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Osteoarthritis Movement Fears: Implications and Resolution

Ray Marks

Department of Health and Behavior Studies, Columbia University, Teachers College, New York, NY 10027, USA

***Corresponding Author:** Dr. Ray Marks, Department of Health and Behavior Studies, Teachers College, Columbia University, Box 114, 525W, 120th Street, New York, NY 10027, United States.*

Abstract

Osteoarthritis, a largely irreversible highly painful disabling health condition with incalculable personal, financial and social costs and ramifications prevalent among immense numbers of older adults in all parts of the world is an enormous public health concern. A disease that is highly challenging to prevent and adequately ameliorate despite being the topic of immense research efforts in the last few decades, osteoarthritis is often conceived as the endpoint of multiple factors that impact joint status negatively, but that are not well understood. Moreover, although negative publications are often not accepted for publication, a fair number are currently found to produce suboptimal treatment results among different osteoarthritis groups, as well as more consistent findings of a possible lack of motivation or willingness to pursue intervention recommendations such as exercise. This mini review specifically sought to review one under researched albeit possibly important attribute of this condition, namely the psychological construct of fears of movement as this might affect joint and health status. Based largely on research published in the last five years [2016-2021], and that focused on the topic of fear in the context of osteoarthritis pathology and its progression, including fears of movement, a descriptive analysis was undertaken to shed light on how movement fears might impact osteoarthritis and what the research tells us. Results showed many older adults may be especially susceptible to excess osteoarthritis disability if they are excessively fearful of moving their affected painful or unstable arthritic joints, and may hence refrain from exercise as well as physical activity participation. This situation might not only undermine their functional ability, but their well being as well. Careful attention is indicated in this regard by providers as well as future researchers to enhance more desirable outcomes and reduce the public health burden.

Keywords: *Aging, Elderly, Fear of Movement, Osteoarthritis, Pain, Prevention, Surgery, Treatment*

Introduction

Osteoarthritis, the most common form of arthritis is a destructive functionally disabling disease commonly involving the supportive tissues and structural components of one or more freely moving joints of a high number of older adults [1, 2]. Associated with varying degrees of pain, stiffness, swelling, bone deformity, and functional disability, and currently affecting millions of older adults worldwide, many aspects of this disease, while heavily researched, remain fragmented or severely limited in explaining the nature of the disease and its varying rates of progression and severity. As well, even though a case can be made for the possible favorable contribution of some self-management approaches and others, the disease is commonly viewed solely as a mechanical aging response that is largely inevitable, and one that is progressive and not possible to reverse. At the same time, this widespread myth, which can generate distress and hopelessness in its own right may be reinforced inadvertently by health providers, research that only somewhat seeks to focus on joint cartilage regeneration potential, significant others who may or may not be appropriately informed, and negative media messages, while those interventions that are often forthcoming commonly fail to address those emergent or co-morbid cognitive and other disease variables that impact pain, and that can conceivably

contribute towards both the onset as well as the rate of further joint deterioration and its spreads to other joints, and to other chronic health conditions such as obesity.

Indeed, it appears safe to propose that in absence of a total understanding of the disease among the older adult population in particular, and ongoing thoughtfully imparted informed evidence-based education and face to face discussions with empathetic and trustworthy providers, plus therapeutic and skilled guidance, especially given COVID-19 pandemic restrictions on care delivery, a reliance on hearsay or media messages of disinformation, or lack media of access, technologic and health literacy skills, plus providers that do not offer hope, may yet be collectively heightening the degree of suffering experienced by the older adult with osteoarthritis of one or more joints, especially those with a fatalistic view, low self-efficacy and lack of social support, who may not only be carrying out harmful activities, but may be especially reluctant to engage in such strategies to counter this disease due to their negative beliefs. That is, despite the known value of partaking in one or more exercise-based strategies designed in efforts to mitigate or attenuate the disease and its progression more successfully than not, many older adults may be actively refraining from this recommendation for the above reasons and others, including fear.

As a result, even if osteoarthritis is not reversible, and most non-operative approaches are somewhat palliative, the disease can still be predictably exacerbated in the face of excess stresses imparted to the joint by weak muscles and excess stiffness, as a result of excess activity avoidance among other factors [1]. In addition, research and practice-based evidence generally shows excess sedentary behavior can be expected to heighten rather than reduce pain, thus further reducing the willingness to move due the fear of generating pain. In particular, a lack of attention to the predictable impact of any existing negative joint physiological and structural properties that may invoke inflammation and joint instability, along with associated fears of movement are likely to both provoke pain as well as increase, rather than decrease osteoarthritis disability over time unless addressed comprehensively. The instead of the fact the older adult suffering from osteoarthritis may have multiple unrecognized or untreated fears and anxieties can also be expected to independently hamper their ability to adapt successfully to their disease. As well, unresolved movement fears may in turn, not only tend to increase rather than decrease pain, but may readily exacerbate the risk or presence of other damaging health conditions such as obesity, frailty, and a proclivity for falling, falls injuries, and fears of falling [3-6].

Objective

In this report, the goal was to expand upon what is known as regards the possible importance of acquiring a better understanding of the influence of fear in the day to day activity participation practices and motivations of older adults with one or more joints affected by osteoarthritis, who need to be encouraged to participate in movement, but at the same time to protect their joints. To this end, this current review elected to build on others in the field, as far as fear of movement leading to movement avoidance is concerned and whether this attribute is a possible precursor that can play a sizeable role in explaining exercise non adherence, despite its probable impact on heightening the disease process or in fostering undue suffering.

Also sought was how excess fears that impede activity participation might be overcome and to what degree.

It was hypothesized that the emotion of fear would be found to have an impact where it exists on the pursuit of exercise and physical activities among many of the older population suffering from osteoarthritis due to either pain or joint instability or both. A second hypothesis was that unaddressed movement fears would persist or be instrumental in dictating the nature of the observed outcomes of total joint replacement surgery, as well as conservative intervention approaches.

Significance

It was believed that osteoarthritis pathology is possibly impacted adversely by multiple mental health as well as physical health correlates that interact in complex ways and hence appears to warrant more intense recognition in this respect than is commonly observed. In particular, in addition to the belief that nothing can be done to avert osteoarthritis degradation once it has commenced, addressing and recognizing the attribute of fear as related to movement and its possible strong and multiple predictable influences on joint status

and especially on overall osteoarthritis disease progression due to movement avoidance, as well as possible avoidance of therapeutic opportunities, can have a strong bearing on overall social, emotional, physical, and functional outcomes.

Theoretical Framework

Osteoarthritis, the most prevalent joint disease [7] and one involving the gradual disruption of many joint tissues as well as painful inflammatory processes and multiple biomechanical abnormalities that impact function [8] is a chronic disease, which may manifest independently or as a co-morbid condition in many elderly adults, where it produces costly personal, as well as immense social and economic costs. Specific challenges include but are not limited to periods of intractable pain, aversive symptoms that wax and wane without any predictability, fatigue, weakness, functional and neurological challenges, independence losses, plus more intense progressive physical disability and impairments that are immensely challenging to ameliorate. The additional attributes of movement fears, depression, anxiety, and having a poor outlook are all possible disease modifying factors [3] that may prevail in various forms of osteoarthritis and may explain why some cases affected by osteoarthritis are more disabled than others. The variable of fear in particular, may provide some unique insight as well as to why most intervention approaches devised to date may fall short of expectations, or fail to either provide optimal results, or encourage sufficient adherence levels to desired exercise recommendations and others, even if the pathology is comparable [9]. In addition, limited attention to factors underpinning movement fears may be expected to foster further distress [10], plus the likelihood of increasing joint vulnerability of the affected joint to mechanical forms of injury and further pain, especially in the obese case [11-13]. Moreover, simply encouraging exercise even though movement fears are justified because the movements may indeed be just as injurious to an unstable or inflamed joint than no exercise participation is more likely to heighten the extent and rate of joint deterioration than the goal of protecting the damaged joint [14].

Unfortunately, as recounted by Heuts et al. [15], although fears of pain, as well as fears of movement, are consequently likely be plausible pathogenic osteoarthritis factors, existing osteoarthritis literature tends to focus primarily on examining osteoarthritis from a radiographic, biomechanical, molecular, and biological disease perspective rather than any cognitive deterministic perspective [16]. Fears related to movement along with avoidance behaviors are also applicable to total joint replacement surgery, a technical intervention designed to reduce pain and dysfunction in end stage osteoarthritis because these surgeries may not directly impact upon possible mediating or moderating cognitive factors, such as movement fears, that can arguably induce high levels of the adoption of sedentary behaviors, and with this muscle weakness, plus excess rates of joint pain and inflammation, and irrational fears, despite surgery [17].

Schematically these proposed ideas are represented below in Figure 1.

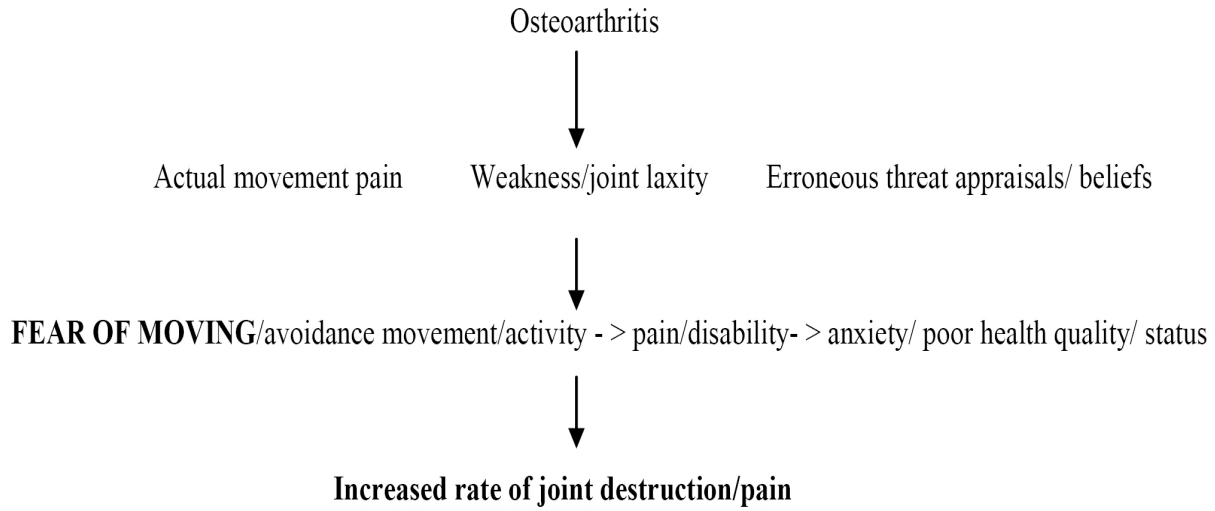

Figure1. *Theoretical association of the impact of fear of movement in the context of osteoarthritis pathology*

Methods

To assist in achieving the aims of this mini review, the PUBMED and GOOGLE SCHOLAR depositaries believed to house salient topical peer reviewed articles were employed. Key terms used included, *osteoarthritis and fear of movement/kinesiophobia*. After an extensive search, those data deemed to adequately address one or more aspects of the current topic were scanned for their relevance and implications and downloaded accordingly. From these data, it was clear only a narrative report was feasible, given the low number of topical papers, especially well-controlled longitudinal or basic studies in general, on this topic. Excluded were articles on rheumatoid arthritis, knee surgical conditions other than osteoarthritis, proposals and surveys being developed to assess fear associated emotions and articles that did not refer to osteoarthritis specifically.

Results

Among the few papers that focus precisely on the current topics of interest, a fair number concur that fear of movement has a negative impact on physical activity participation, as well as on other osteoarthritis outcomes [17] such as pain and a poorer functional ability [13]. As well, despite diverse intervention attempts over time to counter osteoarthritis pathology, few are consistently successful over time [13, 18], while many overlook the possible role played by reactive depression and anxiety [19], as well as weakness [10] or a combination of these factors, [19] plus excessive pain. Others may not address the resolution of prevailing fears such as fears of medication dependency that may increase pain, as well as movement fears [20], while others fail to assess the possible role of joint instability as well as anxiety as a potential movement inhibitor and mediator of the willingness to actively pursue exercise [eg., 17]. In turn, even though fear of movement may impact overall joint range of motion, maximal muscle contractility, muscle strength and endurance capacity, as well as joint stability, balance and movement co-ordination due to its impact on muscle physiology and structure, very few studies objectively examined muscle properties in the context of fears of movement, a common fear among many older adults suffering from symptomatic osteoarthritis [17]. As a result, more rather than less pain may be generated over time, and thus unsurprisingly, Kopp et al. [9] who examined several psychological attributes of osteoarthritis cases found their model for pain intensity to not only include time spent exercising, but its mediator, fear of painful movement. That is, the subject's fears that movement might do more harm than good tended to increase their risk for excess disability, because it fostered movement avoidance and placed limitations in the realm of exercise adherence, essential to joint 'health', as well as overall health, weight control and the mitigation of excess emotional distress.

As recounted by Kilinç et al. [21] who studied 200 knee osteoarthritis cases, if the disease progresses and becomes more painful to treat it may not only engender a more permanent state of maladaptive or unwanted movement fears if neglected but multiple adverse cognitive responses that impact adaption and recovery significantly and incrementally. In this regard Selcuk et al. [19] mention that simply focusing on pain relief alone is likely to be insufficient at this stage because the affected individual may have not only have acquired considerable limitations in their physical abilities and capacity, but also in their self-efficacy beliefs for overcoming pain and dysfunction, and disability per se [22]. This can be seen quite starkly in the context of total knee joint arthroplasty surgery [23], as well as total hip joint arthroplasty surgery commonly applied for purposes of ameliorating end-stage painful osteoarthritis [24], and where surgical removal of the diseased joint tissues and replacement by a prosthesis, and possible associated surgery to reduce joint laxity expected to afford pain relief and joint stability, may still evoke movement fears that deter or delay recovery processes quite markedly and significantly [25]. These movement fears may not only have a direct impact on brain neural patterns [26], but possibly on movement avoidance [27], the emergence of pain hyper-vigilance and excess movement fears [28, 29] found to predict unwanted postoperative functional limitations, despite any technically successful surgery [24].

Thus even though Thompson et al. [30] negated the role played by fear of movement, self-efficacy beliefs and fear of falling in the context of osteoarthritis disability, this conclusion is not supported in cases where fears of moving as well as fears of injury [31] or re injury [32], or falling prevail, such as among a sizeable proportion of women with osteoarthritis, as well as those cases who exhibit high levels of anxiety

or body mass [33] who may well suffer excess pain [34]. As a result they may be more predisposed to unexplained increases in joint derangement and disability as observed prospectively by Helminen et al. [35] and Odele et al. [36], and more profound functional limitations than anticipated [37]. They may also exhibit low confidence levels for function and activity participation [38] especially among those who tend to exhibit both pain and stiffness [39], and those. who remain untreated may be expected to not only experience more pain and suffering, but more rapid and extensive joint destruction processes that can heighten injury risk [40, 41], muscle strength declines and their ability to function physically [11]. At the same time, their emotional status, their ability to control pain without resorting to addictive drugs, their willingness to adhere to recommended exercise activities and others, as well as their longevity, life quality, surgical and healing responses may all decline [28, 31, 42-45] if nothing is done to allay their movement fears [10, 62, 73, 79-82].

In addition, delaying the introduction of strategies to offset fears of activity and their determinants, especially among those in high distress and who exhibit negative pain coping skills [21, 56], may foster more negative than desirable outcomes [17, 21], especially if physical activity participation is vital, but much needed patient education, including efforts to increase the awareness of the fear of movement and its implications is not forthcoming in a timely manner [19, 67] and thus fails to obviate any prevailing and ongoing maladaptive and possibly injurious pain responses and excess avoidance behaviors [28, 47-49].

On the other hand, careful and timely screening, followed by a personalized therapy program designed to avoid provoking excess pain and possible fears of future exercise activities may be paramount in efforts to foster optimal joint and overall wellbeing plus possible improvements in joint stability, muscle reflex activation, muscle strength and endurance, decreased pain, stiffness, and joint swelling and increased balance, balance confidence, and mobility [62, 56, 73, 75, 79, 81-83, 91], all commonly compromised to some degree, especially in older adults with advanced osteoarthritis of one or more joints [10, 78]. As well, approaches that safely foster exercise participation such as guided imagery [24], aquatic exercises [50] and Tai Chi [54], along with brain targeted, cognitive behavioral, and biopsychosocial approaches [17, 51, 77], education and educational resources [20, 24, 52, 53, 67, 77, 83] and others designed to reduce pain and protect the damaged joint[s] may help to increase physical activity levels without provoking unwanted pain fears [19, 21, 34, 38, 55, 80] that commonly engender multiple adverse osteoarthritis, as well as health outcomes and persistent fears of movement or re-injury [92].

Discussion

Modest to fairly robust evidence continues to show that osteoarthritis, the most common disease affecting the mobility and independence of many older adults and one generally resistant to most current modes of intervention, even when surgery is implemented, is an enormous public health and human challenge. In this regard, although past as well as emerging research indicates that the disease remains generally impervious to reversal or amelioration despite years of research and practice based experiences, it may yet be possible to offer older adults with this condition some respite and hope by acknowledging those preventable psychological factors that may impact its progression and severity. Among these psychological factors, the correlate of fear, in general, as well as the fear of movement in particular, come to mind, and appears worthy of consideration based on research from other fields such as cardiovascular disease.

To this end, and bearing in mind the strong need to offer older adults with osteoarthritis more efficacious modes of interventions and interventions that can minimize the multiple physical and emotional adverse impacts of the disease, a number of strategies may be quite helpful, especially those that can be introduced early on to reduce activity fears [21] and combine exercise with graded movement exposure and are designed in considerations of the underlying pathology [83]. Indeed, rather than omitting to do this, a carefully construed tailored treatment plan that embraces possible implications of movement fears is likely to have immense potential to improve the comfort and function of the older osteoarthritis sufferer [9] as well as helping them to maintain autonomy, dignity, and confidence.

As such, we believe this mini review, which focused on what is known about fears associated with movement in the event an older adult is afflicted with chronic

disabling osteoarthritis, implies the unwanted generation of excess movement fears may well have a profound bearing on osteoarthritis outcomes and interventions as outlined in Figure 1 and implied by multiple authors [11, 22, 32, 41, 42, 45, 62, 69, 70-75] if neglected or overlooked. In this regard, it appears that more effort to extend the research in this sphere is strongly warranted and may markedly help to elucidate the most common origins of movement fears where present, and how these impact the dimensions of functional status and recovery status post surgery and how to best address these factors that appear to impact overall health risks, long-term disability, frailty, persistent pain, post surgical dissatisfaction, and a decreased life quality [57, 58, 59, 82].

Examining who is most vulnerable and how movement fears might manifest and correlate with its molecular pathology, movement patterns, muscle shock absorbing properties, and overall patient physical and mental wellbeing and healing capacity is especially encouraged in this regard for fostering osteoarthritis self-care recommendations and others on a public scale.

As well, even if pain related fears are not found relevant in some osteoarthritis studies [60] both high anxiety and fear-avoidance beliefs should not be neglected osteoarthritis correlates because these are consistently related to poorer function, pain and osteoarthritis disability [66-67] plus possible catastrophic thinking and heightened pathological severity of both the arthritic condition, as well as overall wellbeing [78].

In sum, and undoubtedly, despite gaps in the literature, and a need for future research, it seems reasonable to assert with modest confidence that the emotion of movement fear, if unaddressed, will systematically yield poor overall osteoarthritis and health outcomes rather than desirable optimal outcomes. As well, the extent of prevailing joint degenerative and its extent and rate of progression will possibly increase, along with its pain manifestations [6, 46, 86] and far reaching emotional and social consequences [46, 56, 71, 72].

To help avert undue suffering [71] that may well stem from the persistent adoption of harmful maladaptive sedentary practices, clinicians are called on to carefully screen for possible prevailing or future fears of movement in all their elderly osteoarthritis clients earlier, rather than later. Proceeding accordingly thereafter, those clinicians can expect heightened wellbeing among their clients in multiple respects. To this end, those patients with visual impairments, those who are frail with a falls history, those who live alone, those who face environmental challenges to safe forms of physical activity, those with anxiety challenges, those with comorbid health conditions that impact sensation eg., diabetes, who might be most vulnerable, might be preferentially targeted. In particular, as well as being mindful that Falls Fear Surveys alone may not capture all the attributes of movement fears, the value of a focused trustworthy empathetic provider approach and conversation, plus reference to evidence based study findings should not be overlooked.

Conclusions and Significance

Despite the limited depth and extent of the current data base available, and a need for further research, encouraging trends in the data lead us to conclude:

Fears of movement due to osteoarthritis pain or joint instability can arguably impact the extent of osteoarthritis disease progression, as well as co-occurring comorbid debility and suffering quite markedly and rapidly.

On the other hand, it appears that interventions designed to help affected adults to understand the importance of overcoming fears that lead to movement avoidance, which has numerous linkages to adverse joint and health status outcomes, may prove to be an especially important correlate in the context of promoting those physical activity recommendations believed to foster more optimal levels of cumulative joint as well as overall health among those chronically impacted elderly adults with osteoarthritis of one or more joints. It may also help avert deconditioning impacts, conditioning of unwanted behavioral responses, and multiple non surgical as well as surgical joint associated disabling situations [90].

At the same time, efforts to embrace a holistic disease perspective, rather than solely a biomechanical oriented symptomatic focus, along with an insightful broad based patient-centered and step by step personalized approach, and one that builds self-efficacy for pain control and function systematically over time, are strongly recommended.

Further insightful research that includes both qualitative as well as quantitative components may

be expected to markedly facilitate the adoption and adherence of desirable clinical practices that will produce more efficacious health affirming and protective osteoarthritis health outcomes, including injury prevention, reduced rates and severity of disablement, and their collective human, economic and social costs among many older adults worldwide than is presently observed and appears highly warranted.

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