.625	.000
III	Sub-group in Ogbia	33.138	0.000	0.536	0.287	0.278	.089	2.267	.024
	Stage of pregnancy						-.131	-2.306	.022
	Patterns of CAM use						.366	9.054	.000
IV	Sub-group in Ogbia	14.013	0.000	0.626	0.392	0.364	.069	1.755	.081
	Stage of pregnancy						-.166	-2.715	.007
	Patterns of CAM use						.266	5.581	.000
	Age						-.025	-.683	.495
	Marital status						.041	1.617	.107
	Education						.085	1.974	.050
	Religion						-.048	-.544	.587
	Types of family						-.019	-.262	.794
	Occupation						-.152	-6.040	.000
	Average income						-.011	-.302	.763
	Household status						-.128	-1.216	.225

*Significant at p≤0.05.

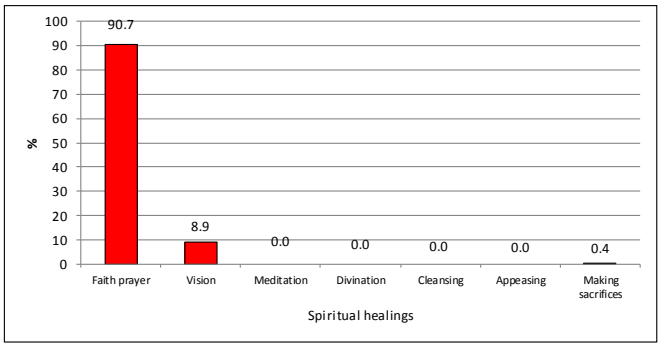

Figure 4 Percentage distribution of respondents by spiritual healing (n=325).

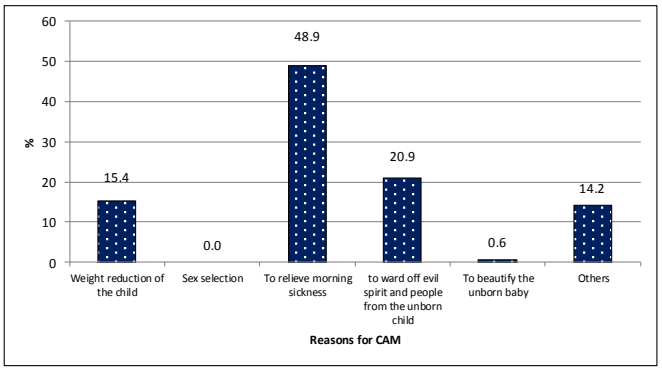

Figure 5 Percentage distribution of respondents by the reasons for using CAM.

Moreover, with the inclusion of CAM usage patterns at model III, there is joint significant relationship between predictor and dependent variables (R =0.536, R^2=0.287, $F_{(3, 246)}$=33.138, Adj. R^2 =0.278, p<0.05). Sub-group in Ogbia predicted the extent of CAM by 8.9%, stage of pregnancy influences the extent of CAM use by 13.1% and patterns of CAM use by 36.6%. This is indicative that while sub-group membership and patterns of CAM usage positively influenced the extent of CAM use by pregnant women at this model, stage of pregnancy had negative relationship between the dependent variable (Table 3).

At model IV, the socio-demographic variables of the respondents were included. There is joint significant influence of the predictor variables on the dependent variables (R = 0.626, R^2= 0.392, $F_{(11, 236)}$=14.013, Adj. R^2 = 0.364, p<0.05). While sub-group in Ogbia, stage of pregnancy, age, marital status, religion, types of family, average income, and household did not independently influence the extent of CAM use, patterns of CAM use predicted the dependent variable by 26.6%, education by 8.5%, and occupation by 15.2%. In fact, an improvement in occupation of a pregnant woman has a decreasing effect on the extent of CAM use due to the fact that most occupation in formal sectors provide healthcare services for their employees at a discount rate as mostly provided from the orthodox medicine practitioners when compared to those without formal employment.

Discussion of findings

Findings from this study revealed a very high percentage of CAM use among pregnant women (88%). However, this contrast with the study of Singh, Raidoo & Harries[7] among the Indians in South-Africa, whose study showed a very low prevalence CAM use rate (38.5%). Nonetheless, findings from this study is similar to that of Onyiapat et al.,[17] and Mbada et al.,[19] studies where they found a very high prevalence of CAM use; 84.7% and 96.8% respectively. Findings from this study revealed the use of CAM to be most common among people aged 30-34. The study indicates a significant relationship between age and the use of CAM with an increase in the use of CAM for younger age groups and a decrease in the use of CAM for older age groups. This finding is similar to that of Okoronkwo, et.al.,[18] where they found the use of CAM to be more prevalent among the age range of 34–41 to be 22.3%, and the study of Onyiapat et al.,[17] whose study also indicated CAM use was highest among those aged 25 – 34 (48.2%). Both studies also indicated that an increase in the use of CAM among younger age groups and a decrease in the use of CAM among older age groups.

Pregnant women who are married were discovered in this study to be the highest users of CAM with 48% of them using CAM. This finding also indicated a significant relationship between the use of CAM and marital status with an increase in the use of CAM among married individuals and a decrease among single or cohabiting individuals. This is similar to the study of Onyiapat et al.,[17] that found a high prevalence of CAM use (59.7%) among married individuals. Also, the study of Okoronkwo et al.,[18] was also alike with a high prevalence rate of CAM use (59.7%) among married individuals. The findings of this study indicate that level of education plays a significant role in the use of CAM. Those with secondary education had 44.6% who made use of CAM. This differs from, Onyiapat et al.,[17] and Okoronkwo et al.,[18] studies that found a high prevalence of CAM use (58.5%) among individuals with tertiary education, and 36.5% among individuals with secondary education.

The study found no relationship between religion and CAM use. However, the Christian religion, had a very high CAM use rate of 82.2%. This finding is not much different from the studies of Onyiapat et al.,[17] and Okoronkwo et al.,[18] who both found a high prevalence of 99.3% CAM use rate among Christians. Additionally, findings from this study revealed that CAM use is highest among women in monogamous marriages (68.9%). This finding is a little bit different from that of Kaadaaga et al.,[20] where they found herbal medicine use among women in monogamous marriages to be 56.6% and those in polygamous marriages also high at 43.4%. In this study, it was found out that CAM use was highest among those who were pregnant for the first time (31.7%) and those with their fourth pregnancy (21.2%). These figures are quite different compared to Hillary[21] study on "Utilization of herbal medicine during pregnancy, labour and post-partum period among women at Embu provincial general hospital" which discovered a high prevalence rate of 62.2% for women with 1-3 children, 69.7% for women with 4-7 children, 83.8% for women with 8-10 children and 100% for women with above 10 children. However, Laelago et al.,[22] study took a different twist when it discovered on its own part a high prevalence rate of 76.1% of herbal use among women with 1-2 children, 18.3% among women with 3-4 children and 5.6% among women with above four children (Table 1 below for the summaries of CAM use by socio-demographic profiles of pregnant women in other studies). This study also revealed that the most commonly used plant products were bitter kola (29.3%), closely followed by unripe fruits (20.4%). Also, the study discovered that, more than half of the respondents used other animal parts (54.3%) as CAM, which included animal fats, skin, and feathers. These findings are quite similar to the studies of Hillary[21] Laelago et al.,[22] Okoronkwo et al.,[18] and Onyiapat et al.,[17] that all identified Biological products such as Ginger, garlic, oil, raspberry, animal skins, honey etc

as the most used CAM. Onyiapat et al.,[17] and Okoronkwo et al.,[18] both recorded a prevalence rate of 56.0% for biological products, while Laelago et al.,[22] recorded 69.8% prevalence rate for garlic, and 55.8% prevalence rate for ginger as the most used CAM.

The study also discovered Massage as the most common Alternative therapy with a prevalence rate of 64.0%, Faith prayer as the most used Spiritual therapy, with a prevalence rate of 90.7% and Honey as one of the most used animal products with a prevalence rate of 23.9%. These findings are similar to that of Onyiapat et al.,[17] that also recorded a high prevalence rate of 56% for honey as one of the most use animal product, 49.4% prevalence for Faith prayer as one of the most used Spiritual therapy and 22% prevalence rate for massage as the most use alternative therapy. The study discovered a high prevalence rate of CAM use among women in all the five clans studied during their 1st trimester of pregnancy. These findings are quite different from that of Adawi which discovered a prevalence rate of CAM use of 7.5% during the 1st trimester, 20.0% during the 2nd trimester and 35.8% during the 3rd trimester. Unlike the findings of this study, the study by Adawi found a high prevalence CAM use rate among women during the 2nd and 3rd trimester. Nonetheless, findings from this study correlates with that of Hashim et al.,[23] which discovered a high prevalent rate of 67.5% during the 1st trimester and a prevalent rate of 37.7% during the 2nd trimester. Another study whose findings are similar to this research is the study by Khadivzadeh etal.,[24] in which a prevalence CAM use rate of 64.3% during the 1st trimester, 28.9% during the 2nd trimester and a CAM use rate of 5.4% during the 3rd trimester was recorded. Both studies agree with the findings of this research that CAM use rate is highest during the 1st trimester. The reasons for the use of CAM were examined in this study and to "relieve morning sickness during pregnancies" was the highest reason (48.9%). This result is quite different from that of Sawalha[25] where they discovered that "Abdominal pain" was the highest reason for the use of CAM among pregnant women (36.0%). However, the finding of this study is similar to that of Orief et al.,[26] which discovered abdominal colic and Nausea/vomiting as the highest reasons for the use of CAM (47.6%) and (28.0%) respectively. It is also similar to the study of Al-Riyami et al.,[27] who discovered "Flu and cold" as the highest reason for CAM use.

Conclusion and recommendations

Based on the findings from the study, the following conclusions can be made; Firstly, the general use of CAM among pregnant women in the area of study is very high with plant products (e.g. bitter kola, unripe fruits, and herbal tear) animal products (Animal bones and Honey), alternative medicine (massaging) and spiritual therapy (faith prayer) being the major CAM used. Also, socio-demographic characteristics of pregnant except religion significantly influence the CAM use. In other words, pregnant women's demographic profile dictates whether to use CAM or not. Still, CAM usage is highest during the 1st trimester of pregnancy, and is used in relieving morning sicknesses which include; vomiting, nauseating etc. Given the findings of this study, it is recommended firstly that; there is need for investigating the safety of these products. Given sparse data on efficacy, even small risks might well outweigh benefits. Secondly, since the use of CAM have come to stay, there is the need to for Health care providers to integrate it into modern medical practice and have guidelines for the usage of CAM during pregnancy. Again, health education program should be directed toward pregnant women to increase their awareness about the effects of CAM and the importance of consultation physicians before taking any types of CAM during pregnancy, since many of these CAM remedies are self-prescribed based on the woman's own information or belief.

Still, there is a great need for community stakeholders, relatives of especially young pregnant women, and women in the area of study to be sensitized on the need to rely less on CAM and rely more on conventional medicine by the Governmental and Non-Governmental agencies charged with the responsibility of ensuring the reduction of maternal and child mortality in the country. This is because most pregnant women strongly belief in the efficacy of the use of CAM even with the many flaws that have been identified by studies.

In addition, operations of TBA centres which modern medicine have come to recognise as being very useful, should be regulated and closely monitored by health services departments of the government in line with global best practices. This will go a long way in ensuring women who prefer the use of TBAs are given health care that are not detrimental. Finally, the available health centres must be well-equipped with adequate maternal health facilities and manpower which is clearly lacking especially in the rural areas. This has left pregnant women with no choice but to look for an alternative source of health care.

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Conflicts of interest

The authors declare that there are no conflicts of interest.

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