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Perceptions of Safety and Factors Influencing the Use of Complementary and Alternative Medicine among Surgical Outpatients at LAUTECH Teaching Hospital, Ogbomoso, Nigeria

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ABSTRACT

Complementary and alternative medicine (CAM) has emerged as people seek additional ways to alleviate pain and manage illnesses. Its usage is increasing among populations worldwide, including in both developed and developing countries, and notably among surgical patients. Understanding the perceived adverse effects, safety perceptions, and factors influencing CAM use is essential to inform advocacy for proper regulation. A cross-sectional study was conducted among surgical outpatients at a tertiary hospital. A total of 150 patients, aged 18 to 85 years, were recruited. Data were collected through an interviewer-administered questionnaire and analyzed using SPSS version 22.

Among respondents, the lifetime prevalence of CAM use was 76%, while the current (point) prevalence was 37.3%. CAM was used for surgical complaints by 30.4% of current users. Biological-based therapies accounted for 110 (72%) of CAM usage, with unbranded herbal products representing over two-thirds of these therapies. Approximately one-third of patients (46, 30.7%) considered CAM to be safe, while 62 (41.3%) were uncertain about its safety. Only 15 (13.2%) and 6 (5.3%) of participants reported experiencing side effects and drug interactions, respectively. Factors associated with CAM use included older age, monthly income below 10,000 Naira, positive safety perception, and beliefs regarding CAM. CAM usage among surgical outpatients is notably high. Key factors influencing its use include patient age, perception of safety, and income level.

Keywords: Surgery outpatients, Homeopathic medicine, Complementary and alternative medicine, Perception of safety

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Introduction

The use of complementary and alternative medicine (CAM) originates from humans' pursuit of additional ways to alleviate pain and manage illnesses, influenced by their beliefs, values, and cultural backgrounds [1]. CAM encompasses a broad spectrum of practices and products used for medical or surgical conditions that are not considered part of conventional medicine [2]. It can be categorized into complementary medicine—used alongside conventional medical treatment—and alternative medicine, which is employed in place of conventional care [3]. Thus, CAM may function as either a complementary or alternative therapy, depending on whether it is used in conjunction with standard medical treatments. Examples of CAM therapies include traditional medicine, herbal remedies, acupuncture, and bone-setting practices.

Globally, CAM use is increasing in both developed and developing nations. It is commonly applied for conditions such as fever, headache, musculoskeletal pain, and insomnia [4], with worldwide prevalence estimates ranging from 30% to 75% [5]. In Nigeria, higher prevalence rates have been documented in the North Western (84%) [6] and South Western (90%) regions [7]. Across Africa, CAM includes local herbal remedies, indigenous healthcare

practices like traditional bone setting, and imported modalities such as acupuncture and chiropractic care [8]. In Nigeria, traditional herbal treatments remain widely practiced and accessible [9].

Many CAM users employ these therapies as adjuncts to conventional medicine for disease prevention [10]. Additional motivations include lower cost, attention to individual patient needs, and cultural alignment, which are features often lacking in orthodox medicine [11]. Determinants of CAM use vary across regions and populations, encompassing factors such as age, educational attainment, disease prognosis, and income level. In developed countries, CAM use is more prevalent among women of higher socioeconomic status, young and middle-aged adults, and individuals with higher education [9], while determinants in developing nations are more diverse.

Surgical patients utilize CAM for a variety of reasons, ranging from non-life-threatening conditions to serious illnesses such as cancer [12]. Research indicates that surgical patients are more likely to use herbal medications than the general population, particularly during the peri-operative period [13]. Studies report peri-operative herbal medicine usage rates of 22%, 32%, and 30% among different surgical populations [14]. Herbal medications can significantly affect peri-operative care by interacting with anesthetic agents, potentially causing morbidity and mortality [15]. Concerns have also been raised regarding other CAM modalities due to side effects and drug interactions [12], with documented complications including excessive bleeding, stroke, and prolonged anesthesia [13].

Patient disclosure of CAM use is an important consideration. Kaye *et al*. [16] found that 70% of patients did not report their use of herbal medicines. Reasons for non-disclosure, as noted by Ang-Lee *et al*. [13], include anticipated physician disapproval, fear of consequences, or use of CAM for non-medical purposes. Conversely, patients who discuss their CAM use and health beliefs with surgeons often show better adherence to peri-operative instructions [12].

Physicians' attitudes toward CAM often highlight concerns regarding efficacy, safety, and lack of regulatory oversight. Understanding the frequency and nature of CAM-related adverse effects is critical to inform policy and regulation, ensuring safe and effective use [17]. Currently, studies on CAM usage and safety perception among surgical patients, particularly those with non-malignant conditions in Nigeria, are limited. This study aims to determine the prevalence of CAM use among surgical outpatients, assess patients' perceptions of safety, evaluate reported side effects and experiences with CAM–conventional drug interactions, and identify factors influencing CAM utilization. The focus on surgical patients is essential, as this population may face serious adverse outcomes from interactions between CAM and conventional treatments.

Materials and Methods

Setting/study population

This investigation was conducted among Surgery Outpatients—specifically those attending Orthopaedic and Trauma, Plastic Surgery, General Surgery, and Urology clinics—at LAUTECH Teaching Hospital in Ogbomoso, Oyo State, Nigeria. Eligible participants were adult patients aged 18–85 years.

Study design/sampling

A cross-sectional design was employed, using a systematic approach to recruit participants between March 31 and June 30, 2021. Patient registers from the four surgical units (Urology, General Surgery, Orthopaedic Surgery, and Plastic Surgery) were reviewed to determine the weekly outpatient volume for each unit. Based on the calculated sample size, proportional allocation was applied to estimate the number of respondents required from each unit. On each clinic day, the first patient attended to by the consultant was selected, and subsequently, every fifth patient was included until the allocated number for that unit was achieved. Adults aged 18–85 years presenting with surgical conditions such as benign prostatic hyperplasia, breast malignancy, thyroid enlargement, chronic ulcers, or osteoarthritis, and who provided informed consent, were enrolled. Individuals with cognitive deficits or documented psychiatric disorders were excluded.

Variables of interest

The principal outcome variable was the utilization of complementary and alternative medicine (CAM). Key independent variables included participants' beliefs regarding CAM, their perceived safety of CAM, and any reported adverse effects. Analyses primarily contrasted current CAM users with non-users, although certain comparisons involved individuals who had ever used CAM versus those who had never used it.

Sample size calculation

Leslie Fischer formula

The sample size was determined using the Leslie Fischer formula:

$$n = z^2pq / d^2 \quad (1)$$

where:

- z = 1.96 (95% confidence level)
- p = estimated prevalence of CAM use (90%) [17]
- q = 1 – p
- d = allowable error (0.05)

The computed value was 138, and with an additional 10% allowance for non-response, the final sample size was adjusted to 150.

Questionnaire

Data collection was conducted using an interviewer-administered instrument designed by the researcher based on similar published surveys. The tool consisted of five sections: sociodemographic information, CAM modalities used, usage patterns, beliefs about CAM, and safety-related perceptions. Except for two closed-ended items, all questions were open-ended. A pilot test involving 15 patients at the General Outpatient Clinic was carried out to refine the instrument. Questionnaires were completed anonymously after clarifying the definition of CAM to each respondent. To minimize interviewer bias, data collection was performed by personnel not involved in the clinical management of patients in the respective units.

Ethical consideration

Approval was granted by the hospital's Ethical Review Committee. Written informed consent was secured from all participants after the study objectives were explained in English or the local language. Participation was voluntary, and confidentiality and anonymity were emphasized.

Data analysis

IBM SPSS version 22 was used for statistical analysis. Categorical variables were summarized using frequencies and percentages. Chi-square tests were employed for comparisons of categorical data, and a multinomial regression model was used to identify predictive factors. The significance level was set at 0.05.

Results and Discussion

A total of 160 patients were initially selected, but 150 completed the study. Ten patients were excluded: eight declined consent, and two had dementia **(Figure 1)**.

The majority of participants were aged 41–60 years (50, 33.3%), followed by 21–40 years (44, 29.3%), with a mean age of 48.93 ± 18.98 years. Males accounted for 81 (54%), and 106 (70.7%) were married. Nearly all participants were of Yoruba ethnicity (147, 98.0%). Educationally, 73 (48.7%) had tertiary education, while 10 (6.7%) had no formal education. Fifty-six participants (37.3%) were skilled workers, and 37 (24.7%) were unemployed. Monthly income ranged from 10,000–50,000 Naira for 60 participants (40%) and above 100,000 Naira for 19 participants (12.7%) **(Table 1)**.

The lifetime prevalence of CAM use was 76%, and the current (point) prevalence was 37.3% **(Table 2)**. Biological-based therapies constituted the majority of CAM use (51, 91.1%), with unbranded herbal products representing over two-thirds (48, 85.7%). Other CAM types included spiritual therapy (43, 76.8%), manipulative/body-based therapy (18, 32.1%), mind-body therapy (12, 21.4%), and whole-body therapy (2, 3.6%) **(Table 3)**.

Acute infections (e.g., febrile illnesses, upper respiratory infections, acute diarrhea) were the most common indications for CAM use (16, 28.6%). Positive personal experience was the primary reason for CAM use (24, 42.9%), followed by the search for effective disease treatment (13, 23.2%) **(Table 4)**.

Among current CAM users, 17 (30.4%) used CAM for surgical complaints, while 39 (69.6%) used it for non-surgical complaints. Most current users (43, 76.7%) combined CAM with orthodox medicine. CAM was most

commonly used either daily (15, 26.8%) or monthly (15, 26.8%), with oral administration being the predominant route (50, 74.6%) **(Table 5)**.

Regarding safety perception, 46 participants (30.7%) considered CAM safe, while 62 (41.3%) were unsure. The main safety concern was the absence of standardized dosing (45, 30%). Among CAM users, 15 (13.2%) reported side effects, and 6 (5.3%) experienced drug interactions, with nearly half of side effects being non-specific (10, 43.5%), followed by generalized body discomfort (4, 17.4%) **(Table 6)**.

Predictors of CAM use were analyzed using a multinomial regression model with forward stepwise selection (entry $p = 0.05$, removal $p = 0.1$). Older age was associated with higher likelihood of ever using CAM. Participants earning <10,000 Naira and 50,000–100,000 Naira were 8.074 and 4.753 times more likely, respectively, to have ever used CAM compared to those earning >100,000 Naira. Patients perceiving CAM as safe were 10.233 times more likely to have ever used it and 3.111 times more likely to be current users than those perceiving it as unsafe **(Table 9)**.

Bivariate analysis using Chi-square tests indicated that age, marital status, monthly income, and safety perception were significantly associated with ever using CAM **(Table 7)**. For current CAM use, only safety perception was significantly associated. Most patient beliefs about CAM were significantly linked to current CAM use, except for the beliefs that CAM is healthier than conventional medicine, more effective than orthodox medicine, or more likely used by those with lower income **(Table 8)**.

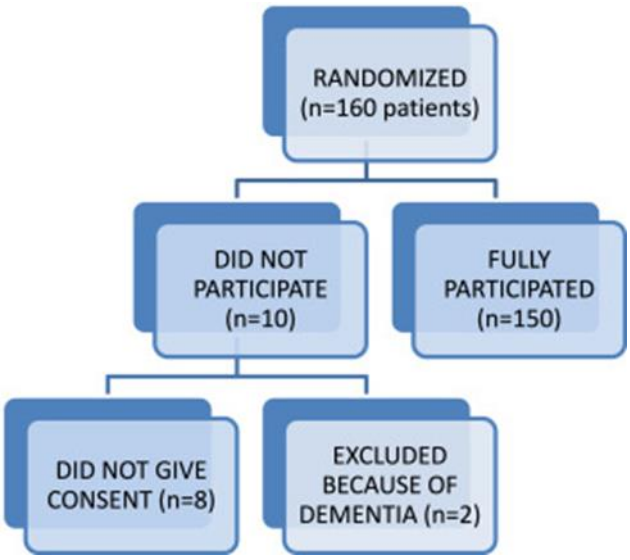

Figure 1. Flow diagram illustrating patient selection, randomization, and participation in the study.

Table 1. Sociodemographic Characteristics of Study Participants (N = 150)

Variable	Frequency	Percentage (%)
Age (years)		
<20	9	6.0
21–40	44	29.3
41–60	50	33.3
61–80	39	26.0
>80	8	5.3
Sex		
Male	81	54.0
Female	69	46.0
Marital Status		
Single	36	24.0
Married	106	70.7

Divorced	2	1.3
Widow/Widower	6	4.0
Ethnicity/Tribe		
Yoruba	147	98.0
Igbo	2	1.3
Other	1	0.7
Religion		
Christianity	103	68.7
Islam	45	30.0
Traditionalist	2	1.3
Education Level		
No formal education	10	6.7
Primary	24	16.0
Secondary	43	28.7
Tertiary	73	48.7
Occupation		
Unemployed	37	24.7
Unskilled	30	20.0
Semi-skilled	27	18.0
Skilled	56	37.3
Monthly Income (Naira)		
<10,000	39	26.0
10,000–50,000	60	40.0
50,001–100,000	32	21.3
>100,000	19	12.7

Table 2. Prevalence of CAM Use among Participants (Lifetime and Current Use, N = 150)

CAM Use Category	Frequency	Percentage (%)
Lifetime Exposure (Ever Used CAM)		
Used CAM at least once	114	76.0
Never used CAM	36	24.0
Current Utilization (Point Prevalence)		
Actively using CAM at the time of the study	56	37.3
Not using CAM currently	94	62.7

Table 3. Types of CAM Currently Used Among Participants (N = 56)
Multiple responses allowed

Type of CAM	Frequency	Percentage (%)
Biologically-Based Therapies	51	91.1
Unbranded Herbal Products	48	85.7
High-Dose Vitamins	5	8.9
“Kedi” Products	5	8.9
Medicinal Teas	10	17.9

"Forever Living" Products	4	7.1
GNLD Products	2	3.6
Other Chinese Products	2	3.6
Urine Therapy	3	5.4
Spiritual Therapies	43	76.8
Anointing Oil	30	53.6
Prayer	34	60.7
Holy Water	18	32.1
Divination & Incantation	3	5.4
Whole-Body Therapy	2	3.6
Acupuncture	1	1.8
Spinal Manipulation	1	1.8
Mind-Body Therapies	12	21.4
Meditation	4	7.1
Faith Healing	10	17.9
Manipulative/Body-Based Therapies	18	32.1
Massage	10	17.9
Scarification	7	12.5
Bloodletting	1	1.8

Table 4. Indications for and Reasons Behind Current CAM Use (N = 114)

Variable	Frequency	Percentage (%)
Symptoms/Conditions for CAM Use		
Acute Infections	16	28.6
Infertility / Hemorrhoids	11	19.6
Musculoskeletal Pain	9	16.1
Non-Specific Symptoms	7	12.5
Fractures / Limb Deformities	4	7.1
Prostate Cancer / BPH	3	5.4
Leg Ulcers / Osteomyelitis	3	5.4
Goiter	2	3.6
Breast Cancer	1	1.7
Reasons for Using CAM		
Perceived Limitations of Conventional Healthcare	11	19.6
Dissatisfaction with Pharmaceutical-Focused Conventional Care	2	3.6
Seeking Effective Disease Treatment	13	23.2
Positive Personal Experience with CAM	24	42.9
Other Reasons	6	10.7

Table 5. Patterns and Practices of Current CAM Use (N = 56)
Multiple responses allowed for route of administration

Variable	Frequency	Percentage (%)
Type of Complaints Treated with CAM		

Surgical	17	30.4
Non-Surgical	39	69.6
Usage Pattern		
CAM Alone	13	23.2
CAM Combined with Conventional Medicine	43	76.7
Frequency of CAM Use		
Daily	15	26.8
Weekly	12	21.4
Monthly	15	26.8
Every Two Months	2	3.6
Annually	4	7.1
Less than Annually	6	10.7
Anytime as Needed	2	3.6
Route of Administration (N = 67)		
Oral	50	74.6
Topical / Skin Application	16	23.9
Ocular / Via Eyes	1	1.5

Table 6. Safety Perception, Concerns, and CAM Profile of Respondents (N = 150)
Multiple responses allowed where indicated

Variable	Frequency	Percentage (%)
Perception of CAM Safety		
Not Sure	62	41.3
Considered Safe	46	30.7
Considered Unsafe	42	28.0
Safety Concerns Regarding CAM (N = 187)		
Hygiene Issues	40	26.7
Potential Adverse Effects	34	22.7
Lack of Standardized Dosing	45	30.0
Unclear Product Labeling	24	16.0
No Specific Reason	44	29.3
Experience of Side Effects (N = 114)		
Yes	15	13.2
No	81	71.1
Not Sure	18	15.8
Experience of Drug Interactions with Conventional Medicine (N = 114)		
Yes	6	5.3
No	66	57.9
Not Sure	42	36.8
Type of Side Effects Experienced (N = 23)		
Non-Specific	10	43.5
Generalized Body Discomfort	4	17.4

Dizziness	3	13.0
Weakness	3	13.0
Diarrhea	2	8.7
Constipation	1	4.3

Table 7. Association between sociodemographic characteristics, safety perception and current CAM use.

Variables	Current CAM use		TOTAL	STATISTICS
	Yes	No		
Age (Years)				
<20	4 (7.1)	6 (6.4)	10 (6.7)	$X^2 = 0.857$ Df = 4 Pvalue = 0.931
21-40	16 (28.6)	28 (29.8)	44 (29.3)	
41-60	20 (35.7)	29 (30.9)	49 (32.7)	
61-80	14 (25.0)	25 (26.6)	39 (26.0)	
>80	2 (3.6)	6 (6.4)	8 (5.3)	
Sex				
Male	35 (62.5)	46 (48.9)	81 (54)	$X^2 = 2.599$ Df = 1 Pvalue = 0.107
Female	21 (37.5)	48 (51.1)	69 (46)	
Marital status				
Single	14 (25.0)	22 (23.4)	36 (24)	$X^2 = 1.653$ Df - 3 Pvalue = 0.647
Married	39 (69.6)	67 (71.3)	106 (70.7)	
Divorced/Separated	0 (0.0)	2 (2.1)	2 (1.3)	
Widow/Widower	3 (5.4)	3 (3.2)	6 (4.0)	
Tribe				
Yoruba	55 (98.2)	92 (97.9)	147 (98)	$X^2 = 2.870$ Df = 2 Pvalue = 0.238
Ibo	0 (0.0)	2 (2.1)	2 (1.3)	
Others	1 (1.8)	0 (0.0)	1 (0.7)	
Level of Education				
No formal education	8 (5.3)	2 (1.3)	10 (6.7)	$X^2 = 1.961$ Df = 1 Pvalue = 0.581
Primary	20 (13.3)	4 (2.7)	24 (16.0)	
Secondary	34 (22.7)	9 (6.0)	43 (28.7)	
Tertiary	52 (34.7)	21 (14)	73 (48.7)	
Religion				
Christianity	38 (67.9)	65 (69.1)	103 (68.7)	$X^2 = 1.337$ Df = 2 Pvalue = 0.921
Islam	18 (32.1)	27 (28.7)	45 (30)	
Traditionalist	0 (0.0)	2 (2.1)	2 (1.3)	
Average monthly income				
<10,000 naira	15 (26.8)	24 (25.5)	39 (26)	$X^2 = 0.993$ Df = 3 Pvalue = 0.803
10,000–50,000 naira	21 (37.5)	39 (41.5)	60 (40)	
51,000–100,000 naira	14 (25)	18 (19.1)	32 (21.3)	
>100,000 naira	6 (10.7)	13 (13.8)	19 (12.7)	
Safety perception				
Not sure	14 (25.0)	48 (51.1)	62 (41.3)	

Safe	28 (50.0)	18 (19.1)	46 (30.7)	$X^2 = 16.947$ Df = 2 Pvalue= <0.0001
Not safe	14 (25.0)	28 (29.8)	42 (28.0)	

Table 8. Association between belief about CAM and the current use of CAM.

Variables	Current CAM use		TOTAL	STATISTICS
	Yes	No		
Complementary and alternative medicine (CAM) is highly effective.				
Agree	44 (78.6)	40 (42.6)	84 (56)	$X^2 = 19.443$ Df = 2 Pvalue<0.0001
Indifferent	7 (12.5)	21 (22.3)	28 (18.7)	
Disagree	5 (8.9)	33 (35.1)	38 (25.3)	
CAM is associated with fewer side effects.				
Agree	34 (60.7)	31 (33.0)	65 (43.3)	$X^2 = 10.999$ Df = 2 Pvalue = 0.004
Indifferent	10 (17.9)	28 (29.8)	38 (25.3)	
Disagree	12 (21.4)	35 (37.2)	47 (31.3)	
The use of CAM is likely to rise if the government invests in its development.				
Agree	38 (67.9)	43 (45.7)	81 (54.0)	$X^2 = 6.918$ Df = 2 Pvalue = 0.03
Indifferent	14 (25.0)	39 (41.5)	53 (35.3)	
Disagree	4 (7.1)	12 (12.8)	16 (10.7)	
CAM is considered healthier compared to conventional medications.				
Agree	11 (19.6)	10 (10.6)	21 (14)	$X^2 = 5.150$ Df = 2 Pvalue = 0.076
Indifferent	23 (41.1)	30 (31.9)	53 (35.3)	
Disagree	22 (39.3)	54 (57.4)	76 (50.7)	
CAM boosts the body's natural defense mechanisms.				
Agree	37 (66.1)	31 (33.0)	68 (45.3)	$X^2 = 16.375$ Df = 2 Pvalue<0.0001
Indifferent	12 (21.4)	31 (33.0)	43 (28.7)	
Disagree	7 (12.5)	32 (34.0)	39 (26.0)	
CAM benefits physical, mental, and spiritual well-being.				
Agree	37 (66.1)	26 (27.7)	63 (42)	$X^2 = 23.163$ Df = 2 Pvalue<0.0001
Indifferent	14 (25.0)	36 (38.3)	50 (33.3)	
Disagree	5 (8.9)	32 (34.0)	37 (24.7)	
Greater knowledge of CAM leads to increased usage.				
Agree	45 (80.4)	41 (43.6)	86 (57.3)	$X^2 = 20.845$ Df = 2 Pvalue= <0.0001
Indifferent	9 (16.1)	30 (31.9)	39 (26.0)	
Disagree	2 (3.6)	23 (24.5)	25 (16.7)	
The more my friends use CAM, the more inclined I am to use it as well.				
Agree	18 (32.1)	2 (1.3)	28 (18.7)	$X^2 = 10.963$ Df = 2 Pvalue = 0.004
Indifferent	16 (28.6)	12 (8)	47 (31.3)	
Disagree	22 (39.3)	22 (14.7)	75 (50.0)	
CAM is considered more effective than conventional medicine.				
Agree	10 (17.9)	12 (12.8)	22 (14.7)	

Indifferent	24 (42.9)	30 (31.9)	54 (36.0)	$X^2 = 3.616$ Df = 2 Pvalue = 0.164
Disagree	22 (39.3)	52 (55.3)	74 (49.3)	
The greater the fear of conventional medicine, the more likely one is to use CAM.				
Agree	30 (53.6)	27 (28.7)	57 (38)	$X^2 = 10.143$ Df = 2 Pvalue = 0.006
Indifferent	12 (21.4)	39 (41.5)	51 (34)	
Disagree	14 (25.0)	28 (29.8)	42 (28)	
People with limited financial resources are more likely to use CAM.				
Agree	34 (60.7)	46 (48.9)	80 (53.3)	$X^2 = 2.002$ Df = 2 Pvalue = 0.368
Indifferent	9 (16.1)	21 (22.3)	30 (20.0)	
Disagree	13 (23.2)	27 (28.7)	40 (26.7)	

Significant values ($p < 0.05$).

Table 9. PEDICTORS of CAM use (ever used and current use).

EVER USED CAM			
MODEL VARIABLES	β	OR (95 % CI)	Df (p-value)
Age			
<20	−19.064	5.255E-9 (8.271E-10-3.339E-8)	1 (<0.0001)
21–40	−18.109	1.366E-8 (3.684E-9-5.062-E8)	1 (<0.0001)
41–60	−18.044	1.457E-8 (4.023E-9-5.278E-8)	1 (<0.0001)
61–80	−16.651	5.866E-8 (5.866E-8-5.866E-8)	1
>80 (ref)	0[b]		
Income			
<N 10,000	2.087	8.074 (1.793–36.353)	1 (0.007)
N10,000- N50,000	1.167	3.212 (0.882–11.695)	1 (0.077)
>N50,000- N100,000	1.559	4.753 (1.094–20.653)	1 (0.038)
>100,000 (ref)	0[b]		
Safety perception			
Not sure	0.496	1.642 (0.647–4.166)	1 (0.297)
Safe	2.326	10.233 (2.502–41.860)	1 (0.001)
Not safe (ref)	0[b]		
$X^2 = 35.375$, p-value<0.0001			
CURRENT CAM USE			
MODEL VARIABLE(S)	β	OR (95%CI)	Df (p-value)
Safety perception			
Not sure −0.539		0.583 (0.243–1.400)	1 (0.227)
Safe 1.135		3.111 (1.299–7.449)	1 (0.011)
Not safe (ref) 0[b]			
$X^2 = 16.931$, p-value<0.0001			

The utilization of CAM continues to rise, showing differences across various populations [9, 18, 19]. In the present study, nearly three-quarters of respondents reported having used CAM at some point, while approximately four in ten were currently engaging with at least one form of CAM. This prevalence is lower than that observed among hematology outpatients at Lagos University Teaching Hospital, where almost nine out of ten patients reported CAM use within the three months preceding the study [7]. Conversely, a cross-sectional survey conducted by

Onyiapat *et al*. across three local government areas in Enugu state found that 620 participants (87.4%) had used CAM at some stage [19]. Nevertheless, the rate observed here exceeds the previously documented CAM use among cancer patients at University Teaching Hospital (UNTH), Enugu [9], likely reflecting differences in the health conditions of the populations studied.

The types of CAM employed by respondents in this study align with those most frequently cited in the literature [9, 18, 19]. Herbal remedies are the predominant CAM modality in Nigeria, followed by spiritual practices such as faith healing and prayer [19]. In the current study, biological products, primarily herbal preparations, were the most commonly used for managing both surgical and non-surgical conditions. This observation is consistent with data from the United States, where herbal products are the leading form of CAM among elderly populations [20]. Spiritual therapies were the next most prevalent CAM approach among respondents, supporting findings by Singh *et al*. [18], who reported that herbal and spiritual interventions were the primary CAM methods among Indians living in South Africa. However, a study by Tor-Anyiin *et al*. among healthcare workers indicated that spiritual therapies were more frequently used than herbal products [21]. Within this study, unbranded herbal products constituted the majority of biological products utilized, although some respondents also reported using branded foreign products such as "Kedi," medicinal teas, "Forever Living Products," Golden Neo-Life Diamite (GNLD) items, and high-dose vitamins. The marketing of these products as natural herbs or nutritional supplements may explain their growing popularity among the Black population.

Surgical patients in this study predominantly used CAM for acute infections—such as febrile illnesses, upper respiratory tract infections, and acute diarrhea—alongside non-specific symptoms, infertility, piles, and musculoskeletal pain. Among current CAM users, 30.4% were utilizing CAM for surgical-related complaints, while the remainder used it for non-surgical issues. In comparison, Culha *et al*. [4] reported that pain (44.6%) was the primary indication for CAM use, followed by stress, sleep disturbances, and fatigue; only 8.7% used CAM for surgical problems, highlighting differences with the present findings.

Most current CAM users in this study consumed CAM products orally, with relatively few applying them topically. Usage frequency varied, with many using CAM daily or monthly, and a smaller proportion using it weekly. Notably, over three-quarters of the current users combined CAM with conventional medicine, while just over one-fifth relied solely on CAM. This combined usage rate exceeds that reported in another study, where only 40% of respondents used CAM alongside conventional treatments [22]. It is important to note that concurrent use of CAM and conventional medicine has been associated with unpredictable interactions and potential adverse effects [23, 24].

Approximately three-fifths of respondents in this study were uncertain about the safety of CAM, particularly regarding biological products; only about one-third considered them safe, while the remainder believed they were unsafe. This contrasts with the findings of Jimoh *et al*., who reported that 54% of respondents in Sokoto, North-western Nigeria, perceived CAM as safe and 29% were unsure [6]. The higher positive safety perception in Jimoh *et al*.'s study may be attributable to the more heterogeneous nature of the participants and the fact that they were not receiving treatment for surgical or medical conditions at the time. This perception could also be influenced by the common belief that CAM, being largely derived from natural sources, is inherently safe. Misconceptions regarding the potential risks of certain herbal products may further shape safety perceptions. Among respondents in the current study who had used CAM, slightly more than one-tenth reported experiencing side effects, and only 5.3% noted interactions with conventional drugs, whereas Jimoh *et al*. [6] documented a higher proportion of participants experiencing significant adverse effects.

In this study, CAM use was more common among older individuals, those earning less than 100,000 Naira per month, and participants who held positive beliefs about CAM and perceived it as safe. Conversely, Busari *et al*. [25] found that individuals with post-secondary education were less likely to use CAM compared to those with lower or no formal education, while Amira *et al*. [26] reported no association between CAM use and socio-demographic factors. Gender was not significantly linked to CAM use in this study, which differs from findings in some developed countries where women were more likely to use CAM [15, 27], though other Nigerian studies reported higher CAM use among men [17, 19, 22].

Limitations

Potential interviewer bias was addressed by employing personnel who were not directly involved in patient care to administer questionnaires. Another limitation is the inclusion of hospital patients, who might typically prioritize conventional medicine over CAM; this was mitigated by informing participants that alternative medicine has a

recognized role in modern healthcare. Data on the specific surgical conditions leading to treatment were not collected, which could influence CAM prevalence in this population. Additionally, being a single-center study, the findings may not be generalizable to all surgical outpatients in Nigeria, and multicenter studies are recommended to validate these results in the future.

Conclusion

This study demonstrates a high prevalence of CAM use among surgical outpatients, with the key determinants being older age, income level, positive beliefs about CAM, and perceptions of its safety.

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