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Post COVID community based self-care management of disabling osteoarthritis: importance and possible targeted needs

Abstract

Background: Osteoarthritis, a highly common, disabling joint disease affecting a large number of older adults is presently incurable, and not always amenable to surgery or pharmacologic interventions.

Purpose: Further complicated by multiple past and ongoing COVID-19 pandemic issues and disease consequences, the purpose was to examine what current data reveal as to the prevailing epidemiological features of osteoarthritis and its pathology. Another was to review the utility of some non-pharmacological and non-operative treatment strategies that have been advocated for alleviating the pain and disability of this disease in later life.

Methods: Building on a 35 year prior review conducted in 2015, this current review was conducted to identify relevant literature published on this topic over the last 5 years, particularly since COVID-19 onset in 2019. Key words included osteoarthritis, COVID-19, prevention, and intervention.

Results: As in prior years, osteoarthritis continues to induce considerable physical disability and consistently impedes the attainment of a high life quality for many older adults. Although not studied to any degree, COVID-19 factors may be expected to render further challenges that compound the disease presentation and its mitigation over time, especially among the long COVID affected older adult. In the face of closures, limited resources, and complex disease presentations, it does appear a variety of non-operative and non-pharmacologic approaches may yet influence the disease process and functional outcomes more positively than not with low safety risks. They may help the older adult more effectively even if surgery is indicated and multiple medications are yet required.

Conclusion: The application of one or more carefully designed conservative interventions is likely to reduce the functional disability and pain experienced by older people with any form of osteoarthritis, regardless of whether surgical and or pharmacologic strategies are indicated.

Keywords: aging, COVID-19, disability, intervention, osteoarthritis, outcomes, prevention

Volume 7 Issue 3 - 2022

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Received: October 20, 2022 | **Published:** October 28, 2022

Introduction

As has been demonstrated in many past reports, osteoarthritis, the most common rheumatic disease remains a chronic non-fatal condition with significant individual, social and economic ramifications.[1-3] Principally featuring varying degrees of localized disruptions in the articular cartilage tissue lining of one or more freely joints of the body, osteoarthritis often causes varying degrees of painful mechanical dysfunction[2] that can severely impair an individual's ability to function physically as well as mentally and emotionally without compromise.[2,3] Unfortunately, while useful in restoring function and ameliorating pain in severe cases of the disease, not all cases of osteoarthritis may be amenable to artificial joint-replacement surgery, invasive forms of medication delivery and nerve blocks, especially if multiple joint sites are affected, multiple health issues prevail, including those that involve nerve or severe bone attrition or damage at the affected joint site. Reducing osteoarthritic pain by means of analgesic medication and non-steroidal anti-inflammatory drugs, also frequently proves ineffective or harmful in multiple ways[2] and the potential of disease modifying drugs awaits further research.[3]

Thus in seeking to assist people with osteoarthritis, who are frequently 60 years or older often with multiple health challenges, including those associated with COVID-19, and service and access inequalities[4] what can be done to help them meet the current challenges of daily life as optimally and safely as possible in 2022 and beyond. What adjunctive methods other than medications, intra articular injections, nerve blocks, or surgery might reduce the pain and disability associated with osteoarthritis, and that may be cost effective and can be done with minimal assistance in the post COVID realm of service limitation? While somewhat effective in selected cases, it has been shown that many patients may not report improvements nor feel they have been sufficiently educated about their disease and its treatment options, and prognosis.[4]

Many too, may thus suffer more extensively than desired, and may fail to employ or engage in any non-pharmacologic strategy that could possible help them, even though these are often recommended late in the disease process and possibly not before surgical treatment options are considered.[5] With few definitive longitudinal studies of any design, providers may not be aware of all the factors that influence the natural history of the disease, nor the potential utility of a host of possible self-management approaches that can be of collective multiple short and long term benefits. By contrast, those cases who are aware of their options, and their treatment recommendations are

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based on careful tailoring of some evidence based approaches as well as recipient preferences and beliefs may be satisfied with their ability to undertake a health affirming rather than negating life and actively seek to follow these guidelines diligently and without cessation.[6]

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 osteoarthritic joint disease, especially components of the disease that might be positively affected by one or more non-pharmacologic strategies.[7] It considers how osteoarthritis, the most common rheumatic disease, might be managed reasonably effectively by a variety of conservative non-pharmacologic and non-operative approaches that may be more important than ever in the post COVID-19 period as far as the older adult is concerned in moderating pain and functional disability, as well as preventing future excess impairments is concerned.[7] In addition, a concerted conservative approach can potentially help to address the burgeoning health costs of failing to act especially in areas where aging adult populations are densely located.[8]

Methods

Used were the PubMed, Google Scholar, and PubMed Central data bases housing articles deemed to osteoarthritis care and epidemiology as perceived as relevant to understanding the disease and possible added burden of COVID-19 related issues that have prevailed and continue to unfold as of December 2019. Keywords applied were, COVID-19, disability, osteoarthritis, intervention, prevention. Specifically sought were articles of a current nature published in 2022, and that have systematically reviewed the research in this realm in narrative or meta analytic formats, regardless of any possible flaws or limitations. The data extracted were then categorized according to the disease itself, and those research data that could be possibly be applied by an older community dwelling adult who may live alone with few resources along with the possible altered perspective of the scope of expected self-management practices previously advocated but that may have placed an added burden on the older adult, especially those who may not be suitable candidates for invasive or pharmacologic based therapies.

Results

Osteoarthritis

As of 2022, it is safe to say, that while the numbers of scientific reports on this topic are promising, the disease is often neglected as a serious health condition, for example, it was not considered relevant to a high degree in the face of multiple COVID-19 restrictions and service cuts, and evidence that these rules would largely worsen this disease and its burden and costs at all disease stages. Moreover, the finding of persistent COVID-19 strains and infection risk continues to produce an untold burden and costly outcome not only for society as a whole, but for adults of all ages, especially the older adult suffering from one or more joint lesions due to osteoarthritis joint damage. At the same time, research to understand the disease, while increasing in scope, persists in being largely proceeded from a biological perspective in multiple disease models and isolated tissue sample rather than the pursuit of a holistic clinical perspective wherein the pathology of osteoarthritis, which entails the presence of focal or complete lesions of the articular cartilage lining of one or more joints and is not limited to this tissue alone is carefully studied in multiple samples, especially among adults with differing disease presentations and manifestations, and those in the higher age ranges. Indeed, ample research now reveals there are not only various degrees of osteoarthritis associated changes in the underlying bone tissues, as well as surrounding muscles, capsular and ligaments that may contribute independently or collectively to the spread and intensity of unrelenting bouts of pain and its progression and severity, but there is evidence of associated nerve damage that can impact joint sensation and joint protective mechanisms adversely and to varying degrees. There is also current evidence of a substantive array of cognitive factors that may well impact, accompany, or emerge from the presence of the disease, such as anxiety and fear of moving that alone can exacerbate noxious symptoms of local and widespread pain quite markedly and negatively.

In addition to local disease factors, emerging evidence is beginning to show a significant relationship between having a history of cumulative disadvantage and the clinical outcomes of pain and depression as experienced in osteoarthritis that is believed to be mediated by perceived discrimination. [4]While not well studied, a role for worsening socioeconomic circumstances in fostering a future arthritis diagnosis may be a highly relevant disease moderator or mediator in the presence of 2022 global economic downturns as well as post COVID related service challenges. Hence, it appears possible to predict that if clinicians fail to consider the role of one or more of these many diverse pathological as well as socioeconomic factors that clearly extend beyond the cartilage tissue, it seems likely that the older adult with osteoarthritis may experience abnormal stress levels, and ultimately abnormal or subnormal cartilage cellular signals that may hasten the disease process,[9] especially the hallmark of symptomatic osteoarthritis, namely pain. Moreover, if unremitting and accompanied by extended periods of immobility due to pain, an ensuing decline in joint range of motion may emerge that places abnormal stresses on the affected joint as well as the risk of further joint damage,[8] and a downward spiral of overall function irreversible joint deformity and limb alignment[10] that may be expected to invoke a state of anxiety, depression, and impaired psychosocial functioning, along with decreased self-efficacy, plus impairments of general health, nutrition, sleep, weight status, as well as vitality.[11,12]

Consequently, although not usually fatal, untreated osteoarthritis may be expected to severely reduce the ability of an older adult to carry out his or her normal activities of daily living independently and without undue distress.[11] It may also limit their overall self-care ability and motivation, their endurance capacity, their ability to live independently, plus the pursuit of a desirable life quality.[10-12] In particular, the older adult suffering from disabling osteoarthritis may be more severely compromised than ever,[8] especially among those cases where COVID-19 post infection symptoms of fatigue, weakness, and dizziness prevail unabated[11] if the oxidative processes associated with COVID-19 further induce abnormal cell-matrix interactions within the osteoarthritic cartilage tissue,[13] as well as exacerbating prevailing levels of inflammation, pain, low self-efficacy perceptions,[14] and matrix damage attributable to the release of destructive enzymes.[15] This is supported by numerous loading studies ranging from those examining the impacts of joint immobilization to those examining the outcomes of excessive joint loading[16] and others that imply that both too little movement as well as excessive repetitive movements can foster cartilage damage or render the bone beneath this tissue noncompliant[17] with dire functional and pain consequences, even if the individual is initially in good health, and especially if the older adult already suffers from osteoarthritis of one or more joints,[18] and is a woman.[19] In addition, while often overlooked, a host of prior economic factors,[20] as well as age, trauma, and obesity[21,22] may have a collective negative impact on the complex manifestations

of osteoarthritis, including possible emergent problems of joint instability, muscle and bone attrition, excess functional disability, and impairments of those sensory perception mechanisms that serve joints and are designed to foster protection against undue loads and the high risk of moderate to severe joint injury, common in vulnerable adults.

In addition, a failure to contain the pain associated with the disease along with preventable forms of injury may increase this noxious sensation markedly and more extensively thus inducing a need for high levels of dangerous narcotics, as well as reactive depression, and associated self-management challenges, including fears of movement,[22-28] and the inability to move without pain and immense distress.[29,30] There may also be varying degrees of muscle pathology, a high rate of muscle protein degradation and muscle volume losses, related problems that stem from damage or dysfunction of the joint sensory and motor nerves, muscle inhibition and/or weakness, plus evidence of increasing postural instability in weight bearing joints.[31-37] In addition, an immense loss of functional independence, motivation for self-care, a loss of independence, and a declining belief in their ability to overcome their life challenges are cognitive factors that may be expected to increasingly exacerbate the older adults pain,[38] and overall multiple biomechanical disease impacts.[39]

As such, if an older adult suffering from various degrees of osteoarthritis wants to remain in the community, rather than reside in a nursing home, their goals can probably only be met if concerted efforts are made to assess if this is feasible, for example if they have mild-moderate rather than severe forms of the disease, and if so to carefully and insightfully assess their past medical history, and current health and disease status, and address and plan for their immediate, short term and long term needs accordingly, bearing in mind the more recently acknowledged need to keep older adults as healthy as possible and protected against COVID infections and their oftentimes dire repercussions.

Possible community based intervention approaches

As of 2022, and in light of the many overlapping osteoarthritis disease factors mentioned above and others, plus the fact many older adults may now be experiencing long or extended COVID symptoms that parallel some of those in osteoarthritis, while lowering desirable immunity status and associated health status, it appears some of the non pharmacologic opportunity to support their wish to live in the community is indicated. While this idea is not new, the topic may yet warrant more careful examination, in light of the many challenges to multiple forms of service delivery that were functional in pre COVID times, such as outpatient exercise programs, but are now closed or hard to access due to escalating transportation costs. Even if previously adapted for home based usage, one or more commonly advocated conservative approaches may now be too challenging for the impaired older adult living in the community in 2022 to access and apply without help, for example purchasing home health aides and using these appropriately.

Moreover, many may now be excessively impaired due to lack of service provisions during the pandemic, unable to now exercise safely without guidance, or attend group self-management programs, thus, especially if newly diagnosed, may not understand the importance of joint protection strategies and optimal nutrition in addressing their condition, nor that behaviours and lifestyle are highly salient disease and disability predictors. As well, following remotely staged exercise regimens-not designed for the particular client, as well as media adverts for technological appliances that do nothing to stem the disease progression, may do more harm than good. In addition needed possible home based safety modifications, such as ensuring lighting is optimal, may be very challenging to undertake for many in the higher age ranges as well as those with multiple affected joint sites and medical conditions without appropriate assistance and guidance and discussion with the key provider.[40-42]

However, given that subnormal joint loading is a key factor influencing the osteoarthritis disease process,[43] and may have multiple origins, it seems reasonable to assert that efforts to eliminate the most detrimental forces falling on the affected joint surface, as well as improving the ability of the surrounding osteoarthritis joint tissues, such as the muscles, to absorb stresses, is likely to prove especially helpful for most older moderately impaired healthy adults, including those who require surgery, irrespective of causative mechanisms underpinning this joint disease.[44] Similarly, encouraging periodic, rather than continuous bouts of movements, incorporating safe movement approaches into one's daily routine in place of formal regimented exercise routines that may be challenging and unsafe for some, plus other supplementary efforts designed to optimize a healthy joint state, such as the use of appropriate footwear and splints, plus the adoption of sound nutrition and sleep hygiene practices appears to have considerable merit in efforts to relieve pain, fatigue, and stiffness, particularly during the early disease stages.[45,46]

These approaches may be especially noteworthy to apply and acknowledge as plausible medically oriented substitutes in 2022, and beyond, and that render the older adult a more profound quality of life than not, especially if health service access persist in being disrupted in some way due to COVID-19 related factors.[47,48]

However, rather than employing any standardized menu of bullet points that can be uniformly applied, it appears likely that the most optimal result for an individual can only ne achieved through a tailored personalized approach in this respect. That is, the clinician or team of providers must be in a position as well as motivated to conduct and undertake a thorough medical history, a comprehensive physical examination, plus a detailed environmental assessment of the older adults key needs before ascertaining what the precise intervention aims might be and if these can be attained in due course, while being implemented safely in the home by an older adult who is in pain, who may be very anxious and fearful, and functionally and socially as well as economically challenged. They can also conduct a specific mental health screening test to examine whether depression, anxiety, or stress are likely to be factors requiring additional intervention attention. Ascertaining the disease magnitude and related prognostic factors, as well as examining the client's general health status, along with their health beliefs and self-efficacy perceptions may also help to assess lifestyle and behavioural factors that contribute to the disease burden.

To specifically help the older adult to make informed decisions, and to help reduce potential feelings of helplessness, especially in cases where the osteoarthritis symptoms are possibly exacerbated by prior exposure to COVID-19 disease, pandemic restrictions in services, and possible long COVID infections,[47,48] effective provider communications and ongoing follow up support appear essential, especially among those adults with multiple morbidities. To this end, and in light of multiple probable unanticipated COVID-19 implications for osteoarthritis service delivery, and the fact older adults with osteoarthritis may be worse off than predicted health wise, policy makers are urged to expand supportive resources so as to allow for in depth candid provider conversations and evaluations, followed by the provision of personalized information and directives. Developed in conjunction with input from the older adult in question, as well as in consideration of their available resources and degree of social support

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this process is a probable highly necessary first line post pandemic approach that may have far reaching long term benefits. In particular, rather than advocating for multiple complex strategies, even if each is empirically valid, desirable practical non complex interventions that can foster, rather than impede, programmatic adherence and build rather than diminish their self-efficacy may enable a high degree of pain relief, as well as acceptance about their situation along with a strong and continued commitment to do all possible to minimize any further joint attrition and remain independent.

Past research in this regard shows that in this case, written exercise and/or nutrition instructions and others with diagrams understandable by both the older adult and their significant others, along with audio or video tapes that are culturally and/or linguistically tailored to the patient's literacy level are indicated. As well, empathetic face to face supportive therapeutic approaches appears especially desirable in the event the older adult is not conversant with technology or has no access or skill or motivation for employing this approach.[49] Finally, to mitigate the impact of depression due to the disease chronicity, helping to build the patient's confidence and coping ability, plus the provision of emotional and tangible support, along with efforts to offset any obesity and joint injury or excess frailty risk, are strongly recommended.[50-52]

In short, unlike medications, which do not currently reverse the disease process, and may not be indicated for all older adults, along with surgery, a significant proportion of those older adults who wish to continue live independently in the community rather than the nursing home and who may suffer many challenges due to their osteoarthritis may yet tend to be better off in response to efforts to optimize joint biomechanics and life quality and self-efficacy than not. In the future, in addition to novel forms of intervention, there may also be a more well defined and key role for specific nutrient or dietary supplementation interventions[11,53] as well as phenotype specific intervention recommendations[54] that should be studied more intently.

As well, to foster any of the above ideas, it appears plausible to suggest, and begin to apply a social determinants approach to preventing osteoarthritis disability and efforts designed to consider and eliminate health disparities, and educational inequities that may heighten the disease burden, and to mindfully apply universal access principles, and policies that foster prevention and universal access to healthy options. The provision of accessible safe physical environments and positive social and financial options, as well as careful follow up evaluations to see what is working or not is also deemed highly salient in this regard.

In the interim, more dedicated clinical research and funding as well as educational efforts by aging societies and others directed towards fostering resilience and function in the older adult suffering from painful osteoarthritis are increasingly imperative,[61] as are economic studies that compare the costs of nursing an older adult with various degrees of osteoarthritis housed in a long term care unit versus having them live in their desired environment, with or without assistive support. Lessons learned from COVID-19 restrictions and the pandemic as far as the health of the older adult with osteoarthritis is concerned, plus efforts to conduct post COVID follow up comparative studies, along with those that specifically track long COVID cases who complain of pain and weakness and what this can convey are also strongly indicated.[55-57] Reducing barriers to social support services and physical activity participation in the post COVID-19 period is especially indicated.[58,62] In addition the role of face to face personalized health coaching and efforts to boost physical resilience directly may help to effectively counter the extent of any ensuing disability quite markedly and significantly at lower costs than would occur by failing to do this.[59-61]

However, much more carefully designed clinical research is clearly needed if we are to uncover the degree to which older adults living alone who have varying degrees of osteoarthritis may yet be at risk for acquiring COVID-19 or developing severe COVID symptoms, as well as long COVID and how to ensure COVID-19 protection in these older adults through careful self-management approaches and conservative interventions that can be applied without direct assistance. Policy makers can help to ensure resource accessibility and should be regularly apprised of the true benefits and multiple advantages of one or more of the aforementioned actions that are urgently needed to avert a tsunami of health care costs as well as social costs.

Discussion and conclusion

This current mini review, which not all inclusive, clearly shows that osteoarthritis, a common painful disabling disease affecting the older population, in particular, and frequently affecting one or more freely moving joints, remains highly challenging to prevent or treat and in an aging society is a major societal health issue and increasing burden warranting immediate attention. However, until more research prevails, it can be anticipated that the current costs of the disease, as well as future costs will continue to soar, if broad public health efforts as well as primary care opportunities remain limited due to COVID associated factors and others, for example the belief that the disease is largely biological in origin and irreversible and inevitable. Moreover, those older adults with osteoarthritis and suffering from long COVID may be overlooked, in an effort to address more compelling health issues, or because the attributes of long COVID, such as muscle weakness are poorly understood.

However, it is apparent that careful and insightful application of a variety of conservative management approaches applied alone, or in combination, including, but not limited to, patient education, weight reduction, the appropriate application of assistive devices and orthotics, exercises to maximize muscle strength and endurance, joint range of motion and aerobic capacity, among others may permit those older adults who so desire, to continue to reside in their own homes, rather than in nursing homes, while also reducing office visits and possible expensive invasive or surgical options and the spread of the disease from one joint to others.

That is, sufficient research indicates that carefully tailored and personalized uni- or multicomponent approaches recommended in light of the extent of prevailing joint destruction, and the patient's age, health status, beliefs, fears, anxieties, resources, apparent physical resilience, and general capabilities for self-management can potentially yield quite favourable rather than unfavourable disease outcomes, regardless of whether other interventions may be desirable.

In particular, educating the patient and motivating them to assert some degree of control over their disease, plus the adoption of realistic treatment goals and expectations may not only benefit possible inherent joint regeneration processes, but may minimize the degree of any excess joint destruction and associated inflammation, while improving their life quality. In particular, dispelling the myth that osteoarthritis is progressive and untreatable, and revealing the promising results of many current non-pharmacologic intervention studies when viewed independently, along with their low risks of side-effects or long term health concerns, might provide patients as well as providers with a strong rationale for pursuing and adhering to such modest and low cost programs.

In this regard, given the failure of prevailing pharmacologic and surgical interventions to prevent disability in all cases, future research to investigate the long-term benefits of the various conservative intervention approaches that have shown promise to date or have been discussed in the related literature are indicated, but must focus on broadening inclusion criteria as far as older adults and COVID associated exposures goes to be fruitful in the future. As well, whether any of these recommended approaches can assist in efforts to improve cartilage regeneration efforts and can minimize inflammation that can worsen structural damage, while improving the mechanical environment of an osteoarthritis joint also awaits further research.

However, until more evidence is forthcoming efforts to examine exactly what is most appropriate as well as needed and acceptable to the individual patient, followed by well construed educational approach as well as the provision of resources will be expected to optimize adherence to-and persistence with such regimes. It is also the author's view that even if such an approach does not prevent the progression of the disease or reverse it, health status as a whole is likely to be more positively impacted than not by employing these aforementioned non pharmacologic self-management directives, while strengthening the immune system of the vulnerable older adult to COVID disease. As outlined in the literature, the ability to function physically and socially in meaningful activities promises to be life affirming in its own right, as well as mitigating preventable degrees of disability and despair.

However, we conclude that the costs of living in the community with or without assistance, versus long term care must be carefully weighted by the provider in light of

1. the many factors that may impact the extent of the prevailing disease over time
2. the fact that many older adults with multiple morbidities may not be better off living in their own homes
3. the ability of providers to assist the older adult with osteoarthritis to live independently may depend on their personal beliefs, self-efficacy to overcome challenges, economic and social support attributes, and motivation to persist with the anticipated physical and mental challenges and health risks that might ensue.

Acknowledgments

None.

Funding

None.

Conflicts of interest

Author declares that there is no conflict of interest.

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Citation: Marks R. Post COVID communitybased self-care management of disabling osteoarthritis: importance and possible targeted needs. *Int Phys Med Rehab J.* 2022;7(3):106–111. DOI: 10.15406/ipmrj.2022.07.00314