



***PREVALENCE OF CHRONIC MUSCULOSKELETAL PAIN AND ITS
ASSOCIATED FACTORS TOWARDS TREATMENT OPTIONS AMONG
ELDERLY IN SELECTED PUBLIC CLINICS, SELANGOR, MALAYSIA***

LEE FOONG SIM

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By

LEE FOONG SIM

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Master of Science**

November 2019

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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By

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November 2019

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Chronic pain is a highly prevalent disabling condition among older adults but little is known about its prevalence, the associated factors and also treatment option of preference among this population. Chronic pain of musculoskeletal origin is widespread among the elderly, which is often under-recognised and under-treated. The purpose of this study was to determine the prevalence and associated factors to treatment options for chronic musculoskeletal pain among the elderly in Petaling District, Selangor.

A cross-sectional study was performed on 276 respondents recruited from six public health clinics in Petaling District, Selangor between August to September 2018. A stratified sampling proportionate to size with individual clinics as the strata was used in this study. Based on the proportion calculated from individual clinics, eligible elderly were selected by systematic random sampling based on the registration list. Data were collected using a pre-tested and validated questionnaire through face-to-face interview with each respondent at the clinic. The questionnaire consisted of seven sections, namely, socio-demographic, comorbidity, depression, pain severity, treatment options, attitude towards chronic pain and chronic musculoskeletal pain. Data collected was analysed using IBM Statistical Package for Social Science (SPSS®) version 23.0. For data analysis, Chi-Square and Fisher's Exact Tests were used to measure the association while predictors were examined using Multivariate Logistic Regression. The *P* value of ≤ 0.05 regarded as statistically significant.

A total of 276 respondents completed the questionnaires from 282 who were eligible, making the response rate of 97.9%. The findings of the study presented a high prevalence of chronic musculoskeletal pain among the elderly of 87.7%. The majority

were treated with non-pharmacological treatment options for chronic musculoskeletal pain (85.1%), compared to only 44.6% for pharmacological treatment option and 37.3% treated with both. The predictive models revealed no significant factors found to be associated with the use of non-pharmacological treatment options. Stomach disease (AOR = 2.52, 95% CI [1.11, 5.75], *P* Value = 0.028), back pain (AOR = 2.59, 95% CI [1.40, 4.79], *P* Value = 0.002) and pain severity (AOR = 2.88, 95% CI [1.52, 5.45], *P* Value = 0.001) were found to be the significant factors associated with pharmacological treatment options; while back pain (AOR = 4.38, 95% CI [1.22, 15.69], *P* Value = 0.023) and presence of comorbidity (AOR = 4.2, 95% CI [1.30, 13.54], *P* Value = 0.016) were the significant factors associated with the use of both treatment options.

This study showed a high prevalence of chronic musculoskeletal pain, which was dominated by non-pharmacological treatment options. Stomach disease, back pain and pain severity were associated with the adherence of respondents towards pharmacological treatment options while having back pain and presence of comorbidity were associated the use of both treatment options.

Keywords: Elderly, pain, musculoskeletal, treatment, back pain.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

PREVALENS KESAKITAN OTOT KRONIK DAN FAKTOR YANG BERKAITAN DENGAN PILIHAN RAWATAN DALAM KALANGAN WARGA EMAS DI KLINIK KESIHATAN TERPILIH DI SELANGOR, MALAYSIA"

Oleh

LEE FOONG SIM

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Walaupun kesakitan kronik adalah keadaan yang sangat prevalen dan sering mencacatkan golongan warga emas, masih kurang maklumat diketahui tentang prevalensnya, faktor yang berkaitan dan juga pilihan rawatan keutamaan di kalangan golongan warga emas. Kesakitan kronik berasal otot adalah fenomena yang biasa di kalangan warga emas yang sering tidak diakui dan tidak diubati. Tujuan kajian ini adalah untuk mengenalpasti prevalens kesakitan otot kronik dan faktor-faktor yang berkaitan dengan pilihan rawatan di kalangan golongan warga emas di Daerah Petaling, Selangor.

Satu kajian keratan rentas telah dijalankan bermula dari Ogos sehingga September, 2018 yang melibatkan 276 responden yang direkrut dari enam klinik kesihatan di Daerah Petaling Selangor. Satu persampelan bertingkat mengikut saiz dengan setiap klinik sebagai strata telah digunakan dalam kajian ini. Berdasarkan perkadaran yang dikira dari setiap klinik, warga emas yang layak dipilih melalui persampelan rawak sistematik berdasarkan senarai pendaftaran. Data dikumpul menggunakan soal selidik yang telah diuji dan disahkan melalui teknik wawancara bersemuka dengan setiap responden di klinik. Soal selidik terdiri daripada tujuh bahagian iaitu sosio-demografi, komorbiditi, kemurungan, keterukan kesakitan, pilihan rawatan, sikap terhadap sakit kronik dan kesakitan otot kronik. Data yang dikumpul dianalisa dengan menggunakan Pakej Statistik untuk Sains Sosial (SPSS®) IBM versi 23.0. Untuk analisis data, Analisa Chi-Square dan Fisher's Exact digunakan untuk mengukur persatuan manakala peramal diperiksa menggunakan Regresi Logistik Berganda. Nilai $P < 0.05$ dianggap sebagai signifikan secara statistik.

Daripada jumlah 282 responden yang layak, hanya 276 sahaja yang menyiapkan borang soal selidik menjadikan kadar respons sebanyak 97.9%. Hasil kajian ini menunjukkan prevalens kesakitan otot kronik yang tinggi di kalangan warga emas iaitu 87.7%. Kebanyakan dari mereka sedang dirawat dengan pilihan rawatan bukan farmakologi untuk kesakitan otot kronik (85.1%), berbanding dengan hanya 44.6% untuk pilihan rawatan farmakologi sementara 37.3% dirawat dengan rawatan kombinasi kedua-duanya. Model ramalan menunjukkan tiada sebarang peramal dijumpai untuk penggunaan rawatan bukan farmakologi. Penyakit perut (Nisbah Odds Terlaras [NOT] = 2.52, 95% Skala Keyakinan (SK) [1.11, 5.75], Nilai p = 0.028), sakit tulang belakang (NOT = 2.59, 95% SK [1.40, 4.79], Nilai p = 0.002) dan keterukan kesakitan (NOT = 2.88, 95% SK [1.52, 5.45], Nilai p = 0.001) merupakan faktor yang berkaitan dengan pilihan rawatan farmakologi; manakala sakit tulang belakang (NOT = 4.38, 95% SK [1.22, 15.69], Nilai p = 0.023) dan kehadiran komorbiditi (NOT = 4.2, 95% SK [1.30, 13.54], Nilai p = 0.016) merupakan faktor yang berkaitan dengan penggunaan pilihan rawatan kombinasi kedua-duanya.

Kajian ini mempersembahkan prevalens kesakitan otot kronik yang tinggi di kalangan golongan warga emas yang mengambil bahagian dalam kajian ini dimana kebanyakannya dikuasai oleh pilihan rawatan bukan farmakologi. Penyakit perut, sakit tulang belakang dan keterukan kesakitan merupakan faktor yang berkaitan dengan rawatan farmakologi sementara sakit tulang belakang dan kehadiran komorbiditi merupakan faktor yang berkaitan dengan penggunaan rawatan kombinasi kedua-duanya (farmakologi dan bukan farmakologi).

Kata-kata Kunci: Warga emas, kesakitan, otot, rawatan, sakit tulang belakang

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

ADL	Activities of daily living
AGS	American Geriatric Society
AOR	Adjusted odds ratio
ATCP	Attitude towards chronic pain
BPS	Biopsychosocial
CBT	Cognitive-behavioural therapy
CI	Confidence interval
CKD	Chronic kidney disease
CLBP	Chronic lower back pain
CMP	Chronic musculoskeletal pain
COPD	Chronic obstructive pulmonary disease
DM	Diabetes mellitus
DMARD	Disease-modifying antirheumatic drugs
ECAQ	Elderly cognitive assessment questionnaire
EORA	Elderly onset rheumatoid arthritis
ET	Exercise therapy
GCPS	Graded chronic pain scale
GDS	Geriatric depression scale
IQR	Inter-quartile range
LBP	Lower back pain
MMSE	Mini-mental state examination
MOH	Ministry of Health
MSK	Musculoskeletal pain
NIH	National Institutes of Health
NMRR	National Medical Research Register Malaysia
NPTO	Non-pharmacological treatment option
NSAIDs	Non-steroidal anti-inflammatory drugs

OA	Osteoarthritis
OTC	Over-the-counter
PAQ	Pain attitude questionnaire
PCA	Patient-controlled analgesia
PTO	Pharmacological treatment option
QOL	Quality of life
Q-Q PLOT	Quantile-quantile plot
RA	Rheumatoid arthritis
SD	Standard deviations
TENS	Transcutaneous electro nerve stimulation therapy
TO	Treatment option
UN	United Nations
WHO	World Health Organization
YORA	Young-onset elderly rheumatoid arthritis

CHAPTER 1

INTRODUCTION

1.1 Background of study

The world population is ageing fast. United Nations New York reported that globally, adults aged 60 years and above is projected to increase from 12.3 per cent in 2015 or one in eight people to 16.5 per cent in 2030 or one in six people. This increase translated to a projected growth from 901 million to 1.4 billion. This number is expecting to continue to rise to 2.1 billion by the year 2050 (United Nations, Department of Economic and Social Affairs, 2017)

Malaysia, a multi-ethnic country exhibits a similar trend too. According to the United Nations, between the year 2017 to 2050, the Malaysian population aged 60 and above is projected to rise from 3.074 million (9.7%) to 9.647 million (23.1%). This number is translated to a 20.8% increase in just 33 years (Population Division (2017) United Nations, Department of Economic and Social Affairs, 2017). This ageing phenomenon presents immense challenges to Malaysia's social and economic development as there will be increased demand on healthcare services, in particular, the need for multi-disciplinary and specialized geriatric care due to the increasing prevalence of non-communicable diseases and attrition of the conventional or customary family support system of the elderly (Tey et al., 2016).

The ageing process undoubtedly amplifies the incidence of health conditions, which contributes to chronic pain among the elderly. Chronic or persistent pain is a disabling condition that links to emotional, medical and economic burdens (Froncini, Lanfranchi, & Cucinotta, 2007). The typical chronic pain experienced by the elderly is of musculoskeletal origin, mostly due to the prevalence of age-related disorders (Takai, Yamamoto-mitani, Okamoto, & Koyama, 2010). Approximately 80% of the elderly experienced some form of musculoskeletal (MSK) pain and its incidence increases steadily with ageing (Donald & Foy, 2004).

MSK pain is recognised to be the leading contributing factor of disability and falls among the elderly population (Leveille et al., 2009). The most common sites of the disorder on chronic musculoskeletal pain (CMP) are the spine, knees, shoulders and feet and the four associated primary MSK conditions are osteoarthritis (OA), rheumatoid arthritis (RA), low back pain (LBP) and osteoporosis. Sleep disturbance, reduced activities, fatigue and mood alternations commonly linked to CMP. However, the impact and symptom of experience differ significantly among the elderly (Dieppe, 2013).

As reported by J.Woo et al., (2009) the prevalence of MSK pain among the Chinese elderly, both men and women, contributed to significant psychological and functional impairments. The most common underlying causes of MSK pain include arthritis, osteoporosis or soft tissue pathology and previous fractures.

1.2 Problem statement

The rapid growth of elderly population, one of the most significant demographic trend globally, and the health status of this group of the community become a vital issue medically and economically (Wan Ibrahim et al., 2017). The physiological changes associated with ageing put older adults at risk of various comorbidities such as cardiac failure, cancer, asthma, chronic obstructive pulmonary disease, diabetes, MSK disorder and depression (Moore, Boscardin, Steinman, & Schwartz, 2012).

Pain in the elderly is usually undertreated and also not being valued as a crucial health issue (Brown et al., 2011). Podichetty et al. through their systematic analysis also stressed that CMP is a common, disabling condition frequently under-reported and inadequately treated in the elderly (Podichetty, Mazanec, & Biscup, 2003). Due to the unequal treatment, it leads to a decline in the functional ability among the elderly and also affected their activities of daily living (ADL) (Kaye, Baluch, & Scott, 2010). The inability to do some of the most fundamental tasks that underlie daily function was 70–80% more common in elderly with pain than in those without and these effects were even more pronounced in those with pain in multiple sites (Patel, Guralnik, Dansie, & Turk, 2013).

MSK pain usually becomes chronic, and many cases of CMP strongly linked to degenerative diseases such as OA due to ageing. The prolonging of suffering will cause numerous components – functional and also psychosocial issues (Ushida, 2015).

The CMP generally affects the elderly ability to perform necessary ADL (Sugai, Tsuji & Matsumoto, 2017). CMP due to disorders like back pain, osteoporosis, OA can lead to immobilisation and subsequently leads to detrimental quality of life (QOL) of older adults (Edeer & Tuna, 2012). As elderly suffer in pain, it leads to depression, social isolation, sleep disturbance, ambulation decline, decreased life enjoyment and altered social relationships (Brown et al., 2011).

A plethora of treatment option (TO)s commonly manage CMP that include pharmacological [e.g. analgesic, non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroid injections] and non-pharmacological (for example self-management advice and education, physical therapy, psychosocial, acupuncture, cognitive behavioural therapy (CBT), biofeedback, bio-stimulation, massage) interventions (Babatunde et al., 2017). Many factors are contributing to optimal pain treatment among the elderly. These include socio-demographic factors, elderly cognition status, a high number of comorbidities, awareness of pain belief, fear of addiction and side

effects and pain reporting, communication problem and elderly knowledge on TOs (Veale, Woolf, & Carr, 2008). Consequently, pain management is difficult to be carried out due to the existence of multiple medical issues and the increased prevalence of treatment side-effects. Majority of researches on TOs, assessment and pain management of elderly were focusing mainly on the management of acute postoperative pain and pain related to specific chronic illnesses, but there is a lack of research conducted on the elderly CMP experience and management particularly in Malaysia context.

According to the National Health and Morbidity Survey 2006 (Mohamed Zaki & Hairi, 2014), the prevalence of chronic pain among the elderly in Malaysia was 15.2% where the incidence increased with advancing age. The highest prevalence was seen among the old-old group (80 years and older), females, Indian ethnicity, widows/widowers, rural residency and those without any education. The prevalent causes of pain among the elderly were post-stroke pain, cancer-related pain, peripheral vascular disease, post-herpetic neuralgia, painful diabetic neuropathy and MSK disorders including OA, low back and neck pain, osteoporotic fractures and chronic joint pain (United Nations, Department of Economic and Social Affairs, 2015; Mitchell, 2001). Complaints of pain increased with age in the age group of >65, where the main issue was about joints, localised OA of the knee and disability of not able to squat (Veerapen, Wigley, & Valkenburg, 2007).

Based on the contributing factors as mentioned above, more understanding of the pain pathophysiology, assessment, pharmacological and non-pharmacological management to provide more effective pain management is paramount for enhancing the ADL life of the elderly. This research studied the prevalence and associated factors of both pharmacological and non-pharmacological treatment options for CMP among community-dwelling elderly in the Petaling District of Selangor.

1.3 Research questions

- i. What is the prevalence of CMP among elderly in Petaling District Selangor?
- ii. What is the pattern of treatment options for CMP among the elderly?
- iii. What are the associated factors to treatment options (pharmacological, non-pharmacological and both) for CMP among the elderly?
- iv. What are the predicting factors for each treatment options (pharmacological, non-pharmacological and both) for CMP among the elderly?

1.4 Significance of the study

First and foremost, this study provided the baseline knowledge on the prevalence of CMP among the community-dwelling elderly, the pattern of TOs for CMP commonly adopted by the elderly and also the contributing factors associated with the available TOs to address elderly CMP conditions.

There are various reasons why community-dwelling elderly require support and care. The majority is due to declining in physical and cognitive functioning as well as unavailability of support from family members to maintain self-care (Nakrem et al., 2013). Though there are various effective pharmacological and non-pharmacological treatments readily available, there is inadequate management of pain, particularly in the elderly, which is well-documented in the United States (Smith, Purdy, & Latham, 2016). It is imperative to acknowledge the elderly's right to receive appropriate pain treatments that conserve their ability to continue with their ADL as well as for better well-being (Lucky et al., 2017).

Secondly, all the information obtained from the study able to assist the relevant authorities to develop appropriate intervention strategies and programmes to effectively manage this population within the community for prevention of CMP as well as rehabilitation (Podichetty et al., 2003; Smith et al., 2016). By improving the management and treatment of musculoskeletal pain, it may shift the threshold of disability among the elderly. Even a small increase in treatment success may reduce the degree of pain, keeping elderly independent for more extended periods in the community. It is of paramount importance to develop an effective holistic and integrated CMP intervention to improve the ADL, well-being and sustain the functional abilities of the elderly for as long as possible.

1.5 Study objectives

1.5.1 General objective

To determine the prevalence of CMP and its associated factors towards treatment options (pharmacological, non-pharmacological and both) among the elderly in public clinics Petaling District, Selangor.

1.5.2 Specific objectives

- a. To determine the prevalence of CMP and treatment options (pharmacological, non-pharmacological and both) among the elderly in six public clinics Petaling District Selangor
- b. To determine the distributions of the respondents according to the Biopsychosocial Model of biological, psychological and social factors
- c. To determine the associated factors and predictive model towards treatment options (pharmacological, non-pharmacological and both) for CMP among the elderly in six public health clinics Petaling District Selangor

1.6 Study hypothesis

- i. There is a significant association between TOs and biological factors (age, gender and presence of comorbidity)
- ii. There is a significant association between TOs and psychological factors (depression, pain severity, and attitude towards chronic pain (ATCP))
- iii. There is a significant association between TOs options and social factors (ethnicity, education background, marital status and income)



REFERENCES

- Abdulla, A., Adams, N., Bone, M., Elliott, A. M., Gaffin, J., Jones, D., ... British Geriatric Society. (2013). Guidance on the management of pain in older people. *Age and Ageing*, 42 Suppl 1. <https://doi.org/10.1093/ageing/afs200>
- AHRQ (Agency for Healthcare Research and Quality). (2017). *Non-invasive, Non-pharmacological Treatment for Chronic Pain*. Retrieved from www.effectivehealthcare.ahrq.gov
- Airaksinen, O., Brox, J. I., Cedraschi, C., Hildebrandt, J., Klüber-Moffett, J., Kovacs, F., ... Zanolì, G. (2006). Chapter 4: European guidelines for the management of chronic nonspecific low back pain. *European Spine Journal*, 15(SUPPL. 2), 192–300. <https://doi.org/10.1007/s00586-006-1072-1>
- Aittomäki, A., Lahelma, E., Rahkonen, O., Leino-Arjas, P., & Martikainen, P. (2007). The contribution of musculoskeletal disorders and physical workload to socioeconomic inequalities in health. *European Journal of Public Health*, 17(2), 145–150. <https://doi.org/10.1093/eurpub/ckl121>
- Allione, A., Pivetta, E., Pizzolato, E., Lorenzati, B., Pomero, F., Barutta, L., ... Tartaglino, B. (2017). Determinants of inappropriate acute pain management in old people unable to communicate verbally in the emergency department. *Turkish Journal of Emergency Medicine*, 17(4), 160–164. <https://doi.org/10.1016/j.tjem.2017.08.001>
- Alshammari, M. J., Ali, O. M. B., al-shamlani, S. khaled, Bashantoo, S. K., Qalib, Z. A., Al-Amri, B. Z., ... Alfallaj, E. H. (2018). Peptic Ulcer Disease in Elderly Population of Arar City, Northern Saudi Arabia. *The Egyptian Journal of Hospital Medicine*, 73(4), 6494–6501. <https://doi.org/10.12816/ejhm.2018.15116>
- Amarapurkar, D. N. (2011). Prescribing Medications in Patients with Decompensated Liver Cirrhosis. *International Journal of Hepatology*, 2011(Figure 1), 1–5. <https://doi.org/10.4061/2011/519526>
- American Geriatric Society (AGS). (2002). The Management of Persistent Pain in Older Persons. *Journal American Geriatric Society*, 50, 205–224.
- Ayres, E., Warmington, M. & Reid, M. C. (2012). Managing chronic pain in older adults: 6 steps to overcoming medication barriers. *The Journal of Family Practice*, 61(9), 0–4.
- B. E.McKenna, H.Meredith, A. Sali, G. Robert, R. L. (2015). Pain Management in the Elderly: Treatment Considerations. *Practical Pain Management*, 15(#1), 0–6.
- Babatunde, O. O., Jordan, J. L., Van Der Windt, D. A., Hill, J. C., Foster, N. E., & Protheroe, J. (2017). Effective treatment options for musculoskeletal pain in primary care: A systematic overview of current evidence. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0178621>

- Bair, M. J., Robinson, R. L., Katon, W., & Kroenke, K. (2006). Depression and Pain. *Arch Intern Med.*, *163*, 2433–2445. <https://doi.org/10.3109/9780203090640-14>
- Baker, T. A., Clay, O. J., Johnson-Lawrence, V., Minahan, J. A., Mingo, C. A., Thorpe, R. J., ... Crowe, M. (2017). Association of multiple chronic conditions and pain among older black and white adults with diabetes mellitus. *BMC Geriatrics*, *17*(1), 1–9. <https://doi.org/10.1186/s12877-017-0652-8>
- Balliet, W. E., Koch, D., Willner, I., Madan, A., Barth, K. S., Malcolm, R., ... Hernandez-Tejada, M. A. (2012). Chronic Pain among Liver Transplant Candidates. *Progress in Transplantation*, *22*(4), 379–384. <https://doi.org/10.7182/pit2012535>
- Bernheim, S. M., Ross, J. S., Krumholz, H. M., & Bradley, E. H. (2008). Influence of Patients' Socioeconomic Status on Clinical Management Decisions, 53–59. <https://doi.org/10.1370/afm.749>. Department
- Bevers, K., Brecht, D., & Gatchel, R. (2018). Pain Intervention Techniques for Older Adults: A Biopsychosocial Perspective. *EC Anaesthesia*, *3*(February), 75–88.
- Boyd; Fortin. (2010). Future of Multimorbidity Research: How Should Understanding of Multimorbidi...: Start Your Search! *Public Health Reviews*, *32*(2), 451–474. <https://doi.org/10.1007/BF03391611>
- Brabant, T., & Stichtenoth, D. (2005). Pharmacological treatment of osteoarthritis in the elderly. *Zeitschrift Fur Rheumatologie*, *64*(7), 467–472. <https://doi.org/10.1007/s00393-005-0778-5>
- Bradford, E. ., Hartzell, M., Asih, S., Hulla, R., & Gatchel, R. . (2015). Pain Management in the Elderly: Treatment Considerations. *Practical Pain Management*, *15*(1).
- Bressler, R., & Bahl, J. J. (2003). Principles of Drug Therapy for the Elderly Patient. *Mayo Clinic Proceedings*, *78*(12), 1564–1577. <https://doi.org/10.4065/78.12.1564>
- Briggs, A. M., Cross, M. J., Hoy, D. G., Sánchez-Riera, L., Blyth, F. M., Woolf, A. D., & March, L. (2016). Musculoskeletal Health Conditions Represent a Global Threat to Healthy Aging: A Report for the 2015 World Health Organization World Report on Ageing and Health. *Gerontologist*, *56*, S243–S255. <https://doi.org/10.1093/geront/gnw002>
- Brown, S. T., Kirkpatrick, M. K., Swanson, M. S., & Mckenzie, I. L. (2011). Pain Experience of the Elderly. *Pain Management Nursing*, *12*(4), 190–196. <https://doi.org/10.1016/j.pmn.2010.05.004>
- Bruckenthal, P. (2010). Integrating Nonpharmacologic and Alternative Strategies Into a Comprehensive Management Approach for Older Adults With Pain. *Pain Management Nursing*, *11*(2), S23–S31. <https://doi.org/10.1016/j.pmn.2010.03.004>

- Burton, K. A., Tillotson, K. M., Main, C. ., & Hollis, S. (1995). Psychosocial Predictors of Outcome in Acute and Subchronic Low Back Trouble.pdf. *Spine*, 20(6), 722–728.
- Campbell, C. M., & Edwards, R. R. (2012). Ethnic differences in pain and pain management. *Pain Management*, 2(3), 219–230. <https://doi.org/10.2217/pmt.12.7>
- Campbell, C. M., Edwards, R. R., & Fillingim, R. B. (2005). Ethnic differences in responses to multiple experimental pain stimuli. *Pain*, 113(1–2), 20–26. <https://doi.org/10.1016/j.pain.2004.08.013>
- Carey, T. S., Freburger, J. K., Holmes, G. M., Castel, L., Darter, J., Agans, R., ... Jackman, A. (2009). A long way to go: Practice patterns and evidence in chronic low back pain care. *Spine*, 34(7), 718–724. <https://doi.org/10.1097/BRS.0b013e31819792b0>
- Carlson, H., & Carlson, N. (2011). An overview of the management of persistent musculoskeletal pain. *Therapeutic Advances Musculoskeletal Disease*, 3(2), 91–99. Retrieved December 05, 2017, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3382682/pdf/10.1177_1759720X11398742.pdf
- Carroll, L. J., Cassidy, J. D., & Côté, P. (2000). The Saskatchewan health and back pain survey: The prevalence and factors associated with depressive symptomatology in Saskatchewan adults. *Canadian Journal of Public Health*, 91(6), 459–464. <https://doi.org/10.1007/bf03404830>
- Caughey, G. E., Roughead, E. E., Vitry, A. I., McDermott, R. A., Shakib, S., & Gilbert, A. L. (2010). Comorbidity in the elderly with diabetes: Identification of areas of potential treatment conflicts. *Diabetes Research and Clinical Practice*, 87(3), 385–393. <https://doi.org/10.1016/j.diabres.2009.10.019>
- Cayea, D., Perera, S., & Weiner, D. K. (2006). Chronic low back pain in older adults: What physicians know, what they think they know, and what they should be taught. *Journal of the American Geriatrics Society*, 54(11), 1772–1777. <https://doi.org/10.1111/j.1532-5415.2006.00883.x>
- Chakrabarty, S. N. (2013). Best Split-Half and Maximum Reliability. *IOSR Journal of Research & Method in Education (IOSRJRME)*, 3(1), 01–08. <https://doi.org/10.9790/7388-0310108>
- Chodosh, J., Solomon, D. H., Roth, C. P., Chang, J. T., MacLean, C. H., Ferrell, B. A., ... Wenger, N. S. (2004). The Quality of Medical Care Provided to Vulnerable Older Patients with Chronic Pain. *Journal of the American Geriatrics Society*, 52(5), 756–761. <https://doi.org/10.1111/j.1532-5415.2004.52214.x>
- Chou, R., Fanciullo, G., Fine, P., Adler, J., Ballantyne, J., Daies, P., ... Miasklowski, C. (2017). Clininal Guidelines for the Use of Chronic Opioid Therapy in Chronic Non-cancer Pain. *Journal of Pain*, 32(7), 736–740.

<https://doi.org/10.1016/j.jpain.2008.10.008>. Clinical

- Christensen, K., Doblhammer, G., Rau, R., & Vaupel, J. W. (2010). Ageing populations: the challenges ahead. *PMC*, 374(9696), 1196–1208. [https://doi.org/10.1016/S0140-6736\(09\)61460-4](https://doi.org/10.1016/S0140-6736(09)61460-4). Ageing
- Chung, J., Zeng, M., & Wong, T. (2013). Drug Therapy for the Treatment of Chronic Nonspecific Low Back Pain: Systematic Review and Meta-analysis. *Pain Physician*, 16, 685–704.
- Cicekci, E., Ozisler, Z., Ozel, S., Unsal-delialioglu, S., & Ozisler, C. (2017). The Factors of Musculoskeletal Pain in Geriatric Patients and the Relationship between Pain and Quality of Life. *International Journal of Clinical Medicine*, 8, 504–513. <https://doi.org/10.4236/ijcm.2017.88047>
- Clemente, M. A., Rabasco, P., Iannelli, G., Villonio, A., Lotumolo, A., Gioioso, M., ... Cammarota, A. (2018). Vertebral Compression Fractures in Elderly: How to Recognize and Report. *Current Radiology Reports*, 6(9). <https://doi.org/10.1007/s40134-018-0289-1>
- Connelly, P. (American G. S. (1998). The Management of Chronic Pain in Older Persons. *The American Geriatrics Society*, 46, 635–651.
- Cornally, N., & Mccarthy, G. (2011). Chronic Pain: The Help-Seeking Behavior, Attitudes, and Beliefs of Older Adults Living in the Community. *Pain Management Nursing*, 12(4), 206–217. <https://doi.org/10.1016/j.pmn.2010.12.006>
- Cunningham, N. R., & Kashikar-Zuck, S. (2014). Nonpharmacologic Treatment of Pain in Rheumatic Diseases and Other Musculoskeletal Pain Conditions. *Curr Rheumatol Rep.*, 15(2), 306. <https://doi.org/10.1007/s11926-012-0306-y>
- Davison, S. (2019). Considerations in Pain Management in Patients with Advanced Kidney Failure. *Clinical Journal of the American Society of Nephrology: CJASN*, 14(6), 917–931. <https://doi.org/10.2215/CJN.05180418>
- Decker, S. A., Culp, K. R., & Cacchione, P. Z. (2009). Evaluation of Musculoskeletal Pain Management Practices in Rural Nursing Homes Compared with Evidence-Based Criteria. *Pain Management Nursing*, 10(2), 58–64. <https://doi.org/10.1016/j.pmn.2008.02.008>
- Denkinger, M. D., Lukas, A., Nikolaus, T., Peter, R., & Franke, S. (2014). Multisite pain, pain frequency and pain severity are associated with depression in older adults: results from the ActiFE Ulm study. *Age and Ageing*, 43, 510–514. <https://doi.org/10.1093/ageing/afu013>
- Denkinger, M. D., Lukas, A., Nikolaus, T., Peter, R., Franke, S., Geiger, H., ... Rapp, K. (2014). Multisite pain, pain frequency and pain severity are associated with depression in older adults: Results from the ActiFE Ulm study. *Age and Ageing*, 43(4), 510–514. <https://doi.org/10.1093/ageing/afu013>

- Department of Economic and Social Affairs. (2016). Health Inequalities in Old Age. *Programme on Ageing The Focal Point on Ageing in the United Nation System, 2015*(October), 4,5.
- Di Silvestre, M., Lolli, F., & Bakaloudis, G. (2014). Degenerative lumbar scoliosis in elderly patients: Dynamic stabilization without fusion versus posterior instrumented fusion. *Spine Journal, 14*(1), 1–10. <https://doi.org/10.1016/j.spinee.2012.10.023>
- Diabetes, V. I. I., & In, C. (2011). Standards of medical care in diabetes-2011. *Diabetes Care, 34*(SUPPL.1). <https://doi.org/10.2337/dc11-S011>
- Dieppe, P. (2013). Chronic Musculoskeletal Pain. *Peninsula College of Medicine and Dentistry, Exeter, 3146*(May).
- Dionne, C. E., Von Korff, M., Koepsell, T. D., Deyo, R. A., Barlow, W. E., & Checkoway, H. (2001). Formal education and back pain: A review. *Journal of Epidemiology and Community Health, 55*(7), 455–468. <https://doi.org/10.1136/jech.55.7.455>
- Dionne, Clermont E., Dunn, K. M., & Croft, P. R. (2006). Does back pain prevalence really decrease with increasing age? A systematic review. *Age and Ageing, 35*(3), 229–234. <https://doi.org/10.1093/ageing/afj055>
- Donald, I. P., & Foy, C. (2004). A longitudinal study of joint pain in older people, *43*(10), 1256–1260. <https://doi.org/10.1093/rheumatology/keh298>
- DOSM. (2016). Department of Statistics Malaysia Press Release Vital Statistics Current Population Estimates, Malaysia, 2014-2016, (July), 1–3.
- Durso, S. C. (2006). Using Clinical Guidelines Designed for Older Adults With Diabetes Mellitus and Complex Health Status. *JAMA, 295*(16), 1935–1940.
- Edeer, Ayse Ozcan and Tuna, H. (2012). Management of Chronic Musculoskeletal Pain in the Elderly : Dilemmas and Remedies. *Intech Open Science*, (Chapter 5).
- Edeer, A. ., & Tuna, H. (2012). Management of Chronic Musculoskeletal Pain in the Elderly: Dilemmas and Remedies. In *Pain In Perspective*. <https://doi.org/10.5772/50780>
- Edwards, R. R., Doleys, D. M., Fillingim, R. B., & Lowery, D. (2001). Ethnic differences in pain tolerance: Clinical implications in a chronic pain population. *Psychosomatic Medicine, 63*(2), 316–323. <https://doi.org/10.1097/00006842-200103000-00018>
- Edwards, R. R., Moric, M., Husfeldt, B., Buvanendran, A., & Ivankovich, O. (2005). Ethnic similarities and differences in the chronic pain experience: A comparison of African American, Hispanic, and white patients. *Pain Medicine, 6*(1), 88–98. <https://doi.org/10.1111/j.1526-4637.2005.05007.x>

- Eggermont, L. H. P., Leveille, S. G., Shi, L., Kiely, D. K., Shmerling, R. H., Jones, R. N., ... Bean, J. F. (2014). Pain characteristics associated with the onset of disability in older adults: The maintenance of balance, independent living, intellect, and zest in the elderly boston study. *Journal of the American Geriatrics Society*, 62(6), 1007–1016. <https://doi.org/10.1111/jgs.12848>
- Fan, A. Y., Miller, D. W., Bolash, B., Bauer, M., Mcdonald, J., & Faggert, S. (2017). Global Views Acupuncture's Role in Solving the Opioid Epidemic: Evidence, Cost-Effectiveness, and Care Availability for Acupuncture as a Primary, Non-Pharmacologic Method for Pain Relief and Management — White Paper 2017. *Journal of Integrative Medicine*, 15(6), 411–425. [https://doi.org/10.1016/S2095-4964\(17\)60378-9](https://doi.org/10.1016/S2095-4964(17)60378-9)
- Fashner, J., & Gitu, A. (2015). Diagnosis and treatment of Helicobacter pylori infection in peptic ulcer disease. *American Family Physician*, 91(4), 236–242. Retrieved from <http://www.ccfmrp.com/assets/pud-1-.pdf>
- Feinstein, J. S. (1993). The Relationship between Socioeconomic Status and Health: A Review of the Literature. *The Milbank Quarterly*, 71(2), 279. <https://doi.org/10.2307/3350401>
- Felson, D. T. (2000). NIH Conference Osteoarthritis : New Insights. *Annals of Internal Medicine*, 133(8), 637–639. <https://doi.org/10.7326/0003-4819-133-8-200010170-00016>
- Figueira, I., Fernandes, A., Mladenovic, A., Lopez-contreras, A., Henriques, C. M., Selman, C., ... Bellantuono, I. (2016). Interventions for age-related diseases : Shifting the paradigm. *Mechanisms of Ageing and Development*, 160, 69–92. <https://doi.org/10.1016/j.mad.2016.09.009>
- Fisher, J. E., Ballantyne, P. J., & Hawker, G. A. (2012). Older adults living with osteoarthritis: Examining the relationship of age and gender to medicine use. *Canadian Journal on Aging*, 31(3), 323–333. <https://doi.org/10.1017/S0714980812000256>
- Folstein, M., Folstein, S., & McHugh, P. (1975). Mini-mental state. A grading the cognitive state of patients for the clinician. *J Psychiatr Res*, 12, 189–198. [https://doi.org/10.1016/0022-3956\(75\)90026-6](https://doi.org/10.1016/0022-3956(75)90026-6)
- Fortin, M., Stewart, M., Poitras, M., & Maddocks, H. (2012). A Systematic Review of Prevalence Studies on Multimorbidity: Toward a More Uniform Methodology, 142–151. <https://doi.org/10.1370/afm.1337>.INTRODUCTION
- Fowler, T., Edlund, B., & Durham, C. (2014). Managing knee osteoarthritis in older adults Nonselective oral NSAIDs. *American Nurse Today*, 9(7).
- Fried, T. R., Tinetti, M. E., Iannone, L., O, J. R., Towle, V., & Van Ness, P. H. (2014). Health Outcome Prioritization as a Tool for Decision Making among Older Persons with Multiple Chronic Conditions. *Arch Intern Med.*, 171(20), 1854–1856. <https://doi.org/10.1001/archinternmed.2011.424>

- Fron dini, C., Lanfranchi, G., & Cucinotta, D. (2007). Affective, Behavior and Cognitive Disorders in the Elderly with Chronic Musculoskeletal Pain: The Impact on an Aging Population. *Arch. Gerontol. Geriatr. Suppl.*, 1, 167–171. <https://doi.org/10.2320/materia.46.171>
- Fulmer, T.T., Mion, L.C., and Bottrell, M.M. (1996). Pain Management Protocol. *Geriatric Nursing*, (October), 222–226.
- Fusco, D., Lattanzio, F., Tosato, M., Corsonello, A., Cherubini, A., Volpato, S., ... Onder, G. (2009). Development of CRiteria to assess appropriate Medication use among Elderly complex patients (CRIME) project: rationale and methodology. *Drugs & Aging*, 26 Suppl 1, 3–13. <https://doi.org/10.2165/11534620-000000000-00000>
- Gagliese, L., & Melzack, R. (2003). Age-related differences in the qualities but not the intensity of chronic pain. *Pain*, 104(3), 597–608. [https://doi.org/10.1016/S0304-3959\(03\)00117-9](https://doi.org/10.1016/S0304-3959(03)00117-9)
- Gatchel, Robert J; Howard, K. J. (2018). The Biopsychosocial Approach. *Practical Pain Management*, 8(4), 302.
- Gerrits, M. M. J. G., Marwijk, H. W. J. Van, Oppen, P. Van, Horst, H. Van Der, & Penninx, B. W. J. H. (2015). Longitudinal association between pain, and depression and anxiety over four years. *Journal of Psychosomatic Research*, 78(1), 64–70. <https://doi.org/10.1016/j.jpsychores.2014.10.011>
- Gibson, S. J., & Helme, R. D. (2001). Age-related differences in pain perception and report. *Clinics in Geriatric Medicine*, 17(3), 433–456. [https://doi.org/10.1016/S0749-0690\(05\)70079-3](https://doi.org/10.1016/S0749-0690(05)70079-3)
- Gijzen, R., Hoeymans, N., Schellevis, F. G., Ruwaard, D., Satariano, W. A., & Van Den Bos, G. A. M. (2001). Causes and consequences of comorbidity: A review. *Journal of Clinical Epidemiology*, 54(7), 661–674. [https://doi.org/10.1016/S0895-4356\(00\)00363-2](https://doi.org/10.1016/S0895-4356(00)00363-2)
- Gloth, M. J., & Matesi, A. M. (2001). Physical therapy and exercise in pain management. *Clinics in Geriatric Medicine*, 17(3), 525–535. [https://doi.org/10.1016/S0749-0690\(05\)70084-7](https://doi.org/10.1016/S0749-0690(05)70084-7)
- Goldman, N., Korenman, S., & Weinstein, R. (1995). Marital status and health among the elderly. *Social Science and Medicine*, 40(12), 1717–1730. [https://doi.org/10.1016/0277-9536\(94\)00281-W](https://doi.org/10.1016/0277-9536(94)00281-W)
- Goldstein, N. E., & Morrison, R. S. (2005). Treatment of pain in older patients, 54, 157–164. <https://doi.org/10.1016/j.critrevonc.2005.01.001>
- Gouke, C., Scheer, S., & Katz, B. (2005). *Pain in Residential Aged Care Facilities Management Strategies*.
- Green, C. R., Baker, T. A., Smith, E. M., & Sato, Y. (2003). The effect of race in older adults presenting for chronic pain management: A comparative study of black and white Americans. *Journal of Pain*, 4(2), 82–90.

<https://doi.org/10.1054/jpai.2003.8>

- Guerriero, F., Bolier, R., Van Cleave, J. H., & Reid, C. (2016). Pharmacological Approaches for the Management of Persistent Pain in Older Adults. *J Gerontol Nurs*, 25(3), 289–313. <https://doi.org/10.1007/s11065-015-9294-9>.
- Guisado-Clavero, M., Violán, C., López-Jimenez, T., Roso-Llorach, A., Pons-Vigués, M., Muñoz, M. A., & Foguet-Boreu, Q. (2019). Medication patterns in older adults with multimorbidity: A cluster analysis of primary care patients. *BMC Family Practice*, 20(1), 1–12. <https://doi.org/10.1186/s12875-019-0969-9>
- Gureje, O., Von Korff, M., Simon, G. E., & Gater, R. (1998). Persistent Pain and Well-being. *Jama*, 280(2), 147. <https://doi.org/10.1001/jama.280.2.147>
- Gurwitz, J. H. (2004). Polypharmacy: A new paradigm for quality drug therapy in the elderly? *Archives of Internal Medicine*, 164(18), 1957–1959. <https://doi.org/10.1001/archinte.164.18.1957>
- Hagen, K., Bovim, G., Zwart, J. A., Svebak, S., & Stovner, L. J. (2005). Low socioeconomic status is associated with chronic musculoskeletal complaints among 46,901 adults in Norway. *Scandinavian Journal of Public Health*, 33(4), 268–275. <https://doi.org/10.1080/14034940510005699>
- Hairi, N. N., Cumming, R. G., Blyth, F. M., & Naganathan, V. (2013). Chronic pain, impact of pain and pain severity with physical disability in older people - Is there a gender difference? *Maturitas*, 74(1), 68–73. <https://doi.org/10.1007/s00222-016-0708-y>
- Hall-Lord, M. L., Larsson, G., & Steen, B. (1999). Chronic pain and distress among elderly in the community: Comparison of patients' experiences with enrolled nurses' assessments. *Journal of Nursing Management*, 7(1), 45–54. <https://doi.org/10.1046/j.1365-2834.1999.00991.x>
- Hartvigsen, J., Hancock, M. J., Kongsted, A., Louw, Q., Ferreira, M. L., Genevay, S., ... Underwood, M. (2018). What low back pain is and why we need to pay attention. *Www.TheLancet.Com*, 391. [https://doi.org/10.1016/S0140-6736\(18\)30480-X](https://doi.org/10.1016/S0140-6736(18)30480-X)
- Hartvigsen, J., Natvig, B., & Ferreira, M. (2013). Is it all about a pain in the back? *Best Practice & Research Clinical Rheumatology*, 27, 613–623. <https://doi.org/10.1016/j.berh.2013.09.008>
- Heins, J. K., Heins, A., Grammas, M., Costello, M., Huang, K., & Mishra, S. (2006). Disparities in Analgesia and Opioid Prescribing Practices for Patients With Musculoskeletal Pain in the Emergency Department. *Journal of Emergency Nursing*, 32(3), 219–224. <https://doi.org/10.1016/j.jen.2006.01.010>
- Hilmer, S. N., & Gnjidic, D. (2009). The effects of polypharmacy in older adults. *Clinical Pharmacology and Therapeutics*, 85(1), 86–88. <https://doi.org/10.1038/clpt.2008.224>

- Hirase, T., Kataoka, H., Inokuchi, S., Nakano, J., Sakamoto, J., & Okita, M. (2017). Factors associated with chronic musculoskeletal pain in Japanese community-dwelling older adults. *Medicine*.
- Hirase, T., Kataoka, H., Inokuchi, S., Nakano, J., Sakamoto, J., & Okita, M. (2018). Effects of Exercise Training Combined with Increased Physical Activity to Prevent Chronic Pain in Community-Dwelling Older Adults: A Preliminary Randomized Controlled Trial. *Pain Research and Management*, 2018, 1–7. <https://doi.org/10.1155/2018/2132039>
- Holmes, A., Christelis, N., & Arnold, C. (2012). Depression and chronic pain. *Medical Journal of Australia*, 1(October), 17–20. <https://doi.org/10.5694/mjao12.10589>
- Horgas, A. L., & Elliott, A. F. (2004). Pain assessment and management in persons with dementia. *Nursing Clinics of North America*, 39(3), 593–606. <https://doi.org/10.1016/j.cnur.2004.02.013>
- Hosmer, D., & Lemeshow, S. (2000). Applied Logistic Regression. <https://doi.org/10.1074/jbc.272.33.20373>
- Hoy, D., Bain, C., Williams, G., March, L., Brooks, P., Blyth, F., ... Buchbinder, R. (2012). A systematic review of the global prevalence of low back pain. *Arthritis and Rheumatism*, 64(6), 2028–2037. <https://doi.org/10.1002/art.34347>
- Hu, Y., & Goldman, N. (1990). Mortality Differentials by Marital Status: An International Comparison. *Demography*, 27(2), 233–250. <https://doi.org/10.2307/2061451>
- Huang, E. S. (2016). Management of diabetes mellitus in older people with comorbidities. *BMJ (Online)*, 353(June), 1–12. <https://doi.org/10.1136/bmj.i2200>
- Hung, M., Bounsanga, J., Voss, M. W., Crum, A. B., Chen, W., & Birmingham, W. C. (2017). The relationship between family support; pain and depression in elderly with arthritis. *Psychology, Health and Medicine*, 22(1), 75–86. <https://doi.org/10.1080/13548506.2016.1211293>
- Ickowicz, E. (2009). Pharmacological management of persistent pain in older persons. *Journal of the American Geriatrics Society*, 57(8), 1331–1346. <https://doi.org/10.1111/j.1532-5415.2009.02376.x>
- Iii, F. M. G. (2011). Pharmacological Management of Persistent Pain in Older Persons: Focus on Opioids and Nonopioids. *The Journal of Pain*, 12(3), S14–S20. <https://doi.org/10.1016/j.jpain.2010.11.006>
- Ikeda, T., Sugiyama, K., Aida, J., Tsuboya, T., Watabiki, N., Kondo, K., & Osaka, K. (2019). Socioeconomic inequalities in low back pain among older people: The JAGES cross-sectional study. *International Journal for Equity in Health*, 18(1), 1–11. <https://doi.org/10.1186/s12939-019-0918-1>

- Iiffe, S., Kharicha, K., Carmaciu, C., Harari, D., Swift, C., Gillman, G., & Stuck, A. E. (2009). The relationship between pain intensity and severity and depression in older people: Exploratory study. *BMC Family Practice*, *10*, 1–7. <https://doi.org/10.1186/1471-2296-10-54>
- International Diabetes Federation. (2017). IDF Worldwide Diabetes Atlas 2017. <https://doi.org/http://www.diabetesatlas.org/>. (accessed 7 December 2015)
- Ishak, N. A., Zahari, Z., & Justine, M. (2016). Effectiveness of Strengthening Exercises for the Elderly with Low Back Pain to Improve Symptoms and Functions: A Systematic Review. *Scientifica*, *2016*. <https://doi.org/10.1155/2016/3230427>
- Jacobsson, L., Lindgarde, F., Manthorpe, R., & Ohlsson, K. (1992). Effect of education, occupation and some lifestyle factors on common rheumatic complaints in a Swedish group aged 50-70 years. *Annals of the Rheumatic Diseases*, *51*(7), 835–843. <https://doi.org/10.1136/ard.51.7.835>
- Jirathanathornnukul, N., Limthongkul, W., Yingsakmongkol, W., Singhatanadgige, W., Parkpian, V., & Honsawek, S. (2016). Increased expression of vascular endothelial growth factor is associated with hypertrophic ligamentum flavum in lumbar spinal canal stenosis. *Journal of Investigative Medicine*, *64*(4), 882–887. <https://doi.org/10.1136/jim-2015-000024>
- Johnson, N. J., Backlund, E., Sorlie, P. D., & Loveless, C. A. (2000). Marital status and mortality: The National Longitudinal Mortality Study. *Annals of Epidemiology*, *10*(4), 224–238. [https://doi.org/10.1016/S1047-2797\(99\)00052-6](https://doi.org/10.1016/S1047-2797(99)00052-6)
- Jones, L. D., Pandit, H., & Lavy, C. (2014). Back pain in the elderly: A review. *Maturitas*, *78*(4), 258–262. <https://doi.org/10.1016/j.maturitas.2014.05.004>
- Jordan, K. P., Thomas, E., Peat, G., Wilkie, R., & Croft, P. (2008). Social risks for disabling pain in older people: A prospective study of individual and area characteristics. *Pain*, *137*(3), 652–661. <https://doi.org/10.1016/j.pain.2008.02.030>
- Jüni, P., Low, N., Reichenbach, S., Villiger, P. M., Williams, S., & Dieppe, P. A. (2010). Gender inequity in the provision of care for hip disease: Population-based cross-sectional study. *Osteoarthritis and Cartilage*, *18*(5), 640–645. <https://doi.org/10.1016/j.joca.2009.12.010>
- Karttunen, N. M., Turunen, J., Ahonen, R., & Hartikainen, S. (2014). More attention to pain management in community-dwelling older persons with chronic musculoskeletal pain. *Age and Ageing*, *43*(6), 845–850. <https://doi.org/10.1093/ageing/afu052>
- Kavanaugh, A. F. (2004). Rheumatoid arthritis in the elderly: Is it a different disease? *The American Journal of Medicine*, *103*(6), S40–S48. [https://doi.org/10.1016/s0002-9343\(97\)90007-3](https://doi.org/10.1016/s0002-9343(97)90007-3)

- Kaye, A. ., Baluch, A. ., Kaye, R. ., Niaz, R. ., Kaye, A. ., & Fox, C. . (2014). Geriatric pain management , pharmacological nonpharmacological considerations. *Psychology & Neuroscience*, 7(1), 15–26. <https://doi.org/10.3922/j.psns.2014.1.04>
- Kaye, A., Baluch, A., & Scott, J. . (2010). Pain Management in the Elderly Population: A Review. *The Oschner Journal*, 10(3), 179–187. <https://doi.org/10.1043/TOJ-10-018.1>
- Kerr, E. A., Heisler, M., Krein, S. L., Kabeto, M., Langa, K. M., Weir, D., & Piette, J. D. (2007). Beyond comorbidity counts: How do comorbidity type and severity influence diabetes patients' treatment priorities and self-management? *Journal of General Internal Medicine*, 22(12), 1635–1640. <https://doi.org/10.1007/s11606-007-0313-2>
- Kjeken, I., Smedslund, G., Dagfinrud, H., Grotle, M., Moe, R. H., Hagen, K. B., & Østerås, N. (2012). Exercise therapy for bone and muscle health: an overview of systematic reviews. *BMC Medicine*, 10(1). <https://doi.org/10.1186/1741-7015-10-167>
- Koes, B. W., Backes, D., & Bindels, P. J. E. (2018). Pharmacotherapy for chronic non-specific low back pain: current and future options. *Expert Opinion on Pharmacotherapy*, 19(6), 537–545. <https://doi.org/10.1080/14656566.2018.1454430>
- Koes, B. W., van Tulder, M. W., Ostelo, R., Kim Burton, A., & Waddell, G. (2001). Clinical Guidelines for the Management of Low Back Pain in Primary Care. *Spine*, 26(22), 2504–2513. <https://doi.org/10.1097/00007632-200111150-00022>
- Korff, M. V. O. N., & Wagner, E. H. (1991). Chronic Pain and Use of Ambulatory Health Care. *Psychosomatic Medicine*, 79(53), 61–79.
- Kovačević, S. V., Simišić, M., Rudinski, S. S., Čulafić, M., Vučićević, K., Prostran, M., & Miljković, B. (2014). Potentially inappropriate prescribing in older primary care patients. *PLoS ONE*, 9(4), 1–7. <https://doi.org/10.1371/journal.pone.0095536>
- Kress, H.-G., Ahlbeck, K., Aldington, D., Alon, E., Coaccioli, S., Coluzzi, F., ... Sichère, P. (2014). Managing chronic pain in elderly patients requires a CHANGE of approach. *Current Medical Research and Opinion*, 30(6), 1153–1164. <https://doi.org/10.1185/03007995.2014.887005>
- Kudrina, I., Shir, Y., & Fitzcharles, M. A. (2015). Multidisciplinary treatment for rheumatic pain. *Best Practice and Research: Clinical Rheumatology*, 29(1), 156–163. <https://doi.org/10.1016/j.berh.2015.04.029>
- Kumar, A., Ashwlayan, V., Verma, M., & Abdul, A. (2019). Diagnostic approach & pharmacological treatment regimen of Peptic Ulcer Disease. *Phar Pharm Res Open Acc J*, 1(1), 1–12. <https://doi.org/10.30881/pproj.00001>
- Kviz, F. J. (1977). Toward a Standard Definition of Response Rate.

- Laird, R., & Udeshi, A. R. (2016). Chronic Musculoskeletal Pain: Initial Pharmacological and Nonpharmacological Therapies. *Today's Geriatric Medicine*, 2(March/April), 10.
- Lapane, K. L., Sands, M. R., Yang, S., McAlindon, T. E., & Eaton, C. B. (2012). Use of complementary and alternative medicine among patients with radiographic-confirmed knee osteoarthritis. *Osteoarthritis and Cartilage*, 20(1), 22–28. <https://doi.org/10.1016/j.joca.2011.10.005>
- Larson, S. L., Clark, M. R., & Eaton, W. W. (2004). Depressive disorder as a long-term antecedent risk factor for incident back pain: A 13-year follow-up study from the Baltimore Epidemiological catchment area sample. *Psychological Medicine*, 34(2), 211–219. <https://doi.org/10.1017/S0033291703001041>
- Lautenbacher, S., Kunz, M., Strate, P., Nielsen, J., & Arendt-Nielsen, L. (2005). Age effects on pain thresholds, temporal summation and spatial summation of heat and pressure pain. *Pain*, 115(3), 410–418. <https://doi.org/10.1016/j.pain.2005.03.025>
- Lemeshow, S., Hosmer, D. W., Klar, J., & Lwanga, S. K. (1990). *Adequacy of Sample Size in Health Studies*. Retrieved March 15, 2019, from https://apps.who.int/iris/bitstream/handle/10665/41607/0471925179_eng.pdf;jsessionid=70C1541632185BA2546108B450340E72?sequence=1
- Leong, I. Y., Farrell, M. J., Helme, R. D., & Gibson, S. J. (2007). The relationship between medical comorbidity and self-rated pain, mood disturbance, and function in older people with chronic pain. *Journals of Gerontology - Series A Biological Sciences and Medical Sciences*, 62(5), 550–555. <https://doi.org/10.1093/gerona/62.5.550>
- Lépine, J. P., & Briley, M. (2004). The epidemiology of pain in depression. *Human Psychopharmacology*, 19(SUPPL. 1). <https://doi.org/10.1002/hup.618>
- LeResche, L. (2011). Defining gender disparities in pain management. *Clinical Orthopaedics and Related Research*, 469(7), 1871–1877. <https://doi.org/10.1007/s11999-010-1759-9>
- Letchuman, G. R., Wan Nazaimoon, W. M., Wan Mohamad, W. B., Chandran, L. R., Tee, G. H., Jamaiyah, H., ... Ahmad Faudzi, Y. (2010). Prevalence of diabetes in the Malaysian National Health Morbidity Survey III 2006. *Medical Journal of Malaysia*, 65(3), 173–179.
- Leveille, S. G., Jones, R. N., Kiely, D. K., Hausdorff, J. M., Shmerling, R. H., & Kiel, D. P. (2009). and the Occurrence of Falls in an Older Population, 302(20).
- Liyanatul, N., Minhat, H. (2016). Knowledge on maintaining cold chain for childhood immunisation vaccines at the primary healthcare setting malaysia. *International Journal of Public Health and Clinical Sciences*, 3(4), 110–122.
- Loftis, T., Ellis, B., & Margham, T. (2014). Musculoskeletal Conditions and Multimorbidity. *Arthritis Research UK's Policy and Public Affairs*, (February 2018), 1–4. <https://doi.org/10.1055/b-0034-75016>

- Lucky TM, Ahmed SS, Zaman SB, Biswas A, Choyan NA, et al. (2017). Pattern of Musculoskeletal Disorder among Geriatric People Residing Old Home. *MOJ Public Health*, 5(4), 4–7. <https://doi.org/10.15406/mojph.2017.05.00134>
- Mackenbach, J. P. (1992). Socio-economic health differences in the Netherlands: A review of recent empirical findings. *Social Science and Medicine*, 34(3), 213–226. [https://doi.org/10.1016/0277-9536\(92\)90264-Q](https://doi.org/10.1016/0277-9536(92)90264-Q)
- Mailis-Gagnon, A., Lakha, S. F., Louffat, T. O. A., Yegneswaran, B., Umana, M., Cohodarevic, T., ... Deshpande, A. (2011). Chronic noncancer pain: Characteristics of patients prescribed opioids by community physicians and referred to a tertiary pain clinic. *Canadian Family Physician*, 57(3), 97–105.
- Majjad, A., Errahali, Y., Toufik, H., Djossou, J. H., Ghassem, M. A., Kasouati, J., & El Maghraoui, A. (2018). Musculoskeletal Disorders in Patients with Diabetes Mellitus: A Cross-Sectional Study. *International Journal of Rheumatology*, 2018(March 2016). <https://doi.org/10.1155/2018/3839872>
- Malik, A., Hussein, M., & Deepak, S. (2009). The Malaysian LOW BACK PAIN management guidelines. First Edition., 26.
- Manchikanti, L., Manchikanti, K. N., Cash, K. A., Singh, V., & Giordano, J. (2008). Age-related prevalence of facet-joint involvement in chronic neck and low back pain. *Pain Physician*, 11(1), 67–75.
- Mangoni, A. A., & Jackson, S. H. D. (2004). Age-related changes in pharmacokinetics and pharmacodynamics: Basic principles and practical applications. *British Journal of Clinical Pharmacology*, 57(1), 6–14. <https://doi.org/10.1046/j.1365-2125.2003.02007.x>
- Mannucci, P. M., Nobili, A., Tettamanti, M., Pasina, L., Franchi, C., Sparacio, E., ... Pignatti, F. (2014). Multimorbidity and polypharmacy in the elderly: Lessons from REPOSI. *Internal and Emergency Medicine*, 9(7), 723–734. <https://doi.org/10.1007/s11739-014-1124-1>
- Mäntyselkä, P., Kumpusalo, E., Ahonen, R., & Takala, J. (2001). Patients' versus general practitioners' assessments of pain intensity in primary care patients with non-cancer pain. *British Journal of General Practice*, 51(473), 995–997.
- Marchesini, G., Bianchi, G., Amodio, P., Salerno, F., Merli, M., Panella, C., ... Abbiati, R. (2001). Factors associated with poor health-related quality of life of patients with cirrhosis. *Gastroenterology*, 120(1), 170–178. <https://doi.org/10.1053/gast.2001.21193>
- Marcum, Z. A., Duncan, N. A., & Makris, U. E. (2016). Pharmacotherapies in Geriatric Chronic Pain Management. *Clinics in Geriatric Medicine*, 32(4), 705–724. <https://doi.org/10.1016/j.cger.2016.06.007>
- Marengoni, A., Angleman, S., Melis, R., Mangialasche, F., Karp, A., Garmen, A., ... Fratiglioni, L. (2011). Aging with multimorbidity: A systematic review of the literature. *Ageing Research Reviews*, 10(4), 430–439. <https://doi.org/10.1016/j.arr.2011.03.003>

- Maung, T., & Phyu, H. (2018). Co-morbidities and associated factors among elderly Malaysians. *Journal of Dental and Medical Sciences*, 17(12), 68–74. <https://doi.org/10.9790/0853-1712016874>
- Maximova, T., Ng, N., Yawson, A., Peltzer, K., Arokiasamy, P., Chatterji, S., ... Wu, F. (2015). Risk Factors and Disability Associated with Low Back Pain in Older Adults in Low- and Middle-Income Countries. Results from the WHO Study on Global AGEing and Adult Health (SAGE). *Plos One*, 10(6), e0127880. <https://doi.org/10.1371/journal.pone.0127880>
- Maxwell, C. J., Dalby, D. M., Slater, M., Patten, S. B., Hogan, D. B., Eliasziw, M., & Hirdes, J. P. (2008). The prevalence and management of current daily pain among older home care clients. *Pain*, 138(1), 208–216. <https://doi.org/10.1016/j.pain.2008.04.007>
- McKellar, G. (2007). Rheumatoid arthritis: appropriate treatment in older people. *Prescriber*, 18(7), 54–60. <https://doi.org/10.1002/psb.55>
- Melikterminas, E., Ranganath, V., & Furst, D. (2008). Treatment of the elderly rheumatoid arthritis patient. *Future Rheumatology*, 3(3), 235–238. Retrieved July 24, 2019, from <http://www.embase.com/search/results?subaction=viewrecord&from=export&id=L351984102%5Cnhttp://www.futuremedicine.com/doi/pdf/10.2217/17460816.3.3.235%5Cnhttp://dx.doi.org/10.2217/17460816.3.3.235%5Cnhttp://www.tdnet.com/gml/resolver/default.asp?sid=EMBASE>
- Merashli, M., Chowdhury, T. A., Jawad, A. S. M., Royal, T., Hospital, L., Royal, T., & Hospital, L. (2015). Musculoskeletal Manifestations of Diabetes Mellitus. *International Journal of Medicine*, 108(11), 853–857.
- Miranda, V. S., Bf Decarvalho, V., Machado, L. A., Marcos, J., & Dias, D. (n.d.). Prevalence of chronic musculoskeletal disorders in elderly Brazilians: a systematic review of the literature. <https://doi.org/10.1186/1471-2474-13-82>
- Mirishova, S., & Ali Hammad, Y. (2018). Pain Management in Patients with Impaired Kidney Function. *Intech Open Science*, 13. <https://doi.org/http://dx.doi.org/10.5772/intechopen.81695> Abstract
- Mitchell, C. (2001). Assessment and management of chronic pain in elderly people, (1997).
- Mohajan, H. K. (2017). Two Criteria for Good Measurements in Research: Validity and Reliability. *Annals of Spiru Haret University. Economic Series*, 17(4), 59–82. <https://doi.org/10.26458/1746>
- Mohamed Zaki, L. R., & Hairi, N. N. (2014). Chronic pain and pattern of health care utilization among Malaysian elderly population: National Health and Morbidity Survey III (NHMS III, 2006). *Maturitas*, 79(4), 435–441. <https://doi.org/10.1016/j.maturitas.2014.08.014>

- Mohammad, N. M. N., & Abbas, M. Y. (2012). Elderly Environment in Malaysia: Impact of Multiple Built Environment Characteristics. *Procedia - Social and Behavioral Sciences*, 49, 120–126. <https://doi.org/10.1016/j.sbspro.2012.07.011>
- Mojtaba Vaismoradi, & Bondas, S. S. & T. E. (2016). Normalizing suffering : A meta-synthesis of experiences of and perspectives on pain and pain management in nursing homes. *International Journal of Qualitative Studies on Health and Well-Being*, 11.
- Molton, I. R., & Terrill, A. L. (2014a). Overview of Persistent Pain in Older Adults. <https://doi.org/10.1037/a0035794>
- Molton, I. R., & Terrill, A. L. (2014b). Overview of Persistent Pain in Older Adults. <https://doi.org/10.1037/a0035794>
- Moore, K. L., Boscardin, W. J., Steinman, M. A., & Schwartz, J. B. (2012). Age and sex variation in prevalence of chronic medical conditions in older residents of U.S. Nursing homes. *Journal of American Geriatric Society*, 60(4), 756–764. <https://doi.org/10.1111/j.1532-5415.2012.03909.x>
- Morlion, B. (2013). Chronic low back pain: Pharmacological, interventional and surgical strategies. *Nature Reviews Neurology*, 9(8), 462–473. <https://doi.org/10.1038/nrneurol.2013.130>
- Naci, H., & Loannidis, J. P. . (2013). Comparative effectiveness of exercise and drug interventions on mortality outcomes: metaepidemiological study. *BMJ (Online)*, 347. <https://doi.org/10.1136/bmj.f5577>
- Nakamura, M., Nishiwaki, Y., Ushida, T., & Toyama, Y. (2014). Prevalence and characteristics of chronic musculoskeletal pain in Japan: A second survey of people with or without chronic pain. *Journal of Orthopaedic Science*, 19(2), 339–350. <https://doi.org/10.1007/s00776-013-0525-8>
- Nakrem S., Visnes A.G., Harkless G. Paulsen B., & S. A. (2013). Ambiguities: Residents' experience of "nursing home as my home." *International Journal of Older People Nursing*, 8, 216–225.
- Nations, U. (2017). *Population*.
- Nobili, A., Garattini, S., & Mannucci, P. M. (2011). Multiple Diseases and Polypharmacy in the Elderly: Challenges for the Internist of the Third Millennium. *Journal of Comorbidity*, 1(1), 28–44. <https://doi.org/10.15256/joc.2011.1.4>
- Noroozian, M., Raeesi, S., Hashemi, R., Khedmat, L., & Vahabi, Z. (2018). Pain: The neglect issue in old people's life. *Open Access Macedonian Journal of Medical Sciences*, 6(9), 1773–1778. <https://doi.org/10.3889/oamjms.2018.335>
- Olver, J. S., & Hopwood, M. J. (2012). Depression and physical illness. *Medical Journal of Australia*, 1(October), 9–12. <https://doi.org/10.5694/mjao12.10597>

- Pandey, M. (2008). *Association between marital status and health: examining the role of age and gender*. Retrieved January 01, 2020, from <https://mpra.ub.uni-muenchen.de/15923/>
- Panta, O. B., Songmen, S., Maharjan, S., Subedi, K., Ansari, M. A., & Ghimire, R. K. (2015). Morphological Changes in Degenerative Disc Disease on Magnetic Resonance Imaging: Comparison Between Young and Elderly. *Journal of Nepal Health Research Council*, *13*(31), 209–213.
- Patel, K. V., Guralnik, J. M., Dansie, E. ., & Turk, D. C. (2013). Prevalence and impact of pain among older adults in the United States: findings from the 2011 National Health and Aging Trends Study. *Pain*, *154*(12), 1–22. <https://doi.org/10.1016/j.pain.2013.07.029>.Prevalence
- Payne, R. A., Avery, A. J., Duerden, M., Saunders, C. L., Simpson, C. R., & Abel, G. A. (2014). Prevalence of polypharmacy in a Scottish primary care population. *European Journal of Clinical Pharmacology*, *70*(5), 575–581. <https://doi.org/10.1007/s00228-013-1639-9>
- Picavet, H. S. J., & Schouten, J. S. A. G. (2003). Musculoskeletal pain in the Netherlands: prevalences, consequences and risk groups, the DMC(3)-study. *Pain*, *102*(1–2), 167–178. Retrieved December 30, 2019, from <http://www.mendeley.com/catalog/musculoskeletal-pain-netherlands-prevalences-consequences-risk-groups-dmc-3-study/>
- Pilotto, A., Franceschi, M., Maggi, S., Addante, F., & Sancarlo, D. (2010). Optimal management of peptic ulcer disease in the elderly. *Drugs and Aging*, *27*(7), 545–558. <https://doi.org/10.2165/11537380-000000000-00000>
- Podichetty, V. K., Mazanec, D. J., & Biscup, R. S. (2003). Chronic non-malignant musculoskeletal pain in older adults: clinical issues and opioid intervention. *Postgraduate Medical Journal*, *79*, 627–633. Retrieved December 19, 2017, from <http://pmj.bmj.com/content/postgradmedj/79/937/627.full.pdf>
- Prostran, M., Vujovic, K. S., Vuckovic, S., Medic, B., Srebro, D., Divac, N., ... Cerovac, N. (2016). Pharmacotherapy of pain in the older population: The place of opioids. *Frontiers in Aging Neuroscience*, *8*(JUN), 1–7. <https://doi.org/10.3389/fnagi.2016.00144>
- Rao, A., & Cohen, H. J. (2004). Symptom management in the elderly cancer patient: fatigue, pain, and depression. *Journal of the National Cancer Institute. Monographs*, *27710*(32), 150–157. <https://doi.org/10.1093/jncimonographs/lgh031>
- Raveendran, A. V, Chacko, E. C., & Pappachan, J. M. (2018). Non-pharmacological Treatment Options in the Management of Diabetes Mellitus. *European Endocrinology*, *14*(2), 31–39. Retrieved March 16, 2019, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6182920/pdf/euendo-14-31.pdf>

- Reid, M. C. (2015). Management of chronic pain in older adults. *The BMJ*, *91*, 399–404.
- Reisner, L. (2011). Pharmacological management of persistent pain in older persons. *Journal of Pain*, *12*(3 SUPPL.), 1331–1346. <https://doi.org/10.1016/j.jpain.2011.01.001>
- Riley, J. L., Wade, J. B., Myers, C. D., Sheffield, D., Papas, R. K., & Price, D. D. (2002). Racial/ethnic differences in the experience of chronic pain. *Pain*, *100*(3), 291–298. [https://doi.org/10.1016/S0304-3959\(02\)00306-8](https://doi.org/10.1016/S0304-3959(02)00306-8)
- Riley, J. L., Wade, J. B., Robinson, M. E., & Price, D. D. (2000). The stages of pain processing across the adult lifespan. *Journal of Pain*, *1*(2), 162–170. [https://doi.org/10.1016/S1526-5900\(00\)90101-9](https://doi.org/10.1016/S1526-5900(00)90101-9)
- Riskowski, J. L. (2014). Associations of socioeconomic position and pain prevalence in the united states: Findings from the national health and nutrition examination survey. *Pain Medicine (United States)*, *15*(9), 1508–1521. <https://doi.org/10.1111/pme.12528>
- Robeck, I. (1993). Chronic pain in the elderly: Special challenges. *Practical Pain Management*, *8*(4), 27–37. <https://doi.org/10.1097/00013614-199306000-00005>
- Roberts, M. H., Mapel, D. W., Hartry, A., Von Worley, A., & Thomson, H. (2013). Chronic pain and pain medication use in chronic obstructive pulmonary disease: A cross-sectional study. *Annals of the American Thoracic Society*, *10*(4), 290–298. <https://doi.org/10.1513/AnnalsATS.201303-0400C>
- Robles, T. F., Slatcher, R. B., Trombello, J. M., & McGinn, M. M. (2014). Marital quality and health: A meta-analytic review. *Psychological Bulletin*, *140*(1), 140–187. <https://doi.org/10.1037/a0031859>
- Rogal, S. S., Winger, D., Bielefeldt, K., Rollman, B. L., & Szigethy, E. (2013). Healthcare utilization in chronic liver disease: The importance of pain and prescription opioid use. *Liver International*, *33*(10), 1497–1503. <https://doi.org/10.1111/liv.12215>
- Rogal, S. S., Winger, D., Bielefeldt, K., & Szigethy, E. (2013). Pain and opioid use in chronic liver disease. *Digestive Diseases and Sciences*, *58*(10), 2976–2985. <https://doi.org/10.1007/s10620-013-2638-5>
- Rozenberg, S., Foltz, V., & Fautrel, B. (2012). Treatment strategy for chronic low back pain. *Joint Bone Spine*, *79*(6), 555–559. <https://doi.org/10.1016/j.jbspin.2012.09.003>
- Safdar, B., Heins, A., Homel, P., Miner, J., Neighbor, M., Desandre, P., ... Fosnocht, D. (2009). Impact of physician and patient gender on pain management in the emergency department - A multicenter study. *Pain Medicine*, *10*(2), 364–372. <https://doi.org/10.1111/j.1526-4637.2008.00524.x>

- Sakai, Y., Ito, K., Hida, T., Ito, S., & Harada, A. (2015). Pharmacological management of chronic low back pain in older patients: A randomized controlled trial of the effect of pregabalin and opioid administration. *European Spine Journal*, 24(6), 1309–1317. <https://doi.org/10.1007/s00586-015-3812-6>
- Salaffi, F., Ciapetti, A., & Carotti, M. (2012). Pain assessment strategies in patients with musculoskeletal conditions. *Reumatismo*, 64(4), 216–229. <https://doi.org/10.4081/reumatismo.2012.216>
- Sangha, O., Stucki, G., Liang, M. H., Fossel, A. H., & Katz, J. N. (2003). The self-administered comorbidity questionnaire: A new method to assess comorbidity for clinical and health services research. *Arthritis & Rheumatism*, 49(2), 156–163. <https://doi.org/10.1002/art.10993>
- Satghare, P., Chong, S. A., Vaingankar, J., Picco, L., Abdin, E., Chua, B. Y., & Subramaniam, M. (2016). Prevalence and Correlates of Pain in People Aged 60 Years and above in Singapore : Results from the WiSE Study, 2016.
- Savvas, S., & Gibson, S. (2015). Pain management in residential aged care facilities, 44(4), 198–204.
- Schofferman, J., & Mazanec, D. (2008). Evidence-informed management of chronic low back pain with opioid analgesics. *Spine Journal*, 8(1), 21–27. <https://doi.org/10.1016/j.spinee.2007.10.006>
- Scott, & Guyatt. (2010). Cautionary tales in the interpretation of clinical studies involving older persons (Archives of Internal Medicine (2010) 170, 7 (587-595)). *Archives of Internal Medicine*, 170(11), 927. <https://doi.org/10.1001/archinternmed.2010.160>
- Shafiee, G., Mohajeri-Tehrani, M., Pajouhi, M., & Larijani, B. (2012). The importance of hypoglycemia in diabetic patients. *Journal of Diabetes and Metabolic Disorders*, 11(1), 1. <https://doi.org/10.1186/2251-6581-11-17>
- Shanti, B., Tan, G., & Shanti, I. (2012). Adjuvant Analgesia for Management of Chronic Pain. *Practical Pain Management*, 1–13.
- Smith, T., Purdy, R., & Latham, S. (2016). The prevalence , impact and management of musculoskeletal disorders in older people living in care homes : a systematic review . White Rose Research Online URL for this paper : Article : Smith , TO , Purdy , R , Latham , SK et. *Rheumatology International*, 36(1), 55–64. <https://doi.org/https://doi.org/10.1007/s00296-015-3322-1>
- Soares, J. J. F., Sundin, Ö., & Grossi, G. (2004). The stress of musculoskeletal pain: A comparison between primary care patients in various ages. *Journal of Psychosomatic Research*, 56(3), 297–305. [https://doi.org/10.1016/S0022-3999\(03\)00078-3](https://doi.org/10.1016/S0022-3999(03)00078-3)
- Sousa, R. M., Ferri, C. P., Acosta, D., Albanese, E., Guerra, M., Huang, Y., ... Prince, M. (2009). Contribution of chronic diseases to disability in elderly people in countries with low and middle incomes: a 10/66 Dementia Research Group population-based survey. *The Lancet*, 374(9704), 1821–1830.

[https://doi.org/10.1016/S0140-6736\(09\)61829-8](https://doi.org/10.1016/S0140-6736(09)61829-8)

- Sozen, T., Calik Basaran, N., Tinazli, M., & Ozisik, L. (2018). Musculoskeletal problems in diabetes mellitus. *European Journal of Rheumatology*, 5, 258–265. <https://doi.org/10.5152/eurjrheum.2018.18044>
- Steinman, M. A., Seth Landefeld, C., Rosenthal, G. E., Berthenthal, D., Sen, S., & Kaboli, P. J. (2006). Polypharmacy and prescribing quality in older people. *Journal of the American Geriatrics Society*, 54(10), 1516–1523. <https://doi.org/10.1111/j.1532-5415.2006.00889.x>
- Stubbs, B., Schofield, P., Patchay, S., & Leveille, S. (2015). Title: Musculoskeletal pain characteristics associated with lower balance confidence in community-dwelling older adults. *Physiotherapy*. <https://doi.org/10.1016/j.physio.2015.03.3721>
- Sugai, K., Tsuji, O., & Matsumoto, M. (2017). Orthopaedic Surgery Chronic musculoskeletal pain in Japan (The final report of the 3-year longitudinal study): Association with a future decline in activities of daily living, 25(3), 1–6. <https://doi.org/10.1177/2309499017727945>
- Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education*, 48(6), 1273–1296. <https://doi.org/10.1007/s11165-016-9602-2>
- Taffet, G., Donohue, J., & Altman, P. (2014). Considerations for managing chronic obstructive pulmonary disease in the elderly. *Clinical Interventions in Aging*, 9, 23–30. <https://doi.org/10.2147/CIA.S52999>
- Takai, Y., Yamamoto-mitani, N., Okamoto, Y., & Koyama, K. (2010). Literature Review of Pain Prevalence Among Older Residents of Nursing Homes. *Pain Management Nursing*, 11(4), 209–223.
- Takeda, T. (2016). Treatment of elderly rheumatoid arthritis. *Japan Clinical Immunology*, 39(6), 497–504. <https://doi.org/10.2177/jsci.39.497>
- Tan, G., Craine, M. H., Bair, M. J., Garcia, M. K., Giordano, J., Jensen, M. P., ... Tsao, J. C. I. (2007). Efficacy of selected complementary and alternative medicine interventions for chronic pain. *The Journal of Rehabilitation Research and Development*, 44(2), 195. <https://doi.org/10.1682/jrrd.2006.06.0063>
- Taylor-Stokes, G., Lobosco, S., Pike, J., Sadosky, A. B., & Ross, E. (2011). Relationship Between Patient-Reported Chronic Low Back Pain Severity and Medication Resources. *Clin Ther*, 33, 1739–1748. <https://doi.org/10.1016/j.clinthera.2011.09.026>
- Tey, N. P., Siraj, S. B., Kamaruzzaman, S. B. B., Chin, A. V., Tan, M. P., Sinnappan, G. S., & Müller, A. M. (2016). Aging in multi-ethnic Malaysia. *Gerontologist*, 56(4), 603–609. <https://doi.org/10.1093/geront/gnv153>

- Thomas, E., Peat, G., Harris, L., Wilkie, R., & Croft, P. R. (2004). 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*, *110*(1–2), 361–368. <https://doi.org/10.1016/j.pain.2004.04.017>
- Tobias, D. E. (2003). Start Low and Go Slow. *Hospital Pharmacy*, *38*(7), 634–636.
- Tracy, B., & Morrison, R. S. (2013). Pain Management in Older Adults. *Clinical Therapeutics*, *35*(11), 1659–1668. <https://doi.org/10.1016/j.clinthera.2013.09.026>
- Treede, R., Rief, W., Barke, A., Aziz, Q., Bennett, M. I., Benoliel, R., ... Wang, S. (2015). A classification of chronic pain for ICD-11, *156*(6).
- Tse, M. M. ., & Ho, S. S. . (2013). Pain Management for Older Persons Living in Nursing Homes : A Pilot Study. *Pain Management Nursing*, *14*(2), e10–e21. <https://doi.org/10.1016/j.pmn.2011.01.004>
- Turunen, J. H. O., Mäntyselkä, P. T., Kumpusalo, E. A., & Ahonen, R. S. (2004). How do people ease their pain? A population-based study. *Journal of Pain*, *5*(9), 498–504. <https://doi.org/10.1016/j.jpain.2004.08.003>
- Tutuncu, Z., & Kavanaugh, A. (2007). Treatment of elderly rheumatoid arthritis. *Future Rheumatology*, *2*(3), 313–319. <https://doi.org/10.2217/17460816.2.3.313>
- United Nations, Department of Economic and Social Affairs, Population Division (2015). (2015). World Population Ageing.
- United Nations, Department of Economic and Social Affairs, Population Division (2017). (2017). *World Population Ageing 2017 - Highlights*.
- Urwin, M., Symmons, D., Allison, T., Brammah, T., Busby, H., Roxby, M., ... Williams, G. (1998). Estimating the burden of musculoskeletal disorders in the community: The comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Annals of the Rheumatic Diseases*, *57*(11), 649–655. <https://doi.org/10.1136/ard.57.11.649>
- Ushida, T. (2015). Burdensome problems of chronic musculoskeletal pain and future prospects. *Journal of Orthopaedic Science*, *20*(6), 958–966. <https://doi.org/10.1007/s00776-015-0753-1>
- Van Den Akker, M., Buntinx, F., Roos, S., & Knottnerus, J. A. (2001). Problems in determining occurrence rates of multimorbidity. *Journal of Clinical Epidemiology*, *54*(7), 675–679. [https://doi.org/10.1016/S0895-4356\(00\)00358-9](https://doi.org/10.1016/S0895-4356(00)00358-9)
- Van Der Leeuw, G., Ayers, E., Leveille, S. ., Blankenstein, A. ., Van Der Horst, H. E., Verghese, J., & Verghese, J. (2018). The Effect of Pain on Major Cognitive Impairment in Older Adults. *Journal of Pain*, *19*(12), 1435–1444. <https://doi.org/10.1016/j.jpain.2018.06.009>

- Vasudevan, S. V., Potts, E. E., & Mehrotra, C. (2003). Pain Management in Arthritis: Evidence-Based Guidelines. *Wisconsin Medical Journal*, 102(7), 14–18.
- Veal, F., Williams, M., Bereznicki, L., Cummings, E., Thompson, A., Peterson, G., & Winzenberg, T. (2017). Barriers to Optimal Pain Management in Aged Care Facilities : An Australian Qualitative Study. *Pain Management Nursing*, 1–9. <https://doi.org/10.1016/j.pmn.2017.10.002>
- Veale, D. J., Woolf, A. D., & Carr, A. J. (2008). Chronic musculoskeletal pain and arthritis: Impact, attitudes and perceptions. *Irish Medical Journal*, 101(7).
- Veerapen, K., Wigley, R. D., & Valkenburg, H. (2007). Musculoskeletal Pain in Malaysia: A COPCORD Survey. *The Journal of Rheumatology*. Retrieved from <https://pdfs.semanticscholar.org/5d50/09427dd507c9f7749b9ee4c2e779b31644a5.pdf>
- Vogeli, C., Shields, A. E., Lee, T. A., Gibson, T. B., Marder, W. D., Weiss, K. B., & Blumenthal, D. (2005). Multiple Chronic Conditions : Prevalence , Health Consequences , and Implications for Quality , Care Management , and Costs, 391–395. <https://doi.org/10.1007/s11606-007-0322-1>
- Von Korff, M., Ormel, J., & Keefe, F. (1992). Graded Chronic Pain Scale (GCPS) Scoring Criteria for Grading Chronic Pain Severity Characteristic Pain Intensity is a 0 to 100 score derived from Questions 1 through 3 : Disability Points Disability Days (0-180 Days) 0-6 Days 7-14 Days 15-30 Days Cla. *Pain*, 9–10.
- Vos, T., Allen, C., Arora, M., Barber, R. M., Brown, A., Carter, A., ... Zuhlke, L. J. (2016). Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: A systematic analysis for the Global Burden of Disease Study 2015. *The Lancet*, 388(10053), 1545–1602. [https://doi.org/10.1016/S0140-6736\(16\)31678-6](https://doi.org/10.1016/S0140-6736(16)31678-6)
- Vu, T., Finch, C. F., & Day, L. (2011). Patterns of comorbidity in community-dwelling older people hospitalised for fall-related injury: A cluster analysis. *BMC Geriatrics*, 11. <https://doi.org/10.1186/1471-2318-11-45>
- Wan Ibrahim, W., Mohd Ashi, S., Othman, N., Mohd Zukri, S., Anwar, R., Miskiman, N., ... Abdul Shukor, F. (2017). Silver Tsunami. *Population and Demographics*, 1, 1–2.
- Wandner, L.D., Heft, M.W., Lok, B.C., Hirsh, A.T., George, S.Z., Horgas, A.L., Atchison, J.W., Torres, C.A., and Robinson, M.E. (2015). THE IMPACT OF PATIENTS’ GENDER, RACE, AND AGED ON HEALTH CARE PROFESSIONALS ’ PAIN MANAGEMENT DECISIONS : AN ONLINE SURVEY USING VIRTUAL HUMAN. *International Journal of Nursing Studies*, 51(5), 726–733. <https://doi.org/10.1016/j.ijnurstu.2013.09.011>.THE
- Wang, S. J., Liu, H. C., Fuh, J. L., Liu, C. Y., Wang, P. N., & Lu, S. R. (1999). Comorbidity of headaches and depression in the elderly. *Pain*, 82(3), 239–243. [https://doi.org/10.1016/S0304-3959\(99\)00057-3](https://doi.org/10.1016/S0304-3959(99)00057-3)

- Weiner, D. K., Sakamoto, S., Perera, S., & Breuer, P. (2006). Chronic low back pain in older adults: Prevalence, reliability, and validity of physical examination findings. *Journal of the American Geriatrics Society*, *54*(1), 11–20. <https://doi.org/10.1111/j.1532-5415.2005.00534.x>
- Weinstein, J. N., Lurie, J. D., Tosteson, T. D., Zhao, W., Blood, E. A., Tosteson, A. N., ... Hu, S. S. (2009). Surgical Compared with Nonoperative Treatment for Lumbar Degenerative Spondylolisthesis. *The Journal of Bone and Joint Surgery-American Volume*, *91*(6), 1295–1304. <https://doi.org/10.2106/jbjs.h.00913>
- Weiss, C. (2007). Patterns of Prevalent Major Chronic Disease. *Jama*, *298*(10), 1160–1163.
- Whitson, H. E., Landerman, L. R., Newman, A. B., Fried, L. P., Pieper, C. F., & Cohen, H. J. (2010). Chronic medical conditions and the sex-based disparity in disability: The cardiovascular health study. *Journals of Gerontology - Series A Biological Sciences and Medical Sciences*, *65* A(12), 1325–1331. <https://doi.org/10.1093/gerona/gdq139>
- WHO. (2019). *COPD : Definition*. World Health Organization.
- Wijnhoven, H. A. H., De Vet, H. C. W., & Picavet, H. S. J. (2007). Sex differences in consequences of musculoskeletal pain. *Spine*, *32*(12), 1360–1367. <https://doi.org/10.1097/BRS.0b013e31805931fd>
- Wolff, J. L., Starfield, B., & Anderson, G. (2002). Prevalence, expenditures, and complications of multiple chronic conditions in the elderly. *Archives of Internal Medicine*, *162*(20), 2269–2276. <https://doi.org/10.1001/archinte.162.20.2269>
- Wong, A. Y. L., Karppinen, J., & Samartzis, D. (2017). Low back pain in older adults : risk factors , management options and future directions. *Scoliosis and Spinal Disorders*, 1–23. <https://doi.org/10.1186/s13013-017-0121-3>
- Woo, J., Leung, J., & Lau, E. (2009a). Prevalence and correlates of musculoskeletal pain in Chinese elderly and the impact on 4-year physical function and quality of life. *Public Health*, *123*(8), 549–556. <https://doi.org/10.1016/j.puhe.2009.07.006>
- Woo, J., Leung, J., & Lau, E. (2009b). Prevalence and correlates of musculoskeletal pain in Chinese elderly and the impact on 4-year physical function and quality of life. *Public Health*, *123*, 549–556. <https://doi.org/10.1016/j.puhe.2009.07.006>
- World Health Organization. (2002). *Active Ageing - A Policy Framework* (2nd Edn), 1–60.
- World Health Organization. (2016). *Multimorbidity: Technical Series on Safer Primary Care*.

- Yach, D., Hawkes, C., Linn Gould, C., & Haman, K. J. (2004). The Global Burden of Chronic Diseases Overcoming Impediments to Prevention and Control. *JAMA - Journal of the American Medical Association*, 291(21), 2626-2622. Retrieved from www.iama.com
- Yesavage, J. A. (1988). Geriatric Depression Scale (Short Version). *Psychopharmacology Bulletin*, 24(4), 709-711.
- Yong, H., Gibson, S. J., & Helme, R. D. (2001). Development of a Pain Attitudes Questionnaire to Assess Stoicism and Cautiousness for Possible Age Differences, 56(5), 279-284.
- Yoshihara, H. (2012). Sacroiliac joint pain after lumbar/lumbosacral fusion: Current knowledge. *European Spine Journal*, 21(9), 1788-1796. <https://doi.org/10.1007/s00586-012-2350-8>
- Yu, H., & Tang, F. (2011). Use, Perceived Effectiveness, and Gender Differences of Pain Relief Strategies Among the Community-Dwelling Elderly in Taiwan. *Pain Management Nursing*, 12(1), 41-49. <https://doi.org/10.1016/j.pmn.2009.10.002>
- Yu, S., Yu, ---Hsing-Yi, Tang, F.-I., Yeh, M.-C., & Ing-Tiau Kuo, B. (2011). Use, Perceived Effectiveness, and Gender Differences of Pain Relief Strategies Among the Community-Dwelling Elderly in Taiwan. *Pain Management Nursing*, 12(1), 41-49. <https://doi.org/10.1016/j.pmn.2009.10.002>
- Yuan, Q. L., Wang, P., Liu, L., Sun, F., Cai, Y. S., Wu, W. T., ... Zhang, Y. G. (2016). Acupuncture for musculoskeletal pain: A meta-analysis and meta-regression of sham-controlled randomized clinical trials. *Scientific Reports*, 6(July), 1-24. <https://doi.org/10.1038/srep30675>
- ZA, Z., O, Z., & Ah, C. W. (2007). Validation of Malay Mini Mental State Examination. *Malaysian Journal of Psychiatry*, 16, 16-19.
- Zheng, H., & Thomas, P. A. (2013). Marital Status, Self-Rated Health, and Mortality: Overestimation of Health or Diminishing Protection of Marriage? *Journal of Health and Social Behavior*, 54(1), 128-143. <https://doi.org/10.1177/0022146512470564>