Supplement 1: Search Strategy

Bibliometric analysis of published research articles on elderly pain from 2000 to 2019.

Data retrieval strategy

Search terms Web of science:

elderly	pain
Aging or aged or elderly or old*	pain* or nocicep* or ache* or analg* or headache* or migraine* or "stomach ache*"or "abdominal ache*" or toothache* or "neck pain" or "back pain" or "musculoskeletal pain" or sciatic* or fibromyalg* or neuralgi* or hyperalg* or radiculalg*or arthralg* or causalg*or earache*or "cancer pain"or osteoarthritis or arthritis

Supplement 2: Coded Data

Ref Works #	Identifying information				Abstract available ?		Article included?		If excluded,	Citation score	Citation score/year	Author information				Country 1st author	State 1st author	Organisation 1st				Department 1st author												Type of Article						Topic							Subjects								Pain characteristics							
	Year	Authors	Title	Journal	Yes	No	Yes	No				Multiple authors	Single author	Anonymous	Not listed			universities/ hoys	Institute	hospital	others	Medical	Nursing	Physiotherapy	Psychology	Pharmacology	Anesthesiology	Dentistry	Cardiovascular	Neurological/Neuroscience	orthopedist	Geriatrics/gerontology	Public health	Other	Anonymous	Not listed	Research paper	Theoretical paper	Guidelines	Review	Narrative review	Systematic review	Pain assessment	Pain intervention	Characterization	Model development	Procedural factors	Biological factors	Family factors	Healthy	Clinical	nursing home	community	Unclear	Animal	Health professional	Experimental - Human	Exp - electrical	Exp - Mechanical	Exp - Thermal	Exp - Nerve Damage	Exp - inflammation	Exp - Injury	Acute	Chronic	Disease-related	Surgical pain	Procedure-related pain	unclear	Other
1	2000	Rapp, S. R. Rejeski, W. J. Miller, M. E.	Physical function among older adults with knee pain: The role of pain coping skills	Arthritis Care and Research	1	0	1	0		47.00	2.35	1	0	0	0	USA	Winston-Salem	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2000	Abrahm, J. L.	Advances in pain management for older adult patients	Clinics in Geriatric Medicine	1	0	1	0		16.00	0.80	0	1	0	0	USA	Pennsylvania	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
3	2000	Brandt,K.D.Heilman, S. K.Siemens,S. C.Katz, B. P.Mazzuca, S.Braunstein, E.	A comparison of lower extremity muscle strength, obesity, and depression scores in elderly subjects with knee pain with and without radiographic evidence of knee osteoarthritis	Journal of Rheumatology	1	0	1	0		42	2.10	1	0	0	0	USA	Indiana	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4	2000	Gibson, S. J. Helme, R. D.	Cognitive factors and the experience of pain and suffering in older persons	Pain	1	0	1	0		52.00	2.60	1	0	0	0	Australia	Victoria	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5	2000	Hopman-Rock, M. Westhoff, M. H.	The effects of a health-educational and exercise program for older adults with osteoarthritis of the hip or knee	Journal of Rheumatology	1	0	1	0	0	121.00	6.05	1	0	0	0	The Netherlands	Leiden	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
6	2000	Jelicic, M. van Boxtel, M. P. J. Houx, P. J. Jolles, J.	Does migraine headache affect cognitive function in the elderly? Report from the Maastricht Aging Study (MAAS)	Headache	1	0	1	0		49.00	2.45	1	0	0	0	The Netherlands	Maastricht	1	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
7	2000	Krulewitch, H. London, M. R. Skaled, V. J. Lundebrock, G. J. Thomason, H. Brummer-Strawn, V.	Assessment of pain in cognitively impaired older adults: A comparison of pain assessment tools and their use by nonprofessional caregivers	Journal of the American Geriatrics Society	1	0	1	0		85.00	4.25	1	0	0	0	USA	Oregon	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8	2000	Hadjistavropoulos, T. LaChapelle, D. Hale, C. MacLeod, F. K.	Age- and appearance-related stereotypes about patients undergoing a painful medical procedure	Pain Clinic	1	0	1	0		16	0.80	1	0	0	0	Canada	Saskatchewan	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
9	2000	Kung, F. Gibson, S. J. Helme, R. D.	A community-based program that provides free choice of intervention for older people with chronic pain.	Journal of Pain	1	0	1	0		4.00	0.20	1	0	0	0	Australia	Victoria	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
10	2000	Kung, F. T. Gibson, S. J. Helme, R. D.	Older people with chronic pain: comparison of pain clinic patients with a community based sample	Pain Clinic	1	0	1	0		14.00	0.70	1	0	0	0	Australia	Victoria	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
11	2000	Lamb, S. E. Guralnik, J. M. Buchner, D. M. Ferrucci, L. M. Hochberg, M. C.	Factors that modify the association between knee pain and mobility limitation in older women: the Women's Health and Aging Study	Annals of the Rheumatic Diseases	1	0	1	0		100.00	5.00	1	0	0	0	UK	Coventry	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
12	2000	Landvoy, G.	Chronic pain management: a qualitative study of elderly people's preferred coping strategies and barriers to management	Disability and Rehabilitation	1	0	1	0		84.00	4.20	0	1	0	0	Australia	New South Wales	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13	2000	Mann, C. Pouzeratte, Y. Boccara, G. Millat, B. Verpre, C. Brunet, G.	Comparison of intravenous or epidural patient-controlled analgesia in the elderly after major abdominal surgery	Anesthesiology	1	0	1	0		182.00	9.10	1	0	0	0	France	Montpellier	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
14	2000	Mattsson, P. Sandbodt, K. Lundberg, P. O. Westerberg, C. E.	The prevalence of migraine in women aged 40–74 years: a population-based study	Cephalalgia	1	0	1	0		48.00	2.40	1	0	0	0	Sweden	Uppsala	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
15	2000	Mercadante, S. Casucci, A. Porro, S. Fulfaro, F.	Factors influencing the opioid response in advanced cancer patients with pain followed at home: the effects of age and gender	Supportive Care in Cancer	1	0	1	0		45.00	2.25	1	0	0	0	Italy	Palermo	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
16	2000	Mesler, S. P. Lorner, R. F. Mitchell, M. N. Valle, G. Morgan, T. P. Rejeski, W. J.	Exercise and weight loss in obese older adults with knee osteoarthritis: A preliminary study	Journal of the American Geriatrics Society	1	0	1	0		161.00	8.05	1	0	0	0	USA	North Carolina	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
17	2000	Mizuno, M. Saito, K. Takagaki, M. Yoshida, J.	Percutaneous microcompression of the trigeminal ganglion for elderly patients with trigeminal neuralgia and patients with atypical trigeminal neuralgia	Neurologia Medico-Chirurgica	1	0	1	0		4.00	0.20	1	0	0	0	Japan	Aichi	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2000	Mossey, J. M. Gallagher, R. M. Tirumalasetti, F.	The effects of pain and depression on physical functioning in elderly residents of a continuing care retirement community	Pain Medicine	1	0	1	0		48.00	2.40	1	0	0	0	USA	Philadelphia	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
19	2000	Petrella, R. J. Bartha, C.	Home based exercise therapy for older patients with knee osteoarthritis: A randomized clinical trial	Journal of Rheumatology	1	0	1	0		110.00	5.50	1	0	0	0	Canada	Ontario	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
20	2000	Rafferty, B. Allendoerfer, C. Rubenstein, L. Chodosh, J. Dunbar, P. Nakamura, Y.	A facet-based system for computer-assisted instruction in pain management for elderly patients	Journal of the American Medical Informatics Association	1	0	1	0		2.00	0.10	1	0	0	0	USA	Washington	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
21	2000	Stuesse, S. L. Cruce, W. L. R. Lovett, J. A. McBurney, D. L. Crisp, T.	Microglial proliferation in the spinal cord of aged rats with a sciatic nerve injury	Neuroscience Letters	1	0	1	0		46.00	2.30	1	0	0	0	USA	Ohio	1	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	2000	Wang, S. J. Fuh, J. L. Lu, S. R. Liu, C. Y. Hsu, L. C. Wang, P. N.	Chronic daily headache in Chinese elderly--Prevalence, risk factors, and biannual follow-up	Neurology	1	0	1	0		203.00	10.15	1	0	0	0	China	Taiwan	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
23	2000	Washington, L. Gibson, S. J. Helme, R. D.	Age-related differences in the endogenous analgesic response to repeated cold water immersion in human volunteers	Pain	1	0	1	0		124.00	6.20	1	0	0	0	Australia	Victoria	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
24	2000	Wilcox, S. Brenes, G. A. Levine, D. Sevick, M. A. Shumaker, S. A. Craven, T.	Factors related to sleep disturbance in older adults experiencing knee pain or knee pain with radiographic evidence of knee osteoarthritis	Journal of the American Geriatrics Society	1	0	1	0		116.00	5.80	1	0	0	0	USA	Columbia	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	2000	Zheng, Z. Gibson, S. J. Khalil, Z. Helme, R. D. McMeiken, J. M.	Age-related differences in the time course of capsaicin-induced hyperalgesia	Pain	1	0	1	0		51.00	2.55	1	0	0	0	Australia	Parkville	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0
							25			1770.00	88.50	23	2	0	0			15	6	1	4	9	1	1	2	1	1	0	0	5	0	4	2	7	0	1	24	0	0	1	1	0	7	8	7	4	0	1	0	1	8	2	7	7	1	1	1	0	1	1	0	2	0	2	10	6	1	0	6	0
26	2001	Al Snih, S. Markides, K. S. Ottenbacher, K. J. Al Snih, S. Markides, K. S. Ray, L.	Impact of pain on disability among older Mexican Americans	Journals of Gerontology Series a-Biological Sciences and Medical Sciences	1	0	1	0		28.00	1.47	1	0	0	0	USA	Galveston	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
27	2001	Baker, K. R. Nelson, M. E. Felson, D. T. Layne, J. E. Sarno, R. Roubenoff, R.	The efficacy of home based progressive strength training in older adults with knee osteoarthritis: A randomized controlled trial	Journal of Rheumatology	1	0	1	0		199.00	10.47	1	0	0	0	USA	Boston	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
28	2001	Bell, G. M. Schnitzer, T. J.	Cox-2 inhibitors and other nonsteroidal anti-inflammatory drugs in the treatment of pain in the elderly	Clinics in Geriatric Medicine	1	0	1	0		22.00	1.16	1	0	0	0	USA	California	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0
29	2001	Bharucha, A. E. Camilleri, M.	Functional abdominal pain in the elderly	Gastroenterology Clinics of North America	1	0	1	0		4.00	0.21	1	0	0	0	USA	Minnesota	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
30	2001	Bowsher, D.	Stroke and central poststroke pain in an elderly population	Journal of Pain	1	0	1	0		34.00	1.79	0	1	0	0	UK	Liverpool	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
31	2001	Chithnall, J. T. Tait, R. C.	Pain assessment in cognitively impaired and unimpaired older adults: a comparison of four scales	Pain	1	0	1	0		164.00	8.63	1	0	0	0	USA	Missouri	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
32	2001	Edwards, R. R. Fillingim, R. B.	Effects of age on temporal summation and habituation of thermal pain: Clinical relevance in healthy older and younger adults	Journal of Pain	1	0	1	0		115.00	6.05	1	0	0	0	USA	Alabama	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
33	2001	Fine, P. G.	Opioid analgesic drugs in older people	Clinics in Geriatric Medicine	1	0	1	0		12.00	0.63	0	1	0	0	USA	Utah	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
34	2001	Gibson, S. J. Helme, R. D.	Age-related differences in pain perception and report	Clinics in Geriatric Medicine	1	0	1	0		235.00	12.37	1	0	0	0	Australia	Victoria	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
35	2001	Given, C. W. Given, B. Azzouz, F. Kozachik, S. Stommel, M.	Predictors of pain and fatigue in the year following diagnosis among elderly cancer patients	Journal of Pain and Symptom Management	1	0	1	0		145.00	7.63	1	0	0	0	USA	Michigan	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

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Supplement 3: Country Data

country	Total number of publications between 2000-2019	Percentage of publications between 2000-2019
USA	741	35.20%
Australia	175	8.31%
United Kingdom (including England, Scotland, Northern Ireland and Wales)	167	7.93%
China	136	6.46%
Japan	97	4.61%
Canada	89	4.23%
Italy	76	3.61%
Netherlands	70	3.33%
Germany	62	2.95%
Brazil	56	2.66%
Sweden	57	2.71%
South Korea	54	2.57%
France	49	2.33%
Turkey	46	2.19%
Spain	43	2.04%
Finland	28	1.33%
Poland	18	0.86%
Switzerland	16	0.76%
Norway	14	0.67%
Denmark	15	0.71%
Ireland	13	0.62%
Israel	11	0.52%
Thailand	9	0.43%
Portugal	9	0.43%
Singapore	8	0.38%
New Zealand	8	0.38%
Austria	8	0.38%
Iran	7	0.33%
Belgium	7	0.33%
Serbia	4	0.19%
Saudi Arabia	4	0.19%
Malaysia	4	0.19%
Russia	2	0.10%
Lebanon	2	0.10%
Egypt	2	0.10%
Senegal	1	0.05%
Pakistan	1	0.05%
Mexico	1	0.05%
Indonesia	1	0.05%
Iceland	1	0.05%
Hungary	1	0.05%
Greece	1	0.05%
Chile	1	0.05%
Bosnia and Herzegovina.	1	0.05%
Bangladesh	1	0.05%
Nigeria	1	0.05%
India	1	0.05%
Costa Rica	1	0.05%

Supplement 4: The Coding Rules of Topics and Pain Characteristics

Table 1 The coding rules of topic.

Code	Definition
Pain assessment	Articles focuses on pain assessment or pain diagnostic tests. For example, the efficacy and cost of a diagnostic test, rather than the establishment of a scale
Pain intervention	The article focuses on interventions for pain (eg, applying surgical procedures, physical / behavior, etc.). Such as articles on the efficacy, side effects and cost-effectiveness of pain treatment and also included is to explain the mechanism of action of the intervention (non-clinical research). In addition, articles reporting on clinical pain management, training, experimental ethics, or health care policies / use are also included.
Pain characteristic	Articles describing the prevalence, morbidity (ie epidemiology) of pain, articles describing pain-related predictors or risk factors and their impact on other variables
Model development	Describe the reliability and validity of scales, questionnaires, models, techniques, diagnostic tests, or describe (or refine, translate, evaluate) their usefulness.
Procedural factors	Articles about the regulation of procedural factors in pain (especially immune-related articles)
Biological factors	Articles on the regulatory effects of biological factors, body factors or molecules on pain, also including the study of physiological processes related to pain
Family factors	Articles about the regulation of family-related factors on pain or the effect of pain on family function (such as spouse, children, etc.)

Table 2 The coding rules of pain characteristic.

Code	Definition
Disease-related pain	Experience pain related to disease (such as musculoskeletal disease or cancer-related pain)
Experimental pain	Pain caused by experiments (including animals and humans): Mechanical: mechanical force (dynamic or static pressure, expansion or vibration) was applied or elicited by an action of the subject (animal or human); Electrical: Stimulate the subject's body with electric current to cause pain. Thermal: heat or cold stimuli were applied; Nerve Damage: Traumatic (surgical) or chemical nerve injury; Inflammation: Operation using known inflammatory substances or releasing chemical aldehydes (aldehydes include carrageenan, Freund's adjuvant, hypotonic / hypertonic saline) to get them into paws or knees’ Injury model: an animal model that adopts a specific human clinical pain state (such as amputation, fracture, burn, laparotomy, polyarthritis model).
Acute pain	Samples of subjects currently experiencing acute pain (eg, acute abdominal pain, immunization, blood draw, postoperative pain) or review theoretical paper relates to acute pain. If the article reviews or investigates acute pain, then the type of acute pain was coded as following Surgical pain:

	pain related to surgery or operation (eg, postsurgical pain) Procedural pain: pain related to a medical procedure (eg, immunization pain, lumbar punctures, pain due to dental procedure).
Chronic pain	Samples of subjects diagnosed with a chronic, persistent, or recurrent pain condition or review/ theoretical paper relates to a chronic pain condition (eg, dysmenorrhea, chronic abdominal pain, migraines).

Supplement 5: Top 20 Original Articles with the Highest Total Citation Scores

Supplement 5 Top 20 original articles with the highest total citation scores.

Rank	Year	Authors	Title	Journal	Citation Score
1	2004	Messier et al.	Exercise and dietary weight loss in overweight and obese older adults with knee osteoarthritis - The arthritis, diet, and activity promotion trial	*Arthritis and Rheumatism*	611.00
2	2003	Lin et al.	Effect of improving depression care on pain and functional outcomes among older adults with arthritis - A randomized controlled trial	*JAMA*	375.00
3	2004	Thomas et al.	The prevalence of pain and pain interference in a general population of older adults: cross-sectional findings from the North Staffordshire Osteoarthritis Project (NorStOP)	*PAIN*	314.00
4	2004	Herr et al.	Pain intensity assessment in older adults - Use of experimental pain to compare psychometric properties and usability of selected pain scales with younger adults	*Clinical Journal of Pain*	267.00
5	2008	Morone et al.	Mindfulness meditation for the treatment of chronic low back pain in older adults: A randomized controlled pilot study	*PAIN*	249.00
6	2001	Jones et al.	The effect of age on pain, function, and quality of life after total hip and knee arthroplasty	*Archives of Internal Medicine*	236.00
7	2010	Solomon et al.	The comparative safety of analgesics in older adul ts with arthritis	*Archives of Internal Medicine*	236.00
8	2009	Leveille et al.	Chronic musculoskeletal pain and the occurrence of falls in an older population	*JAMA*	228.00
9	2005	Gagliese et al.	The measurement of postoperative pain: A comparison of intensity scales in younger and older surgical patients	*PAIN*	226.00

10	2005	Lautenbacher et al.	Age effects on pain thresholds, temporal summation and spatial summation of heat and pressure pain	*PAIN*	211.00
11	2003	Edwards et al.	Age-related differences in endogenous pain modulation: a comparison of diffuse noxious inhibitory controls in healthy older and younger adults	*PAIN*	209.00
12	2013	Patel et al.	Prevalence and impact of pain among older adults in the United States: Findings from the 2011 National Health and Aging Trends Study	*PAIN*	207.00
13	2000	Wang et al.	Chronic daily headache in Chinese elderly - Prevalence, risk factors, and biannual follow-up	*Neurology*	203.00
14	2001	Baker et al.	The efficacy of home based progressive strength training in older adults with knee osteoarthritis: A randomized controlled trial	*Journal of Rheumatology*	199.00
15	2007	Raskin et al.	Efficacy of duloxetine on cognition, depression, and pain in elderly patients with major depressive disorder: An 8-week, double-blind, placebo-controlled trial	*American Journal of Psychiatry*	198.00
16	2004	Dawson et al.	Epidemiology of hip and knee pain and its impact on overall health status in older adults	*Rheumatology*	190.00
17	2003	Song et al.	Effects of tai chi exercise on pain, balance, muscle strength, and perceived difficulties in physical functioning in older women with osteoarthritis: A randomized clinical trial	*Journal of Rheumatology*	186.00

18	2000	Mann et al.	Comparison of intravenous or epidural patient-controlled analgesia in the elderly after major abdominal surgery	*Anesthesiology*	182.00
19	2009	Vitiello et al.	Cognitive behavioral therapy for insomnia improves sleep and decreases pain in older adults with co-morbid insomnia and osteoarthritis	*Journal of Clinical Sleep Medicine*	177.00
20	2006	Paradowski et al.	Knee complaints vary with age and gender in the adult population. Population-based reference data for the knee injury and osteoarthritis outcome score (KOOS)	*Bmc Musculoskeletal Disorders*	170.00

Supplement 6 Top 20 original articles with the highest relative citation scores.

Rank	Year	Author	Title	Journal	Relative Citation Scores
1	2004	Messier et al.	Exercise and dietary weight loss in overweight and obese older adults with knee osteoarthritis - The arthritis, diet, and activity promotion trial	*Arthritis and Rheumatism*	38.19
2	2013	Patel et al.	Prevalence and impact of pain among older adults in the United States: Findings from the 2011 National Health and Aging Trends Study	*PAIN*	29.57
3	2010	Solomon et al.	The comparative safety of analgesics in older adults with arthritis	*Archives of Internal Medicine*	23.60
4	2017	Avidan et al.	Intraoperative ketamine for prevention of postoperative delirium or pain after major surgery in older adults: an international, multicentre, double-blind, randomised clinical trial	*Lancet*	23.33
5	2003	Lin et al.	Effect of improving depression care on pain and functional outcomes among older adults with arthritis - A randomized controlled trial	*JAMA*	22.06
6	2008	Morone et al.	Mindfulness meditation for the treatment of chronic low back pain in older adults: A randomized controlled pilot study	*PAIN*	20.75
7	2009	Leveille et al.	Chronic musculoskeletal pain and the occurrence of falls in an older population	*JAMA*	20.73
8	2004	Thomas et al.	The prevalence of pain and pain interference in a general population of older adults: cross-sectional findings from the North Staffordshire Osteoarthritis Project (NorStOP)	*PAIN*	19.63

9	2004	Herr et al.	Pain intensity assessment in older adults - Use of experimental pain to compare psychometric properties and usability of selected pain scales with younger adults	*Clinical Journal of Pain*	16.69
10	2013	Langan et al.	Herpes zoster vaccine effectiveness against incident herpes zoster and post-herpetic neuralgia in an older US population: A cohort study	*PLoS Medicine*	16.43
11	2016	Morone et al.	A mind-body program for older adults with chronic low back pain a randomized clinical trial	*JAMA Internal Medicine*	16.25
12	2009	Vitiello et al.	Cognitive behavioral therapy for insomnia improves sleep and decreases pain in older adults with co-morbid insomnia and osteoarthritis	*Journal of Clinical Sleep Medicine*	16.09
13	2010	Saunders et al.	Relationship of opioid use and dosage levels to fractures in older chronic pain patients	*Journal of General Internal Medicine*	15.50
14	2007	Raskin et al.	Efficacy of duloxetine on cognition, depression, and pain in elderly patients with major depressive disorder: An 8-week, double-blind, placebo-controlled trial	*American Journal of Psychiatry*	15.23
15	2005	Gagliese et al.	The measurement of postoperative pain: A comparison of intensity scales in younger and older surgical patients	*PAIN*	15.07
16	2009	Muraki et al.	Prevalence of radiographic knee osteoarthritis and its association with knee pain in the elderly of Japanese population-based cohorts: The ROAD study	*Osteoarthritis and Cartilage*	14.91

17	2013	Stannus et al.	Associations between serum levels of inflammatory markers and change in knee pain over 5 years in older adults: a prospective cohort study	*Annals of the Rheumatic Diseases*	14.29
18	2005	Lautenbacher et al.	Age effects on pain thresholds, temporal summation and spatial summation of heat and pressure pain	*PAIN*	14.07
19	2010	Solomon et al.	The comparative safety of opioids for nonmalignant pain in older adults	*Archives of Internal Medicine*	14.00
20	2011	Kurth et al.	Headache, migraine, and structural brain lesions and function: population based epidemiology of vascular ageing-MRI study	*British Medical Journal*	13.44