

A COMPARISON OF HIGH FREQUENCY AND
LOW FREQUENCY VISITORS TO
PRACTITIONERS OF COMPLEMENTARY AND
ALTERNATIVE MEDICINE (CAM)

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Abstract

Aim: To investigate whether individuals with a high frequency of CAM visits differ from those with a low frequency of CAM visits in relation to socio-demographic characteristics, lifestyle, health, health-care utilisation, motivation for use and experienced CAM efficacy.

Method: The study used data from a cross sectional total population study in Central Norway, the third Nord-Trøndelag Health Study (HUNT3) conducted in the period 2006-2008. A total of 4366 individuals who had visited a CAM practitioner the last 12 months were included. In addition, a sub-analysis of 1985 individuals who had visited a practitioner of acupuncture the last 12 months was performed. Variables included demographics, lifestyle, health status, health care utilisation, motives for CAM use and experienced CAM efficacy. Pearson chi-square tests were performed to compare high frequency CAM visitors with low frequency CAM visitors. Multivariable logistic regression was used to calculate adjusted odds ratio.

Results: The variables which significantly increased the odds of being a high frequency CAM visitor ($p < 0.01$) were being aged between 56 and 75 (Adj OR, 1.4) or over 75 (Adj OR, 2.0) compared to those under 36, being currently working (Adj OR, 1.32), having reduced global health (Adj OR for “fair” global health, 1.50), having visited a chiropractor (Adj OR, 1.42), acupuncturist (Adj OR, 2.79), reflexologist (Adj OR, 2.36) or “other CAM modality” (Adj OR, 1.87) the last 12 months. The variables which decreased the odds of being a high frequency CAM visitor were being male (Adj OR, 0.81) or having experienced a positive effect from the use of at least one CAM modality (Adj OR, 0.53). In the subanalysis, reduced global health increased the odds of being a high frequency CAM visitor (Adj OR for “fair” global health, 1.83), while having experienced a positive effect from the use of at least one CAM modality decreased the odds of being a high frequency CAM visitor (Adj OR, 0.47).

Conclusion: High frequency CAM visitors were more likely to be middle-aged to old females who were currently working and had reduced global health. Having experienced a positive effect from use of CAM decreased the odds of being a high frequency CAM visitor. Choice of CAM modality seems to have an impact on frequency of visits, and future research could enhance understanding on this point.

Introduction

Complementary and alternative medicine (CAM) is a broad set of health care practises. There are regional differences in which treatments are included in this category, but it has been defined as treatment modalities which are predominantly offered outside the dominant health care system [1, 2]. The term “complementary” refers to practises used alongside conventional medical therapy, while “alternative” describes practices meant to replace conventional medical therapy [3]. The CAM spectrum is heterogeneous. The Norwegian Research Centre for Complementary and Alternative Medicine (NAFKAM) have listed 57 categories of CAM on their web portal nifab.no [4]. Some modalities are offered through practitioners working mainly outside the national health care system, i.e. homeopathy [5]. Other modalities are offered by personnel both outside and within the national health care system, like acupuncture [6, 7]. The final important subcategory is self-treatment conducted by the patient, an example being the use of natural supplements [8].

The full list of modalities outlined by NAFKAM is too extensive to cover, but homeopathy and acupuncture are among the more commonly known modalities and will be mentioned briefly. At least 103 countries have citizens who use acupuncture according to the World Health Organization [2]. Findings from a representative Norwegian population in the HUNT3 study reported that 2089 (4.1%) of the 50,827 participants had visited a practitioner of acupuncture the last 12 months [9]. The treatment involves placement of solid, sterile needles according to specific trigger points on the human body. Classical acupuncture explains the cause for disease as imbalances or blockades in the flow of qi, a life energy. By applying the needles to the specific trigger points, these imbalances will be resolved and the patient healed. In medical acupuncture, practitioners base their practice on a western understanding of health and disease, without the notion of qi. These practitioners assume that the needles can stimulate nerves and muscles and thereby have an effect on certain conditions [10]. When performed correctly, acupuncture is perceived a safe treatment with low risk of serious adverse effects [10, 11].

During the early parts of our millennia, the 12-month prevalence estimates of visitors to practitioners of homeopathy in the western world have been approximately 2% [5]. The theory behind homeopathy relies on two main principles: “like cures like” – the notion that a disease can be cured by a substance that produce similar symptoms in healthy individuals; and

a “law of minimal dose” – the notion that diluting remedies and thereby lowering the concentration of the active substance increases the potency of the medication [12].

Homeopathy and acupuncture are similar in that both involve visitation of a specific practitioner, but the frequency of these visits may be quite different. The homeopath is not just a consultant, but a provider of homeopathic remedies. Both patient and practitioner may find one visit sufficient, and may not require follow up once the homeopathic pills have been administered. In contrast, acupuncture is often performed over a number of treatment sessions, depending on the issue.

Prevalence of CAM use

Some systematic reviews from the past decade suggest that the prevalence of any CAM use by the general population in the industrialized world is substantial, with a smaller but significant proportion consulting CAM practitioners [13, 14]. A systematic review of prevalence of CAM use by Harris et al. report estimates of 12-month prevalence of any CAM use and 12-month prevalence of visits to CAM practitioners, ranging from 9.8 to 76% and 1.8 to 48.7% respectively [13]. A systematic review of the prevalence of CAM use in the EU done by Eardley et al. concluded that exact prevalence numbers are hard to estimate due to heterogeneous studies, many of which hold poor quality [15]. Many of the studies conducted on CAM users have been done in the United States, an example being Clarke et al. reporting on CAM use across three points in time this millennia [16]. According to their findings, more than one third of the adult US population participating in the National Health Interview Survey had used CAM during the last 12 months both in 2002, 2007 and 2012. Studies conducted in Scandinavian countries show similar trends, with reported prevalence of people ever having used CAM ranging from 34 to 49 % [17, 18]. When limited to CAM use within the last 12 months, studies from Nordic countries report use by as much as one third of the population [18-20]. Analogous to the reviews, Norwegian studies also imply that the prevalence of those having visited a CAM practitioner is less than for any CAM use, but significant [1, 19]. A study done in the municipality of Tromso found that 13.1% of the participants had visited a CAM practitioner the last 12 months in 2007/2008 [19], while results from the HUNT studies report that 12.6 % of the participants had visited a CAM practitioner the last 12 months in 2008 [1].

The various studies show that prevalence of ever CAM use is different from use last 12 months or prevalence of visits to a CAM practitioner, and this is underlined by Kristoffersen

et al. [21]. The various reported numbers do nevertheless seem to illustrate a considerable interest for CAM in the population.

Who are the CAM users?

Studies repeatedly indicate that CAM users are likely to be female, young to middle-aged, well educated and report poor health status compared to non-users [19, 22, 23]. Results from the National Health Interview Survey (NHIS) in the United States suggest that female CAM users were more likely than male to have a bachelor degree, be separated or widowed [24]. The same paper shows that a higher proportion of female CAM users reported using CAM to enhance general wellness and prevent disease compared to male CAM users. The association between female gender and CAM use has also been found in several specific patient groups suffering from Parkinson's [25], cancer [26, 27] or gastrointestinal conditions [28]. While much work has been put in characterizing CAM users, and comparing them with non-users, there seem to be fewer studies investigating differences among the CAM users. Studies comparing user groups within the CAM using population tend to investigate differences due to gender [9, 19, 24], or focus on specific patient groups like those suffering from cancer or cardiovascular disease [29]. Multivariate analyses of CAM use imply that there might be important differences between CAM users, and that different pathways can lead to the use of CAM [30]. Sirois et al. propose that reasons leading to sustained CAM use may differ from those leading to initial or trial use [31], and if so, continuous CAM users may also differ from those only trying it out. There seems to be a lack of knowledge in this area.

Why people use CAM

Several studies have investigated the reasons and motivations for using CAM. Systematic reviews suggest that self-control and active participation in the treatment process, a holistic view of disease causality and treatment, scepticism towards synthetic medication in favour of natural products and general philosophies of life are some of the factors relating to CAM use [30, 32, 33]. A way of viewing reasons for CAM use is as push – and pull factors [34-36]. Vincent and Furham describe push factors as reasons individuals might have for rejecting conventional medical therapy, leaving CAM as the preferred alternative [37]. Examples of factors within this group are adverse effects related to use of conventional medication, lack of effect from conventional medicine or negative experiences with health personnel in the public health care system. The same authors describe pull factors as reasons why individuals find CAM attractive. Examples of pull factors are positive beliefs regarding the clinical

effectiveness of CAM, the ability to alleviate negative side effects from conventional medical therapy or promote general well being. Although motivations for CAM use are complex and vary among different users, a systematic review by Verhoef et al. suggest that pull factors may be of greater influence than push factors on the decision to use CAM [33]. There are other examples of quantitative and qualitative research supporting this notion [32, 35]. Overall, literature seem to suggest that motivations behind CAM use are heterogeneous, and consist of both psychological and health-related factors. The labelling of motivations as mainly push – or pull factors may be to simplistic, but will be the adopted approach in this analysis of motivations for CAM use.

How often is CAM used

As presented above, there are a number of studies on the prevalence of CAM use in the population. However, there are few studies on how often those using CAM are e.g. visiting a CAM practitioner. Thus, there seems to be a lack of studies on the general population investigating characteristics of – and beliefs held by people who visit a CAM practitioner frequently. Some studies focus on motives for sustained CAM use as compared to initial use [31, 38], and there are also some examples of studies investigating which characteristics are associated with a high level of CAM use [39, 40]. Shumay et al. found in a study done on cancer patients that a larger degree of CAM use was associated with being female, Caucasian, having more education and greater symptoms of nausea and vomiting. A larger degree of use was also associated with lower doctor satisfaction and greater perception of disease severity [39]. A study done by Sirois et al. on admittedly a small sample of CAM users suggest that individuals who are open and agreeable, as described by a five factor model of personality, consult CAM practitioners to a greater extent [40].

Aim

Although there are examples of articles focused on broadening our understanding of individuals with a frequent CAM use, this study will seek to contribute to a seemingly limited field of literature regarding individuals with frequent visits to practitioners of CAM.

The aim of this study was therefore do investigate whether individuals with a high frequency of CAM visits differ from those with a low frequency of CAM visits in relation to socio-demographic characteristics, lifestyle, health, health-care utilisation, motivation for use and experienced CAM efficacy.

Method

The study used data from a cross sectional total population study in Central Norway, the third Nord-Trøndelag Health Study (HUNT3) conducted in the period 2006-2008.

An application seeking approval from the Regional Committee for Medical and Health Research Ethics, South-East Norway (REK) for the current project was sent, but deemed unnecessary by the committee (2015/2387/REK sør-øst C).

Setting

Norway has slightly more than 5.2 million inhabitants [41], and provide them with equal access to healthcare services independent of personal income. Norway is one of the major spenders on health per capita[42]. The life expectancy of Norwegians (2015) have surpassed 84 years for women and 80 years for men [43]. Government funding is limited to practices included in the national health care system. Thus the majority of CAM services are paid out of pocket by the patients who wish to undergo this form of treatment. Some CAM modalities are to a limited extent provided within the government-funded health care system, i.e. acupuncture [6], while chiropractic is licensed as a health care profession in Norway and therefore not part of the spectrum of CAM modalities regarded in this study.

About the HUNT studies

Norway has a total of 19 counties, and the Nord-Trøndelag county is geographically situated in central Norway. The county and its population is considered fairly representative of the general Norwegian population concerning geographical, demographic and occupational structure [44], despite the absence of larger cities and a population income and education level slightly below the national average. The HUNT Study (an acronym for the Norwegian name: **H**else**u**ndersø**k**elsen I **N**ord-**T**røndelag) is as indicated in the name conducted in Nord-Trøndelag county. HUNT constitutes a large population database for medical and health-related research [45]. To this date, three HUNT surveys have been completed. The first, HUNT1, in 1984-86, HUNT2 in 1995-97 and HUNT3 in 2006-08. In the HUNT3 survey, which this study is based on, all residents of Nord-Trøndelag county aged 20 years or above received a postal invitation to participate, including a first questionnaire (Q1). Those who decided to participate returned the Q1 questionnaire at a health station where they underwent a brief medical examination and received a second questionnaire (Q2) to be returned by post.

The questions in Q1 were mainly related to general health, diseases, lifestyle and health care utilisation [46]. Based on the answers provided by the participants in Q1, a maximum of three relevant Q3 questionnaires were handed out relating to specific diseases or other selection criteria, such as use of CAM [45]. The Q3: CAM questionnaire provided a more detailed examination regarding use of specific CAM modalities, frequency of CAM use, motives for use and experienced efficacy etc. [47].

Sample

A total of 93860 individuals were invited to participate in HUNT3, which of 50807 (54.1%) completed Q1 (Figure 1) and were defined as participants by the HUNT Research Centre. Among the 50807 participants, a total of 6380 (12.6%) individuals answered “yes” to the following question on Q1: *“Have you during the last 12 months visited a practitioner of homeopathy, acupuncture, reflexology, layer of hands or other alternative treatment?”*. This group was consequently provided with the Q3: CAM questionnaire, where a total of 4366 (68.4%) reported minimum one CAM visit the last 12 months by answering the following question: *“How many times the last 12 months have you visited a practitioner of CAM? (none/ 1-3 times/ 4 times or more)”*. These 4366 individuals were included in this study.

Dependent variable – Frequency of visits to CAM practitioners

High frequency visitors and low frequency visitors were defined on the basis of answers to the question: *“How many times the last 12 months have you visited a practitioner of CAM? (none/ 1-3 times/ 4 times or more)”*. Those who answered “4 times or more” were defined as high frequency visitors, and those who answered 1-3 times were defined as low frequency visitors (figure 1).

Independent variables

Demographics

Age and sex of the participants were by HUNT collected from public registers. Marital status of the participants was categorized as married/cohabiting, single, divorced/separated or widowed. Education level was classified on three levels, as having completed compulsory school, middle level education (included vocational education below university level) or university degree. Participants were defined as currently working or not, based on the question: *“Are you currently working?”* (No/Yes)

Lifestyle

The level of physical activity, tobacco smoke and alcohol consume were included as lifestyle measurements. Individuals were labelled as daily smokers or non-smokers on the basis of daily use of cigarettes, cigars and/or pipe. Occasional smokers were not included in the analysis. The level of physical activity was dichotomized to working out less than, or once or more weekly. Frequency of alcohol consume was dichotomized to drinking less than, or once or more weekly the last 12 months.

Health Status

Variables on health status were constructed on the basis of the following questions with recoding of answer categories in brackets:

- 1) Global health: How is your health at the moment? (poor, fair, good, very good).
- 2) Recent complaint (answered yes to at least one of the following):
 - To which extent have you experienced Nausea/Heartburn/Diarrhea/Constipation/Intermitting diarrhea and constipation/Feeling bloated the last 12 months? (Never = No/Little = Yes/Much = Yes).
 - Have you experienced abdominal pain or discomfort the last 12 months? (Yes, much = Yes/Yes, little = Yes/No, never = No).
 - Have you experienced stiffness or pain in your muscles/joints that has lasted for more than three consecutive months during the last year? (Yes/No)
 - Have you suffered symptoms from hay fever/allergic rhinitis the last 12 months? (Yes/No).
 - Have you suffered from headaches the last year? (Yes/No).
 - Do you cough daily in periods of the year? (Yes/No)
 - Have you experienced episodes with wheezing or heavy breath the last 12 months? (No/Yes).
- 3) Chronic complaint: Do you suffer from any long standing (minimum one year) somatic or psychiatric illness, disease or disability that limit your activities of daily life? (Yes/No).
- 4) Number of symptoms was determined by adding the total number of “yes” answers to questions regarding experience of Headache/Hay fever/Abdominal pain/Nausea/Heartburn/Diarrhea the last 12 months. It was thus possible to report 6

symptoms. The variable was trichotomized into individuals having experienced no symptoms, between one and three symptoms or between four and six symptoms the last 12 months.

5) The number of current or past diseases was determined by adding the total number of “yes” answers to the questions of currently having/having had the diseases below. It was thus possible to report 19 diseases. The resulting numbers were separated in three groups; no diseases, between one and two diseases and three or more of the following diseases:

- Asthma
- Chronic bronchitis/emphysema/COPD
- Diabetes
- Cancer
- Rheumatoid arthritis
- Ankylosing spondylitis
- Osteoporosis
- Fibromyalgia
- Arthrosis
- Myocardial infarction
- Angina pectoris
- Heart failure
- Other heart disease
- Psoriasis
- Stroke/cerebral haemorrhage
- Kidney disease
- Hand eczema
- Epilepsy
- Sarcoidosis

Health Care Utilisation

Visits to conventional health care providers were measured by answers to the following questions, individuals who answered “No” to both were defined as only having visited a practitioner of CAM:

- During the last 12 months, have you visited a general practitioner? (No/Yes)
- During the last 12 months, have you visited a chiropractor? (No/Yes)

Visits to specific CAM providers were measured by answers to the following questions (response categories: None/1 time/2-3 times/4-5 times/6-10 times/More than 10 times), and the answers were recoded into visitors (1 time or more) and non-visitors (none visits) of each modality:

- How many times have you visited a practitioner of homeopathy the last 12 months?
- How many times have you visited a practitioner of acupuncture the last 12 months?
- How many times have you visited a practitioner of reflexology the last 12 months?
- How many times have you visited a practitioner of other alternative treatment the last 12 months?

Motives for CAM Use

Reasons for CAM use were measured by answers to the following question: “*Why have you used, or why do you use alternative treatment?*”. Each individual could check one or more of eleven given alternatives. The reasons used in this analysis were lack of effect from conventional treatment, avoidance of adverse effects from conventional treatment, a belief in CAM and earlier experience with CAM.

Reasons for CAM use were categorised into “push” and “pull” factors.

A push factor was defined as present if the individual checked the alternative giving a lack of effect from conventional treatment as a reason for CAM use and/or the alternative giving adverse effects from conventional treatment as a reason for CAM use. If neither of these alternatives were checked, the push factor was defined as not present.

A pull factor was defined as present if the individual checked the alternative giving belief in CAM as a reason for CAM use and/or the alternative giving earlier experience with CAM as a reason for CAM use. If neither of these alternatives were checked, a pull factor was defined as not present. The other seven alternatives were not included in the analysis.

Experienced efficacy

The Q3: CAM questionnaire asked participants to rate experienced effect of homeopathy, acupuncture, reflexology, healing/layer of hands/reading, prayer, herbs/natural remedies/dietary supplements, magnet therapy and other alternative treatment (response categories: Much better/Little better/Unchanged/Little worse/Much worse). Answer categories were recoded such that the possible outcomes of each treatment were better, unchanged or worse. Two variables were constructed to measure experienced efficacy; one measuring those who had gotten better from use of at least one CAM modality, and one for those who had gotten worse from at least one CAM modality. Two variables were constructed because the same individual could get better from one modality and worse from another, and could in this way be counted in both groups.

Statistical Analyses

High frequency visitors to practitioners of CAM were compared to the low frequency visitors of CAM practitioners in bivariable chi square analyses and multivariable logistic regression analyses with 95 % confidence intervals (95% CI) of the odds ratio (OR). In the multivariable analyses, the adjusted odds ratio (Adj OR) was calculated in a model where all variables were included to identify unique contributions of each variable on high frequency of visits to a CAM practitioner (the dependent variable). Due to the relatively high N, statistical significance was accepted at the 1% level ($p < 0.01$). All data were analysed using IBM SPSS Statistics, version 23.0 (IBM Corp., Armonk, N.Y., USA).

A sub-analysis was conducted due to the possibility that choice of CAM modality is the predominant influence on frequency of CAM visits. The sub-analysis compared high frequency visitors who had visited a practitioner of acupuncture at least one time the last 12 months with low frequency visitors who had also visited a practitioner of acupuncture. Some of the independent variables from the overall analyses were excluded from the sub-analyses. Specifically, variables measuring visits to practitioners of homeopathy, acupuncture, reflexology or other CAM modalities were excluded from the sub-analyses. Except from this, all the variables included in the sub-analyses were the same as in the overall analyses. The statistical analyses were conducted in the same way as the overall analysis described above.

Results

Of the 94,194 invited adult inhabitants in Nord-Trøndelag county, 50,807 (54.1%) chose to participate in HUNT3 (Figure 1). A total of 6380 participants answered yes to the question on CAM visits the last 12 months in Q1. A total of 4366 answered the question in Q3: CAM on how many times they had visited different types of CAM practitioners the last 12 months.

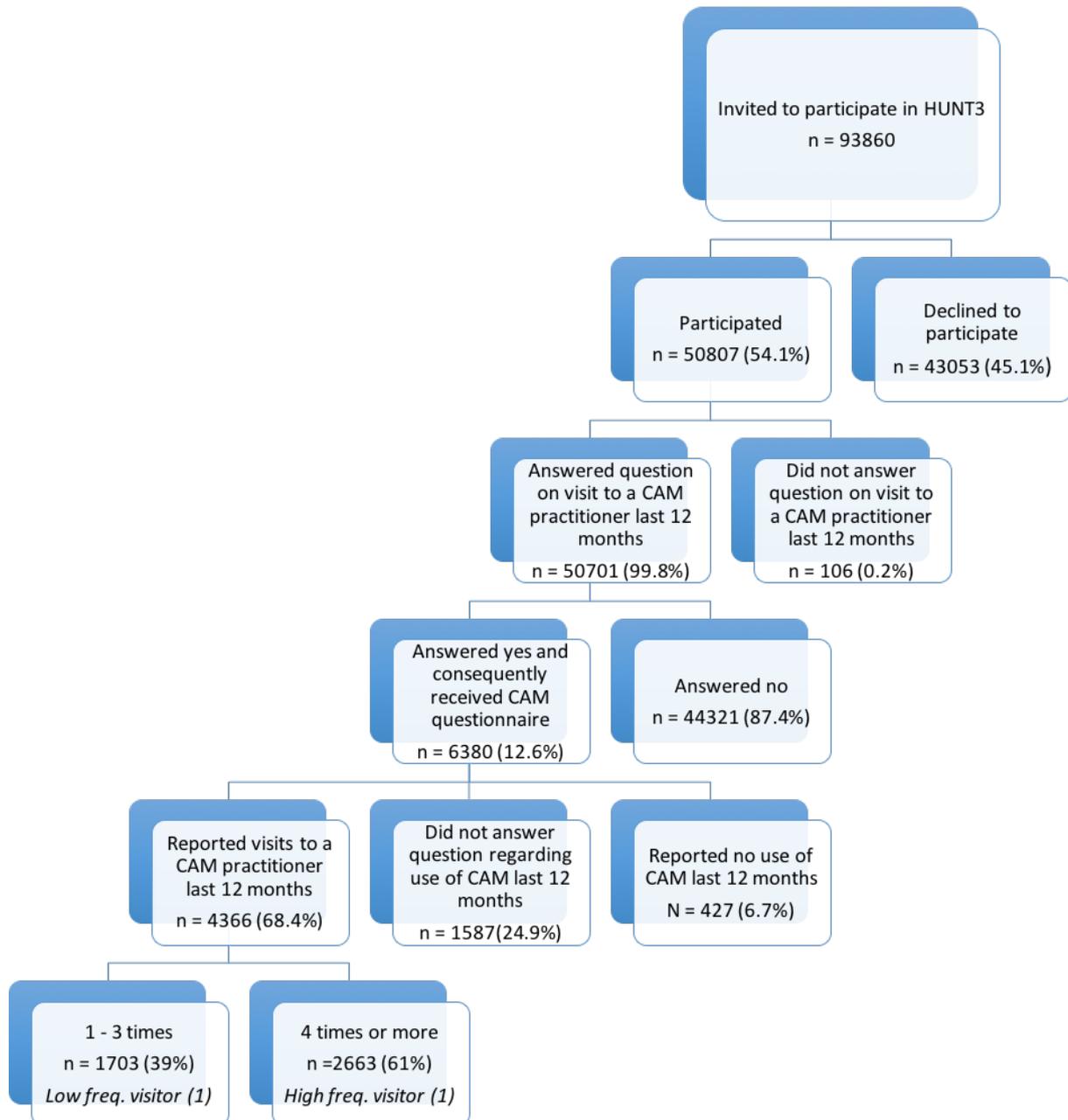


Figure 1. Flow chart showing the process of defining dependent variable; High frequency user.

The number of individuals reporting a minimum of four visits to a CAM practitioner the last 12 months, hereafter named high frequency users, was 2663. Of the high frequency users, 1999 (75.1%) were women and 664 (24.9%) were men. The average age of this group was 51.4 years.

Characteristics of high frequency users – Bivariable

The bivariable analysis (table1) showed that high frequency users were significantly different from low frequency users with regards to gender, age, health status, health care utilisation and experienced efficacy of CAM use. A larger proportion of the high frequency users were women (75.1 % versus 70.3 % for low frequency users). They also differed from low frequency users in that slightly more of them reported less than good global health (88.0 % versus 84.1 %) and had experienced at least four symptoms the last 12 months (29.1 % versus 25.7 %). A slightly larger proportion of the high frequency users reported having visited a GP the last year compared to low frequency users (90.5 % versus 86.4 %), while the difference regarding visits to a chiropractor was even greater (17.1 % of high frequency CAM visitors had visited a chiropractor the last year versus 12.0 % of low frequency CAM visitors).

When asked for visits to specific CAM practitioners, fewer of the high frequency users reported having visited a homeopath the last 12 months than low frequency users (10.5 % versus 20.4 %). In contrast, a larger proportion of the high frequency users reported having visited an acupuncturist (52.7 % versus 34.1 %) or reflexologist (24.1 % versus 14.7 %). More of the high frequency users reported health enhancement from the use of at least one CAM modality compared to low frequency users (90.9 % versus 82.6 %) (Table 1).

Table 1. Bivariable and multivariable analyses of association between high frequency visitors of CAM practitioners and demographic characteristics, lifestyle, perceived health, symptoms and diseases, health care utilisation, motives for – and effect of CAM use.

Independent variables	Bivariable analyses			Multivariable analyses	
	All users of Complementary and Alternative Medicine, N	Frequent Users (≥ 4 times last 12 M) N (%)	<i>p</i> Value	Adjusted OR (95 % CI)	<i>p</i> Value
All participants	4366	2663 (61.0)			
Sex			0.001		
Female	3196	1999 (62.5)		Ref.	
Male	1170	664 (56.8)		0.81 (0.69 – 0.94)*	0.007
Age group			0.047		
< 36	674	381 (56.5)		Ref.	
36 - 55	2059	1256 (61.0)		1.13 (0.92 – 1.38)	0.248
56 - 75	1457	916 (62.9)		1.40 (1.11 – 1.77)*	0.005
> 75	176	110 (62.5)		2.02 (1.28 – 3.19)*	0.003
Education			0.012		
Compulsory	717	435 (60.7)		Ref.	
Middle level	2398	1505 (62.8)		1.03 (0.85 – 1.25)	0.783
University	1212	699 (57.7)		0.85 (0.68 – 1.06)	0.147
Marital status			0.102		
Married /cohabiting	3561	2187 (61.4)		Ref.	
Single	376	213 (56.6)		0.98 (0.77 – 1.26)	0.882
Divorced / separated	220	143 (65.0)		1.15 (0.83 – 1.58)	0.405
Widow(er)	199	113 (56.8)		0.69 (0.49 – 1.00)	0.049
Currently working			0.018		
No	1308	763 (59.3)		Ref.	
Yes	3058	1900 (62.1)		1.32 (1.10 – 1.58)*	0.003
Current lifestyle					
<i>Daily smoker</i>			0.371		
No	3612	2214 (61.3)		Ref.	
Yes	754	449 (59.5)		0.91 (0.76 – 1.09)	0.292
<i>Physical activity</i>			0.044		
≥ 1 time per week	3539	2183 (61.7)		Ref.	
< 1 time per week	745	430 (57.7)		1.12 (0.93 – 1.34)	0.231
<i>Alcohol consume</i>			0.576		
≥ 1 time per week	1566	964 (61.6)		Ref.	
< 1 time per week	2689	1632 (60.7)		1.02 (0.89 – 1.18)	0.748
Perceived health					
<i>Global health</i>			<0.001		
Very good	434	219 (50.5)		Ref.	
Good	2276	1371 (60.2)		1.30 (1.04 – 1.63)	0.021
Fair	1415	917 (64.8)		1.50 (1.14 – 1.97)*	0.003
Poor	84	55 (65.5)		1.80 (1.03 – 3.14)	0.040
<i>Health complaints</i>					
Recent, one or more			0.004		
No	160	80 (50.0)		Ref.	
Yes	4206	2583 (61.4)		1.37 (0.92 – 2.04)	0.121
Chronic > 12 M			<0.001		
No	2521	1470 (58.3)		Ref.	
Yes	1845	1193 (64.7)		1.20 (1.02 – 1.42)	0.027

Independent variables	Bivariable analyses			Multivariable analyses	
	All users of Complementary and Alternative Medicine, N	Frequent Users (≥4 times last 12 M) N (%)	p Value	Adjusted OR (95 % CI)	p Value
Number of symptoms last 12 M			0.005		
0	605	340 (56.2)		Ref.	
1-3	2548	1547 (60.7)		0.87 (0.68 – 1.12)	0.272
4-6	1213	776 (64.0)		0.94 (0.80 – 1.10)	0.456
Number of current/past diseases			0.455		
0	2077	1249 (60.1)		Ref.	
1-2	1897	1177 (62.0)		1.34 (1.03 – 1.75)	0.031
≥3	392	237 (60.5)		1.26 (0.97 – 1.62)	0.079
Visited last year					
General practitioner			<0.001		
No	485	254 (52.4)		Ref.	
Yes	3881	2409 (62.1)		1.22 (0.66 – 2.25)	0.536
Chiropractor			<0.001		
No	3707	2208 (59.6)		Ref.	
Yes	659	455 (69.0)		1.42 (1.15 – 1.74)*	0.001
Only CAM practitioner			<0.001		
No	3933	2440 (62.0)		Ref.	
Yes	433	223 (51.5)		1.07 (0.56 – 2.04)	0.851
Motivation for use					
Push			0.015		
No	2294	1360 (59.3)		Ref.	
Yes	2072	1303 (62.9)		0.93 (0.81 – 1.07)	0.332
Pull			0.037		
No	1863	1103 (59.2)		Ref.	
Yes	2503	1560 (62.3)		1.04 (0.90 – 1.20)	0.608
Visited specific practitioner last 12 M					
Homeopath			<0.001		
No	3738	2383 (63.8)		Ref.	
Yes	628	280 (44.6)		0.56 (0.46 – 0.68)*	<0.001
Acupuncturist			<0.001		
No	2381	1259 (52.9)		Ref.	
Yes	1985	1404 (70.7)		2.79 (2.37 – 3.28)*	<0.001
Reflexologist			<0.001		
No	3472	2020 (58.2)		Ref.	
Yes	894	643 (71.9)		2.36 (1.95 – 2.86)*	<0.001
Other CAM modality			0.012		
No	2299	1362 (59.2)		Ref.	
Yes	2067	1301 (62.9)		1.87 (1.58 – 2.21)*	<0.001
Experienced efficacy of specific treatment					
Got better from at least one CAM modality			<0.001		
No	540	243 (45.0)		Ref.	
Yes	3826	2420 (63.3)		0.53 (0.43 – 0.65)*	<0.001
Got worse from at least one CAM modality			0.466		
No	4327	2637 (60.9)		Ref.	
Yes	39	26 (66.7)		0.52 (0.25 – 1.11)	0.092

Characteristics of high frequency users – Multivariable

In the multivariable analysis (Table 1), 11 out of 33 variables were significantly associated ($p < 0.01$) with being a high frequency CAM visitor (Table 1). The significant findings were related to demographics, employment, perceived global health, health care utilisation and experienced efficacy.

Demographics

Females had a 1.2 times increased odds of being high frequency CAM visitors (Adj OR for being male, 0.8). Compared to individuals aged under 36, those aged between 56 and 75 were 1.4 times more likely to be high frequency CAM visitors (Adj OR, 1.4, 95% CI 1.1 to 1.8) and those older than 75 were about twice as likely to be high frequency CAM visitors (Adj OR, 2.0, 95% CI 1.3 to 3.2).

Employment

Those who were currently working were more likely to be high frequency CAM visitors than those who were out of employment (Adj OR, 1.3, 95% CI 1.1 to 1.6).

Health status

Individuals reporting worse global health were more likely to be high frequency CAM visitors than those reporting “very good” global health (“fair” global health Adj OR, 1.5 95% CI 1.1 – 2.0). There was a non significant gradient suggesting that poorer health was associated with being a high frequency CAM visitor, but the results for “good” and “poor” global health were slightly below the chosen significance level of $p < 0.01$ (p – value = 0.021 and 0.040 respectively).

Health care utilisation

CAM visitors who had also been to a chiropractor the last year were more likely to be high frequency CAM visitors than those who had not (Adj OR, 1.4, 95% CI 1.2 to 1.7). Regarding visits to specific CAM practitioners, those who had been to a reflexologist (Adj OR, 2.4, 95% CI 2.0 to 2.9), acupuncturist (Adj OR, 2.8, 95% CI 2.4 to 3.3) or other CAM modality (Adj OR, 1.9, 95% CI 1.6 – 2.2) had increased odds of being a high frequency visitor.

In contrast, having visited a homeopath the last 12 months decreased the likelihood of being a high frequency CAM visitor (Adj OR, 0.6, 95% CI 0.5 to 0.7).

Experienced CAM efficacy

Having experienced a positive effect of the use of at least one CAM modality turned out to be negatively associated with being a high frequency CAM user according to the multivariable analysis (Adj OR, 0.5, 95% CI 0.4 to 0.7).

Sub-analyses of visitors to a practitioner of acupuncture

Bivariable

The sub-analyses of visitors to a practitioner of acupuncture were performed because of the suspicion that choice of CAM modality might be the major influence on frequency of visits to a CAM practitioner. By analysing only those who had visited a practitioner of acupuncture, the aim was to gain better insight into the importance of other independent variables than choice of CAM modality.

The high frequency CAM visitors differed from low frequency CAM visitors in gender, self-perceived health and experienced CAM efficacy. A larger proportion of the high frequency users were female, and reported “fair” or “poor” global health. Fewer of the high frequency users reported very good or good global health compared to low frequency users. In addition, a larger proportion of the high frequency users reported having a chronic complaint lasting at least 12 months. With regards to number of symptoms, a larger proportion of the high frequency users suffered from at least 4 symptoms the last 12 months compared to the low frequency users. More of the high frequency users reported health enhancement from the use of at least one CAM modality compared to low frequency users (Table 2).

Table 2. Bivariable and multivariable analyses of association between high frequency visitors of CAM practitioners and demographic characteristics, lifestyle, perceived health, symptoms and diseases, health care utilisation, motives for – and effect of CAM use among individuals who had visited a practitioner of acupuncture.

Independent variables	Bivariable analyses			Multivariable analyses	
	All users of Acupuncture, N	Frequent Users of CAM (≥4 times last 12 M) N (%)	p Value	Adjusted OR (95 % CI)	p Value
All participants	1985	1404 (70.7)			
Sex			0.004		
Female	1497	1084 (72.4)		Ref.	
Male	488	320 (65.6)		0.76 (0.59 – 0.97)	0.025
Age group			0.951		
< 36	292	206 (70.5)		Ref.	
36 - 55	926	650 (70.2)		0.98 (0.71 – 1.35)	0.914
56 - 75	688	491 (71.4)		1.14 (0.79 – 1.64)	0.477
> 75	79	57 (72.2)		1.37 (0.68 – 2.79)	0.378
Education			0.393		
Compulsory	291	209 (71.8)		Ref.	
Middle level	1082	774 (71.5)		0.94 (0.69 – 1.29)	0.706
University	588	403 (68.5)		0.83 (0.59 – 1.19)	0.312
Marital status			0.024		
Married /cohabiting	1639	1145 (69.9)		Ref.	
Single	146	109 (74.7)		1.34 (0.88 – 2.03)	0.173
Divorced / separated	109	89 (81.7)		1.93 (1.14 – 3.26)	0.015
Widow(er)	85	55 (64.7)		0.68 (0.39 – 1.16)	0.155
Currently working			0.808		
No	597	420 (70.4)		Ref.	
Yes	1388	984 (70.9)		1.10 (0.82 – 1.46)	0.532
Current lifestyle					
<i>Daily smoker</i>			0.373		
No	1666	1185 (71.1)		Ref.	
Yes	319	219 (68.7)		0.86 (0.65 – 1.14)	0.302
<i>Physical activity</i>			0.668		
≥ 1 time per week	1648	1169 (70.9)		Ref.	
< 1 time per week	287	200 (69.7)		1.08 (0.81 – 1.45)	0.608
<i>Alcohol consume</i>			0.843		
≥ 1 time per week	729	518 (71.1)		Ref.	
< 1 time per week	1202	849 (70.6)		1.12 (0.90 – 1.40)	0.302
Perceived health					
<i>Global health</i>			<0.001		
Very good	181	107 (59.1)		Ref.	
Good	1011	703 (69.5)		1.55 (1.10 – 2.19)	0.012
Fair	668	500 (74.9)		1.83 (1.21 – 2.75)*	0.004
Poor	45	35 (77.8)		2.23 (0.97 – 5.16)	0.060
<i>Health complaints</i>					
Recent, one or more			0.096		
No	59	36 (61.0)		Ref.	
Yes	1926	1368 (71.0)		1.23 (0.65 – 2.32)	0.520
Chronic > 12 M			<0.001		
No	1099	742 (67.5)		Ref.	
Yes	886	662 (74.7)		1.29 (1.00 – 1.65)	0.050

Independent variables	Bivariable analyses			Multivariable analyses	
	All users of Acupuncture, N	Frequent Users of CAM (≥4 times last 12 M) N (%)	p Value	Adjusted OR (95 % CI)	p Value
Number of symptoms last 12 M			0.001		
0	256	159 (62.1)		Ref.	
1-3	1168	822 (70.4)		0.61 (0.41 – 0.89)	0.011
4-6	561	423 (75.4)		0.82 (0.64 – 1.06)	0.128
Number of current/past diseases			0.759		
0	917	642 (70.0)		Ref.	
1-2	883	632 (71.6)		1.52 (1.01 – 2.29)	0.044
≥3	185	130 (70.3)		1.36 (0.93 – 1.99)	0.117
Visited last year					
General practitioner			0.060		
No	178	115 (64.6)		Ref.	
Yes	1807	1289 (71.3)		1.10 (0.41 – 2.94)	0.844
Chiropractor			0.094		
No	1662	1163 (70.0)		Ref.	
Yes	323	241 (74.6)		1.26 (0.93 – 1.69)	0.135
Only CAM			0.066		
No	1828	1303 (71.3)		Ref.	
Yes	157	101 (64.3)		1.08 (0.38 – 3.05)	0.890
Motivation for use					
Push			0.013		
No	987	673 (68.2)		Ref.	
Yes	998	731 (73.2)		0.86 (0.69 – 1.06)	0.153
Pull			0.048		
No	814	556 (68.3)		Ref.	
Yes	1171	848 (72.4)		0.94 (0.75 – 1.18)	0.604
Experienced efficacy of specific treatment					
Got better from at least one CAM modality			<0.001		
No	225	124 (55.1)		Ref.	
Yes	1760	1280 (72.7)		0.47 (0.34 – 0.65)*	<0.001
Got worse from at least one CAM modality			0.509		
No	1967	1390 (70.7)		Ref.	
Yes	18	14 (77.8)		0.65 (0.20 – 2.11)	0.475

Multivariable

In the multivariable analysis done on the group of CAM users who had visited a practitioner of acupuncture last 12 months, only 2 out of 29 variables were significantly associated ($p < 0.01$) with being a high frequency CAM visitor (Table 2). The significant findings were related to perceived global health and experienced efficacy.

Demographics

The multivariable analysis indicated that female CAM visitors might be more likely than male CAM visitors to be high frequency CAM visitors (Adj OR, 1.3, 95% CI 1.0 to 1.7), but the results were slightly below significance level (p – value = 0.025). Age was not found significant in this analysis.

Health status

Individuals reporting “fair” global health were more likely to be high frequency CAM visitors than those reporting “very good” global health (Adj OR, 1.8 95% CI 1.2 – 2.8). There was a non-significant gradient suggesting an association between poorer health and being a high frequency visitor, but the results for “good” and “poor” global health were slightly below significance level (p – value = 0.012 and 0.060 respectively).

Experienced CAM efficacy

Having experienced a positive effect of the use of at least one CAM modality was negatively associated with being a high frequency CAM user according to the multivariable analysis (Adj OR, 0.5, 95% CI 0.3 to 0.7).

Discussion

A total of 2663 individuals (61% of the CAM visitors) had visited a CAM practitioner at least 4 times during the past 12 months. Being a high frequency CAM visitor was associated with being a middle-aged or older female who was currently working. There was also increased odds of being a high frequency CAM visitor by having reduced global health. Individuals who had visited a chiropractor, reflexologist, acupuncturist or other CAM modality except from homeopathy were more likely to be high frequency CAM visitors.

Visitors to practitioners of homeopathy the last 12 months, and those who had experienced a positive effect from the use of at least one CAM modality, were less likely to be high frequency CAM visitors. Level of education, marital status, motivation for CAM use and lifestyle factors showed no association with being a high frequency CAM visitor.

In the sub-analysis of individuals who had visited an acupuncturist, individuals with reduced global health had increased odds of being high frequency CAM visitors. Individuals who had experienced a positive effect from the use of at least one CAM modality had decreased odds of being a high frequency CAM visitor.

Strength and limitations

A strength of this study is that it is the first study of this type based on a total population study and the number of individuals included in the analysis. The 4366 individuals included in the overall analysis were sampled from a nationally representative general population, and is in context of the Norwegian population of relevant size and constitution. Only 1985 individuals were included in the sub-analysis, but this is still almost half of the individuals included in the overall analysis. As the study is cross-sectional, it is impossible to assert any causality in the interpretation of results, but it may be reasonable to suggest that for instance reduced global health increases the number of visits to CAM practitioners and is not a result of the number of visits. The association between poor health and CAM use had been shown in other studies [5, 9, 19, 22, 23].

One should note that the results should probably not be directly compared to findings from other studies concerning all CAM users, as this study only includes CAM visitors. It is not unthinkable that CAM visitors differ from those who only use self-care variants of CAM, and comparisons of results from this study with studies which include both CAM visitors and individuals using self-care CAM modalities should be approached cautiously. It is a problem with surveys like HUNT that people might have difficulties remembering past actions and

events. When interpreting the results on number of CAM visits and visits to specific CAM practitioners, it is possible to be misled by inaccurate responses. The same problem relates to a lot of the other questions, e.g. it might be difficult to remember past diseases, symptoms the last 12 months etc. In addition to wrong answers due to lack of memory, people may find it uncomfortable to provide answers that present them in an unfavourable manner. Examples of this could be questions on unemployment or poor lifestyle choices like smoking or excessive alcohol consumption. Findings from this study may not be representative of all visitors to CAM practitioners due to the possibility that those who chose to participate in HUNT3, and furthermore those who answered the question on number of CAM visits, may be different from those who did not. There could be certain characteristics which make people less likely to want to participate in surveys like HUNT3 or answer specific questions. A total of 6380 individuals reported visits to a CAM practitioner the last 12 months in Q1, and only 4366 individuals reported the same in Q3 (figure 1). Those who either chose to not answer the question on CAM visits in Q3, or reported no visits to a CAM practitioner in Q3, might be different from those who affirmed their previous answer from Q1.

Number of visits

The fact that so many of the visitors had visited a CAM practitioner at least four times the past 12 months (61%) could suggest that the majority of visitors are satisfied with the treatment provided by CAM practitioners, and therefore wish to return. It could also be a reflection of the preferred CAM modalities in the group that was studied, as different CAM practices may require different number of treatment sessions. In this study, 1985 of the CAM visitors had visited a practitioner of acupuncture, and 2067 individuals had visited a practitioner of a CAM modality other than homeopathy, acupuncture and reflexology. The number of people who had visited a practitioner of homeopathy or reflexology was much less; 628 and 894 respectively. It is thinkable that so many of the CAM visitors were high frequency visitors because of more required treatment sessions within acupuncture and the collective group of other CAM modalities, compared to homeopathy and reflexology.

Demographics

It is well established in literature that being female is associated with the use of CAM [1, 17-20, 22, 23, 33, 48]. Findings in this study suggest that additionally, women are more likely than men to be high frequency visitors of CAM practitioners. One explanation may be that women use more health care services in general [49, 50]. A systematic review of CAM use

among adult cancer patients by Verhoef et al. suggest that younger individuals are more likely to be CAM users [33]. Other studies have also found that young to middle-aged individuals are more likely to be CAM users [48, 51]. One might suspect that individuals who more readily try out certain practices also adhere to them to a larger extent, and that younger individuals therefore could be more likely to be high frequency users. However, this study found that middle-aged to old individuals were more likely to be high frequency CAM visitors compared to individuals under the age of 36. An explanation of this could be the deterioration of health due to increasing age, as findings in this study also suggest an association between reduced global health and being a high frequency CAM visitor.

Employment

Findings in this study suggest that those currently employed were more likely to be high frequency CAM visitors. Earlier studies have suggested that individuals who are employed and have higher income are more likely to use CAM [33, 48]. A proposed explanation for this has been that people with income are more likely to use services that are paid out of pocket, and it does not seem unreasonable to suggest that having an income could also enable people to use these services to a larger extent.

Health status

This study found a non significant gradient suggesting that the likelihood of being a high frequency CAM visitor increased with deteriorating health. The link between having worse health or greater perception of disease severity and using more CAM services has also been found in several earlier studies [17, 39, 52, 53]. Individuals who reported “fair” global health were more likely to be high frequency CAM visitors than those who reported “very good” health, and this finding was also significant. The effect of deteriorating health on frequency of CAM visits could as mentioned earlier be a contributing factor when explaining the association between being middle-aged to old and having a high frequency of CAM visits. .

Experienced efficacy

Having experienced a positive effect of the use of at least one CAM modality was negatively associated with being a high frequency CAM visitor. This was surprising, and the author is unable to provide any reasonable explanation for this finding.

Health care utilisation

This study found that those who had been to a chiropractor the last year were more likely to be high frequency CAM visitors than those who had not. Choice of CAM modality had an apparent dominant influence on the frequency of visits. Those who had visited a practitioner of acupuncture, reflexology or “other” CAM modality were more likely to be high frequency CAM visitors, while visitors of homeopaths were less likely to be high frequency CAM visitors. Different CAM modalities are practiced in various manners regarding number of treatment sessions etc., and this could provide an explanation for the contrasting associations between being a high frequency visitor and having visited a homeopath, compared to the other specific CAM modalities.

Variables which remained significant in sub-analysis

The suspicion that choice of CAM modality could be the dominant influence on frequency of CAM visits was also the reason for performing a sub-analysis on the individuals who had visited an acupuncturist, as this is a CAM modality which may be conducted over a wide range of treatment sessions [54]. The fact that the number of significant independent variables was significantly decreased in the sub-analysis compared to the overall analysis, could be an affirmation of the notion that choice of CAM modality is the dominant influence on number of CAM visits. The variables which were significant both in the overall analysis and sub-analysis were reduced global health (having “fair” as compared to “very good” global health) and experienced CAM efficacy. Having “fair” global health increased the odds of being a high frequency CAM visitor in both the overall analysis and sub-analysis, while having experienced a positive effect of the use of at least one CAM modality decreased the odds of being a high frequency CAM visitor in both the overall analysis and sub-analysis.

These results may indicate that these variables have a stronger influence on frequency of CAM visits than the variables which were significant in the overall analysis, but did not remain significant in the sub-analysis.

Conclusion

High frequency CAM visitors were more likely to be middle-aged to old females who were currently working and had reduced global health. The variables which were significant both in the overall analysis and sub-analysis were reduced global health and having experienced positive effect from CAM use. These variables therefore seem to have the strongest impact on frequency of CAM use. The fact that so few variables remained significant in the sub-analysis

may imply that the choice of CAM modality has a dominant influence on frequency of CAM visits, and future research could broaden our understanding on this point.

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