

Review

The Use of Complementary and Alternative Medicine in Scandinavia

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Abstract. *Background:* Complementary alternative medicine (CAM) is widely used among patients with cancer. This usage may have potentially harmful effects, especially when combined with anticancer drugs. However, some complementary methods may benefit patients. This review investigated the prevalence of CAM use among patients with cancer in Scandinavia and secondly studied the educational levels of CAM users compared to non-users. *Materials and Methods:* A systematic search of the PubMed library was carried out to locate articles published between January 2000 and October 2015 that investigated prevalence of CAM use among Scandinavian patients with cancer. *Results:* Twenty-two articles were found, of which nine were included in the review. The prevalence of CAM use was 7.9% to 53%, with an average of 36.0% across all studies. *Conclusion:* Use of CAM is widespread among patients with cancer. Knowledge about CAM should be disseminated to both patients and staff in order to optimise discussions about CAM in clinical practice.

The role of complementary and alternative medicine (CAM) has continuously increased in Swedish society, with an increasing number of shops selling alternative and complementary remedies (1). Despite this fact, the medical community has not recognised this as an important issue and CAM is not a topic that is discussed with patients

attending cancer clinics in northern Europe (and especially Sweden) (2, 3). The explanation for this may be multifactorial, with both a perceived lack of interest from attending healthcare professionals, as well as unease from patients in telling their healthcare professional about the CAM that they are taking (4). In the present review article, we compiled a comprehensive list of available studies investigating the usage of CAM in Scandinavian patients with cancer with the aim of determining the percentage of such patients that regularly use CAM.

What is CAM? According to the United States National Centre for Complementary and Alternative Medicine (NCCAM), CAM is defined as healthcare outside conventional proven medicine. There is however a difference between 'complementary' and 'alternative' medicine. The term 'complementary' is used when patients use non-mainstream practice as a complement to conventional medicine. The term 'alternative medicine', on the other hand, is used when non-mainstream healthcare practice is used instead of proven mainstream therapies. When patients with cancer choose alternative medicine instead of conventional therapy, they risk delaying primary treatment. Consequently, potentially curable early stages of cancer may progress and become fatal (5).

In recent years, the term CAM has been challenged and numerous studies suggest that it should be changed. In a review article by Cassiellth *et al.*, the following reason was cited: "This controversial term should be changed, since the words 'complementary' and 'alternative' have different meanings and should not be connected by 'and' " (5, 6). Alternatively, when the use of conventional cancer therapy combined with complementary methods aims to reduce symptoms, the term 'integrative oncology' is more adequate. The use of non-proven healthcare, regardless of being complementary or alternative, is divided into several

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subcategories. The first subcategory is that of natural products, such as herbs, vitamins, probiotics *etc.*, that are often sold as healthy dietary supplements, whereas some of these supplements may in fact be harmful (7). 'Miracle cures' such as amygdalin and caesium chloride have not only shown lack of efficiency in clinical studies, they may also cause cyanide toxicity and potentially lethal cardiac arrhythmia (5).

The second subcategory is that of mind and body practices, such as mind-body therapies, acupuncture and manipulative and body-based practices.

Mind-body therapies such as meditation, relaxation, hypnotherapy, yoga, tai chi, music therapy and qigong have shown beneficial effects on anxiety reduction, improvement of quality of life and sleep.

Acupuncture has been evaluated as a safe method of improving symptoms such as pain, chemotherapy-induced nausea, and radiation-induced xerostomia, and its inclusion in multimodal management plans of patients with cancer has been suggested (5).

Manipulative and body-based practices such as Swedish massage, shiatsu, tui na, reflexology, Thai massage, Ayurvedic massage, lymphatic drainage and myofascial release have shown beneficial effects on pain and anxiety, however, these results were based on clinical trials with poor research methodology (5).

Other complementary health approaches that do not fit into the subcategories listed above include traditional healers, homeopathy, naturopathy *etc.* (8).

Are CAM therapies harmless? Not all patients are aware that the use of non-proven therapies is not harmless. There are several potentially harmful natural products that may interact with anticancer drugs. For example, Sparreboom *et al.* described how the natural products *Allium sativum*, *Ginkgo biloba*, *Echinacea purpurea*, *Panax ginseng*, *Hypericum perforatum* and *Piper methysticum* all had the potential to modulate the activity of drug-metabolizing enzymes such as cytochrome *p450* and the drug transporter P-glycoprotein, hence they can potentially have pharmacokinetic interactions with anticancer drugs (7). Furthermore, Rakovitch *et al.* conducted a study including 251 patients with breast cancer, of whom 43% used CAM. The authors showed that the patients that used CAM had a significantly higher risk of cancer recurrence and death than non-users (9). It has also been suggested that fewer than half of all CAM users consult their healthcare professionals about their CAM use (3).

Who uses CAM and why? Several studies have indicated that the typical CAM-users are younger, highly educated female individuals (10-12). CAM users have a higher income and overall higher social status than non-users (13). More often,

patients with a poorer quality of life including symptom progression use CAM (14, 15). Studies in the last decade have shown that patients who use CAM have higher levels of anxiety, pain, depression, dissatisfaction with conventional care and a lower quality of life than non-users (16, 17).

However, involvement in medical decision-making of conventional medicine does not seem to affect the decision to use CAM (18). Oncology health professionals may also use CAM. Kolstad *et al.* showed in a national multicentre survey from Norwegian health professionals that about 20% of oncologists and 50% of nurses used CAM of some sort (19).

Patients using CAM do not necessarily mistrust conventional drugs. The principles of anthroposophic medicine are that, frequently, conventional medicine is not enough to reach 'true healing'. In order to achieve this, the patients must use complementary methods, such as bodily practices or a variety of natural products (20).

Patients, however, are not very keen to tell physicians about their use. Reasons for this nondisclosure were investigated by Eisenberg *et al.*, and the majority of patients reported their reason for nondisclosure as "It wasn't important for the physician to know" (61%) and "The doctor never asked" (60%). However, only 14% reported that they thought the doctor would disapprove of or discourage their use of CAM (4).

Use of multiple CAM therapies. Several studies have highlighted that patients using CAM often use a variety of several different CAM therapies at the same time (21, 22). This makes it difficult to evaluate both positive and adverse effects of the diverse substances and practices.

Aim of study. The aim was to characterize in a structural manner the available literature concerning CAM-use among Scandinavian cancer patients, which according to our knowledge never has been done before.

Materials and Methods

Electronic database searches and article selection strategy. We searched for articles published from January 2000 until October 2015 in international peer-reviewed journals through a systematic search of PubMed. The MeSH terms used were: complementary alternative medicine AND patients with cancer AND survey AND Scandinavia. We excluded all studies not written in the English language. We also excluded studies based on patients without cancer, as well as studies that did not investigate prevalence of CAM use among their subjects.

Data extraction. For each selected article, the following data were extracted: types of cancer among the subjects, number of subjects included, gender, participation rate/response rate, use of CAM (%) among the subjects, median age, type of anthroposophic therapy, demography and educational levels among CAM users.

Table I. *Inclusions and exclusions of articles regarding use of complementary and alternative medicine (CAM).*

Article title	Authors	Ref.	Year	Included in review	Reason for exclusion
The use of complementary and alternative medicine after the completion of hospital treatment for colorectal cancer: findings from a questionnaire study in Denmark.	Nissen <i>et al.</i>	26	2014	Yes	–
The co-use of conventional drugs and herbs among patients in Norwegian general practice: a cross-sectional study.	Djuv <i>et al.</i>	2	2013	No	Not cancer patients
Modes of embodiment in breast cancer patients using complementary and alternative medicine.	Salamonsen <i>et al.</i>	34	2012	No	No study on prevalence of CAM use
Acupuncture with manual and low frequency electrical stimulation as experienced by women with polycystic ovary syndrome: a qualitative study.	Billhult <i>et al.</i>	40	2012	No	Not cancer patients
In God and CAM we trust. Religious faith and use of complementary and alternative medicine (CAM) in a nationwide cohort of women treated for early breast cancer.	Pedersen <i>et al.</i>	25	2013	Yes	–
Any difference? Use of a CAM provider among cancer patients, coronary heart disease (CHD) patients and individuals with no cancer/CHD.	Kristoffersen <i>et al.</i>	24	2012	Yes	–
Patients' views of CAM as spiritual practice.	Ulrich <i>et al.</i>	32	2011	No	No study on prevalence of CAM use
Push or pull? Relationships between lung cancer patients' perceptions of quality of care and use of complementary and alternative medicine.	Lövgren <i>et al.</i>	3	2011	Yes	–
Natural remedy use in a prospective cohort of breast cancer patients in southern Sweden.	Hietala <i>et al.</i>	27	2011	Yes	–
Complementary and alternative medicine practitioner consultations among those who have or have had cancer in a Norwegian total population (Nord-Trøndelag Health Study): prevalence, socio-demographics and health perceptions.	Steinsbekk <i>et al.</i>	28	2010	Yes	–
What is an exceptional cancer trajectory?: Multiple stakeholder perspectives on cancer trajectories in relation to complementary and alternative medicine use.	Hök <i>et al.</i>	41	2009	No	No study on prevalence of CAM use
Mapping patterns of complementary and alternative medicine use in cancer: an explorative cross-sectional study of individuals with reported positive "exceptional" experiences.	Hök <i>et al.</i>	22	2008	No	No study on CAM-use prevalence
Herbal use among cancer patients during palliative or curative chemotherapy treatment in Norway.	Engdal <i>et al.</i>	29	2008	Yes	–
Coping in women with breast cancer in complementary and conventional care over 5 years measured by the mental adjustment to cancer scale.	Carlsson <i>et al.</i>	42	2005	No	No study on prevalence of CAM use
Empowering the cancer patient or controlling the tumor? A qualitative study of how cancer patients experience consultations with complementary and alternative medicine practitioners and physicians, respectively.	Steinsbekk and Launso	43	2005	No	No study on prevalence of CAM use
Should complementary therapies be offered in hospitals?.	Risberg <i>et al.</i>	44	2004	No	Not written in English
Evaluation of quality of life/life satisfaction in women with breast cancer in complementary and conventional care.	Carlsson <i>et al.</i>	20	2004	No	No study on prevalence of CAM use
Use of complementary and alternative therapies: a national multicentre study of oncology health professionals in Norway.	Kolstad <i>et al.</i>	19	2004	No	Not cancer patients
Use of alternative medicine among Norwegian cancer patients is associated with mental distress--a follow-up study.	Risberg <i>et al.</i>	23	2002	Yes	–
Should alternative therapists treat cancer--what is the opinion of oncology health personnel?.	Risberg <i>et al.</i>	45	2003	No	Not written in English
Mental distress and use of alternative medicine among cancer patients.	Risberg and Kolstad	46	2003	No	Yes; Not written in English
Does use of alternative medicine predict survival from cancer?	Risberg <i>et al.</i>	14	2003	Yes	–
A new study of patients with cancer in Umeå alternative medicine is no alternative.	Hardell <i>et al.</i>	35	1998	No	Published before January 2000, not written in English
Cancer patients use of nonproven therapy: a 5-year follow-up study.	Risberg <i>et al.</i>	36	1998	No	Published before January 2000.
Use of alternative medicine among Norwegian hospitalized cancer patients.	Risberg <i>et al.</i>	37	1997	No	Published before January 2000, not written in English
The use of non-proven therapy among patients treated in Norwegian oncological departments. A cross-sectional national multicentre study.	Risberg	11	1995	No	Published before January 2000.
Use of non-proven therapies. Differences in attitudes between Norwegian patients with non-malignant disease and patients suffering from cancer.	Risberg <i>et al.</i>	38	1995	No	Published before January 2000.
Alternative treatment of lung diseases.	Munch and Viskum	47	1991	No	Published before January 2000, not written in English

Table II. Information about participants and use of complementary and alternative medicine (CAM).

Authors	Ref.	Cancer type	Total number of patients (n)	Women/men (n)	Participation rate (%)	Use of CAM (%)
Risberg <i>et al.</i>	23	Breast Malignant lymphomas Gastrointestinal Gynaecological Lung Testicular Brain tumour Prostatic Urological Malignant melanoma Smaller diagnostic group	157	83/74	65%	41%
Risberg <i>et al.</i>	14	Breast Lung Urogenital Malignant lymphoma Gastrointestinal Head and neck Gynaecological Smaller diagnostic group	515	290/225	70%	21.7%
Kristoffersen <i>et al.</i>	24	Not specified (<i>versus</i> coronary heart disease <i>versus</i> general population)	6591 (331 with previous cancer diagnosis)	199/132 (cancer)	77.6%	7.9%
Steinbekk <i>et al.</i>	28	Not specified	1406	841/545	58.4%	16.1%
Hietala <i>et al.</i>	27	Breast	846	846/0	50.3%	38.7%
Lövgren <i>et al.</i>	3	Lung	92	65/27	26.8%	53%
Engdal <i>et al.</i>	29	Not specified	112	57/55	78%	46%
Pedersen <i>et al.</i>	25	Breast	2920	2920/0	68%	49.8%
Nissen <i>et al.</i>	26	Colorectal	247	132/115	31.5%	49.4%

Results

A total of 22 articles were found during the search (Table I). Of these, three articles were excluded because they did not include patients with cancer, seven were excluded since they did not investigate prevalence of CAM use among patients with cancer, and three were excluded due to non-English language. After the exclusions, a total of nine articles fulfilled the selection criteria and were included in the review; these articles included data generated from between 92 and 2,920 patients. Two articles included only patients with breast cancer, one article included patients with lung cancer alone and one included only patients with colorectal cancer. Two articles included patients with a variety of cancer diagnoses and three articles did not specify what type of cancer diagnosis the patients had.

All included articles reported both use of CAM among the participants and the participation rate/response rate (Table II). Five articles reported education levels of the CAM users (Table III). In total, five studies were conducted in Norway, two in Sweden and two in Denmark. The use of CAM in the studied populations ranged from 7.9% to 53%, with an average use of 36.0% throughout all articles. Five out of nine articles reported

CAM use above 40%, whilst three articles reported CAM use of 21.7% or less. The participation rate ranged from 26.8% to 78%. Five studies reported a participation rate of 65% or more, whilst only two articles had a participation rate of less than 50% (26.8% and 31.5%, respectively).

What percentage of patients with cancer use CAM continuously? In 2002, Risberg *et al.* investigated the relationship between the use of CAM by patients with cancer and their level of self-perceived mental distress. The authors used a questionnaire-based longitudinal study design and included all patients under 75 years of age who had had their first contact with the Department of Oncology, University Hospital of Tromsø during the period 1990 to 1991 and who survived at least a 1-year follow-up. A total of 157 patients with various cancer diagnoses were asked to answer questions regarding their use of CAM and level of mental distress. The participation rate was 65%. Of all patients that responded to the first follow-up after 12 months, a total of 41% (64/157) reported regular use of CAM during follow-up. Educational levels were only published as basic characteristics of all participants, and no information was reported on the educational level of CAM users specifically (23).

Table III. Type of complementary and alternative medicine (CAM) and sociodemographic data.

Authors	Ref.	Anthroposophic therapy	Demography	Educational level of patients using CAM
Risberg <i>et al.</i>	23	Faith healing, healing by laying on hands, homeopathy, reflexology or zone therapy, biological treatments, herbs and large doses of vitamins, diet treatment, iscador (mistletoe extract), Nitter therapy (vitamin B12, gamma globulins, tranexamic acid, multivitamins and nutritional supplements).	Norway, multicentre	No information about CAM-users only
Risberg <i>et al.</i>	14	Faith healing, healing by laying on hands, homeopathy, reflexology or zone therapy, biological treatments, herbs and large doses of vitamins, diet treatment, iscador (mistletoe extract), Nitter therapy (vitamin B12, gamma globulins, tranexamic acid, multivitamins and nutritional supplements).	Norway, multicentre	Lower education: 54.1% Higher education: 45.9%
Kristoffersen <i>et al.</i>	24	Not specified, only asked if they had visited a CAM provider in the previous 12 months	Tromsø, North Norway	No information about CAM users only
Hietala <i>et al.</i>	27	Aloe vera, apple cider vinegar, arctic root, blueberry extract, brewer's yeast, coneflower, cranberry, fish cartilage <i>etc.</i>	Lund & Helsingborg, Sweden	Not specified
Lövgren <i>et al.</i>	3	Natural remedies, vitamins and minerals, healing, qi gong, massage, acupuncture, naprapathy, chiropractic care, anthroposophic medicine, homeopathy, meditation, prayer.	Patients from Lung Cancer-Patient Organization, Sweden	<High school: 18% High school (12 years): 26%. University: 48%. Other education: 2%. Missing data: 6%
Engdal <i>et al.</i>	29	Green tea, garlic, ginger, noni juice, <i>Aloe vera</i> , other herbal remedies used to fight cancer	Central Norway	Curative patients. Compulsory: 30.8%. Middle/upper secondary school (ages 16-19): 46.2%. University: 23.1% Palliative patients. Compulsory: 17.2%. Middle/upper secondary school (ages 16-19): 51.7%. University: 31.0%
Pedersen <i>et al.</i>	25	Nutrition supplements, massage, herbs, nutrition/exercise counselling, acupuncture, reflexology, relaxation yoga, healing.	Denmark	No information about CAM users only
Nissen <i>et al.</i>	26	Massage, osteopathy and other manipulative therapies, reflexology, acupuncture, healing, cranio-sacral therapy, homeopathy, dietary therapy, kinesiology, hypnosis, mindfulness, natural medicines.	Denmark	Lower or upper secondary education: 37.1%. Tertiary education: 62.9%

Risberg *et al.* performed yet another study in 2003 to examine the association between CAM use and cancer survival. Five regional cancer Centres in Norway gathered information about CAM use among patients with cancer under 75 years of age who were not bedridden. The participants were asked to complete a survey about their use of CAM, quality of life and about various demographic factors. There was an 8-year follow-up to investigate cancer survival among these individuals. The participation rate was 70%. A total of 515 patients with various cancer diagnoses were included in the study. Of these, 112 patients (21.7%) used some kind of CAM: 61% used spiritual methods (faith healing or healing by hand) and 39% used non-spiritual methods only. Nearly half of the CAM users used two or more methods in the same period. There was a slightly higher educational level of the CAM users compared with

non-users (higher education 45.9% *versus* 40.2% in the non-user group). However, a larger proportion of CAM users had a low level of educational (45.9% high level, 54.1% low level). The definition of the different education levels was not stated (14).

In 2012, Kristoffersen *et al.* investigated whether there was a difference in CAM use between patients with cancer, those with coronary heart disease (CHD) and the general population. The authors used data from the Tromsø study series. The survey was conducted in 1994-1995 and a total of 8,040 individuals were included (response rate=77.6%). Altogether 1,280 individuals did not complete the survey correctly and were excluded for that reason. Another 169 had both CHD and cancer, therefore they were excluded. A total of 6,591 participants were included, of whom 331 had cancer. CAM use was defined as having made a visit to a

CAM provider during the previous year. Of all patients with cancer, a total of 7.9% (10.6% of women/3.8% of men) were reported to be CAM users. Educational levels were only reported as basic characteristics and were not specified for the CAM-user group (24).

In 2013, Pedersen *et al.* studied the relationship between religious faith and use of CAM in patients with breast cancer. A total of 4,917 Danish women treated surgically for early-stage breast cancer were invited to answer a questionnaire about their use of CAM and religious conviction. Both natural products and mind-and-body practices were assessed. The first questionnaire was sent out 3-4 months post primary surgery and the response rate was 68%. A follow-up questionnaire was sent out 15-16 months post-surgery and of the remaining eligible recurrence-free women (n=3,128) 94% returned a valid questionnaire regarding questions about CAM use and religious faith. Of the remaining 2,920 women, 49.8% had used some kind of CAM within the previous year (25).

Lövgren *et al.* studied the association between perceptions of quality of life and use of CAM in patients with lung cancer. The authors sent out a questionnaire issuing these questions to all members of the Swedish National Lung Cancer Patient Organisation in 2007, including a total of 351 patients. The response rate was only 26.8%. Of all patients with lung cancer who returned the questionnaire, 53% used CAM. Of note is that fewer than half of the CAM users had told the healthcare system about their use. By educational measurements, 48% had earned a university/college degree, 26% had reached high school and 18% did not have a high school diploma (3).

In 2014, Nissen *et al.* investigated the use of CAM in patients with colorectal cancer by survey assessment. A total of 783 patients were identified through the Danish National Patient Registry and invited onto the study. Of these, 247 (31.5%) participated. Nearly half (49.4%) of them had used some type of CAM in the previous month. Amongst the CAM users, there was a significant relationship between educational level and the use of alternative treatment or natural medicines/dietary supplements. Of those using alternative treatment, 77% had a tertiary degree or higher, whilst 23% had completed primary and lower secondary education only. Amongst users of natural medicines/dietary supplements, 62.9% had a tertiary degree or higher, and 37.1% had lower or upper secondary education only (26).

To study the use of CAM in patients with breast cancer, Hietala *et al.* invited Swedish women who had been preoperatively assessed before undergoing first breast cancer surgery. In this assessment, they filled out a preoperative questionnaire that included questions based on several areas of interest, including use of concomitant medications during the previous week. Follow-up was carried out for up to five years postoperatively. Of all 1,700 patients from both Lund

(n=1132) and Helsingborg (n=568), 855 patients were included in the study (50.3%). Information on CAM use was available for 846 of these patients. Overall, 38.7% of the patients reported having used CAM (natural medicines/dietary supplements) on at least one visit during the study. Educational levels were not specified (27).

In 2010, Steinsbekk *et al.* investigated the use of CAM among those who had or had had cancer in the Norwegian population. Data were used from the cross-sectional Nord-Trøndelag Health Study (HUNT 2 Study) that was conducted between 1995 and 1997 in Norway (39). A total of 2,409 participants reported having either a history of cancer or a current cancer diagnosis. Questions on CAM use were completed by 1,406 (58.4%) of these individuals. In the study, CAM was defined as having visited one or more CAM practitioners in the previous year. In total, 16.1% of the patients with cancer were defined as CAM users. Of the CAM users, 41.5% (n=88) had an educational level of compulsory school, 36.8% (n=78) had completed middle school (secondary school including vocational education below university level) and 21.7% (n=46) had a university degree (28).

Engdal *et al.* studied the use of CAM among patients with cancer treated with chemotherapy for both palliative and curative reasons. A total of 144 patients were invited to participate in the survey-based study at two outpatient clinics in a rural area in Norway between 2006 and 2007. One hundred and twelve patients fulfilled the questionnaires (response rate=78%). Of all patients with cancer treated with chemotherapy, 46% used some kind of herbal therapy either before or concomitant with conventional chemotherapy. Thirty eight percent of all patients used some kind of herbal therapy concomitant with chemotherapy, and no difference was seen between patients treated with curative (38%) or palliative (37%) intent ($p=0.916$). By educational measurements, of all curatively treated patients using CAM; 30.8% had completed compulsory school, 46.2% had completed middle school (optional upper secondary school) and 23.1% had a university degree. Of all patients treated with palliative intent; 17.2% had completed compulsory school, 51.7% had completed middle school and 31% had a university degree (29).

Discussion

The results of this study indicate that CAMs seem to be used by a significant number of patients with cancer in Scandinavian countries. This is noteworthy since staff from conventional healthcare seldom know about the usage of CAM (2, 3) and because of the potential negative side-effects that some natural products may cause (7, 9). An open and respectful dialogue about CAM between patients and healthcare providers has been suggested, which would to open up possibilities for equally sharing different views about CAM use (30) to address this lack of cognizance about CAM use.

Three studies differed substantially from the rest with far lower levels of CAM usage. The lowest report of CAM usage in this review was shown by Kristoffersen *et al.* in 2012 (7.9%). However, this study only investigated visits to a CAM provider, which were not further specified. Thus, all patients using complementary methods such as diets or supplementary natural products might have been excluded. The authors used a population-based design with a general invitation to participate. The reported participation rate was 77.6%; however, the subjects were eventually divided into subgroups and the actual participation rate among patients with cancer was not reported. Hence, the overall level of CAM use was probably greater than reflected in this study (24).

The second lowest level of CAM use (16.1%) was reported by Steinsbekk *et al.* in 2010. The authors defined CAM users as those having visited a CAM provider in the previous 12 months, thus excluding all other types of CAM use. The participants were eligible if “ever having cancer”. Thus patients who had visited a CAM provider while being treated for cancer more than one year earlier, but not since then, were excluded by definition from being CAM users. Hence, the overall use of CAM was probably greater than reported in this study (28).

The third lowest number was reported by Risberg *et al.* in 2003 (21.7%). The authors defined CAM users as those that admitted to using alternative methods to treat their cancer. However, as mentioned earlier, the primary purpose of treatment for many CAM users is to ease symptom burden and not to treat cancer itself. These patients will thus not have been defined as CAM users and the true CAM use was probably greater than reported. Patients above 75 years of age were also excluded, potentially reflecting incorrect levels of true CAM use (23).

Of the studies that reported fairly equal levels of CAM use, close to 50%, Pedersen *et al.* included most participants ($n=2,920$), with an acceptable participation rate (68%). Patients included were those who had used any type of complementary medicine during cancer treatment, most likely reporting a good representation of CAM use among patients with breast cancer. Since the typical CAM user is female, however, this number might be higher than the average use among patients with cancer in general (13).

The remaining studies included either had relatively low numbers of participants or low participation rates, making the results less valid.

This systematic review focused on articles published in Scandinavian settings. No demographic trend was seen in prevalence of CAM use, since articles describing both urban and rural populations reported similar results. For example, a Norwegian multicentre study (14), a study on populations from northern Norway (24) and one from central Norway (28) reported the lowest prevalence rates along with the Swedish study from Lund and Helsingborg (27), which are

quite large cities with high population densities. One reason might be that socioeconomic factors may predict the use of CAM (10) rather than population density or urban/rural demographic areas.

Since complementary medicine can be quite expensive, one might expect that higher socioeconomic status may be associated with use of CAM. Patients with a higher education level may also doubt the conventional system and be more aware of CAM treatments (10). As this review shows, there were various levels of education amongst the CAM users in the different studies. Also, the definitions of educational levels vary among all studies, making comparisons between them less valid. Some studies, however, report a high educational level (3, 26), while others report intermediate or low educational levels amongst the CAM users (14, 28, 29). Hence, in this review, comparisons between educational levels despite different definitions throughout the articles showed no trend towards either high or low educational levels amongst the CAM users.

However, as also seen in previous studies (10-12), most of the reviewed articles reported a higher prevalence of CAM use amongst female individuals compared to the male population, even when excluding articles investigating patients with breast cancer. However, this difference is suggested to be reflected by a greater tendency to seek healthcare in general, as women tend to seek all types of healthcare and suffer from chronic illnesses more often than men (31).

The reasons for using CAM are probably multifactorial. While some patients use CAM due to true dissatisfaction or scepticism (16, 17) others may use it because they believe in anthroposophic medicine rather than distrusting conventional care. Some patients may actually benefit from CAM in terms of better well-being due to spiritual practice (32), which is probably a quite harmless complementary method. Regardless of the reason, few seem to know that specific natural remedies might actually be harmful (4). This underlines the importance of educating both patients and caregivers about the various complementary alternative methods, in order to optimise the discussions of CAM in clinical practice.

In this review, a systematic search was conducted of one database, namely PubMed, and no hand search was undertaken. Consequently, relevant articles might have been missed. Inclusion was based on the studies' relevance for the review aim and not on methodological quality. However, the participation rates of the included studies were fairly high, with only two studies reporting less than 50% participation (26.8% and 31.5%, respectively). This has, however, to be taken into account when making conclusions about the results presented, as such studies can report false results due to selection bias. If all studies had used the NCCAM's definitions for CAM use, comparisons made in this review

would have been more valid. This problem was already raised in a systematic review in 1998 by Ernst *et al.*, who suggested that studies should have a standardised protocol in order to make valid conclusions about the prevalence of CAM use (33).

We suggest that further studies are needed to evaluate the true use of CAM among patients with cancer. One way would be to make a questionnaire-based study including all patients during their first visit to an Oncology Department in a longitudinal manner. The survey should include all possible complementary treatments and a qualitative follow-up could be made based on the results. Moreover, if a personal code number is registered, future matching could be made against registers, allowing analysis of any association with prognosis, type of cancer, stages of cancer, treatment *etc.*

Conclusion

The use of CAM is widespread among patients with cancer, which conventional healthcare providers may not be aware of. Although some patients may benefit from some complementary methods, others use agents that may be potentially harmful. Future research should distinguish between seemingly harmless and harmful methods of CAM in order to understand the effects of dangerous substances on conventional cancer therapy. Knowledge about CAM should be disseminated to both patients and staff in order to optimise discussions about CAM in clinical practice. Interventional studies on how to improve such discussions is crucial. In addition, future studies are needed in order to estimate the use of CAM among patients with cancer in general.

Conflicts of Interest

None to declare.

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