

REVIEW ARTICLE

Managing Painful Disabling Hand Osteoarthritis in Older Adult Populations: Can Complementary Medicine [CAM] Help?

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Abstract

Osteoarthritis of the hand produces considerable disability among a large proportion of older adults in all parts of the world. Carefully designed conservative therapies, may however, influence the disease process quite favourably. This mini review primarily strove to document some of the current clinical observations that have emerged to date regarding disabling hand osteoarthritis among the older population and what role complementary or alternate medicine [CAM] may play in this regard. A second aim was to establish if any benefits might accrue in the case of older adults with hand osteoarthritis if they are exposed to one or more forms of complementary medicine interventions, as needed. Using PUBMED, PubMed Central and Google Scholar data bases, an extensive scan covering more than 40 years of research shows a sizeable percentage of older adults are likely to suffer from multiple adverse hand osteoarthritis health complications including musculoskeletal, cognitive, macro and micro tissue disturbances in the hand joints, plus possible neurological and inflammatory manifestations even if they are receiving standard care. There is some support that in absence of any sound mainstream rehabilitation solutions for any of these complex problems, the timely application of approaches based in alternate healing traditions may prove helpful in multiple spheres.

Keywords: Complementary and Alternative Medicine, Hand Osteoarthritis, Management, Older Adults, Pain, Weakness

Background

Osteoarthritis, the most common rheumatic disease, is a debilitating condition that involves the attrition of one or more freely moving joint such as the hand joints. Commonly progressive, rather than fatal or reversible, osteoarthritis predictably results in an enormous and significant individual burden, as well as immense societal and economic costs, especially among older adult populations, regardless of where they reside.¹⁻³ Principally due to localized disruptions in the cartilage tissue lining of one or more joints, osteoarthritis, for which no cure currently exists,⁴ often causes varying degrees of painful mechanical dysfunction that can severely impair an individual's ability to function physically without compromise, especially if the hand is affected in some way.

However, even though some radiographic studies suggest osteoarthritis may not be progressive in all cases,⁵ for example if treated in consideration of its possible causes or accelerating factors, and preclinical studies exist that indicate the disease can possibly be reversed or arrested,⁶ this line of thought is rarely discussed in contemporary research or clinical contexts. This may be because many cases of osteoarthritis are amenable to joint replacement surgery, especially if the hip or knee joints are compromised. Yet, in addition to the apparent complexity of applying surgery to treat hand osteoarthritis, which is observed to be greater than that occurring at the knee and hip for example,⁷ including aesthetic considerations, the challenges of replacing a single osteoarthritis affected hand joint are further heightened given its multiple differing disease subsets,⁸ and the likelihood of the disease affecting several or multiple joint sites in parallel, rather than a single joint. Thus this form of surgery is generally limited to those with severe hand osteoarthritis cases, and in any event would still require care beyond the surgery even if successful. At the same time, reducing osteoarthritis pain by means of analgesic medication and non-steroidal anti-inflammatory drugs, also frequently proves ineffective, or of moderate impact, or harmful,^{9,10} while biological agents that can serve as disease modifying drugs have not yet been successfully developed or validated as being universally safe and effective.¹¹

As outlined in 1985, almost 40 years ago, older adults with disabling osteoarthritis of the hand may also not receive appropriate treatments because they may be overlooked due to their age, and often times vague nature of the multiple overlapping diffuse multi system changes that prevail. Alternately, they may be given an incorrect, incomplete, or delayed diagnosis because the sufferer does not complain or their complaints are not manifest on the diverse criteria developed by the Arthritis Foundations for hand osteoarthritis, while the reliability of radiographs is not foolproof and depends to a large degree on a good understanding of the

underlying pathology, and may vary according to the radiographic method used, and what joint[s] are measured, among other factors.¹² Given that there are at least six subsets of hand osteoarthritis with distinctive and differential hand osteoarthritis manifestations,⁸ as well as degrees of severity, it is conceivable some evaluations may be misinterpreted if they fail to map these accurately. They may also fail to capture subcellular disease changes that predate radiographic changes, they may not correlate with actual hand dysfunction markers, and those deemed to have radiographic hand osteoarthritis may not need therapy because they are asymptomatic. Hence, radiographic evaluation alone may not be sufficient to provide for optimal ongoing or personally tailored treatment programs that do align with one or more underlying disease determinants and disease manifestations.¹³ In particular, even if a valid diagnosis is forthcoming, hand osteoarthritis sufferers may still receive poor professional advice, for example to rest, or alternately to keep the hand moving-even if not advisable-and/or employ narcotic pain relieving drugs, or injections that may mask pain and lead to excess joint movements, rather than restoration opportunities. Moreover, if in addition, the exact cause of the osteoarthritis remains unknown; and is explained away by the interplay of non-modifiable genetic, biomechanical, gender, hormonal, and aging issues, what specifically is remediable or how to reverse this condition may be unclear. Towheed⁷ in 2005 and Lue¹⁴ more than 10 years later in 2017 also found that there are consistent weaknesses in the designs of most therapies aimed at ameliorating hand osteoarthritis, thus certain promising approaches such as the use of mud-based heat treatments¹⁵ may yet be overlooked in the context of mainstream evidence-based medicine.

As a consequence, and despite more than 100 years of osteoarthritis associated research, the incidence of primary osteoarthritis in the general population, and at the hand, in particular, remains very high, and is expected to increase as society ages. Fortunately, however, the key clinical features of osteoarthritis such as pain, functional disturbances, inflammation, and joint stiffness may yet respond to or be mitigated very favorably to some degree via simple physical and non-medical therapy methods.¹³

In seeking to assist those with hand osteoarthritis, who are mostly older women to meet the challenges of daily life as optimally as possible, a wide array of adjunctive methods other than medications, injections, or surgery that might reduce the pain and disability associated with osteoarthritis, and are cost effective, have consequently been advocated for many years.

Even then, while somewhat effective in selected cases, some patients may not be helped sufficiently, and a fair number

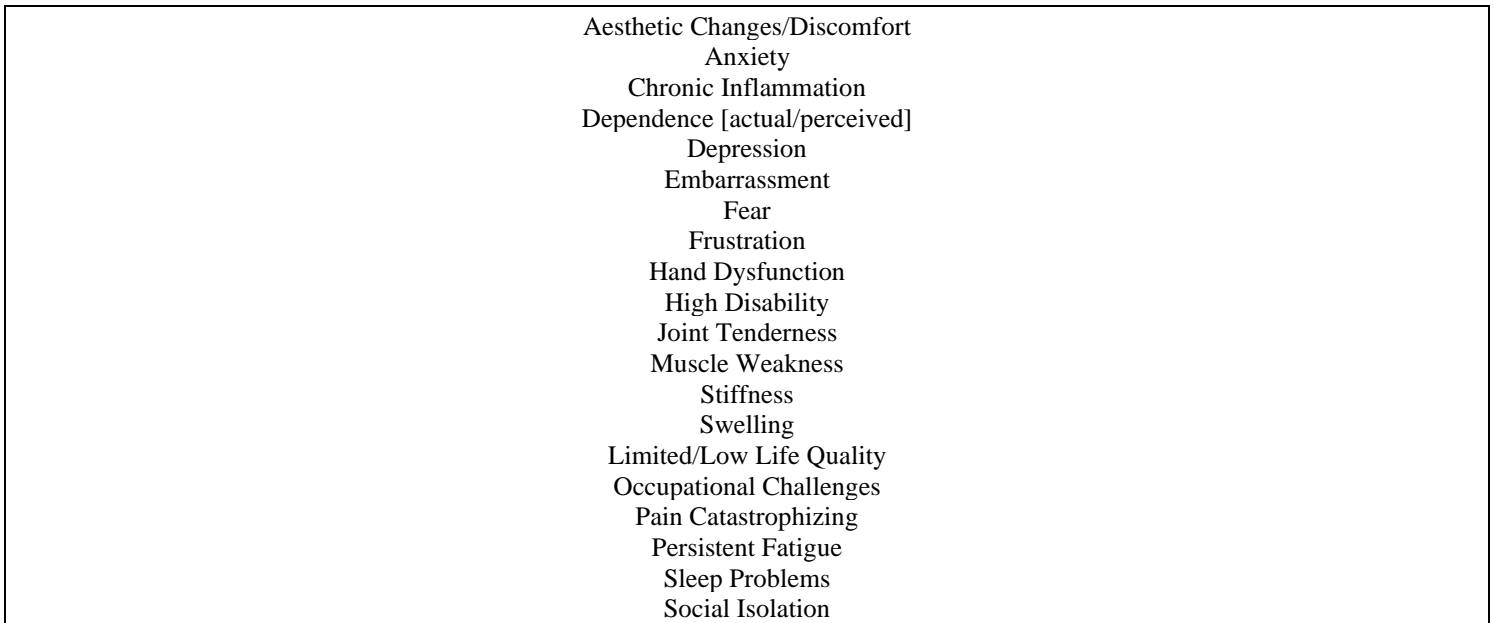


Figure 1. Snapshot of key symptoms as currently described by sizeable numbers of older hand osteoarthritis cases that might heighten existing health challenges and limit independent living in those 60 years or above.^{23,25-31}

may hence seek relief in less well prescribed or supported complementary or alternative medicine solutions,¹⁶ even if disputed as efficacious by Liu,¹⁷ Hauselmann,¹⁸ and Hammond.¹⁹ This may be because many older adults today and possibly their providers, in 2023, may intentionally elect to avoid prescription drugs of any sort, especially those that are palliative and possibly unsafe, as well as costly. They may thus wish to use safe non-pharmacologic strategies instead, even though few definitive studies prevail in this regard, and those that have tried to examine one or more of these various approaches remain non-conclusive. At the same time, patients who are made aware of CAM options may be helped, even if their providers do not support this line of intervention.

Since there is increasing evidence that the rates of disability produced by osteoarthritis are not inevitable, but that lifestyles and behaviours have powerful influences as well, the objective of this brief was to review the chief characteristics of hand osteoarthritis, especially components of the disease that might be positively affected by one or more non-pharmacologic, non-invasive, or surgical strategies, and to consider how this most common form of the disease in older adults, might be managed effectively and safely. Although directed towards a conservative prescription for the management of hand osteoarthritis, one of the most important causes of pain and physical disability in the older community, the therapeutic rationale outlined should be applicable to other joint sites commonly affected by osteoarthritis. In addition to having a major impact on functional ability.

idea may be significant because the persistence of one or more aversive long-term health consequences associated with hand osteoarthritis can possibly raise the risk for expensive hospitalizations and nursing home care, a life of low quality and few social options, as well as limiting any desire to ‘age in place’.

To this end the **PUBMED, PubMed Central, and Google Scholar** data bases housing data published between the years 1980-2023 were examined using key words, *complementary and alternative medicine, hand osteoarthritis, and treatment.* Although some work has been implemented to systematically review the research in this realm,²⁰ most studies are preclinical, or are limited in design in some way, and focus on diverse topics, samples, and joint status [induced or developed naturally], or wide variations in CAM, precluding any useful quantitative synthesis at the present time, yet those that may yield future insights were duly noted, regardless, hence are described in narrative form.

The data selected were those that appeared most insightful and were largely limited to those fairly recent studies that have focused on hand osteoarthritis, and parallel research data that could be applied to address the potential of considering a supportive CAM perspective in efforts to address osteoarthritis of the hand through both conservative as well as surgical interventions, rather than pharmacologic based therapies alone. In this report only CAM associated approaches that may be applied topically to the osteoarthritis

hand or joint, or presented in an oral format are discussed, due to their ability to be applied more readily in the older adult population living in the community or in environments that have service-related challenges and opportunities and possible health contraindications to mainstream pharmacologic and non-continuous passive treatment approaches. To provide some context for the ensuing discussion, what is known about the features of painful hand osteoarthritis is also reviewed. For more information, readers may explore one or more of the attributes listed in the realm of CAM associated approaches below.

Key Findings

Hand osteoarthritis

Multiple studies over time have stressed the diverse features of hand osteoarthritis that appear to emerge over time and that tend to interact to increase pain and dysfunction, and possibly numbers of affected joints. Although considered a heterogeneous disease in its own right,²¹ the main features of the disease are listed in Figure 1 below and can occur independently or interactively at one or more hand joint sites, often in absence of any known cause. The presence of symptomatic hand osteoarthritis at a particular joint is also strongly associated with symptomatic disease features in the same joint of the opposite hand, followed by other joints in the same row of the same hand, and then other joints in the same row of the same hand, especially in women.²² However, even if only one or two affected joints are located in the dominant hand, this is likely to severely limit or prevent the individual from the effective use of the hand in multiple grasping, dexterity, and manual activities vital to health and wellbeing,^{23,24} especially if the disease is considered to be erosive in nature²¹ and is accompanied by inflammation.²⁵ A very common disease among the older adult population, its impairments can hence greatly impact strength capacity, grip force and pinch force capacity, writing, handling, or fingering small objects and the ability to carry a 10-pound (4.5-kg) bundle.^{24,25}

CAM usage

As a result of one or more of the above mentioned prolonged ill health manifestations that have been observed in a fair percentage of hand osteoarthritis cases regardless of traditional forms of intervention efforts, can the use of CAM in any form be applied to help reduce abnormal hand joint stresses, and promote normal hand joint motion in various older adult populations?

Building on prior work in this regard, this current overview aimed to examine what appears promising in this regard, if anything as far as being able to reduce this global burden through the application of complementary medicine approaches that can be applied in most communities without the aid of an allied health worker. While several mainstream medicine approaches are available for patients to carry out themselves in the home, it has been shown that CAM approaches are very commonly sought by people with different forms of arthritis,³² with some promising observable improvements in hand function in the older osteoarthritis sufferer.³³ While one or more of these approaches may not be curative, they may possibly help the affected individual to be more active at the hand joints, rather than protective and failing to use the hand due to pain or fear of medicine based side effects. They may also lessen those psychological factors that exacerbate hand pain and are more strongly associated with hand osteoarthritis manifestations in some cases than radiographs.²⁷

Strategies that may provide significant pain relief are various doses of chondroitin,³⁴ diets high in fruit and vegetables, *diallyl disulphide*, a compound found in garlic and other alliums that represses the expression of matrix-degrading proteases in chondrocyte-like cells, providing a potential mechanism of action for explaining its disease modifying potential.³⁵ As well, a herbal compound known as *Ononin*, a representative isoflavone glycoside component extracted from natural Chinese herbs, exerts anti-inflammatory and proliferative effects that may relieve inflammation as well as delay cartilage degeneration.³⁰ Others are *Astilbin*, the main active component in a variety of natural plants such as *Hypericum perforatum* and *Sarcandra glabra*, which possess antioxidant and anti-inflammatory effects,³⁶ *Indian Frankincense*, *methylsulphonylmethane* and *rose hip*,²⁰ and those listed below,⁴ although not proven, and plagued by poorly designed or small study results²⁰ but may yet offer a means of additional pain relief over and above standard medical recommendations approaches:

- Acupuncture and fine needling therapy³⁷
- Botanical herbs and plants^{38,39}
- Electrotherapy²⁵
- Exercises⁴⁰
- Flaxseed poultice compress⁴¹
- Heat/cold treatments⁴²
- Joint protection strategies⁴³
- Hydro/spa therapy⁴⁴
- Manual therapy⁴⁵⁻⁴⁸
- Massage, aromatherapy⁴⁸
- Oral and nutritional supplements⁴⁹
- Occupational therapy⁵⁰
- Orthotics^{46,51,52}

- Physical modalities/therapy^{25,51,53}
- Rest and relaxation training^{54,55}
- Selected topical analgesics⁵⁶⁻⁵⁸
- Tai Chi and Yoga^{54,59}
- Therapeutic touch⁵⁵
- Topical medicinal plants^{50,61}

Adding to the above possible approaches *Boswellia serrata* (a traditional Ayurvedic medicine strategy) along with other *Boswellia species* may have potent inflammatory effects relevant to treating one or more osteoarthritis symptoms.¹⁰ In addition a combined *Curcuma longa* and *Boswellia serrata* food supplement may help to reduce hand pain,⁴ as may various herbal ointments.⁵⁸

Wang⁶² who aimed to examine the efficacy of a traditional herbal formula *Xianlinggubao* for treatment of patients with knee and hand osteoarthritis using a multicenter, stratified, open label, randomized controlled trial approach found this approach similarly beneficial. That is, after six months of therapy, participants in the experimental group reportedly exhibited significant improvements in pain and functional indicators that were significantly more evident compared to those of the control group. While the mechanisms for the improvements post treatment were not clear, Aborhab⁶³ have attributed the use of the herbs *ginger* and *curcumin rhizomes* cultivated in Egypt in treatment of an osteoarthritis model to a possible chondroprotective effect via anti-inflammatory and antioxidant mechanisms that might apply to other similar botanical products.

Magdoulou⁶⁴ in examining a dried plant root derivative *Angelica sinensis* used widely in Chinese traditional medicine that could be employed for reducing arthritis pain and inflammation suggested its polysaccharidic fraction can promote cartilage proteoglycan biosynthesis, and hence might prevent cartilage destruction in osteoarthritis, while favoring cartilage repair.

Polygonum multiflorum, another traditional herbal medicine rich in polyphenols also has many potential antioxidative and free radical-scavenging properties that may also prove helpful in the context of hand osteoarthritis pain mitigation.⁶⁵ It was found that the rat model of arthritis studied was indeed favorably impacted as far as swelling was concerned as well as by an improved weight-bearing distribution pattern of the affected limb.

In another possible analogous application described by

Park⁶⁶ who examined the efficacy and tolerability of *GCSB-5*, a mixture of six purified herbal extracts for treating hand osteoarthritis, the ingredient induced pain and functional improvements at 4 weeks that were sustained for up to 16 weeks the active group. The approach was also deemed to be tolerable as a whole, a characteristic that may not apply to all topical forms of administration.⁶⁰

Another topical gel *Sphaeralcea angustifolia* has shown similar therapeutic effectiveness and tolerability when administered to patients with hand osteoarthritis and that are comparable to a well-known drug.⁶⁷ Other work shows *red ginseng*, may be an effective dietary supplement for postmenopausal women with degenerative osteoarthritis of the hand.⁶⁸ Another approach discussed by Bahr⁴⁸ indicates a role for the use of massage and essential oils that may have analgesic and anti-inflammatory benefits. Another is some form of *curcumin*,⁶⁹ another anti-oxidant supplements known as *avocado-soya bean unsaponifiables*.⁷⁰

Discussion

Osteoarthritis, often deemed an inevitable condition, and one that may thus be neglected as a serious health condition, continues to produce an untold burden and costly outcome among adults of all ages, especially those in the higher age ranges. Although the pathology which entails the presence of focal or complete lesions of the cartilage lining of one or more joints, as well as various degrees of bone remodelling and exposure of underlying bone is well established, accumulated knowledge shows some of this disability is amenable to prevention or intervention, rather than inevitable even though very few preventative efforts at any level to counter these changes exist. One reason for this may be a failure of clinicians and others to carefully scrutinize the available current research more broadly than may have been done in the past, and to rely on historical myths that osteoarthritis is not only inevitable, but irreversible, and that radiological joint changes equate to clinical osteoarthritis. Hence, both persons with the condition as well as their providers may overlook the disease, or simply believe the disease is progressive, and that thoughts of reversing this condition are 'heresy'. Patients themselves may hold similar beliefs, thus not seeking treatment, even if the provider can offer a favourable stance as to what can be done, rather than not. In addition, mainstream medicine is commonly sceptical of unproven, or 'folk' derived remedial opportunities, and alternative medicine practitioners are often poorly funded and thereby limited. As a result, in addition to neglecting the idea that cartilage cells, even those embedded in osteoarthritis damaged joint tissue environments can respond favoura-

-ably to optimal intracellular signals, other pathological features of the disease process such as various degrees of joint capsular and synovial membrane thickening, joint inflammation, ligament and tendon damage, and muscle pathology and atrophy, which may respond to targeted treatments, may go untreated and as a result may hasten, rather mitigate, or offset, chondrocyte cell death and ensuing joint destruction processes.

This report focusing on what is known about hand osteoarthritis and CAM associated options for its mitigation especially that which a patient could apply at home and drawn largely from the **PUBMED** database was implemented to examine current observations and trends in this regard, as well as data worthy of further consideration and study. Although not usually fatal, the signs and symptoms of osteoarthritis may severely reduce the ability of an individual to carry out his or her normal activities of daily living without undue stress, especially those that involve the hand, and may markedly limit work capacity and wage earnings, while seriously compromising life quality, and the ability to live independently and carry out self-care activities without discomfort.

On the other hand, results of some in vitro studies provide tentative evidence that the abnormal biochemically and biomechanically mediated cell-matrix interactions of osteoarthritic cartilage that usually result in an overall loss of its compressive stiffness and elasticity may be part of an attempted reparative process, rather than a degenerative one. In particular, because mechanical stimuli are essential for the growth and maintenance of cartilage and aberrant mechanical loading can lead to cartilage damage, it appears that careful protection as well as mechanical manipulation of the cell micro-environment may arguably help to foster tissue reconstitution and reduce cartilage matrix damage attributable to the release of harmful and destructive enzymes released by damaged cartilage cells. This is supported by numerous loading studies that imply that excessive repetitive impacts or preventable mechanical insults might potentiate cartilage damage, as well as sustained compressive stresses, or the failure to move at all may render the bone beneath this tissue non-compliant.

In sum, osteoarthritis may not be inevitable in all cases, and even when present may be amenable to amelioration if careful evaluations followed by carefully construed and timely treatment strategies are forthcoming. If patients prefer to use natural remedies rather than standard medical regimens or surgery²⁹ CAM may prove a sound option based on emergent albeit limited evidence.^{60,71} Here, combined interventions, and those preferred by the patient, and applied early in the disease process are likely to work best.^{71,72}

More study is clearly needed though in this regard.

Additionally, even though this applies to most mainstream medical approaches and others for reducing symptomatic hand osteoarthritis, in the case of complementary approaches very carefully designed efforts are essential for supporting past favourable as well as unfavourable results, and for untangling the combined problem of pain, muscle mass losses, hand disability and others and their interactions with one or more CAM approaches.^{73,74} In light of the complexity of the disease, and that it may vary from mild to erosive in intensity and pathology, very careful allocation of subjects is indicated here in randomized studies to account for confounding disease factors, including multiple hand osteoarthritis subsets and underlying disease determinants.⁷⁵ To capture the variations in disease manifestations that may impact CAM delivery, very careful attention to instrument measurement and sensitivity,⁷⁴ plus intervention study approaches are needed as well, to avoid placing undue stress on the affected hand joint[s] or sensitized skin. Those cases deemed to have no definitive hand osteoarthritis, but are symptomatic, or at high risk, should not be excluded from future studies and may best be served by CAM applications. Moreover, excluding those with comorbid diseases, rather than including them, may yield non valid conclusions. Patients who are too fatigued to be studied or persist with this, or fearful of moving if they are weak or embarrassed, and do not want to join study groups readily, are home bound, or may drop out more predictably, may best be studied individually.

At the same time, more emphasis by providers and researchers who study complementary medicine options to educate the public as well as professionals and patients would be highly desirable as there are recent indications of some probable clinical benefits albeit these are not well understood to date.^{73,76} Moreover, if patients are unaware of one or more possible non medicinal or surgical health options and alternate non pharmacologic approaches they might take, they may experience preventable pain exacerbations of one or more their joints, that further impacts their life quality and ability to function optimally and without fears of dependency if they are reluctant or cannot partake in pharmacologic or surgical solutions.

Indeed, while this present overview is not all encompassing, based on what is presently published in this sphere, it is concluded that there is reasonable evidence that a timely coordinated effort to apply CAM approaches, as indicated, can avert, or alleviate rather than increase suffering, even if these approaches are often not reimbursable, or advocated in the primary care system, or the provider does not believe in their value their possible utility for fostering a cost effective and possibly quite safe process of self-healing and wellbeing. As outlined, most sufferers will seek complementary medicine approaches at some point, thus indicating a need to refine this level of

treatment more definitively.

The value of CAM may also be underestimated for mitigating hand osteoarthritis in particular, because most current research efforts in this realm are solely preclinical or preliminary or limited to the exploration of approaches recognized in Asian rather than Western countries that are non uniform in multiple respects and performed on models of arthritis, rather than the human disease. Clinical studies may be vastly underpowered, and may not include those hand osteoarthritis cases that have benefited from CAM interventions, especially if they improved as a result, and do not need to join a study. The possibility that control subjects in clinical studies are receiving some form of CAM and/or mainstream pharmaceutical drugs or allied therapies that accounts for the weak active ingredient results often reported, is also not always ruled out in controlled studies given its wide set of options shown in this overview.

As such, in addition to researchers in general defining their inclusion criteria more carefully, and testing one form of intervention at a time, perhaps CAM providers working alongside mainstream providers may yield desirable sustainable long term results that do diminish suffering, while offering a chance for possible recovery, and self-healing.

In the interim, it is proposed that conducting more focused, timely, and inclusive clinical research of more representative socio-demographic features of vulnerable or affected free living older adults with varying health conditions will yield a more solid evidence base and set of evidence based treatment guidelines to follow in the future.

Until then, in absence of any clear medically oriented clinical approach to counter long term osteoarthritis disability and diminished health related quality of life concerted efforts by practitioners to highlight the potential value of CAM is duly indicated and should be strongly encouraged.

A variety of CAM approaches should be considered because as per Englund,⁷⁷ as of April 2023, one can say with a high degree of confidence that the actual effects of the intended therapeutic elements of today's standard medical interventions remain less than optimal and may be more limited if the hand osteoarthritis population is not carefully examined. At the same time, the different mechanistic pathways and clinical characteristics of hand osteoarthritis are not well established, but clearly involve elements of joint biomechanics, inflammation, and pain. Since surgery is not strongly advocated in most cases of hand osteoarthritis, but the hand is vital to the ability to live independently, there is a great need to do all that is possible to prevent or alleviate the immense burden of severe hand pain, distress, limited life quality and disability of many aging adults, no matter where they reside.⁷⁸

Conclusion

Although this current synopsis is limited in scope, does not account for research design flaws, and does not exclude the role of publication bias, it appears reasonable to conclude:

- Drug free CAM approaches when carefully and insightfully applied may not only impact life quality as a whole, but multiple key features of painful hand osteoarthritis.
- The attributes that may be impacted most favorably include, but are not limited to: pain, dexterity, functional and self esteem benefits, improved sleep health, musculoskeletal and neuropsychiatric health status.
- Considerable fiscal relief in multiple spheres may also ensue and should be duly explored to avert the immeasurable costs and suffering one can otherwise anticipate in the burgeoning older adult population.
- More studies that can unravel the manifestations and determinants of hand osteoarthritis and their responses to a variety of CAM approaches across different disease stages will likely prove immensely beneficial in multiple respects as well.

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Conflicts of Interest

None

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