Complementary and alternative medicine in patients with inflammatory bowel disease: The results of a population-based inception cohort study (IBSEN) ☆

Randi Opheim [a,*], Marte L. Hoivik [a], Inger C. Solberg [b], Bjorn Moum [a]
The IBSEN Study Group

[a] *Department of Gastroenterology, Oslo University Hospital and Institute of Clinical Medicine, University of Oslo, Norway*
[b] *Department of Gastroenterology, Oslo University Hospital, Oslo, Norway*

Abstract

Background and aims: The use of complementary and alternative medicine (CAM) has been increasing in recent decades. Our aim was to determine the proportion of CAM use among patients with inflammatory bowel disease (IBD) in a longitudinal, population-based cohort and to identify predictive factors for CAM use.

Methods: The Inflammatory Bowel South-Eastern Norway (IBSEN) study is a population-based IBD cohort that has been followed prospectively for 10 years. The ten-year follow-up was conducted from 2000 to 2004 and included a questionnaire regarding CAM, a structured interview, a review of hospital records, a clinical examination, laboratory tests, and an ileocolonoscopy.

Results: Of the 620 patients evaluated at the ten-year follow-up, 517 (84%) completed the CAM questionnaire, 353 had ulcerative colitis (UC), 164 had Crohn's disease (CD), and 50% were male. Thirty percent reported the use of CAM at some point since their IBD diagnosis, and 7.5% reported current CAM use. More CD patients than UC patients reported CAM use (38% vs. 27%, respectively; p=0.01). Younger age, female gender, and higher education level predicted CAM use in UC, whereas younger age was the only predictor of CAM use in CD. Thirty-six percent of the CAM users were mostly satisfied or very satisfied with the treatment.

Conclusion: One third of the patients in this population-based cohort had used CAM at some point during a ten-year disease course, but only 7.5% reported current CAM use. CAM use was more common in the CD than in the UC patients. Only socio-demographic factors, such as age, gender and education, predicted CAM use.

1. Introduction

In the Western world, the use of complementary and alternative medicine (CAM) has been increasing in recent decades[1,2] and its use appears to be more prevalent among patients with chronic diseases.[3–6] Inflammatory bowel disease (IBD) is a chronic inflammatory disorder of the gastrointestinal tract of unknown origin. The course of the disease varies widely between patients but is often characterized by a chronic and relapsing disease course and periods of remission. The two major subtypes of IBD are ulcerative colitis (UC) and Crohn's disease (CD). Medical treatment is often effective in inducing remission, but no medicine is curative or can guarantee the prevention of recurrence.

CAM covers a broad range of practices, products and therapies that are not generally considered to be part of conventional medicine.[7–9] Hence, what is considered to be CAM varies between cultures and countries. Even within one country, it is difficult to define the border between CAM and conventional medicine because this field is constantly evolving. For example, acupuncture is offered by licensed health personnel inside the national health care system and by CAM practitioners operating outside the national health care system. Another example is that although chiropractors are licensed and are not categorized as CAM providers in Norway,[1] this is not true for all European countries.

Several studies have investigated the frequency of CAM use among IBD patients,[2] which ranges from 21% to 60%, depending on the CAM definition used. However, there are no published data on the frequency of CAM use among IBD patients in Norway. Most of the published studies have been conducted on patient cohorts from tertiary health care clinics.[2] Hospital-based populations are expected to include the sickest patients, those who seek care through conventional medical providers and those who are most comfortable within the framework of conventional medicine.[2,10] Conclusions from studies on these populations may not hold true for the general IBD population or for different IBD subpopulations. The Inflammatory Bowel South-Eastern Norway (IBSEN) study is one of the few longitudinal, population-based studies in IBD research[11] and it constitutes the basis of this sub study. The primary aim of this study was to determine the proportion of CAM use for IBD among Norwegian IBD patients in a population-based cohort followed for 10 years after the initial diagnosis. The secondary aims were to investigate patients' satisfaction with CAM treatment and to identify possible predictive factors for CAM use.

2. Materials and methods

2.1. Study population and design

From January 1, 1990 to December 31, 1993, data on all newly diagnosed patients with IBD or possible IBD were prospectively recorded in four geographically well-defined areas in southeastern Norway. On January 1, 1992, the total study population in these areas was 966,427. All the general practitioners in these areas (1236) were invited to participate in the study and at each of the 15 participating hospitals, a senior gastroenterologist assumed responsibility for the diagnostic procedures and for the registration and inclusion of patients. The clinical information was subsequently reviewed by a gastroenterologist

at a university hospital. The organization of the inception cohort has previously been described in detail.[12–14] Prescheduled follow-up visits were conducted at 1, 5 and 10 years (±1 year) after inclusion, with a re-evaluation of the diagnosis and a reassessment of the course of disease. Ten years after the diagnosis of IBD, 620 of 756 (82%) patients had completed the ten-year follow-up (423 with UC and 197 with CD), 71 had died, and 65 had been lost to follow-up.[15,16]

2.2. Clinical and socio-demographic data

The ten-year follow-up visit included a patient-reported outcome questionnaire, a structured interview, a clinical examination with laboratory tests, and, if indicated, an ileocolonoscopy. Medical and surgical treatments during follow-up were performed in accordance with established clinical practice. Our study was initiated before immunomodulators were widely used as maintenance therapy for UC and before anti-TNF treatment was generally introduced.

2.3. The CAM questionnaire

At the ten-year clinical follow-up, patients completed a questionnaire on the use of CAM. The questions were restricted to the use of CAM for IBD. CAM use was defined as 1) ever used CAM (any use of CAM in the ten years since diagnosis); 2) recently used CAM (any use of CAM during the 6 months prior to follow-up); and 3) regularly use CAM (the use of CAM more than four times or regularly in the previous 6 months). Furthermore, the type of CAM used was noted through the selection of any of three therapies listed in the questionnaire (homeopathy, acupuncture, and spiritual healers). In addition, patients could specify other therapies they had used in a comments field. The patients were asked to assess their satisfaction with CAM treatment by providing one of four possible scores: not at all satisfied, somewhat satisfied, mostly satisfied, and very satisfied. The question regarding satisfaction with the treatments was asked of all respondents and was not related to one particular treatment.

2.4. Clinical course of the disease

The clinical course from diagnosis onward was visualized using four curves, each reflecting a different disease pattern in terms of the severity of bowel symptoms.[15,16] During the interview, patients were asked to categorize their clinical course for the previous 10 years according to one of four predefined curves: 1) remission or mild severity of intestinal symptoms after initial high activity; 2) an increase in the severity of intestinal symptoms after initial low activity; 3) chronic continuous symptoms; or 4) chronic intermittent symptoms. The curves are depicted in Fig. 1.

2.5. Classification and definitions

The UC patients were classified into three subgroups: proctitis, left-sided colitis (mucosal changes up to the splenic flexure) and extensive colitis (inflammation beyond the splenic flexure). The CD patients were prospectively classified
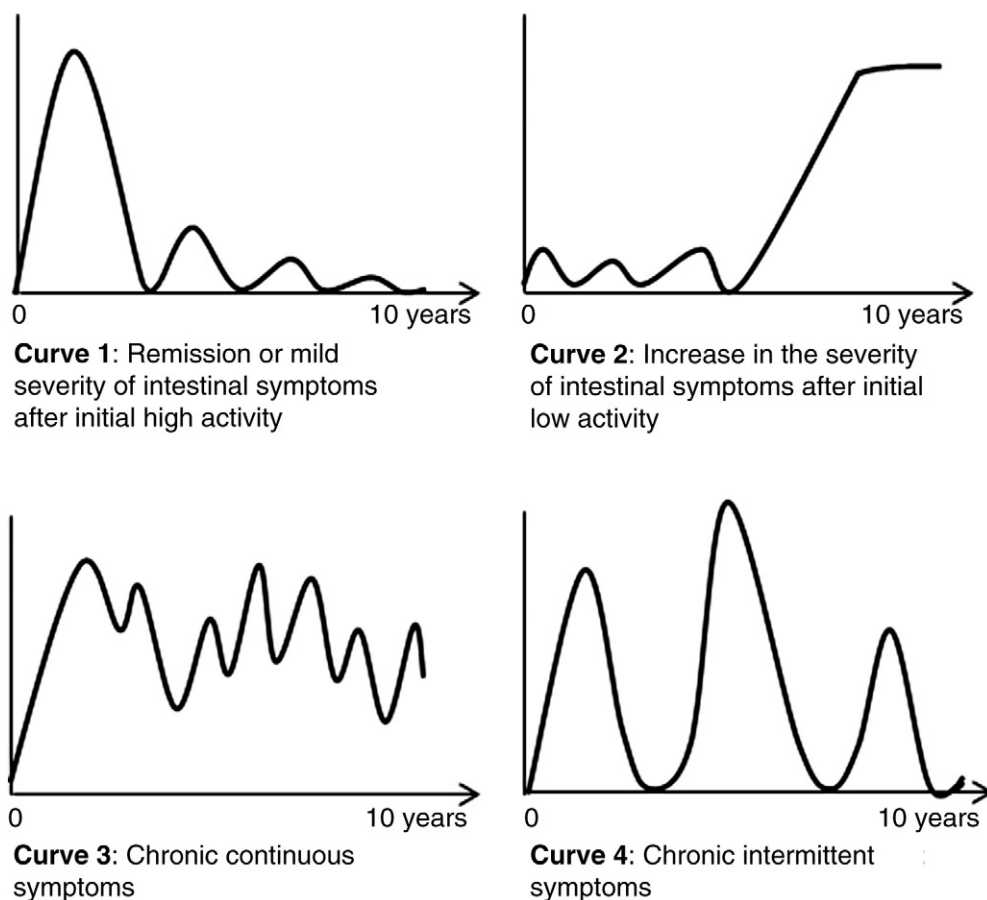
Curve 1: Remission or mild severity of intestinal symptoms after initial high activity

Curve 2: Increase in the severity of intestinal symptoms after initial low activity

Curve 3: Chronic continuous symptoms

Curve 4: Chronic intermittent symptoms

Figure 1 Predefined curves depicting disease course from diagnosing to ten-year follow-up. Curve 1) remission or mild severity of intestinal symptoms after initial high activity. Curve 2) an increase in the severity of intestinal symptoms after initial low activity. Curve 3) chronic continuous symptoms. Curve 4) chronic intermittent symptom.

according to the disease phenotypes of the Vienna classification,[17] which was the standard classification system when the study protocol was designed. Relapse was defined as "any aggravation of IBD symptoms resulting in more aggressive medical treatment or surgery". The overall relapse rates during the first and second five-year periods after diagnosis were recorded, as were the annual relapse rates for the first, fifth, and tenth years of follow-up. Surgery was defined as any intra-abdominal surgical procedure for active CD; thus, incision and drainage of perianal abscesses and simple perianal fistulectomy did not qualify as surgery in this outcome definition. Colectomy status was recorded consecutively for UC patients, and in cases lost to follow-up, the hospital records were reviewed. Educational status was recorded as ≤12 years (maximum upper secondary school) or >12 years (college/university level).

2.6. Statistical analyses

Continuous variables are presented as medians and categorical variables as proportions. The continuous variables for age and disease duration displayed a skewed distribution; therefore, the comparison was performed using the non-parametric Mann–Whitney U test. The chi-squared (χ^2) test was used to compare categorical data. We used logistic regression analyses to assess possible predictive factors for CAM use. Variables for which we found a p-value <0.15 between the CAM users and non-users were entered into the multiple analyses. All analyses were performed separately for the UC patients and the CD patients. The significance level was set to 5%. All statistical analyses were performed using the Predictive Analytics Software PASW (version 18.0; IBM Corporation, Somers, New York, USA).

2.7. Ethics

This study was conducted in accordance with the Helsinki Declaration and was approved by the Regional Committee for Medical Research Ethics and the Norwegian Data Inspectorate. All patients signed an informed consent form prior to inclusion in the study.

3. Results

3.1. Respondents

Of the 619 patients who were evaluated with a ten-year follow-up, 517 (84%) >18 years completed questionnaires regarding CAM (353 with UC and 164 with CD). There were no significant differences with regard to age, gender or

Table 1 Responders versus non-responders.

	Non-responders (n=100)	Responders (n=519)	p-value
Age in years (median and range)	43 (18 to 93)	43 (19 to 86)	0.9
Gender (% men)	58	50	0.1
Diagnosis UC/CD (%)	68/32	68/32	0.9
Disease duration in months (median and range)	124 (99–147)	123 (107–165)	0.4

UC (ulcerative colitis), CD (Crohn's disease).
The continuous variables, age and disease duration, were compared using the Mann–Whitney U test.
The categorical variables, gender and diagnosis, were compared using the Chi-squared test.

diagnosis between patients who completed (responders) and did not complete (non-responders) the questionnaire (Table 1).

3.2. Use of CAM during follow-up

A total of 30% (157/517) of all the respondents had used some form of CAM in the ten-year period since diagnosis. Only 7.5% (39/517) reported current CAM use, and 3.1% (16/517) had used CAM more than four times (regularly) during the previous 6 months. Significantly more women than men reported CAM use (p=0.009), and the CAM users were significantly younger (41 years, range 19 to 86) than the non-users (49 years, range 20 to 86) (p<0.001). The proportion of CAM users was higher among the CD patients compared with the UC patients (38% vs. 27%, p=0.01).

The most frequently used therapies were homeopathy (64%) and acupuncture (39%); only 10% of respondents had visited a spiritual healer. Twenty percent reported the use of alternative therapies other than those specified in the questionnaire (listed in Table 2). One fifth of the patients had used more than one type of CAM. With regard to their satisfaction with CAM, 36% of the users were "mostly satisfied" or "very satisfied" with the treatment, 36% were "somewhat satisfied" and 29% were "not at all satisfied".

Table 2 Types of CAM specified by the patients.

Type of therapy	Frequency
Homeopathy	101 (64%)
Acupuncture	62 (39%)
Healing	16 (10%)
Reflexology	15 (9.5%)
Kinesiology	4 (2.5%)
Herbal products	5 (3%)
Integrative medicine clinic	3 (2%)
Laser	2
Naturopath	1
Colon hydrotherapy	1
Fire cupping	1

Frequency of the different types of CAM (complementary and alternative medicine) specified by the patients. Total exceeds 100%, as many of the patients used more than one type of CAM.

3.3. CAM use in patients with ulcerative colitis

Twenty-seven percent of the UC patients (95/353) reported CAM use during the ten-year period, including significantly more women than men. Furthermore, the CAM users were significantly younger and had a higher education level compared to the non-users (Table 3).

Patients with a severe disease course reported more CAM use (33% of those with a chronic continuous disease course and 35% of those with a chronic intermittent disease course) than patients with a mild disease course (20%). These differences were statistically significant (p=0.005). Curve 2 was omitted from these analyses because the sample size was too small (n=7).

A higher proportion of CAM users than non-users had experienced one or more relapses in the ten-year follow-up period (94% vs. 79%, p<0.001). This finding was consistent in both the first and second five-year periods (data not shown). The distribution of the diseases was comparable between the CAM user and non-user groups. Most patients were classified as having either left-sided or extensive colitis. No significant differences were found between CAM users and non-users with regard to colectomy.

The most common medical treatments in the ten-year follow-up period for UC patients were 5-ASA and systemic steroids; 33% had used 5-ASA at least eight out of the ten previous years, and 46% had used systemic steroids sometime during the ten-year period. Only 7% had used immunomodulators (azathioprine/methotrexate), and none of the patients had used biologic agents. We found no significant differences in the use of medical treatments between the CAM users and non-users.

In the multiple logistic regression analysis, we included the following variables: age, gender, educational level, course of the disease, and relapse rates. The analysis revealed that younger age, female gender and higher education were predictors of CAM use in the UC group (Table 4).

3.4. CAM use in patients with Crohn's disease

Thirty-eight percent (62/164) of patients with Crohn's disease reported CAM use. There were no significant differences with regard to gender or educational level between the CAM users and non-users; however, the CAM users were significantly younger than the non-users (p<0.001) (Table 3).

Patients with a severe disease course reported more CAM use (47% in the chronic continuous disease course group and 50% in the chronic intermittent disease course group) than patients with a mild disease course (24%). These differences were statistically significant (p=0.019). As for ulcerative colitis, curve 2 was omitted from the analysis because there were too few patients (n=4) in this group.

Altogether, 97% of the CAM users, compared with 84% of the non-users, experienced one or more relapses during the ten-year follow-up period (p=0.025). This finding was consistent in both the first and second five-year periods (data not shown). No significant differences in rates of surgery or disease behavior were found between the CAM users and non-users. The use of both systemic steroids and azathioprine was significantly higher in CAM users compared

Table 3 Demographic and clinical characteristics of CAM users and non-users in UC and CD.

	UC (n = 353)			CD (n = 164)		
	CAM users (n = 95)	Non CAM users (n = 258)	p-value	CAM users (n = 62)	Non CAM users (n = 102)	p-value
Gender (% men)	34%	55%	<0.001	52%	48%	NS
Age (median and range)	42 (23–86)	49 (22–86)	<0.001	33 (19–75)	41 (20–83)	<0.001
Highest completed education						
≤12 years	37 (38%)	141 (55%)		30 (48%)	53 (52%)	
>12 years	48 (51%)	76 (30%)	<0.001	22 (36%)	38 (37%)	NS
Missing	10 (10%)	41 (16%)		10 (16%)	11 (11%)	
Course of disease						
Disease course 1	40 (43%)	160 (62%)	0.005	18 (29%)	55 (54%)	0.019
Disease course 2	4 (4%)	3 (1%)		2 (3%)	3 (3%)	
Disease course 3	8 (8%)	16 (6%)		14 (23%)	16 (16%)	
Disease course 4	43 (45%)	79 (31%)		28 (45%)	28 (28%)	
Disease distribution						
Proctitis	20 (21%)	52 (20%)	NS			
Left-sided	39 (41%)	85 (33%)				
Extensive	36 (38%)	121 (47%)				
Behavior of CD						
B1				22 (36%)	50 (49%)	NS
B2				26 (42%)	20 (29%)	
B3				14 (23%)	22 (22%)	
Relapse						
Since disease onset	89 (94%)	204 (79%)	<0.001	60 (97%)	86 (84%)	0.025
Surgery						
Colectomy	8 (8%)	24 (9%)	NS			
Surgery yes/no				28 (45%)	39 (38%)	NS
Systemic steroids						
Any use in the last 10 years	49 (52%)	112 (43%)	NS	53 (86%)	72 (71%)	0.03
5-ASA						
≥Eight out of ten years	32 (34%)	85 (33%)	NS	21 (34%)	45 (44%)	NS
Azathioprine						
Any use in the last 10 years	9 (10%)	15 (6%)	NS	27 (44%)	25 (25%)	0.011

Gender is given as percentage men; age is given as median and range. All other variables are given as absolute number with percentage in parentheses. The Mann–Whitney *U* test was used to compare medians. Chi-squared tests were used to compare proportions. The significance level was set to 5%.
NS (not significant), CAM (complementary and alternative medicine), UC (ulcerative colitis), CD (Crohn's disease), 5-ASA (5 aminosalisylates).

with non-users (Table 3). Thirty-four percent of the CAM users were administered 5-ASA at least eight out of the ten previous years, and the proportion of 5-ASA use was comparable in the CAM user and the non-user groups.

The following variables were included in the multiple logistic regression analysis: age, gender, course of the disease, relapse rates, and use of medications. The analysis revealed that only younger age was a predictor of CAM use in CD (Table 5).

4. Discussion

This is one of few studies to investigate use of CAM in a population-based cohort of IBD patients.[2,18,19] One third of the patients reported that they had used CAM ten-years after the initial diagnosis and only 7.5% had used CAM during the previous 6 months. In contrast to other studies,[2] CAM use was found to be more prevalent among CD patients compared with UC patients.

Table 4 Logistic regression analysis showing predictors of CAM use in UC.

	Univariate			Multivariate		
	OR	95% CI	p-value	OR	95% CI	p-value
Age	0.97	0.95 to 0.98	<0.001	0.97	0.95 to 1.00	0.021
Gender						
Male	1	[Ref]	<0.001	1	[Ref]	0.007
Female	2.39	1.45 to 3.94		2.14	1.23 to 3.73	
Education						
≤12 years	1	[Ref]	0.002	1	[Ref]	0.017
>12 years	2.25	1.34 to 3.79		1.95	1.12 to 3.37	
Disease course						
Curve 1	1	[Ref]	0.002	1	[Ref]	NS
Curve 3+4	2.15	1.32 to 3.49		1.27	0.96 to 1.69	
Relapse [a]						
No	1	[Ref]	0.003	1	[Ref]	NS
Yes	3.81	1.58 to 9.18		2.02	0.77 to 5.30	
Systemic steroids [b]						
No	1	[Ref]	0.27	Not included		
Yes	1.31	0.81 to 2.21				
AZA [b]						
No	1	[Ref]	0.158	Not included		
Yes	1.95	0.77 to 4.95				

Univariate and multivariate logistic regression models. Results given as estimated odds ratios for CAM use with 95% confidence intervals.
Only variables with p<0.15 in the univariate analysis were included in the multivariate analysis.
OR (odds ratio), CAM (complementary and alternative medicine), UC (ulcerative colitis), NS (not significant), Ref (reference category),
AZA (azathioprine).
[a] Since disease onset.
[b] Any use in the last 10 years.

Table 5 Logistic regression analysis showing predictors for CAM use in CD.

	Univariate			Multivariate		
	OR	95% CI	p-value	OR	95% CI	p-value
Age	0.95	0.93 to 0.98	0.00	0.96	0.93 to 0.99	0.004
Gender						
Male	1	[Ref]	0.66	1	[Ref]	NS
Female	0.87	0.46 to 1.63		1.11	0.55 to 2.23	
Education						
≤12 years	1	[Ref]	0.94		Not included	
>12 years	1.02	0.51 to 2.04				
Disease course						
Curve 1	1	[Ref]	0.00	1	[Ref]	NS
Curve 3+4	2.92	1.48 to 5.76		1.38	0.93 to 2.03	
Relapse [a]						
No	1	[Ref]	0.03	1	[Ref]	NS
Yes	5.58	1.24 to 25.18		2.05	0.39 to 10.70	
Systemic steroids [b]						
No	1	[Ref]	0.04	1	[Ref]	NS
Yes	2.35	1.02 to 5.39		1.31	0.50 to 3.46	
AZA [b]						
No	1	[Ref]	0.03	1	[Ref]	NS
Yes	2.11	1.07 to 4.19		1.18	0.53 to 2.63	

Univariate and multivariate logistic regression models. Results given as estimated odds ratios for CAM use, with 95% confidence intervals.
Only variables with p<0.15 in the univariate analysis were included in the multivariate model.
OR (odds ratio), CAM (complementary and alternative medicine), CD (Crohn's disease), NS (not significant), Ref (reference category), AZA
(azathioprine).
[a] Since disease onset.
[b] Any use in the last 10 years.

Because of discrepancies in study populations and definitions of CAM, it is difficult to compare CAM use between different studies. However, our findings are in accordance with the results from selected IBD cohorts that included patients who attended specialist clinics[4,5,20–26] and with the results of surveys of members of Crohn's disease and colitis patient organizations.[3,10,27,28] In these studies, the frequency of overall CAM use ranged from 21% to 60%. In a recently published paper from the Manitoba Inflammatory Bowel Disease Cohort study in Canada[19] the prevalence of CAM use for IBD ranged from 14% to 21% in the 54 months follow-up period. However, the definition of CAM differs from our study, as they included physiotherapy and chiropractic, whereas those treatments were not included in our study. Two national surveys have investigated CAM use among the adult Norwegian population. In the first study, from 1997, the prevalence of "ever-used" CAM was 34%[29] which is consistent with our findings. Ten years later, in 2007, CAM use in the general population had increased to 48.7%.[1] However, in this study, the time period was restricted to "the previous 12 months"; consequently, the proportion of "ever use" is expected to be even higher. The current use of CAM was somewhat lower in our cohort (7.5%) compared with other studies from North America and Europe (11% to 34%),[2,19] and only 3.1% reported regular CAM use. The lower frequency of both current and regular CAM use in our study may have been caused in part by a shorter recall period and because we only asked for CAM use specific to IBD symptoms.

Homeopathy is more common as an alternative treatment in Europe than in North America, and it is the most frequently reported CAM treatment in European studies[2,3,5,20,28]; thus, our findings are consistent with this trend. Acupuncture is offered both inside and outside the national health care system in Norway.[1] This may be one reason for the frequent use of acupuncture in our study. However, to our knowledge, acupuncture is not offered specifically to IBD patients at Norwegian hospitals.

Alternative treatments were more widely used by patients with CD than with UC in our study. Several factors might explain this finding. CD patients often have a more serious disease course, with a higher risk of complications that lead to surgery.[15] It had previously been shown that the CD patients in this cohort used more systemic steroids and immunomodulators compared with the UC patients[15,16] and that the CD patients had lower health-related quality of life (HRQoL) scores than the UC patients.[30] In addition, significantly more CD than UC patients reported chronic active disease courses during the ten-year follow-up period. Curiously, no other studies have supported this difference between the diagnoses, which emphasizes the importance of performing such studies in population-based cohorts, preferably with newly diagnosed patients.[18]

Based on gender differences described in national surveys of the adult Norwegian population,[1,29] our finding that more women than men reported CAM use in the total IBD group was expected. However, when we stratified the results by diagnosis, we found no gender differences among the CD patients: our study showed that men with CD used more CAM than men with UC and more than men in the general Norwegian population.[1] This finding might reflect that men with CD are more affected by the symptom burden of the disease than men with UC. Younger age was a predictive factor for CAM use in both UC and CD patients after adjusting for other variables in the multiple regression analyses. In studies from the United Kingdom[24] and Germany[28] that also reported younger age as a predictive factor for CAM use, the authors' explanation for this finding was that young patients may be more receptive to the concept of CAM and have readier access to information about it.[24] Still, this age-related trend is not consistently reported in IBD studies.[2] Furthermore, the CAM users in the UC group of the present study had a higher educational level than the non-users, and a high educational level was maintained as a predictor of CAM use after adjusting for other variables in the multiple regression analyses. This interrelationship was not found in the CD patients. We have no reasonable explanation for why education level was a predictor of CAM use only in the UC group and cannot exclude the possibility that this was a spurious finding. However, a higher educational level has been associated with CAM use in some previous studies of IBD patients,[21,28] but not in others.[4,19,27,31,32]

Previous reports of the association between CAM use and disease activity have been highly inconsistent, and the disease activity indices that were used varied.[5,10,22,25–27,33] We did not include a disease activity index in our study, but neither disease course, disease distribution or behavior, nor rates of surgery or relapse predicted CAM use. This finding might be due to the sample being studied. Hilsden et al.[2] used the same questionnaire in two different populations and found that different predictors of CAM use were revealed depending on the study population. Disease-related factors (disease duration and use of steroids) were predictors of CAM use in a hospital-based sample, but not in an internet survey.

In the present work, the use of systemic steroids and immunomodulators was higher among the CAM users only in the CD group; however, when we adjusted for other factors using multiple regression analyses, this difference was not statistically significant. Our study was initiated before biological therapies were introduced and before immunomodulators were widely used as maintenance therapy in UC. Therefore, the relationship between IBD medication and CAM use could not be thoroughly elucidated in our study.

There is controversy regarding how to interpret reports of benefits from or satisfaction with alternative treatments. Hilsden at al.[2] argue that there are two broad categories that are commonly addressed: direct, disease-related benefits and indirect, nondisease-related benefits. One third of the CAM users in our cohort were "mostly satisfied" or "very satisfied" with their CAM treatments. Unfortunately, the questionnaire did not ask how the patients had benefited from the alternative treatments, nor were the questions regarding satisfaction related to each specific CAM treatment. Therefore, we were not able to describe how the patients had benefited from the alternative treatments, nor could we differentiate whether the patients were more satisfied with some types of alternative treatments than with others. This information could have been conducive to the assessment of the usefulness of CAM treatments in IBD patients.

The ten-year follow-up was conducted in 2000–2004. At that time, there was no standardized questionnaire about the use of CAM available in Norway,[29] nor were any cross-cultural questionnaires, such as the recently developed I-CAM-Q,[34] available. Therefore, only three CAM therapies

that were common in Norway and the Scandinavian countries at the time were listed in our questionnaire. However, the patients had the opportunity to add other types of CAM they had used and, in so doing, determine what they considered to be CAM. Respondents and researchers may have different definitions of CAM; therefore, this opportunity for the patients themselves to define CAM likely influenced the prevalence of CAM reported in our study.[29] For instance, the prevalence of CAM use is often higher in studies in which more therapies are predefined in the questionnaires (e.g., the use of vitamins, prayer, diet, or exercise).[2] In particular, the use of herbal medicines and other natural products, which was high in several other studies, was extremely low in our study. At the same time, it is interesting that neither massage, which has been defined as CAM in other studies, nor exercise or prayer, was mentioned by any of our patients. In Norway, massage and exercise are often included in physical therapy treatments within the conventional health care system, which might be one reason that the patients did not appear to consider them to be CAM. One could argue that giving patients the opportunity to specify additional CAM treatments might result in a better understanding of what patients consider to be CAM.[29] However, for further research, it appears important to use standardized questionnaires to facilitate comparisons of data across studies and between populations.

In conclusion, 30% of the patients in this population-based cohort reported that they had used CAM for their IBD at some point in the ten-year period since initial diagnosis. Only 7.5% reported CAM use during the previous 6 months, and as few as 3.1% reported regular CAM use. More patients with CD reported CAM use compared to those with UC. Younger age, higher education and female gender predicted CAM use in the UC patients, whereas only younger age predicted CAM use in the CD patients. Interestingly, we found no disease-related factors that predicted CAM use. It is important to address CAM use in clinical practice and to further investigate the reasons why patients seek CAM for their IBD and the benefits these treatments might confer.

5. Conflict of interest

The authors declare no personal or funding conflicts of interest.

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