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This is the Published version of the following publication

Ongoh, Myles, Abekah-Carter, Kwamina, A-iyeh, Edmond, Awuviry-Newton, Kofi and Agyemang-Duah, Williams (2026) Determinants of herbal medical services utilization among retired personnel in the Greater Accra Region of Ghana. BMC Complementary Medicine and Therapies, 26 (1). p. 125. ISSN 2662-7671 (In Press)

The publisher's official version can be found at
<https://doi.org/10.1186/s12906-026-05320-7>

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RESEARCH

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Determinants of herbal medical services utilization among retired personnel in the Greater Accra Region of Ghana

Myles Ongoh^{1*}, Kwamina Abekah-Carter², Edmond A-iyeh³, Kofi Awuviry-Newton⁴ and Williams Agyemang-Duah⁵

Abstract

Background Retired personnel aged 60 years and above represent a significant portion of the shift in Ghana's demographics towards older ages. As older people, retirees are likely to experience some health challenges associated with ageing. Therefore, gaining insight into their preferences for herbal medicine is important given its potential implications for wellbeing. The objective of this study was to examine the determinants of herbal medical services utilization among retirees in Ghana.

Methods This study used a cross-sectional survey design. Participants were selected using cluster and stratified sampling techniques. In all, 410 participants constituted the analytical sample. Multivariable logistic regressions were used to estimate the factors determining herbal medical services utilization among the participants. The significance of the test was set at a p -value ≤ 0.05 .

Results The results showed that male participants (AOR: 2.866, 95%CI: 1.413–5.816), those with secondary education (AOR: 2.873, 95%CI: 1.194–6.909), those who were very dissatisfied (AOR: 9.560, 95%CI: 1.391–65.705) and dissatisfied (AOR: 2.611, 95%CI: 1.151–5.922) with their health status significantly had a higher likelihood of using herbal medical services compared to their counterparts. Also, the results suggested that those who were married (AOR: 0.210, 95%CI: 0.097–0.458), never married/separated (AOR: 0.238, 95%CI: 0.070–0.801), spent less than 500 cedis (AOR: 0.363, 95%CI: 0.162–0.813), 1000–1499 cedis as household expenditure in a month (AOR: 0.318, 95%CI: 0.137–0.740) and performed daily exercises (AOR: 0.274, 95%CI: 0.141–0.531) were significantly less likely to use herbal medical services compared to their counterparts.

Conclusion This study revealed that gender, marital status, education level, expenditure on household, daily exercises and satisfaction with health status determine the utilization of herbal medical services among the participants. The implications of the findings for policy, practice, and future research are also presented in the manuscript.

Keywords Retired personnel, Herbal Medical services, Social Security and National Insurance Trust pensioners, Ghana

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Introduction

Healthcare utilization patterns have significantly evolved in recent decades, with a growing recognition and use of traditional and complementary medicine across the globe [1, 2, 3]. The World Health Organization (WHO) has increasingly emphasized the importance of integrating traditional medicine into national healthcare systems to ensure universal health coverage [4]. Among these alternatives, herbal medicine has gained considerable traction, with approximately 80% of the global population relying on it as part of their healthcare regimen [5]. Herbal medicine encompasses a combination of cultural knowledge, beliefs, skills, and theoretical frameworks applied to promote human health through plant-based remedies for the prevention, diagnosis, and treatment of various health conditions [6, 7]. The preference for herbal medicine is driven by multiple factors, including its accessibility and availability, as highlighted by Nketia et al. [8] in Ghana. Additionally, some people often perceive herbal remedies as safe [9], affordable [10], and culturally aligned with their values and practices [11].

Debates continue to persist about the integration of traditional medicine into formal healthcare systems, particularly in developing countries like Ghana [12]. Issues related to standardization, practitioner regulation, and the scientific validation of efficacy and safety have sparked discussions within the healthcare sector [13, 14, 15]. These debates are especially relevant for vulnerable populations, including retirees, who face unique circumstances that influence their healthcare decisions. In many developing countries like Ghana, the continued reliance on traditional or herbal medicine could partly be attributed to challenges associated with accessing conventional biomedical healthcare services [16]. For some people, seeking care from herbal practitioners is not only culturally resonant but also more practical and feasible given systemic barriers in the formal healthcare system [17]. This growing reliance has prompted the gradual integration of herbal medical services into Ghana's formal healthcare delivery system [18]. This underscores the need to understand the factors influencing this utilization. While previous studies have examined the use of herbal medicine in Ghana [8, 18, 19, 20, 21], there is limited research focusing specifically on its utilization among retirees, an increasingly significant demographic within the country's ageing population [22].

Retired personnel, defined here as individuals who have exited the formal workforce upon reaching the statutory retirement age of 60 years, represent a critical social group navigating age-related health challenges [23, 24]. The preference for herbal medical services among retirees presents unique considerations. Retirees often face age-related health challenges, including chronic illnesses, mobility issues, and the physiological effects of

aging, which may influence their choice of healthcare [25, 26, 27]. For this demographic, the decision to use herbal medicine may also reflect financial constraints, given the economic adjustments many retirees must make post-retirement [28, 29, 30]. Also, traditional medicine may align more closely with retirees' generational values, cultural upbringing, and long-standing beliefs about health and wellness [31].

The lack of focused research is particularly concerning given that Ghana's population is gradually aging [32], with retirees forming a growing subset of this population group. As older persons navigate the challenges of retirement, including health vulnerabilities and shifts in social support, understanding their healthcare choices is critical for informing policy and practice. Consequently, this study seeks to supplement existing literature on the research area by exploring the factors associated with herbal medical service utilization among retirees in Ghana. By identifying the factors that drive retirees to utilize herbal medical services, this research aims to shed light on the motivations underlying these decisions. Furthermore, the findings could guide the development of targeted awareness campaigns, training programs, and interventions designed to address the health concerns of retirees more effectively, thereby contributing to a more inclusive and responsive healthcare system in Ghana.

Methods

Study location

This study was conducted in the Greater Accra Region of Ghana. It is geographically situated in the South-Eastern part of Ghana and shares boundaries with Eastern Region to the North, Volta Region to the East, Central Region to the West and Gulf of Guinea to the South with a total land area of 3, 245 km² [33]. This study was conducted in this region because of its highest records/number of pensioner population in Ghana. A pictorial description of the study area can be seen in Fig. 1.

Data and sample

This study utilized data from a cross-sectional mixed methods research on survival strategies and quality of life among Social Security and National Insurance Trust (SSNIT) pensioners in the Greater Accra of Ghana [34]. The current study specifically focused on an aspect of the larger study that examined herbal medical services utilization among retired personnel. A cross-sectional design was employed because it enables the collection of data at a single point in time, providing a comprehensive snapshot of the current experiences, behaviors, and circumstances of a given population [35]. This design is particularly suitable for examining associations between variables, such as herbal medical service utilization, as well as socio-demographic and health characteristics



Fig. 1 Map of the Greater Accra Region of Ghana

(e.g., gender, educational level etc.). The choice of the cross-sectional design over other potential methods, such as longitudinal studies, was informed by practical considerations, including resource and time constraints. While the design allows for the identification of patterns and associations, it is important to recognize its limitations, including its inability to establish causality due to the single-time-point nature of data collection [36]. Despite this, adopting the cross-sectional design offered a robust and practical means of addressing the aim of this research.

The estimated sample size for the survey was 437 participants, and this was determined using the Yamane's formula. However, there were missing values of 27 in some of the variables considered in this study. These missing values were excluded from the final analysis, bringing the analytic sample down to 410 participants. We duly acknowledge that the missing data could introduce bias. However, we conducted a sensitivity analysis comparing the results of the original analysis to those adjusted with imputed values. The sensitivity analysis indicated that the missing data did not significantly alter the findings, and this supports the validity of our conclusions.

Sampling procedure

Participants were recruited by employing stratified and cluster sampling techniques. The total number of SSNIT pensioners in the study area at the time of the study was 49,673. The stratified sampling technique was used to divide the retirees into two main groups: public and private sector pensioners, as well as by gender. Out of

the total pensioners, 23,058 worked in the private sector, while 26,615 were from the public sector [34]. To determine the number of participants from each sector, the researchers calculated the proportion of each group relative to the overall population and multiplied it by the sample size of 437. This resulted in 236 participants from the public sector and 201 from the private sector. Using the same stratification process, the gender distribution was also calculated (Public sector: 127 males and 109 females; Private sector: 147 males and 54 females).

To recruit participants, the researchers first obtained permission from the Director-General of SSNIT through an introductory letter. The SSNIT research unit directed the team to the Greater Accra pensioners' association, which was organized into 34 zones, each with its own administrative structure. The researchers met with the President of the association, who facilitated contact with the Presidents and Secretaries of all 34 zones [34]. These leaders suggested that researchers attend their weekly meetings to interact directly with members. At each meeting, the researchers introduced the study and explained its purpose. Participation was voluntary, and consent was obtained from interested pensioners. It is important to note that recruitment during these meetings was influenced by the availability and willingness of participants.

While this approach had limitations, such as not providing all retirees with an equal chance of being selected, it was the most practical option. The zonal leaders had declined to share members' contact details, which prevented the use of a random selection process. To improve fairness, the researchers visited each meeting point at

least three times to maximize participation opportunities for all pensioners [34]. A structured questionnaire designed in English and programmed on mobile devices with an electronic tool called Insyt [37], which is an easy, fast, robust, and flexible tool for collecting data, was employed as the data collection instrument.

Validity and reliability

The questionnaire was developed based on a thorough review of relevant literature on herbal medicine utilization. To ensure the validity of the tool, the items were informed by previous studies in the field [8, 19], and the questions were tested via a pilot study with a small sample of retirees prior to the full-scale survey. This allowed for refinement of questions to ensure clarity and relevance, as well as to identify any potential issues with the wording or structure of the questions. Evaluation of the internal consistency of the scales also showed acceptable coefficients for all the key variables. A more detailed information on the methods, sample size calculation/determination, sampling technique, recruitment, and validity has been extensively reported elsewhere [24, 34].

Ethics considerations

For this study, the Ethics Committee for Humanities at the University of Ghana provided ethical clearance (Ref: ECH 006/18–19). Beyond that, verbal and written informed consent was obtained from the participants before the data collection. In complying with ethical practices, confidentiality and privacy of the data provided were ensured throughout the study. Some measures were also implemented to protect confidentiality and ensure data security. For instance, participants' personal identifiers were not included in the data to maintain anonymity. All collected data were securely stored

in password-protected computers that were accessible only to the research team. During the reporting process, findings were presented in aggregate form, preventing the identification of any of the participants. Given the potentially sensitive nature of the data, participants were assured that their responses would remain private and used solely for research purposes. These steps adhered to ethical guidelines to uphold the rights, dignity, and confidentiality of the retirees throughout the study.

Measures

Outcome variable

In this study, the outcome variable was herbal medical services utilization. We asked the participants to indicate whether they consulted an herbalist for medical care or took herbal medicine in the last year preceding the survey. The response was a dichotomous variable indicating no=0, yes=1.

Predictor variables

The independent variables were broadly divided into demographic, socio-economic and lifestyle/health-related variables. Demographic variables were gender (0=male, 1=female), religion (0=Christian, 1=non-Christian), age (years) (0=60–64, 1=65–69, 2=70 or more), marital status (0=consensual union, 1=married, 2=never married/Separated, 3=widowed), household size (0=1–5, 1=6–10, 2=above 10), household head (0=no, 1=yes) and years on retirement (0=less than 5, 1=5–9, 2=10 or more). Socio-economic variables comprised expenditure on household (GH¢) (0=less than 500, 1=500–999, 2=1000–1499, 3=1500 or more), education level (0=none, 1=primary/Junior High School [JHS]/middle school, 2=secondary, 3=vocational/technical, 4=tertiary), employment sector (0=public, 1=private), occupation (0=administrative/managerial/clerical, 1=civil/public service, 2=entrepreneur/industrialist, 3=production work, 4=teacher/lecturer, 5=other) and monthly income (GH¢) (0=less than 260, 1=260–859, 2=860 or more 4=did not disclose their income). Lifestyle/health-related factors included were use of herbalist medical services (0=no, 1=yes), Fitness club membership (0=no, 1=yes), satisfaction with sex life (0=very dissatisfied, 1=dissatisfied, 2=neutral, 3=satisfied 4=very dissatisfied) and satisfaction with health status (0=very dissatisfied, 1=dissatisfied, 2=neutral, 3=satisfied 4=very dissatisfied).

Multi-collinearity analysis

We performed multi-collinearity analysis as indicated in Table 1. For all the variables included in the models, the variable inflation factor (VIF) was less than 2.5. Based on Gujarati and Porter's [38] recommendation, our VIF values demonstrated that there was absence of

Table 1 Multicollinearity analysis

Variables	Tolerance	VIF
Gender	0.649	1.541
Religion	0.951	1.051
Age (years)	0.490	2.043
Years on retirement	0.492	2.032
Marital status	0.740	1.351
Household Size	0.810	1.235
Household head	0.751	1.331
Expenditure on dependents (GH¢)	0.872	1.147
Education	0.885	1.130
Employment	0.882	1.133
Occupation	0.906	1.103
Monthly Income (GH¢)	0.878	1.139
Fitness Club	0.835	1.197
Daily exercises	0.807	1.239
Satisfaction with health status	0.941	1.063
Satisfaction with sex life	0.867	1.153

multi-collinearity among the predictor variables considered in this study. This suggests that our results are valid.

Analytic framework

Embedded in SPSS software version 25, descriptive and inferential analytical frameworks were used to analyze the data. Regarding descriptive analytic frameworks, we used percentages and frequencies to describe the demographic, socio-economic and health/lifestyle characteristics of the participants. Fitting three different models, multivariable logistic regressions as inferential analytic framework was used to estimate the demographic, socio-economic and health-related/lifestyle factors associated with the utilization of herbal medical services among the participants. First, model 1 was made up of demographic variables. Second, model 2 comprised demographic and socio-economic variables. Last, model 3 (final model) consisted of demographic, socio-economic and health-related variables. We reported Adjusted Odd Ratio (AOR) and Confidence Interval with p-value of 0.05 as statistically significant.

Results

Sample characteristics of the participants

The demographic, socio-economic, and health/lifestyle characteristics of the participants are summarized in Table 2. Key highlights include that most participants were male (62%), Christian (82.4%), and aged between 60 and 64 years (47.6%). About 70% were married, and 54.6% had a household size between 1 and 5 persons. Regarding socio-economic status, 42.4% incurred a monthly household expenditure of GH¢500–999, and 35.6% had a primary/junior high/middle school education. Most retirees (55.1%) received a monthly income between GH¢260–859. Concerning health and lifestyle, 19.8% were members of fitness clubs, 44.4% engaged in daily exercise, and 23.9% reported using herbal medical services. The detailed statistics are provided in Table 2 below.

Main regression analysis

In the final model (Model 3), male retirees had 2.866 times higher odds of using herbal services compared to female retirees (AOR=2.866; 95% CI: 1.413–5.816). Compared to widowed participants, those who were married (AOR=0.210; 95% CI: 0.097–0.458) and never married/separated (AOR=0.238; 95% CI: 0.070–0.801) had significantly lower odds of using herbal medical services. Furthermore, participants with secondary education were more likely to use herbal medical services compared to those with tertiary education (AOR=2.873; 95% CI: 1.194–6.909). Participants with lower monthly household expenditures (less than GH¢500) had significantly lower odds of using herbal medical services (AOR=0.363;

Table 2 Sample characteristics of the participants

Variables	Responses	N=410	Percent
Gender	Male	254	62.0
	Female	156	38.0
Religion	Christian	338	82.4
	Non-Christian	72	17.6
Age (years)	60–64	195	47.6
	65–69	138	33.7
	70 or more	77	18.8
Marital status	Consensual union	10	2.4
	Married	288	70.2
	Never married/Separated	37	9.0
	Widowed	75	18.3
Household Size	1–5	224	54.6
	6–10	153	37.3
	Above 10	33	8.0
Household Head	Yes	338	82.4
	No	72	17.6
Years on retirement	Less than 5 years	174	42.4
	5–9 years	144	35.1
	10 years or more	92	22.4
Expenditure on Household (GH¢)	None	10	2.5
	Less than 500	126	30.7
	500–999	174	42.4
	1000–1499	41	10.0
	1500 or more	59	14.4
Education	None	3	0.7
	Primary/JHS/Middle School	146	35.6
	Secondary	53	12.9
	Vocational/Technical	64	15.6
	Tertiary	144	35.1
Employment Sector	Public	216	52.7
	Private	194	47.3
	Administrative/Managerial/Clerical	70	17.1
	Civil/Public Service	94	22.9
	Entrepreneur/Industrialist	20	4.9
	Production Work	106	25.9
	Teacher/Lecturer	77	18.8
	Other	43	10.5
	Less than 260	47	11.5
	260–859	226	55.1
Monthly Income (GH¢)	860 or more	95	23.2
	Did not disclose	42	10.2
	Yes	81	19.8
Fitness Club Membership	No	329	80.2
	very dissatisfied	4	1.0
Satisfaction with sex life	very dissatisfied	24	5.9
	Dissatisfied	197	48.0

Table 2 (continued)

Variables	Responses	N=410	Percent
Satisfaction with health status	Neutral	104	25.4
	Satisfied	69	16.8
	very satisfied	16	3.9
	very dissatisfied	7	1.7
	Dissatisfied	45	11.0
Daily exercises	Neutral	138	33.7
	Satisfied	220	53.7
	Yes	182	44.4
Use of herbal medical services	No	228	55.6
	Yes	98	23.9
	No	312	76.1

95% CI: 0.162–0.813) compared to those with the highest expenditure (GH¢1500 or more). This trend was also observed among participants spending GH¢1000–1499 (AOR=0.318; 95% CI: 0.137–0.740). Additionally, participants who were very dissatisfied (AOR=9.560; 95% CI: 1.391–65.705) or dissatisfied (AOR=2.611; 95% CI: 1.151–5.922) with their health status were more likely to use herbal medical services compared to those who were satisfied with their health. It was also found that retirees who engaged in daily exercise had significantly lower odds of using herbal medical services compared to those who did not exercise daily (AOR=0.274; 95% CI: 0.141–0.531). For a complete breakdown of the statistical results, refer to Table 3.

Discussion

In this study, we examined factors that were associated with herbal medical service utilization among retirees aged 60 years and above in the Greater Accra Region of Ghana. The study observed a higher likelihood for male retirees to utilize herbal medical services than female retirees. This finding is consistent with that of Odaman and Ibiezugbe [39], which indicated an increased patronization of traditional healers among male older persons. However, other studies have found either no significant gender difference [40, 41], or a higher likelihood for women aged 60 years and above to patronize traditional or herbal medicine than their male counterparts [42]. Nonetheless, this observed gender disparity in herbal medical service utilization could also be influenced by some cultural factors [11, 43]. Thus, the inconsistencies in our findings and others may stem from variations in study settings and cultural contexts. This highlights the importance of exploring sociocultural and psychological factors specific to Ghana that shape gendered health-seeking behaviors among the retiree population.

This study also found that widowed retirees were more likely to use herbal medical services compared to their married or never-married counterparts. This finding contrasts with some studies conducted in Western settings, where widowed individuals are generally less likely to seek alternative or traditional healthcare [44]. The difference could be attributed to the availability of cultural and social support systems [45], where widowed individuals may rely on community networks that promote herbal remedies. In addition, cultural norms may encourage widowed retirees to explore alternative healthcare as part of coping strategies for grief or social isolation. Some studies from China have similarly noted the influence of marital status on traditional medicine utilization [46], indicating that the relationship between marital status and herbal medical service utilization could be highly contextual. Future research should explore these dynamics further within the Ghanaian sociocultural landscape.

The positive association between lower education levels and herbal medical service use is consistent with previous findings from Pearson et al. [47] and a Ghanaian study by Nketia et al. [8], where individuals with secondary education reported higher reliance on herbal medicine. This may reflect disparities in health literacy and knowledge across educational levels [48], as lower educational attainment may limit access to information about biomedical options. Conversely, other studies [49, 50] have shown higher education to be associated with greater herbal medicine use, suggesting that some better-educated persons may view herbal remedies as complementary to biomedical care. This disparity underscores the need to consider both cultural perceptions and the accessibility of healthcare resources when analyzing educational influences on herbal medical care utilization.

The finding that retirees with lower household expenditures were less likely to use herbal medical services suggests financial constraints as a potential barrier to accessing even alternative healthcare. Although herbal medicine is often perceived as affordable [8, 10, 17, 18], some studies conducted in Ghana [11, 16] have reported that the perceived high cost of herbal remedies can still pose access challenges for low-income individuals. Unlike conventional biomedical care, which is partly subsidized through Ghana's National Health Insurance Scheme (NHIS), most herbal medical services are paid for out-of-pocket, as they are not comprehensively covered under the NHIS [51, 52]. This cost structure may partly explain the observed association between household expenditure and herbal medical service utilization in this study. The findings of this study highlight the dual perception of herbal medical service as both accessible and potentially expensive, depending on the economic realities of the population.

Health dissatisfaction emerged as associated with herbal medical service utilization, with retirees who reported dissatisfaction being significantly more likely to use herbal remedies. This aligns with Abdullah et al. [17], who indicated that individuals dissatisfied with biomedical treatments are likely to turn to complementary and alternative medicine for perceived effectiveness or to address unmet health needs. This behavior suggests that herbal medical services could be viewed as viable options for retirees facing chronic health issues or dissatisfaction with formal healthcare systems [53]. It is important to consider whether this reflects gaps in Ghana's healthcare delivery, including accessibility and quality of care.

The significantly lower likelihood of herbal medical service utilization among retirees who engaged in daily exercise may reflect the role of physical activity in maintaining health and reducing reliance on healthcare services [54]. This finding aligns with Mochovitch et al. [55] and Ongoh et al. [56], which emphasize the positive impact of regular exercise on health outcomes in older populations. Retirees who exercise regularly may perceive themselves as healthier, thus reducing their need for alternative healthcare. Alternatively, they may prioritize biomedical care for managing health issues while viewing exercise as a preventive strategy.

Study limitations and areas for future research

The major strength of this study is that it is the first to examine factors associated with herbal medical service use among retired personnel in Ghana. However, several limitations must be acknowledged to provide context for interpreting the findings. First, the cross-sectional design of the study limits the ability to establish causal relationships between the dependent variable (herbal medicine use) and the independent variables (demographic, socioeconomic, and lifestyle/health-related factors). Future studies could benefit from employing longitudinal designs to explore how these factors influence herbal medicine use over time. Second, measuring herbal medicine use as a dichotomous variable may have introduced recall bias, potentially leading to underreporting or overreporting of use, particularly given the reliance on a one-year estimation period. To address this, future research should consider measuring herbal medicine use as a count variable or using alternative approaches that minimize recall issues.

Third, this study did not include certain variables, such as smoking, alcohol intake, fruit and vegetable consumption, cultural norms, and health system factors, which may also significantly influence herbal medicine utilization. Incorporating these variables in future research could provide a more comprehensive understanding of the factors driving herbal medicine use. Fourth, the findings did not specify the types of herbal medical services

sought by the participants, and this limits insights into the range and nature of services utilized. Future research should investigate the specific herbal remedies and practices employed, as well as their perceived efficacy and safety. Fifth, this study did not directly measure the cost of herbal medical services relative to conventional biomedical care. As such, interpretations related to financial accessibility are based on household expenditure as a proxy rather than actual service cost. Furthermore, herbal medical service utilization was measured as a dichotomous variable, which limits insights into frequency, intensity, and type of services used.

Lastly, although this study provides valuable insights, its findings may not be fully generalizable beyond the study population due to potential sample representativeness issues. Expanding the scope to include diverse retiree populations across Ghana and other regions would enhance the applicability of the results. Considering these limitations, this baseline study lays the groundwork for further exploration. Future research should aim to employ longitudinal designs, measure herbal medicine use with greater precision, and examine additional factors such as cultural norms, health system characteristics, and dietary habits. Comparative studies across regions or populations could also provide insights into how context shapes herbal medicine use. Such efforts would contribute to a more detailed understanding of herbal medicine utilization among retired persons.

Implications

The findings of this research present some implications for policy and practice. The higher likelihood for male retirees to use herbal medical services may suggest a possible gender disparity that could merit targeted intervention. Policymakers could develop health programs that specifically engage female retirees to help address barriers to their utilization of herbal medical services. For instance, public health campaigns could focus on increasing awareness about the safety and efficacy of herbal medicine for women, while addressing cultural and societal perceptions that may limit their access. Furthermore, this study highlights a potential relationship between educational attainment and the use of herbal medical services. Traditional medicine literacy programs could be developed and implemented across different educational levels to ensure retirees are empowered to make informed decisions regarding the use of herbal and complementary medical services. These interventions could be integrated into existing health education initiatives through local community centers, healthcare facilities, and media platforms. Furthermore, policymakers could explore integrating herbal medicine into the

Table 3 Determinants of utilization of herbalist medical services

	Model 1			Model 2			Model 3 (Final Model)		
	95% CI for AOR			95% CI for AOR			95% CI for AOR		
DEMOGRAPHIC	AOR	Lower	Upper	AOR	Lower	Upper	AOR	Lower	Upper
<i>Gender</i>									
Male	2.587**	1.383	4.842	2.872**	1.472	5.604	2.866**	1.413	5.816
Female (ref)	1.00			1.00			1.00		
<i>Religion</i>									
Christian	0.705	0.381	1.304	0.754	0.384	1.479	0.730	0.353	1.512
Non-Christian (ref)	1.00			1.00			1.00		
<i>Age (years)</i>									
60–64	0.428	0.173	1.061	0.458	0.169	1.239	0.350	0.117	1.045
65–69	1.264	0.544	2.938	1.369	0.551	3.402	0.948	0.350	2.565
70 or more	1.00			1.00			1.00		
<i>Marital Status</i>									
Consensual union	0.223	0.036	1.379	0.278	0.042	1.861	0.359	0.050	2.559
Married	0.252***	0.127	0.502	0.203***	0.097	0.424	0.210***	0.097	0.458
Never married/Separated	0.231**	0.076	0.697	0.215**	0.069	0.677	0.238*	0.070	0.801
Widowed (ref)	1.00			1.00			1.00		
<i>Household Size</i>									
1–5	0.461	0.194	1.096	0.552	0.210	1.451	0.552	0.195	1.564
6–10	0.804	0.342	1.890	0.771	0.300	1.980	0.728	0.269	1.975
Above 10 (ref)	1.00			1.00			1.00		
<i>Household Head</i>									
Yes	0.895	0.418	1.915	0.664	0.295	1.496	0.670	0.282	1.594
No (ref)	1.00			1.00			1.00		
<i>Number of Years on Retirement</i>									
Less than 5 years	2.069	0.836	5.119	0.935	2.041	0.780	2.206	0.786	6.190
5–9 years	1.096	0.475	2.531	0.933	1.015	0.421	1.183	0.454	3.080
10 years or more (ref)	1.00			1.00	1.00		1.00		
SOCIO-ECONOMIC FACTORS									
<i>Education</i>									
None				1.046	0.070	15.559	1.094	0.033	36.626
Primary/JHS/Middle School				1.235	0.624	2.442	1.352	0.659	2.774
Secondary				2.639*	1.160	6.002	2.873*	1.194	6.909
Vocational/Technical				0.905	0.390	2.101	0.886	0.371	2.114
Tertiary (ref)				1.00			1.00		
<i>Employment Sector</i>									
Public				1.034	0.465	2.300	1.036	0.440	2.438
Private (ref)				1.00			1.00		
<i>Occupation</i>									
Administrative/Managerial/Clerical				1.399	0.497	3.940	1.471	0.494	4.382
Civil/Public Service				1.703	0.587	4.938	1.819	0.586	5.646
Entrepreneur/Industrialist				2.465	0.626	9.712	2.670	0.630	11.319
Production Work				1.092	0.380	3.138	1.156	0.386	3.464
Teacher/Lecturer				1.393	0.445	4.357	1.643	0.491	5.501
Other				1.00			1.00		
<i>Monthly Income (GH¢)</i>									
Less than 260				0.839	0.285	2.470	0.654	0.206	2.076
260–859				0.937	0.403	2.175	0.811	0.321	2.053
860 or more				0.740	0.271	2.021	0.745	0.252	2.204
Did not disclose their income (ref)				1.00			1.00		
<i>Expenditure on Household (GH¢)</i>									
None				0.422	0.085	2.101	0.202	0.033	1.248
Less than 500				0.381*	0.181	0.803	0.363*	0.162	0.813

Table 3 (continued)

	Model 1	Model 2		Model 3 (Final Model)		
	95% CI for AOR	95% CI for AOR		95% CI for AOR		
500–999		0.437	0.156 1.226	0.394	0.131 1.188	
1000–1499		0.328**	0.148 0.728	0.318**	0.137 0.740	
1500 or more (ref)		1.00		1.00		
LIFESTYLE/HEALTH-RELATED						
<i>Fitness Club Membership</i>						
Yes				1.798	0.835 3.871	
No (Ref)				1.00		
<i>Daily Exercises</i>						
Yes				0.274***	0.141 0.531	
No (Ref)				1.00		
<i>Satisfaction with Sex Life</i>						
Very dissatisfied				1.099	0.163 7.402	
Dissatisfied				0.797	0.148 4.291	
Neutral				0.924	0.167 5.112	
Satisfied				1.744	0.316 9.616	
Very satisfied (Ref)				1.00		
<i>Satisfaction with Health Status</i>						
Very dissatisfied				9.560*	1.391 65.705	
Dissatisfied				2.611*	1.151 5.922	
Neutral				1.139	0.604 2.145	
Satisfied (Ref)				1.00		

NB Italic values indicate significance of the test

*Test is significant at the 0.05 level

** Test is significant at the 0.01 level

*** Test is significant at the 0.001 level

NHIS in Ghana. Subsidizing herbal medical services or offering financial incentives could enhance affordability and accessibility for retirees, especially those with limited incomes. Collaboration between herbal practitioners and formal health institutions could also strengthen regulation to ensure both affordability and quality assurance.

The association between daily exercise, health satisfaction, and herbal medical service use partly underscores the interconnected nature of lifestyle behaviors and health-seeking patterns. Therefore, it is recommended for healthcare providers to adopt a more holistic approach to patient care that considers physical activity levels, health satisfaction, and alternative medical service preferences. Regular health assessments for retirees could incorporate discussions on lifestyle habits, motivations for seeking herbal medical care, and perceptions of their overall health status. The findings of the current study suggest the relevance for a multi-faceted approach to healthcare policy and encouraging herbal medical service utilization for retirees in Ghana. By addressing gender disparities, improving health literacy, enhancing affordability, and integrating lifestyle factors into healthcare delivery, policymakers can help ensure a more equitable and

inclusive healthcare system that aligns with the needs and preferences of retirees.

Conclusion

This study examined factors associated with the utilization of herbal medical services among retirees in Ghana. The findings revealed that gender, marital status, education level, household expenditure, satisfaction with health status, and daily exercise were significantly associated with the utilization of herbal medical services. Specifically, male retirees and those with secondary education were more likely to use herbal medical services, while those who were married, never married/separated, or allocated lower monthly expenditures to their households were less likely to do so. Also, dissatisfaction with health status emerged as having a significant association with herbal medical service use.

These results shed light on the potential complexity of herbal medical service preference among retirees and emphasize the need for healthcare interventions that account for these diverse factors. Policymakers could prioritize strategies to enhance the accessibility and appeal of herbal medical services, particularly for demographic groups that seek to utilize them in formal healthcare settings. Moreover, healthcare providers could draw from these insights to align service offerings with retirees'

unique needs and preferences, fostering a more inclusive and responsive healthcare environment. By bridging these gaps, our research provides a critical foundation for improving healthcare services tailored to the retired population. This would ultimately contribute to better health outcomes and satisfaction for retirees in Ghana and beyond.

Abbreviations

VIF	Variance Inflation Factor
SSNIT	Social Security and National Insurance Trust
SPSS	Spatial Package for Social Sciences
AOR	Adjusted Odds Ratio
CI	Confidence Interval
GHC	Ghana Cedis
JHS	Junior High School

Acknowledgements

We acknowledge the respondents for providing the study data. We further acknowledge the authors and publishers whose works were consulted.

Authors' contributions

Conceptualization, MO, KA-C, EA, KA-N and WA-D; methodology, MO, KA-C, and WA-D; software, KA-C and WA-D; formal analysis, KA-C and WA-D; data curation, MO; writing—original draft preparation, MO, KA-C, EA, KA-N and WA-D; writing—review and editing, MO, KA-C, EA, KA-N and WA-D; supervision, MO, KA-C and WA-D; funding acquisition, MO. All authors have read and agreed to the published version of the manuscript.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Institutional ethics approval was obtained for the research protocol from the Ethics Committee for Humanities at the University of Ghana (Ref: ECH 006/18-19).

Both written and verbal informed consents were obtained from the participants.

Participants were assured of strict confidentiality and anonymity of the data they provided. The participation of the retired personnel in the study was also voluntary.

In accordance with ethical guidelines, the informed consent of the legal guardians of participants who had no formal education was also sought before they were engaged in this research.

Consent for publication

Not applicable.

Competing interests

KA-N is an Editorial Board Member for BMC Geriatrics. MO, KA-C, EA and WA-D declare no conflict of interest.

Received: 4 February 2024 / Accepted: 24 February 2026

Published online: 02 March 2026

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