Characteristics of persons with hand osteoarthritis visiting complementary and alternative medicine providers

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ABSTRACT
Objective: To examine the frequency of Complementary and Alternative Medicine (CAM) in a hand osteoarthritis (OA) population, and to compare demographic and clinical characteristics between persons with hand OA visiting vs. not visiting CAM providers.

Methods: 300 persons with hand OA from the Nor-Hand study responded to questionnaires concerning demographic information, medical assessments and their use of CAM and other therapies. In addition, they answered questions about health-related quality of life, comorbidities, psychological health and joint symptoms. The characteristics of persons visiting vs. not visiting CAM providers were compared using chi-square tests and t-tests or Mann-Whitney tests, as appropriate.

Results: In total 227 (75.7%) persons with hand OA had used CAM for their joint symptoms and 68 (22.7%) had visited CAM providers. Persons visiting CAM providers reported more severe joint pain when taking all joints into account (mean 4.5 vs. 3.9 on a 0–10 Numerical Rating Scale, p = 0.05) and more frequent use of non-pharmacological interventions, conventional analgesics, opioids, and previous surgery on ligaments and joints compared with persons not visiting CAM providers. Persons visiting CAM providers also reported more comorbidities and anxiety symptoms and they were characterized by having a more approach-seeking behaviour.

Conclusion: Persons with hand OA in secondary care were frequently visiting CAM providers. Persons visiting CAM providers were characterized by more severe joint symptoms despite the use of non-pharmacological and pharmacological interventions compared with persons not visiting CAM providers.

1. Introduction
Osteoarthritis (OA) is the most frequent rheumatic joint disease in the developed countries and is the leading cause of disability in older adults [1]. Hand OA is one of the most common phenotypes and 14% of women and 7% of men between the ages of 40–84 years have symptomatic hand OA, according to data collected in the population-based Framingham study [2]. Pain and aching are some of the hallmark symptoms of the disease and what most frequently drives OA patients to seek medical assistance [3]. Reduced grip strength, stiffness, loss of mobility, aesthetic damage and disability are other important symptoms of hand OA that contributes to functional limitations and reduced quality of life [4]. Further, persons with OA in one joint will often have other joints affected, resulting in greater symptomatic burden of the disease [5]. According to previous studies, persons with hand OA who are referred to secondary care have similar degree of symptoms as persons with rheumatoid arthritis (RA) [6]. Despite being a prevalent disease, options to treat OA are limited and no disease-modifying drugs (DMOADs) currently exist. Hence treatment is focused on pharmacological and non-pharmacological symptom relieving therapies [7,8]. Pain caused by OA is usually treated with oral analgesics and non-steroidal anti-inflammatory drugs (NSAIDs), while in more severe cases orthopedic surgical interventions are required. Due to limited symptom relief from conventional medicine and surgical interventions, persons with OA are seeking an increasing number of different complementary and alternative medicine (CAM) therapies [9].

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CAM is defined as a group of diverse medical and health care practices/products that are not generally considered as part of conventional health care in the country it is being used. Several subcategories of health seeking behavior fall under the definition of CAM: Visits to CAM providers; use of natural remedies and dietary supplements, but also different kinds of self-help practices [10]. CAM is widely used for OA throughout the world ranging from 68% (current use) to 91% (ever used) across studies [11–14]. The most commonly used CAM modalities are natural remedies, homeopathy, chiropractic, acupuncture and reflexology [15]. Previous studies have shown that OA symptoms are among the most common reasons for using CAM [16,17]. Prior studies have also explored characteristics of arthritis patients in general using CAM and suggested that women and participants with higher level of education were more likely to report current use of CAM [11,18].

Although some studies have explored the rates of CAM used by persons with knee OA [19], little is known about the use of CAM in hand OA particularly. As far as we are concerned, no previous studies have explored the frequency and characteristics of persons with hand OA using CAM in their treatment of OA symptoms.

Using cross-sectional data from the Nor-Hand study, our primary aim was to compare demographic and clinical characteristics between persons with hand OA visiting and not visiting CAM providers for treatment of their OA.

2. Material and methods

2.1. Study population

The Nor-Hand study is a large hospital-based observational cohort study, including 300 persons with hand OA recruited from a rheumatology outpatient clinic at Diakonhjemmet Hospital in Oslo, Norway. The current analyses are based on cross-sectional data from the baseline examination in 2016–2017. Consecutive eligible patients included men and women (ages 40–70 years) with ≥1 interphalangeal or thumb base joint with OA, diagnosed clinically and/or by ultrasound. Individuals with RA, spondyloarthritis, psoriatic arthritis, psoriasis or hemochromatosis were excluded. Detailed inclusion/exclusion criteria have been previously published [20]. All participants signed informed consent and the study was approved by the regional ethics committee (Ref: no: 2014/2057).

2.2. Data collection

All participants were invited to a test evening at Diakonhjemmet Hospital where they underwent the clinical examinations. The participants received standardized questionnaires administered in Norwegian in an electronic case report form (eCRF), or alternatively in paper form, prior to or just after the clinical examination.

2.3. Demographic factors

Data on age and sex were collected from their electronic medical records. The participants reported whether they lived in a relationship or not, current working position and their highest education level accomplished (7 categories). Higher education was defined as at least 1 year of university or other higher education.

2.4. Complementary and alternative medicine (CAM)

The questionnaire was developed by the Norwegian National Research Centre in Complementary and Alternative Medicine (NAFKAM) and contained questions regarding the participants' self-initiated use of CAM in treatment for their OA (Online Supplementary File). In the first question the participants were asked which out of 10 different CAM therapy providers (acupuncture, homeopathy, reflexology, healing, kinesiology, massage, naprapathy, gestalt therapy, thought field therapy, others) he/she had been visiting the last 12 months. The study population was divided into two groups, i.e., persons visiting one or more of the ten listed CAM providers within the last 12 months, and persons not visiting any CAM providers for their OA symptoms in this period. The participants were also asked to list their dietary supplements, natural remedies and their use of self-help techniques.

2.5. Pain and clinical findings

OA-related pain was self-reported using standardized questionnaires. The Australian/Canadian hand index (AUSCAN) is a disease-specific questionnaire, which measures pain in persons with hand OA during the last 48 h [21,22]. Similarly, participants reported their pain in knees/hips on the Western Ontario and McMaster Universities Arthritis Index (WOMAC) [23]. Both the AUSCAN and WOMAC subscales contain five questions, each with 5 response options (0–4). The sum scores for both pain subscale ranges from 0 to 20, with higher scores representing worse health. The participants indicated their pain intensity in the hands and overall in all joints in total body during the last 24 h on two separate Numeric Rating Scales (NRS) from 0 to 10, where 0 represents “no pain” and 10 represents “worst pain imaginable”.

One rheumatologist or a rheumatology resident examined whether the participants fulfilled the clinical American College of Rheumatology criteria (ACR) for OA in the hands and in the knees [24,25]. The overall hand OA disease activity was summarized on an NRS from 0 to 10. All participants obtained bilateral frontal hand radiographs (posteroanterior view). The 2nd-5th distal interphalangeal, 1st-5th proximal interphalangeal, 1st-5th metacarpophalangeal and 1st carpometacarpal joints were evaluated by an experienced reader (IKH) using the Kellgren-Lawrence scale [26]. The phalangeal joint and interphalangeal joints were scored similarly, although not included in the original scale. The intra-reader reliability was excellent (ICC 0.99, weighted K = 0.92) [27].

2.6. Comorbidities, medications and psychological health

Data on comorbidities were collected by having each patient respond to The Self-Administered Comorbidity Questionnaire, which includes 12 of the most prevalent medical conditions in general practice and 3 additional unspecified conditions [28]. The questionnaire includes questions about treatment and impact on daily activities giving a comorbidity index with a total score of 0–45.

The participants were asked to bring their list of medications, including those that were taken regularly and as needed. Numbers of participants taking oral analgesics (selective and non-selective NSAIDs, paracetamol, opioid or opioid-like drugs) regularly or as needed were calculated based on screening of the list of medications. The participants’ use of non-pharmacological interventions like hand orthoses and assistive devices (e.g. electric can opener, knife with build-up handle and enlarged grip for opening bottles) was also reported.

Psychological health was assessed using the Hospital Anxiety and Depression Scale (HADS), containing 14 questions on 0–3 scales. Sum scores for each subscale range from 0 to 21 [29], with scores 8 or more indicating a need of further assessment of possible anxiety and/or depression disorder [30]. Pain Catastrophizing Scale (PCS) consists of 13 questions about the persons’ thoughts and feeling when experiencing pain [16]. Sum score ranges from 0 to 52, where higher score reflects more pain catastrophizing. The Arthritis Self Efficacy Scale (ASES), originally designed for RA, evaluates the persons’ ability to influence pain (5 questions) and other symptoms of rheumatic diseases (6 questions) where the score ranges from 10 to 100 and a higher score indicates greater self-efficacy [31]. The Brief Approach/Avoidance Coping Questionnaire (BACQ) includes 12 questions including 6 questions about approach-oriented coping behaviour and 6 questions about avoidance-oriented coping behaviour [32,33]. Each question has 5 response options from “strongly disagree” to “strongly agree” and the sum score ranges from 12 to 60. A high sum score represents more use of approach-oriented (such as actively trying to find a solution on problems,
or talking to selected persons when needed) and a less use avoidance-oriented coping behaviour (such as pulling back from others when having a difficult time, and trying to forget the problems). The participants were asked to indicate their fatigue on an NRS from 0 to 10, and to respond to one question regarding their sleep quality with 5 response options ranging from normal sleep to extreme insomnia.

To calculate the body mass index (BMI, kg/m²) weight and height were measured by a trained medical student.

2.7 Health behaviour

Drinking behaviour was examined with a question about the frequency of alcohol consumption per week (5 categories). In the analyses the variable was dichotomized into frequent drinking (at least 2–4 times per week) vs. more seldom. Participants also responded to a question about smoking (4 categories), and the variable was dichotomized into current daily/non-daily smokers vs. never/previous smokers in the analyses.

2.8 Statistical analyses

Categorical variables were described with frequencies and percentages, while continuous variables were summarized with either mean (standard deviation, SD) or median (interquartile range, IQR) scores, depending on their distribution. The characteristics of the persons visiting CAM providers and persons not visiting CAM providers were compared using chi-square tests for categorical variables and t-test or Mann Whitney test for continuous variables, as appropriate. Statistical analyses were performed using SPSS version 27 (IBM), and p-values < 0.05 were considered statistically significant.

3 Results

3.1 Patient characteristics

The demographic and clinical characteristics of the 300 participants are presented in Table 1. The vast majority of the patients in the NorHand study were women, and their median age was 61 years. The study population were highly educated with more than half of the participants having at least one year of college or university education. The majority fulfilled the ACR criteria for hand OA, and the level of pain was similar in the hands as in all joints in total body. In general, the scores for anxiety, depression and pain catastrophizing were low, although a wide range was found. Self-reported anxiety symptoms were more common than depressive symptoms, with 56 participants (19.3%) having a HADS anxiety score of 8 or more. In comparison, 25 participants (8.6%) had HADS depression score of 8 or more. The self-efficacy was high for both pain and total symptoms, and the results on the BACQ questionnaire suggested approach-oriented behaviour. The prevalence of frequent drinking behaviour (at least 2–4 times per week) was high (40.1%) within the group, while few (15.0%) participants were smoking (10.3% on daily basis).

3.2 Frequency of complementary and alternative medicine (CAM) use

In total 227 participants (75.7%) reported any use of CAM the past 12 months, when taking visits to CAM providers, dietary supplements, natural remedies and self-help techniques into account.

A total of 68 (22.7%) participants reported visits to one or several CAM providers in treatment of their joint symptoms, with the 2 most frequently used modalities being massage and acupuncture (Table 2). Among the 68 persons who visited CAM providers, the majority (n = 41) used only one CAM modality received from provider, while 23 participants visited two different providers, and 4 participants only visited 3 or more. Other kinds of CAM provided than the ones explicitly mentioned in Table 2 were aroma therapy, osteopathy, Ayurveda and magnetic

| Table 1 | Demographic and clinical characteristics of the 300 participants. |  |
| --- | --- | --- |
| Sex, n (%) women | 266 (88.7) |  |
| Age, median (IQR) years | 61.0 (56.7–65.9) |  |
| Body mass index, mean (SD) | 26.5 (5.0) |  |
| Married or living with partner, n (%) | 197 (70.1) |  |
| Higher education, n (%) | 174 (58.2) |  |
| Working position, n (%) | 160 (53.7) |  |
| ACR criteria for hand OA, n (%) | 278 (92.7) |  |
| ACR criteria for knee OA, n (%) | 187 (64.3) |  |
| AUSCAN pain (range: 0–20), mean (SD) | 8.2 (4.0) |  |
| WOMAC pain (range: 0–20), median (IQR) | 5.0 (1.0–9.0) |  |
| NRS hand pain (range: 0–10), mean (SD) | 3.8 (2.3) |  |
| NRS pain all joints total body (range: 0–10), mean (SD) | 4.0 (2.3) |  |
| Kellgren-Lawrence sum score (range: 0–128), median (IQR) | 27.9 (15.0–41.0) |  |
| Comorbidity index (range: 0–45), mean (SD) | 7.7 (4.2) |  |
| HADS anxiety (range: 0–21), median (IQR) | 4.0 (1.0–6.0) |  |
| HADS depression (range: 0–21), median (IQR) | 2.0 (1.0–4.0) |  |
| PCS (range: 0–52), median (IQR) | 9.0 (5.0–15.0) |  |
| ASES pain (range: 10–100), mean (SD) | 62.8 (16.3) |  |
| ASES symptom (range: 10–100), mean (SD) | 73.0 (14.6) |  |
| BACQ (range: 12–60), mean (SD) | 37.7 (4.1) |  |
| NRS fatigue (range: 0–10), median (IQR) | 4.0 (2.0–6.0) |  |
| Moderate to extreme sleeping problems, n (%) | 122 (40.8) |  |
| Frequent alcohol drinking, n (%) | 120 (40.1) |  |
| Current smokers, n (%) | 45 (15.0) |  |

AUSCAN = Australian/Canadian Osteoarthritis hand index, WOMAC = Western Ontario and McMaster Universities Arthritis Index, NRS = Numerical Rating Scale, ACR = American College of Rheumatology, HADS = Hospital Anxiety and Depression Scale, PCS = Pain catastrophizing scale, ASES = Arthritis Self Efficacy scale, BACQ = Brief Approach/Avoidance Coping Questionnaire.

a N = 1 missing for education, NRS hand pain, sleep and alcohol. N = 2 missing for work and WOMAC pain. N = 3 missing for BACQ and NRS pain all joints. N = 4 missing for PCS, ASES and NRS fatigue. N = 9 missing for ACR knee OA. N = 10 missing for HADS. N = 19 missing for relationship.

| Table 2 | Number of participants receiving specific CAM modalities from providers. |  |
| --- | --- | --- |
| | N (%) participants |  |
| Massage | 37 (12.3) |  |
| Acupuncture | 28 (9.3) |  |
| Naprapathy | 8 (2.7) |  |
| Reflexology | 7 (2.3) |  |
| Healing | 5 (1.7) |  |
| Homeopathy | 3 (1.0) |  |
| Gestalt therapy | 1 (0.3) |  |
| Kinesiology | 0 (0.0) |  |
| Thought field therapy | 0 (0.0) |  |
| Other | 16 (5.5) |  |

CAM = Complementary and Alternative Medicine.

3.3 Comparison of demographic and clinical characteristics between patients visiting and not visiting CAM providers

Persons visiting CAM providers differed significantly from persons not visiting CAM providers (Table 3). There was a statistically significant higher proportion of women in the group of persons visiting CAM providers in treatment of their OA, compared with the group not visiting CAM providers. The group of persons visiting CAM providers had a

treatment.

Dietary supplements were used by 196 participants (65.3%), while only 31 (10.3%) participants used natural remedies. The most commonly used dietary supplements were fish oils, glucosamine and vitamins/minerals, while curcumin and ginger were the most frequently consumed natural remedies. A total of 53 participants (17.7%) reported using self-help techniques, with yoga, meditation and qi gong/tai chi being the most frequently used techniques.

3.3. Comparison of demographic and clinical characteristics between patients visiting and not visiting CAM providers

Persons visiting CAM providers differed significantly from persons not visiting CAM providers (Table 3). There was a statistically significant higher proportion of women in the group of persons visiting CAM providers in treatment of their OA, compared with the group not visiting CAM providers. The group of persons visiting CAM providers had a
between the two groups was found in the levels of hand pain. The scores on WOMAC knee/hip pain were also higher within the group of participants visiting CAM providers, although not statistically significant. There was a tendency towards less severe radiographic hand OA in persons visiting CAM providers than in persons not visiting CAM providers, although not statistically significant.

3.4. The use of other treatments by participants visiting and not visiting CAM providers

Persons visiting CAM providers were more frequent users of selective/non-selective NSAIDS, paracetamol and opioids/weak opioids as needed than the patients not visiting CAM providers, although statistically significant for NSAIDs only. The users of CAM were also more frequent users of non-pharmacological interventions such as hand orthoses and assistive devices and had underwent more surgery on ligaments and joints (Table 4). Persons visiting CAM providers reported more frequent use of dietary supplements and self-help techniques, although statistically significant for the latter only (Table 4). In particular, persons visiting CAM providers reported statistically significantly more frequent use of vitamins/minerals than persons not visiting CAM providers (50.0% vs. 19.8%, p < 0.001). No statistically significant difference between groups was found for natural remedies.

4. Discussion

In the Nor-Hand study, which is a hospital-based study of persons with hand OA, we found that 23% of the participants were visiting CAM providers for their OA symptoms. This percentage of use is similar to the general population in Norway who visited CAM providers for various reasons during one year in 2018 [34]. Previous studies have indeed

| Table 3 | A comparison of demographic and clinical characteristics between participants visiting CAM providers and not visiting CAM providers. |
|---------|----------------------------------------------------------------------------------------------------------------------------------|
| Visiting CAM providers (n = 68) | Not visiting CAM providers (n = 232) | P-value |
| Sex, n (%) women | 66 (97.1) | 200 (86.2) | 0.01 |
| Age, median (IQR) years | 60.9 (56.0–66.8) | 61.3 (56.8–65.8) | 0.95 |
| Body mass index, mean (SD) | 26.1 (4.7) | 26.6 (5.0) | 0.43 |
| Married or living with partner, n (%) | 35 (60.3) | 162 (72.6) | 0.07 |
| Higher education, n (%) | 59 (74.7) | 158 (72.6) | 0.12 |
| Working position, n (%) | 30 (41.2) | 130 (56.3) | 0.07 |
| ACR criteria for hand OA, n (%) | 63 (92.6) | 215 (92.7) | 0.99 |
| ACR criteria for knee OA, n (%) | 44 (65.7) | 143 (63.5) | 0.78 |
| AUSCAN pain (range: 0–20), mean (SD) | 8.6 (4.1) | 8.1 (4.0) | 0.41 |
| WOMAC pain (range: 0–20), median (IQR) | 5.0 (1.3–10.0) | 4.0 (0.0–8.0) | 0.15 |
| NRS hand pain (range: 0–10), mean (SD) | 3.9 (2.1) | 3.7 (2.3) | 0.49 |
| NRS pain all joints total body (range: 0–10), mean (SD) | 4.5 (2.2) | 4.3 (2.3) | 0.05 |
| Kellgren-Lawrence sum score (range: 0–128), median (IQR) | 24.0 (10.0–36.8) | 29.0 (16.0–44.0) | 0.09 |
| Comorbidity index (range: 0–45), mean SD | 9.4 (4.3) | 7.2 (4.1) | <0.001 |
| HADS anxiety (range: 0–21), median (IQR) | 5.0 (2.5–8.0) | 3.0 (1.0–6.0) | 0.003 |
| HADS depression (range: 0–21), median (IQR) | 2.0 (1.0–4.0) | 2.0 (1.0–4.0) | 0.73 |
| PCS (range: 0–52), median (IQR) | 10.0 (5.0–18.0) | 9.0 (5.0–14.0) | 0.12 |
| ASES pain (range: 10–100), mean (SD) | 63.6 (16.4) | 62.5 (16.2) | 0.63 |
| ASES symptom (range: 10–100), mean (SD) | 72.4 (15.5) | 73.1 (14.4) | 0.71 |
| BAQ (range: 12–60), median (IQR) | 39.2 (3.9) | 37.3 (4.0) | <0.001 |
| NRS fatigue (range: 0–10), median (IQR) | 4.0 (2.0–7.0) | 4.0 (2.0–6.0) | 0.26 |
| Moderate to extreme sleeping problems, n (%) | 31 (46.3) | 91 (39.2) | 0.30 |
| Frequent alcohol drinking, n (%) | 25 (36.8) | 95 (41.1) | 0.52 |
| Current smokers, n (%) | 10 (14.7) | 35 (15.1) | 0.94 |
| BMI, mean (SD) | 26.1 (4.7) | 26.6 (5.0) | 0.43 |
| ACR criteria for OA, n (%) | 63 (92.6) | 215 (92.7) | 0.99 |
| Other joint or ligament procedures, n (%) | 31 (45.6) | 69 (29.7) | 0.02 |
| Selective/non-selective NSAIDS, n (%) | 26 (38.8) | 70 (30.7) | 0.21 |
| Paracetamol (as needed), n (%) | 8 (11.8) | 17 (7.3) | 0.24 |
| Benzodiazepines (as needed), n (%) | 5 (7.4) | 10 (4.3) | 0.31 |
| Corticosteroid injections in hand joints, n (%) | 40 (58.8) | 112 (48.3) | 0.13 |
| Hand orthoses, n (%) | 40 (58.8) | 112 (48.3) | 0.13 |
| Amisulpride, n (%) | 3 (4.5) | 16 (6.9) | 0.77 |
| Prostaglandins, n (%) | 6 (8.8) | 17 (7.3) | 0.68 |
| Other joint or ligament surgery, n (%) | 31 (45.6) | 69 (29.7) | 0.02 |
| Dietary supplements, n (%) | 50 (73.5) | 146 (62.9) | 0.11 |
| Natural remedies, n (%) | 8 (11.8) | 23 (9.9) | 0.66 |
| Self-help techniques, n (%) | 18 (26.5) | 35 (15.1) | 0.03 |

**Table 4** The use of other treatments by participants visiting and not visiting CAM providers.

**NSAIDs** = nonsteroidal anti-inflammatory drug.

a Missing variables for persons not visiting CAM providers: N = 2 missing for hand orthosis and customized aiding tool. N = 4 missing for corticosteroid injections.

b Missing variables for persons visiting CAM providers: N = 1 missing for corticosteroid injections and customized aiding tool. N = 2 missing for hand orthosis.
shown that OA symptoms are among the most common reasons for using CAM [17,18,35]. The reason for the lower use of CAM found in the present Norwegian study compared with previous international studies, might be due to the fact that CAM therapies are mainly offered outside public health care in Norway and paid out of pocket by the patients themselves. This is in contrast to conventional health care that is fully covered or co-paid only with a small fee. Also, the fact that chiropractic is not considered as CAM in Norway might have influenced the results as chiropractic is considered CAM in most other countries and frequently used among OA patients [15]. The common use of acupuncture in the current study correlates with international findings [36]. The general high prevalence of persons with hand OA using CAM is likely due to the lack of very effective symptom-modifying therapies for OA.

To our knowledge, the Nor-Hand study is the first specifically comparing demographic and clinical characteristics between persons with hand OA visiting and not visiting CAM providers. In line with prior studies [11,18], our results indicate that women were more likely to report current use of CAM therapies than men. This findings confirms the result from another survey conducted on persons with knee OA showing that women were more frequent users of different types of CAM modalities for their knee OA symptoms [37]. Women may be more active than men in seeking health care, which may explain the observed difference [38].

Whereas no difference in the levels of hand pain was found between participants visiting and not visiting CAM providers, we found that the participants visiting CAM providers reported more severe joint pain when taking all joints in total body into account than the participants not visiting CAM providers. Participants visiting CAM providers reported also more pain in hips and knees, although not statistically significant. Although the Nor-Hand study is a study on persons with hand OA, they frequently have involvement of other joints. In the questionnaire about CAM, the participants were therefore asked about OA in general, and not their hands specifically.

Chronic rheumatic diseases often have an important impact on physical, as well as psychological and social aspects of their lives [32]. In the Nor-Hand study, the participants visiting CAM providers reported more comorbidities and anxiety symptoms. These findings support previous research examining patient-reported outcomes among Chinese American rheumatology patients, where the group of patients using traditional Chinese medicine had worse outcomes regarding anxiety, depression, fatigue and ability to participate in social roles and activities [39]. Although the participants were questioned about the use of CAM for their OA symptoms only, we cannot rule out that the participants’ total burden of disease affected their likelihood of using CAM in addition to or instead of conventional medicine. Users might experience that CAM providers have a more global perspective on the whole person, taking into account both the joint symptoms and other somatic as well as mental comorbidities. In addition, persons with higher scores on the HADS anxiety subscale might have worried more about the prognosis of their OA, and therefore visited the CAM providers. Interestingly, persons visiting CAM providers had a statistically significant higher BACQ score compared with the group not visiting CAM providers. Higher BACQ scores indicate high levels of approach-oriented and low levels avoidance-oriented coping behaviour, exemplified by more actively seeking a solution of their problems. Thus, it is likely that these participants have been more active in their search for potentially effective therapies for the OA symptoms. Furthermore, the two groups may have different beliefs and different priorities [40]. There was a tendency that persons visiting CAM providers were less frequently living with a partner and less frequently in paid work than persons not visiting CAM providers, and the groups may thus have different priorities in their daily life.

Looking at the use of conventional medicine, the participants visiting CAM providers were more frequent users of conventional analgesics and opioids. The participants visiting CAM providers were also more frequently using non-pharmacological interventions such as hand orthoses and assistive devices and they had undergone more surgery on ligaments and joints. In line with previous studies, our findings suggest that CAM therapies are frequently used in combination with conventional therapies [19,41]. The higher frequency of non-pharmacological, pharmacological and surgical interventions in the CAM users may partly be due to higher levels of symptoms among the CAM users, and partly due to a more approach-seeking personality.

There are some limitations to our cross-sectional study. First, due to its hospital-based study design where all the participants were recruited from an outpatient clinic, the generalizability of the Nor-Hand study is limited as most hand OA patients normally are managed in general practice. The study participants might have a higher disease activity than the average person with hand OA. However, we aimed to include a heterogeneous group of participants with a wide range of severity, pain intensity and comorbidities. Second, the participants’ use of CAM was evaluated by self-reported questionnaires and they might have under-reported the actual use of these therapies on the basis of recall bias or fear of being stigmatized by the study personnel. Third, the participants were asked about CAM for their joint symptoms during the past 12 months, but they could conceivably have misread the question as if they had been using CAM for any reason, not only joint symptoms. This issue has also been raised in previous studies [11]. Last, because CAM use only was explored the past 12 months, we were unable to assess if previous use of CAM possibly could have affected patients’ current self-reported health status.

Our findings in the present study have implications for researchers and clinicians. Since persons with hand OA are frequent users of CAM, clinicians may need to periodically review their current CAM regimes. Investigating their use of CAM may help clinicians identify those with unmet therapeutic needs.

In conclusion, use of CAM is frequent among persons with hand OA in secondary care. Persons visiting CAM providers were characterized by having more joint symptoms despite more frequently use of conventional non-pharmacological and pharmacological interventions, more comorbidities and anxiety symptoms as well as a more approach-seeking behaviour than the patients not visiting CAM providers.

Author contributions

MU: Substantial contributions to analyses and interpretation of data, drafting the manuscript and final approval of the version of the manuscript to be submitted.

AEK: Substantial contributions to interpretation of data, critical revision of the manuscript and final approval of the version of the manuscript to be submitted.

IK: Substantial contributions to interpretation of data, critical revision of the manuscript and final approval of the version of the manuscript to be submitted.

IHK: Substantial contributions to study design, analyses and interpretation of data, drafting the manuscript and final approval of the version of the manuscript to be submitted.

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Declaration of competing interest

Ida K. Haugen reports a grant from Pfizer, outside the submitted work, and consulting fees from Abbvie and Novartis, outside the submitted work. Marianne Ulrichsen, Agnette E. Kristoffersen and Ingvild Kjeken report no conflict of interest.
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