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Use of Complementary and Alternative Medicine in Patients With Idiopathic Inflammatory Demyelinating Diseases of the Central Nervous System: A Cross-Sectional Study in Thailand

Punchika Kosiyakul, MD[1,2,3], Jiraporn Jitprapaikulsan, MD[1,2], Natthapon Rattanathamsakul, MD[1,2], Sasitorn Siritho, MD[1,2,4], Onpawee Sangsai, MSc[1,2], Kamonchanok Aueaphatthanawong, BSc[1,2], Montira Engchuan, BNS[3], Naraporn Prayoonwiwat, MD[1,2,*]

[1] Division of Neurology, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
[2] Siriraj Neuroimmunology Center, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
[3] Department of Research and Development, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
[4] Bumrungrad International Hospital, Bangkok, Thailand

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ABSTRACT

Background: Complementary and alternative medications (CAM) are common among patients with multiple sclerosis (MS) for physical and psychological support. However, there is insufficient data regarding the application of CAM in the different cultures and beliefs of each community as well as patient's status.
Objective: To evaluate the prevalence and modalities of the use of CAM among patients with central nervous system idiopathic inflammatory demyelinating diseases (CNS-IIDD) in a tertiary care hospital
Methods: A cross-sectional study was conducted at Siriraj Hospital from June to December 2021 involving patients with MS, neuromyelitis optic spectrum disorders (NMOSD), myelin oligodendrocyte glycoprotein antibody-associated disease (MOGAD), idiopathic transverse myelitis (iTM), and optic neuritis (ON) to examine the prevalence and mode of CAM use and its correlation with patient characteristics.
Results: There were 107 patients. The diagnoses were MS (38), NMOSD (55), MOGAD (5), iTM (7), and ON (2). Most of the patients were female (89.7%), and 61.7% were diagnosed over 5 years. The mean Expanded Disability Status Scale was 2.63 (S.D., 2.38), and the median ambulation index was 0 (range 0–8.5). There were 68 patients (63.6%) with a history of CAM use for at least 3 months, while those with current use decreased to 62 (58.5%). Vitamins and minerals were the most commonly used, particularly vitamin D (97.1%) and calcium (47.7%). Both treatments were primarily prescribed (95.3%) rather than self-administered (24.3%). The main reasons for the use of CAM were to strengthen their health (48.6%) and relieve existing symptoms (28.0%).
Conclusions: The use of CAM is common among patients with Thai CNS-IIDD. Further exploration of patient perspectives and preferences regarding CAM usage may contribute to a more comprehensive management approach for patients with CNS-IIDD.

Introduction

Idiopathic inflammatory demyelinating diseases of the central nervous system (CNS-IIDD) are chronic incurable disorders caused by damage to the myelin sheath with a wide range of the clinical spectrum.[1,2] The treatment of chronic incurable diseases can sometimes be difficult to handle.[3,4] Patients with CNS-IIDD patients often suffer from physical and psychological problems, such as immobility, neuropathic pain, spasticity, urinary incontinence, and depression.[5,6] The cornerstone of treatment primarily aims to suppress acute attacks and prevent future relapses.[7,8] However, patient perspectives, including values and beliefs, impacting psychological well-being and quality of life, are often overlooked. Some patient care might not be satisfied by modern medicine alone.[9,10] Several recent studies indicate that patients with various

* Address correspondence to: Naraporn Prayoonwiwat, MD, Division of Neurology, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, 2 Wanglang Road, Bangkok, 10700, Thailand.
E-mail address: naraporn.pra@mahidol.ac.th (N. Prayoonwiwat).

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diseases have explored clinical applications involving different dietary supplements and complementary medicine.[11–13] Therefore, many patients may adopt complementary and alternative medications (CAM) to achieve their individual desires.

According to the National Center for Complementary and Alternative Medicine (NCCAM),[14] CAMs can be divided into four domains, which are (1) biologically based practices, such as dietary supplements; (2) energy medicine, such as electromagnetic radiation; (3) manipulative and body-based therapies, such as chiropractic manipulation; and (4) mind-body medicine, such as meditation. Previous studies showed that complementary medicines were widely used in MS patients with a prevalence of up to almost 85%[15–17] and showed effects on improving the physical and psychological state of the patient's disease.[14]

Despite the widespread use of CAM, there remains a gap in understanding how CAM is utilized among patients with CNS-IIDD, particularly within non-Western cultural contexts. While most previous studies have been conducted in Western countries, Eastern cultural influences, such as those seen in Thailand, may shape CAM usage differently due to unique cultural beliefs, historical practices, and available resources.[18] CAM practices in Thai culture, for example, are deeply rooted, spanning from before Sukhothai (pre-1238 A.D.) until the early 20th century. They are uniquely influenced by Indian and Chinese traditions, blending aspects of Ayurveda and Traditional Chinese Medicine into Thai traditional medicine. In recent decades, the government promoted CAM, leading to the Department of Thai Traditional and Alternative Medicine in the Ministry of Public Health.[19–22] Thereafter, the use of CAM in Thai population is likely to be different from that of the West. However, despite the rich cultural history of CAM usage in Thailand, there is a lack of comprehensive studies examining its utilization among patients with CNS-IIDD.

Acknowledging these differences becomes pivotal in promoting culturally sensitive healthcare practices, ensuring that alternative medicine aligns harmoniously with conventional healthcare approaches. Furthermore, since interactions between CAM and conventional medications have been reported,[23,24] physicians should be aware of the use of CAM by their patients to achieve a better and safer standard of care.

Therefore, this study aims to fill this gap in knowledge by evaluating the use of CAM among patients with CNS-IIDD in Thailand, their opinions about the use and correlations with patient characteristics.

Methods

Study design and research subjects

This is a cross-sectional, descriptive and questionnaire-based study of patients with CNS-IIDD visiting Siriraj Hospital, a tertiary hospital in Bangkok, between June and December 2021. The inclusion criteria were patients older than 18 years, diagnosed with CNS-IIDD, which was multiple sclerosis (MS),[25] neuromyelitis optica spectrum disorders (NMOSD),[26] myelin oligodendrocyte glycoprotein antibody-associated disease (MOGAD),[27] idiopathic transverse myelitis (iTM), and optic neuritis (ON). Patients who answered less than 50% of the questionnaires were excluded. The calculated sample size was at least 100 patients. The study was approved by the Siriraj Institutional Review Board (COA number Si 370/2021). All participants provided their informed consent.

Data collection process

The case record form consisted of three parts: (1) demographic data (gender, age, residence, health coverage scheme, level of education, occupation, income, duration of the disease, clinical status, comorbidities, and current treatment) (2) data on the use of CAM (timing, types, reasons to use, sources) (3) opinions on the use of CAM (effects of modern medication, disclosure of CAM use to their physicians). The questionnaires, which were designed in house by our team, were completed as self-administered or as a structured 10-minute face-to-face interview. Participants could skip answering any question when they wanted. The translated questions and results are attached in the Appendix.

Table 1
Sociodemographic characteristics of 107 Thai patients with CNS-IIDD.

Demographic data	Number of patients (%)
Total number	107
Female sex	96 (89.7)
Residence	
- Urban	76 (71.0)
- Rural	31 (29.0)
Education level	
- Elementary school	20 (18.7)
- High school and junior high school	13 (12.1)
- Vocational school	13 (12.1)
- Bachelor's degree	40 (37.4)
- Master's degree	17 (15.9)
- Doctor of Philosophy	1 (0.9)
- Answer not given	3 (2.8)
Occupation	
- Unemployed	45 (42.0)
- Employee: government	25 (23.4)
- Employee: nongovernment	17 (15.9)
- Business/Self-employed (Freelance)	20 (18.7)
Average monthly income (Baht)	
- <12,000	47 (43.9)
- 12,000–24,999	26 (24.3)
- 25,000–49,999	18 (16.8)
- >50,000	11 (10.3)
- Answer not given	5 (4.7)
Health coverage	
- Universal Coverage scheme	29 (27.1)
- Social Security Scheme	30 (28.0)
- Civil Servant Medical Benefits	24 (22.4)
- State enterprise healthcare benefits	2 (1.9)
- Self-pay	22 (20.6)

CAMs = complementary and alternative medicines; CNS-IIDD = central nervous system idiopathic inflammatory demyelinating diseases.
Average exchange rate, (June–December 2021) 1 USD = 32.91 Baht.

Outcome measurements

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) software version 26 for Windows. Qualitative variables, such as demographic data, diagnosis, clinical data, current treatment, and prevalence of CAMs, were evaluated by frequency, percentage, mean, and standard deviation. Chi–square and Mann–Whitney tests were used to analyze the correlation between categorical and continuous variables between CAM users and nonusers. We also entered variables that were significantly associated with the use of CAM in the univariate analysis into a multivariate analysis with a forward stepwise method. *P*-values less than 0.05 were considered statistically significant.

Results

Baseline characteristics

We recruited 107 patients. Most of them were women (89.7%) with a mean age (±SD) of 46.3 ± 12.6 years. Seventy-six patients (71.0%) lived in urban areas. The diagnoses were 38 MS (35.5%), 55 NMOSD (51.4%), 5 MOGAD (4.7%), 7 iTM (6.5%), and 2 ON (1.9%). Fifty-eight patients (54.2%) had a bachelor's degree or higher. Forty-five patients (42.0%) were unemployed. For monthly

Table 2
Clinical characteristics of 107 Thai patients with CNS-IIDD.

	Total (n = 107)	MS (n = 38)	NMOSD (n = 55)	MOGAD (n = 5)	iTM (n = 7)	ON (n = 2)
Age (year); mean, SD	46.3, 12.6	41.8, 12.0	48.1, 11.9	50.6, 20.2	49.6, 12.1	58.0, 1.4
Female sex (n, %)	96 (89.7)	31 (81.6)	52 (94.5)	5 (100.0)	6 (85.7)	2 (100.0)
Current EDSS; median (range)	2.0 (0–9.0)	1.3 (0–7.0)	2.0 (0–8.5)	4.0 (2.0–5.0)	4.5 (0–9.0)	2.0 (2.0–2.0)
Ambulation index; median (range)	0 (0–8.5)	0 (0–7.0)	0 (0–8.5)	0 (0–0)	4.5 (0–8.5)	0 (0–0)
Duration of disease (year); median (range)	7.0 (0.2–29)	7.0 (0.3–29)	9.0 (0.2–29.0)	5.0 (1–11)	5.0 (2.0–12.0)	4.8 (4.5–5.0)
Interval from the last attack (month); median (range)	37.0 (0–353.0)	34.0 (1.0–214.0)	33.0 (0–353.0)	23.0 (11.0–49.0)	39.0 (13.0–152.0)	64.0 (47.0–81.0)
Comorbid diseases (n, %)						
- Hypertension	17 (15.9)	3 (7.9)	8 (14.5)	3 (60.0)	2 (28.6)	1 (50.0)
- Diabetes mellitus	12 (11.2)	2 (5.3)	5 (9.1)	3 (60.0)	1 (14.3)	1 (50.0)
- Dyslipidemia	25 (23.3)	8 (21.1)	12 (21.8)	1 (20.0)	2 (28.6)	2 (100)
- Coronary artery disease	12 (11.2)	0 (0)	2 (3.6)	1 (20.0)	7 (100)	2 (100)
- Autoimmune diseases	11 (10.2)	2 (5.3)	7 (12.7)	0 (0)	1 (14.3)	1 (50.0)
- Others*	34 (31.8)	10 (26.3)	20 (36.4)	1 (20.0)	3 (42.9)	0 (0)
Current treatment						
Immunotherapy, n (%)	**99 (92.5)**†	**36 (94.7)**‡	**51 (92.7)**§	**5 (100)**‖	**5 (71.4)**	**2 (100)**
Immunosuppressive drugs, n (%)	**66 (61.7)**	**15 (39.5)**	**39 (70.9)**¶	**5 (100)**#	**5 (71.4)**	**2 (100)****
- Prednisolone: average dose, mg/d, median (range)	n = 9 15 (5–60)	n = 1 30 (N/A)	n = 7 10 (10–60)	n = 2 15 (15–15)	n = 0	n = 1 5 (N/A)
- Azathioprine: average dose, mg/d, median (range)	n = 40 100 (37.5–150)	n = 11 100 (50–150)	n = 25 75 (37.5–150)	n = 4 100 (50–125)	n = 3 43.3 (25–100)	n = 1 100 (N/A)
- Mycophenolate mofetil (MMF): average dose, mg/d, median (range)	n = 17 1250 (500–2000)	n = 3 1000 (625–1250)	n = 12 1500 (500–2000)	n = 1 2000 (N/A)	n = 2 1000 (500–1500)	n = 0
- Other immunosuppressive drugs	n = 1 (methotrexate 17.5 mg/wk)††	n = 0	n = 0	n = 0	n = 0	n = 1 (methotrexate 17.5 mg/wk)††
***Disease-modifying therapy;* n (%)**	**37 (34.6)**	**22 (57.9)**	**13 (23.6)**	**1 (20.0)**	0 (0)	0 (0)
- Interferon beta-1a	4 (3.7)	4 (10.5)	0 (0)	0 (0)	0 (0)	0 (0)
- Teriflunomide	4 (3.7)	3 (7.9)	0 (0)	0 (0)	0 (0)	0 (0)
- Fingolimod	4 (3.7)	4 (10.5)	0 (0)	0 (0)	0 (0)	0 (0)
- Rituximab	21 (19.6)	9 (25.7)	11 (20.0)	1 (20)	0 (0)	0 (0)
- Other disease modifying therapies	4 (3.7)	2 (5.3)	2 (3.6)	0 (0)	0 (0)	0 (0)
No immunotherapy	8 (7.5)	2 (5.3)	4 (7.3)	0 (0)	2 (2.86)	0 (0)
Symptomatic treatments	**49 (45.8)**	**11 (28.9)**	**31 (56.4)**	**1 (20.0)**	**6 (85.7)**	**0 (0)**
- Antispasticity medications	18 (16.8)	4 (10.5)	12 (21.8)	0 (0)	2 (28.6)	0 (0)
- Neuropathic pain medications	35 (32.7)	6 (15.8)	23 (41.8)	1 (20)	5 (71.4)	0 (0)
- Antidepressants	5 (4.7)	1 (2.6)	3 (5.5)	0 (0)	1 (14.3)	0 (0)
- Others	20 (18.7)	3 (7.9)	13 (23.6)	1 (20)	3 (42.9)	0 (0)
No symptomatic treatments	**58 (54.2)**	**27 (71.1)**	**24 (43.6)**	**4 (80)**	**1 (14.3)**	**2 (100)**

EDSS = Expanded Disability Status Scale; MOGAD = myelin oligodendrocyte glycoprotein antibody-associated disease; MS = multiple sclerosis; NMOSD = neuromyelitis optica spectrum disorders; iTM = transverse myelitis ON = optic neuritis.

* Other comorbid diseases included cancer, asthma, lymphoma, migraine, pulmonary embolism, alopecia, endometriosis, G6PD deficiency, pulmonary tuberculosis, cerebral venous sinus thrombosis, avascular necrosis, bipolar disorder, breast cancer, iron deficiency anemia, deep vein thrombosis, atrial fibrillation, benign prostate hyperplasia, osteopenia/osteoporosis, syndrome of inappropriate antidiuretic hormone secretion, obesity, gastroesophageal reflux disease.

† Four patients received both prednisolone and other immunotherapy.

‡ One MS patient received both prednisolone and other immunotherapy.

§ Two NMOSD patients received both prednisolone and other immunotherapy.

‖ One MOGAD patient received both prednisolone and other immunotherapy.

¶ Three NMOSD patients received prednisolone and azathioprine, and 2 patients received prednisolone and mycophenolate mofetil.

Two MOGAD patients received both prednisolone and azathioprine.

** One ON patient received both prednisolone and methotrexate.

†† This patient received methotrexate regarding noninfectious scleritis.

incomes, 46.1% received less than 12,000 Baht (approximately USD 365) (Table 1), while the average income per household in 2021 in Thailand was 27,352 Baht.[28] Medical expenses were covered by one of the healthcare coverage schemes for most patients. Only 20% were self-paying.

The mean duration of the disease was 9.1 years (SD 6.9) with a mean interval from the last attack of 51.8 months (SD 52.9). The mean Expanded Disability Status Scale (EDSS) was 2.63 (SD 2.38). Treatment given included immunosuppressive therapy (61 patients, 57.0%), disease-modifying therapy (49 patients, 45.8%), and symptomatic treatments (49 patients, 45.8%) (Table 2). Notably, standard DMTs for MS are currently not on the Essential Drug List in Thailand and cannot be reimbursed by most health insurance programs. Therefore, immunosuppressive drugs were commonly used in MS (22 of 38 patients), and rituximab, although off-label, in 9 patients.

CAMs utilization

Sixty-eight patients (63.6%) admitted having CAM use continuously for at least three months, defined as “CAM users,” whereas the remaining 39 patients were CAM nonusers. (Table S1 in the Appendix) Five patients had used CAM before the diagnosis of CNS-IIDD, and 63 patients used it after the diagnosis. Sixty-two patients (57.9%) had been using CAM in the last 6 months. The most common reason for using CAM was “to strengthen my health,” up

Figure 1a

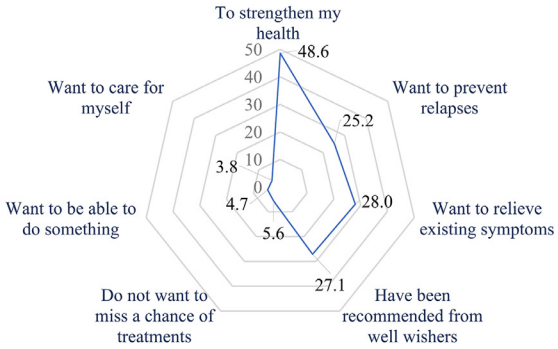

Figure 1b

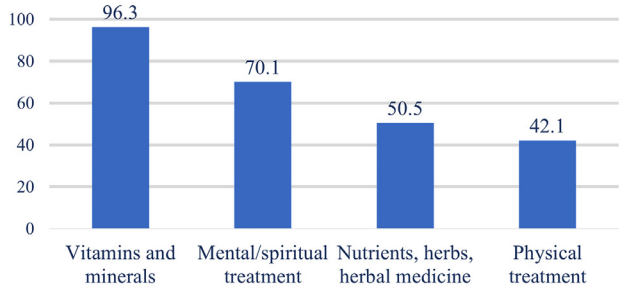

Figure 1. (A) Reasons for the use of CAMs in Thai patients with CNS-IIDD; (B) Types of CAM use in Thai patients with CNS-IIDD.

to 48.6% (Figure 1A). The patients knew about CAMs from their friends (52.5%), social media (13.6%), other patients (3.4%), and the rest from other sources.

Awareness of drug interactions and adverse effects

Most of the patients (80.6%) thought that CAMs had no effect on prescribed medications, while 6.9% realized that CAMs could affect them. The rest (12.5%) were not sure of any effect. Only 17 patients (16.0%) disclosed the use of CAMs to their physicians, neurologists (82.4%) or other physicians (17.6%). For those who did not disclose, 93.5% would continue to do so.

Types of CAMs

Vitamins and minerals were the most commonly used modality (103 patients, 96.3%), with vitamin D and calcium the two most popular in 97.1% and 47.7% of users, respectively. However, they were taken as prescription drugs (95.3%) rather than as self-administered (24.3%). Mental and spiritual treatments ranked second (75 patients, 70.1%), including praying (65 patients, 86.7%), meditation (51 patients, 68.0%), and yoga (2 patients, 2.7%). The patients spent their time praying, meditating or practicing yoga for a mean duration of 3.0, 2.8, and 4.5 hours per week, respectively. Fifty-four patients (50.5%) took nutrients and herbs, traditional Thai or Chinese medicine, in 38 and 28 patients, respectively. Examples of popular nutrients and herbs included garlic, kaempfer, kariyat, bird nest, and essence of chicken. Physical treatment was practiced in 45 patients (42.1%), of which Thai massage was the most common (23 patients, 51.1%), followed by acupuncture (17 patients, 37.8%) (Figure 1B). Colon hydrotherapy, with a considerable risk of infections in specifically immunosuppressed individuals, and aromatherapy were the other modalities adopted (Table S2 in the Appendix).

Relationship between CAM use and sociodemographic characteristics

The occupation of the patients by each category had an impact on the use of CAM ($P = 0.024$), with the self-employed being the group most likely to use CAM. The other characteristics (ie, age, sex, residence, health coverage, education, or average monthly income) did not show statistically significant differences between the groups (Table 3).

Relationship between CAM use and clinical characteristic

The mean duration of the disease in CAM users and nonusers was 9.8 ± 6.9 years and 8.0 ± 6.7 years, respectively, with a 0.058.

Table 3
Relationship between CAM use and sociodemographic parameters.

Parameters	CAMs users N = 68	CAMs nonusers N = 39	*P* value
Age, years; mean (SD)	46.7 (12.4)	45.5 (13.1)	0.584
Residence, number (%)			
- Urban	45 (66.2)	31 (79.5)	0.144
- Rural	23 (33.8)	8 (20.5)	
Occupation, number (%)			
- Unemployed	30 (44.1)	15 (38.5)	**0.024**
- Self-employed	17 (25.0)	3 (7.7)	
- Employee (nongovernment and government)	21 (30.9)	21 (53.8)	
Health coverage, number (%)			
- Universal coverage	20 (29.4)	9 (23.0)	0.913
- Social security	18 (26.5)	12 (30.8)	
- Civil servant medical benefits	16 (23.5)	8 (20.5)	
- State enterprise	1 (1.5)	1 (2.6)	
- Self-pay	13 (19.1)	9 (23.1)	
Education, number (%)			
- Nonuniversity	36 (52.9)	13 (33.3)	0.050
- University	32 (47.1)	26 (66.7)	
Average monthly income*, number (%)			
- Less than 12,000 Baht	34 (51.5)	13 (36.1)	0.151
- Equal to or greater than 12,000 Baht	32 (48.5)	23 (63.9)	
- Data not disclosed	2 (2.9)	3 (7.7)	

* Data disclosed by 102 patients only. 1 USD = 32.91 Baht (average exchange rate, June–December 2021).

(Table S3 in the Appendix) For disability, the current EDSS and the ambulation index of the two groups were also similar. In the CAM user group, the mean and SD of EDSS and the ambulation index were 2.7 ± 2.2 and 1.4 ± 2.6, respectively. In the nonuser group, they were 2.6 ± 2.6, and 1.4 ± 2.7, respectively. Regarding the intervals from the last attack, the mean and SD were 53.5 ± 48.7 months and 48.8 ± 59.5 months in the CAMS user and nonuser groups, respectively. All parameters show no statistically significant difference.

CAM use and patient opinions

Most patients did not realize the potential effects of the use of CAMs on prescribed drugs (58 patients, 80.6%). Only some did (5 patients, 6.9%).

Multivariate analysis of CAM use and clinical characteristics

Univariate and multivariate analyzes of variables potentially associated with the use of CAMs are shown (Table 4). After adjustment by multivariate regression analysis with a forward stepwise

Table 4
Univariate and multivariate analysis of CAM use and clinical characteristics.

Variables	Univariate analysis OR (95% CI)	*P*-value	Multivariate analysis OR (95% CI)	*P*-value
Occupation: employee	Reference		1 (Reference)	
Occupation: unemployed	2.00 (0.84–4.76)	0.117	2.03 (0.81–5.09)	0.132
Occupation: self-employ	5.67 (1.44–22.26)	**0.013**	6.46 (1.57–26.52)	**0.010**
Education level: nonuniversity	2.25 (0.99–5.10)	0.052	-	
Residence in rural area	1.98 (0.785–5.00)	0.148	-	
Income less than 12,000 baht	1.88 (0.82–4.33)	0.138	-	
Interval from the last attack: equal to or more than 40 months	1.80 (0.81–4.01)	0.151	-	
Duration of the disease: qual to or more than 10 years	2.33 (0.96–5.67)	0.061	2.71 (1.06–6.95)	**0.038**

The bolded values represent statistical significance, specifically indicating that they have achieved a significance level of $p<0.05$. Values that are not bolded signify that they did not reach statistical significance at the $p<0.05$ threshold.

method, self-employment and disease duration equaled 10 years or more were significantly associated with the use of CAM. In contrast, unemployment showed a nonsignificant association after adjustment for other variables. After using the occupation as an employee as a controlling factor, self-employed patients were significantly associated with the use of CAMs (adjusted odds ratio 6.46; 95% confidence intervals 1.57–26.52; *P*-value 0.010), while unemployment trended to relate to the use of CAMs, without statistical significance (aOR 2.03, 95% CI 0.81–5.09, *P*-value 0.132). The duration of the disease, equal to 10 years or more, was also significantly associated with the use of CAM (aOR 2.71, 95% CI 1.06–6.95, $P=0.038$).

Discussion

This study highlights the prevalence of CAM use among Thai patients with CNS-IIDD.

Of these individuals, 63.6% openly acknowledged the incorporation of CAMs into their healthcare practices. On the contrary, a contrasting trend was observed among HIV patients in Iran, with an impressive 89.22% reporting using CAM. [29] This difference may be influenced by cultural or regional factors.

This study included data on the use of CAMs among patients with NMOSD and MOGAD, which had not been widely reported, unlike other studies, which focused mainly on MS patients. [30–33]

Regarding the level of education, 42.4% of patients using CAMs in the United States were university graduates with a higher association at the postgraduate level.[30] The opposite trend was found in Thai patients, with nonuniversity education being more likely to use CAM. In our study, patients with a bachelor's degree or higher comprised approximately 50%, although higher than the average number in the general population (25%) but lower than the percentage of over 70% from a study in Saudi Arabia.[34] Nonuniversity graduate patients showed some association with the use of CAMs, unlike the study by[35] which found that MS patients with college or graduate degrees were more likely to report using unconventional treatment. Higher education may afford better access to information on the choices, risks, and benefits of CAMs to make evidence-based decisions.

We found no correlation between disability status and CAM use, similar to studies from the United States and Germany,[36,37] showing that the higher the EDSS, the higher the frequency of CAM use. However, some studies have shown conflicting results, indicating an inverse association between EDSS and CAM use.[38,39]

Self-employed patients and patients with a disease duration of more than 10 years were significantly associated with the use of CAM, aligning with other studies[36,40] contrasting with one study that showed no difference in CAM utilization.[37]

The most prevalent type of CAM use in our study was vitamins and minerals, similar to other studies in MS patients from Denmark and Germany[31,38] This pattern differs from the United States, where chiropractic, massage, and acupuncture were reported as the top three CAM modalities.[30] On the contrary, herbal medicine constituted the predominant choice among Iranian MS patients, accounting for 64.2% of CAM use.[33] These findings diverge from a systematic review of CAM recommendations for depression, which identified exercise as the most recommended intervention for depression treatment while advising against the use of omega-3 fatty acids and vitamin D.[41]

Vitamin D and calcium were the most frequently used CAM. As they were prescribed rather than self-administered, our patients might not recognize them as CAM. This practice of vitamin D and calcium supplements is our standard of care, particularly in patients with NMOSD who received corticosteroids. Furthermore, we had previously found that vitamin D insufficiency was very common (up to 80%) in our patients. Although no association was demonstrated between hypovitaminosis D and disability or disease activity, we routinely check vitamin D status and provide supplements whenever necessary.[42]

Mental and spiritual treatment, such as praying and meditation, was the second most popular CAM. This is similar to a study from Saudi Arabia, where praying was reported in about 60%.[34]

We found that Thai CNS-IIDD patients were unlikely to inform physicians about their CAM use, with only 16% reported to their healthcare providers. This finding aligns with meta-analysis,[43] which revealed a disclosure rate of 33% (95% CI: 24%–43%). Reasons for nondisclosure included lack of information from medical providers, fear of provider disapproval, perception of disclosure as unimportant, belief that providers lacked CAM knowledge, lack of time and belief that CAMs were safe. Most of our patients (80.6%) thought that CAMs have no effect on prescribed medication and therefore would not report their use to their physicians. This underscores the need for healthcare providers to proactively inquire about CAM use among their patients with a nonjudgmental attitude.

This study has some limitations. Firstly, it was conducted in a tertiary care center among patients living in urban areas. Therefore, it cannot represent people in rural areas with a more traditional Thai lifestyle. Additionally, our study recruited patients in 2021 before the legalization and widespread availability of cannabis and cannabis extracts for medical use,[44] thereby not capturing the current popularity of cannabis use. Furthermore, the questionnaire used was not universally applicable, as it was designed in-house. Our study, which is a cross-sectional questionnaire-based study, cannot assess the impact of CAM on clinical outcomes. The inherent nature of a cross-sectional design limits our ability to establish causal relationships.

In conclusion, this is the first study on the use of CAM among Thai CNS-IIDD patients. It is quite a common practice and is most of the time not reported to their physicians. All patients should be asked about their use of CAMs to understand their beliefs and expectations. Health education and safety concerns must be

addressed and appropriate treatments should be incorporated to improve the quality of life.

Declaration of competing interest

There is no potential conflicts of interest or financial relationships that may be perceived as influencing the research presented in the manuscript titled "Use of Complementary and Alternative Medicine in Patients with Idiopathic Inflammatory Demyelinating Diseases of the Central Nervous System: A Cross-Sectional Study in Thailand."

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.curtheres.2024.100749.

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