CARLoquium 2021

Conference Program

March 2-4, 2021

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CARLOQUIUM 2021

The Chiropractic Academy for Research Leadership (CARL) Program is a grassroots initiative about positive, forward-looking, credible academic leadership within chiropractic. It aims to link promising early/mid stage career researchers who are dedicated to developing high-quality evidence regarding chiropractic as well as a global research network. CARL facilitates training on a range of mentoring, leadership, networking and research-specific skills relevant to early/mid-career researchers.

CARL is a core collaborative initiative of three senior research academics at three Universities (Professor Jon Adams, University of Technology Sydney, Australia, Professor Greg Kawchuk, University of Alberta, Canada and Professor Jan Hartvigsen, University of Southern Denmark). All three Professors have extensive experience and track records in health sciences research and mentoring and leadership and all three Universities have developed extensive programs and track records in chiropractic research.

As a result of the success of the first CARL cohort, organizations from Europe, North America, and Australia have supported a second cohort of 14 CARL fellows, who were competitively accepted into the program in early 2020. The CARL II fellows are proud to host the inaugural CARLoquium, a virtual conference for the chiropractic community to meet, chat, and share research.

CHIROPRACTIC ACADEMY FOR RESEARCH LEADERSHIP

The CARL 11 fellows behind CARLOQUIUM 2021

Sasha Aspinall

Murdoch University, Western Australia

Research Interests: Neurophysiological mechanisms associated with spinal manipulation, cham procedures and placebo effects

Andrée-Anne Marchand

UQTR, Canada

Research Interests: Conservative care to improve perioperative outcomes, risk factors of disability, impact of aging processes on functional capacities

Cecilie K. Øverås

University of Southern Denmark, Denmark

Research Interests: Prognosis and prevention of spinal pain, physical behaviour, eHealth and self-management, research implementation

Aron Downie

Macquarie University, Australia

Research Interests: Screening for pathology in back pain, patient-centered recovery, automated and manual methods of spinal assessment

David McNaughton

Macquarie University, Australia

Research Interests: Role of psychological and perceptual processes in persistent physical symptoms

Luana Nyirö

Balgrist University Hospital, Zurich

Research Interests: Specific and unspecific psychophysical and biomechanical effects of spinal manipulation

Jessica Wong

University of Toronto, Canada

Research Interests: Chronic disease and clinical epidemiology, health services research, musculoskeletal health, spinal pain, and knowledge synthesis

Eric Roseen

Boston University, USA

Research Interests: Improving the treatment of common musculoskeletal conditions in primary care settings, particularly in low-income and under-served communities.

Steen Harsted

University of Southern Denmark, Denmark

Research Interests: Aspects of biomechanics such as markerless motion capture, motion patterns and future risk of injury, and spinal stiffness

Hazel Jenkins

Macquarie University, Australia

Research Interests: Use of imaging in the *management* of musculoskeletal pain and dysfunction, implementation of evidence into clinical practice

James Young

University of Southern Denmark, Denmark

Research Interests: Musculoskeletal multimorbidity, outcome measure science, health system strengthening for musculoskeletal disorders

Kenneth Weber

Stanford University, USA

Research Interests: Develop markers of pain and physical function using machine-learning and advanced brain, spinal cord, and musculoskeletal magnetic resonance imaging

Amy Miller

Bournemouth University, UK

Research Interests: Infant manual therapy, infant feeding, inter-professional education and collaborative practice, pragmatic mixed-methods research

Casper Glissman Nim

University of Southern Denmark,Denmark

Research Interests: Neurophysiological changes, and biomechanical effects of spinal manipulation, shift of pain trajectory pattern, vitalism in chiropractic students

Jan Hartvigsen

Greg Kawchuk

Jon Adams

https://www.carlresearchfellows.org

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CARLOQUIUM 2021

Conference program at a glance

Day 1

- **Opening keynote presentation - Auditorium** (20 minute session)
  – DR CHRISTINA TERMINI
  Speaking on: The impact of the COVID-19 pandemic on early career researchers: channeling optimism amidst challenging circumstances

- **Scientific posters SESSION 1 & 2** – **Exposition hall** (80 minute session)

- **Keynote presentation - Auditorium** (20 minute session)
  – DR STEPHANI SUTHERLAND
  Speaking on: COVID-19 and the nervous system

End of Day 1 - Beach gathering

Day 2

- **Awards presentation - Auditorium** (20 minute session)

- **Keynote presentation - Auditorium** (20 minute session)
  – PROF MARK HANCOCK
  Speaking on: Evidence informed diagnosis of low back pain

- **Scientific posters SESSION 1 & 2** – **Exposition hall** (80 minute session)

Closing remarks

End of Day 2 - Beach gathering

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CARLOQUIUM 2021

Sponsors of the inaugural CARLoquium

Keynote Speakers

Dr. Christina Termini received her Ph.D. in Biomedical Sciences from the University of New Mexico where she studied acute myeloid leukemia signaling. She is currently a University of California President's Postdoctoral Fellow at the University of California, Los Angeles where she studies how proteoglycans regulate hematopoietic stem cell maintenance and bone marrow regeneration.

During her postdoctoral training, Dr. Termini has established herself as a dedicated mentor and rising leader in efforts focused on improving diversity, equity, and inclusion in scientific research. Dr. Termini looks forward to beginning an independent research career after completing her postdoctoral training and share her passion for cell biology with scientists from all walks of life.

Dr. Stephani Sutherland, PhD, is a freelance science journalist, neuroscientist, and all-around communicator. Dr. Sutherland has been writing since 2001 and has produced scientific communications for audiences ranging from kids to neuroscientists and everyone in between, for journals, newspaper, magazines, TV, radio and online. In recent years, she has focused on covering pain research and the public health crisis of chronic pain.

Dr. Sutherland is a frequent contributor at the Pain Research Forum, a website for researchers, and its sister site for patients, RELIEF.news. Her work has also appeared in Scientific American, Knowable Magazine, the Los Angeles Times, New Scientist and other outlets. In 2020, like so many science journalists, Dr. Sutherland pivoted to covering COVID-19, and she has authored a series on the coronavirus and its effects on the nervous system for Scientific American. She will be discussing some of the research reported in those articles.

Professor Mark Hancock is a Professor of Physiotherapy, Faculty of Medicine, Health and Human Science, Macquarie University. He has over 20 years of clinical experience as a musculoskeletal physiotherapist working in a primary care setting. His research focuses on the diagnosis and management of back pain.

Professor Hancock completed his PhD at the University of Sydney in 2007. He has published over 160 peer reviewed papers and received over $9 million in funding to support his research. He has published in leading medical journals (e.g. NEJM, Lancet and BMJ and discipline specific journals (e.g. Spine and Journal of Physiotherapy). His work has been accompanied by editorials and received wide media attention. Professor Hancock is a member of the associate editorial board for the Cochrane Back Review Group and Journal of Physiotherapy board member.

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CARLOQUIUM 2021

Conference program – Day 1

Auditorium (20 minute session)

Opening keynote presentation – DR CHRISTINA TERMINI

Speaking on: **The impact of the COVID-19 pandemic on early career researchers: channeling optimism amidst challenging circumstances**

The COVID-19 pandemic has led to major restructuring of traditional research activities to support the health and safety of individuals across the world. Research practices have been remodeled by limiting in-person interactions, shifting to virtual meetings/conferences, and by reducing research operations overall. This talk, will discuss mechanisms by which the COVID-19 pandemic has impacted research activities, how these alterations may have influenced early career researchers, and how the local and far-reaching research community can support early career researchers as they navigate these challenging circumstances.

Exposition hall (80 minute session)

Scientific posters SESSION 1 & 2 (40 minutes each session)

All scientific posters are displayed for the full duration of the conference.

For a map of the poster booths, please refer to page 9.
For a description of the poster presentations for each session, please refer to pages 10-17.

Auditorium (20 minute session)

Keynote presentation – DR STEPHANI SUTHERLAND

Speaking on: **COVID-19 and the nervous system**

Dr. Sutherland, a freelance science journalist, neuroscientist, and all-around communicator, has focused on covering pain research and public health crises in recent years. She has pivoted to covering COVID-19 and has authored a series on the coronavirus and its effects on the nervous system for Scientific American. Dr. Sutherland will be discussing some of the research reported in those articles and emerging topics related to COVID-19 and the nervous system

End of Day 1 - Beach gathering

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CARLOQUIUM 2021

Conference program – Day 2

Auditorium (20 minute session)

Awards presentation - Best Student Poster
Best Early Career Research Poster
Best Published Work Poster
Best Unpublished Work Poster
Best Protocol/Idea Poster

Auditorium (20 minute session)

Keynote presentation – PROF MARK HANCOCK

Speaking on: **Evidence informed diagnosis of low back pain**

For many health conditions, an accurate diagnosis is fundamental to providing high quality care, and patients typically expect to be given a diagnosis. However, diagnosis of low back pain is complex and controversial. International guidelines report it is currently not possible to provide an accurate diagnosis for most people presenting with back pain. This presentation will cover evidence related to the diagnosis and classification of low back pain and discuss how this can be used to guide clinical practice.

Exposition hall (80 minute session)

Scientific posters SESSION 1 & 2 (40 minutes each session)

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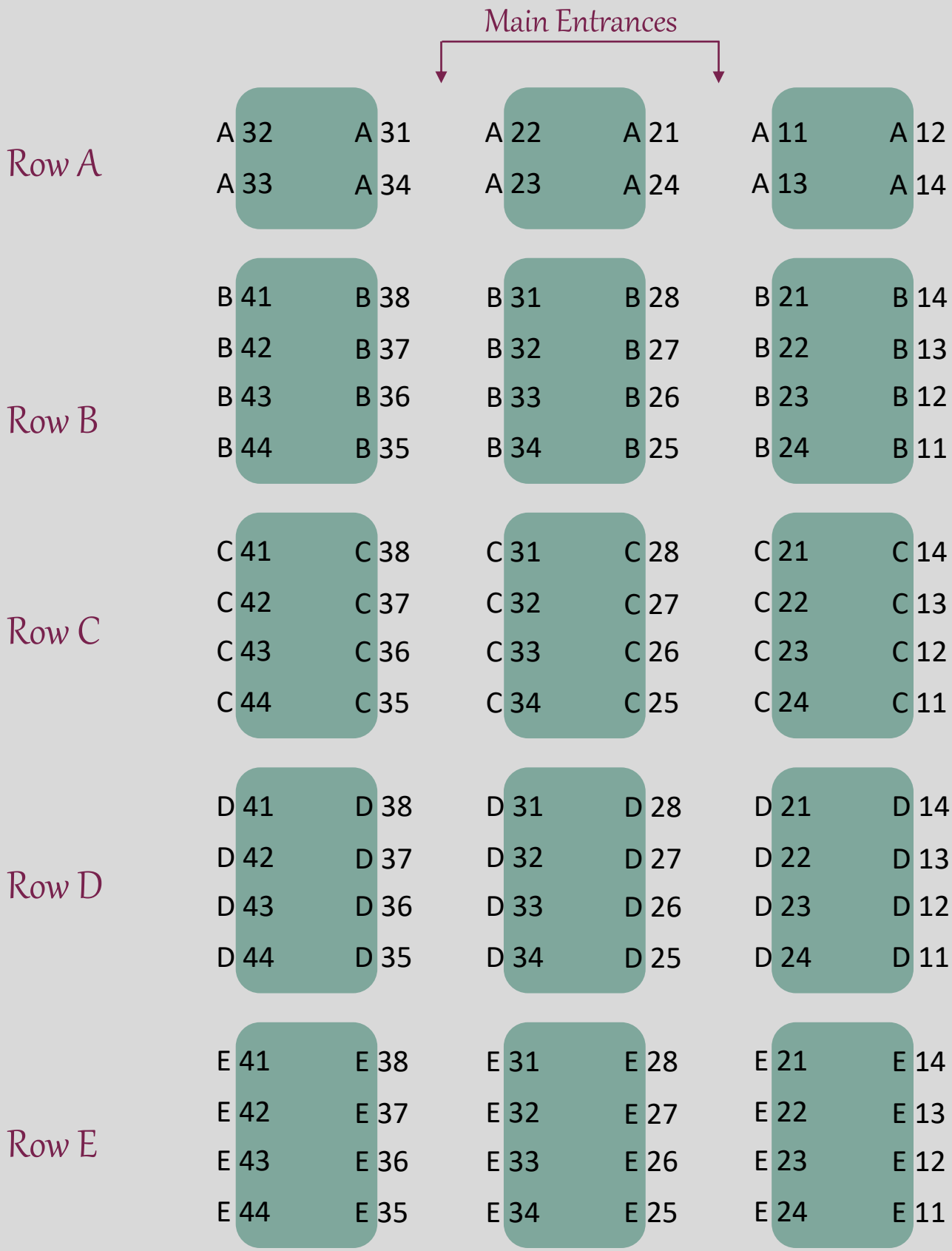
Closing remarks

End of Day 2

- Exposition Hall Floor Map -



Scientific posters SESSION 1

Row - Booth

A-11 Arnold YL Wong BSc - The Hong Kong Polytechnic University, Hong Kong, Hong Kong
Understanding spinal stenosis through Twitter

A-12 Brandyn J Powelske MScPT - University of Alberta, Edmonton, Canada
Tele-GLA:D® Back: a feasibility study of implementing a telehealth version of GLA:D®Back

A-13 Christel H Grand - University of Southern Denmark, Odense, Denmark
Is there something to those old-school nerve charts? The association between disc herniation and visceral symptoms.

A-14 Alex Cleveland Breen PhD - AECC University College, Bournemouth, United Kingdom
Early-to-moderate disc degeneration does not affect lumbar spine flexion mobility in asymptomatic controls

A-21 Cesar A Hincapié DC PhD - Balgrist University Hospital and University of Zurich, Zurich, Switzerland
Spinal manual therapy versus nerve root injection for lumbar radiculopathy: vanguard phase of the SALuBRITY randomised clinical trial

A-22 Cesar A Hincapié DC PhD - Balgrist University Hospital and University of Zurich, Zurich, Switzerland
Use of electronic patient records and encrypted email patient communication among Swiss chiropractors: a full population cross-sectional study

A-23 Christian J Fludder BChiroSc, MChiro - Private Practice, Melbourne, Australia
Assessment of Atlanto-occipital range of motion in the infant: protocol for a scoping review.

A-24 Braden G Keil BAppSc(Chiropractic), MChiroSc(Paediatrics) - Private Practice, Melbourne, Australia
Forces involved in infant manual therapy techniques commonly used by chiropractors

A-31 Alan Jenks DC, PhD Student - Vrije Universiteit, Amsterdam, Netherlands
Roland Morris Disability Questionnaire, Oswestry Disability Index, and Quebec Back Pain Disability Scale: Which has better validity, reliability and responsiveness in Older Adults with Low Back Pain?

A-32 Alan Jenks DC, PhD (candidate) - Vrije Universiteit, Amsterdam, Netherlands
Spinal manipulative therapy in older adults with chronic low back pain: An individual participant data meta-analysis

A-33 Brian S Budgell DC, PhD - Canadian Memorial Chiropractic College, Toronto, Canada
The Research Enterprise at Canadian Memorial Chiropractic College – an analysis incorporating textual and social network analyses

A-34 Brian S Budgell DC, PhD - Canadian Memorial Chiropractic College, Toronto, Canada
Mapping the Global Chiropractic Research Enterprise – A Protocol

B-11 Amber Reichardt - University of Manitoba, Winnipeg, Canada
Spine pain changes in individuals with osteoarthritis following chiropractic care at a publicly funded healthcare facility in Canada

B-12 Chris Bowles M. Chiro - Macquarie University, NSW, Australia
The association between guideline adherent radiographic imaging by chiropractic students and the diagnostic yield of clinically significant findings

B-13 Hazel J Jenkins PhD, MChiro - Macquarie University, Sydney, Australia
Effect of diagnostic imaging for non-specific low back pain on clinical outcomes: an observational study

B-14 Anika Young M Res - Macquarie University, Sydney, Australia
The Detect trial: Do X-rays for spinal pain in patients receiving chiropractic care change patient outcomes? A pilot randomised controlled trial.

Scientific posters SESSION 1

Row - Booth

B-21 James J Young DC, MSc - University of Southern Denmark, Odense, Denmark
Prevalence of multimorbid degenerative lumbar spinal stenosis with knee and/or hip osteoarthritis: protocol for a systematic review and meta-analysis

B-22 Gregory N Kawchuk DC, PhD - University of Alberta, Edmonton, Canada
Repetitive in vivo manual loading of the spine elicits cellular responses in porcine annuli fibrosi

B-23 Henrik Hein Lauridsen D.C., M.Sc., Ph.D. - Department of Sports Science and Clinical Biomechanics, Odense, Denmark
Prevalence and management of patients with headache in chiropractic practice - development and preliminary testing of a questionnaire

B-24 Brian R Anderson DC, MPH, PhD - Palmer College of Chiropractic, Davenport, USA
What happens to patients after an Emergency Department visit for a spine related diagnosis?

B-25 Christopher A Malaya DC - Parker University, Dallas, USA
Immediate impact of extremity manipulation on dual task performance: a randomized, crossover clinical trial

B-26 Imran Khan Niazi PhD - New Zealand College of Chiropractic, Auckland, New Zealand
Effect of 4 weeks of spinal manipulation plus physical therapy Vs physical therapy alone, on motor function in stroke

B-27 Craig Shane Moore PhD - Macquarie University, Sydney, Australia
Chiropractic COVID-19 Global Survey: analysis of impact and response

B-28 Clinton J Daniels DC, MS - VA Puget Sound Health Care System, Tacoma, USA
Manipulative and manual therapies in the management of patients with prior lumbar surgery: A systematic review

B-31 Gregory Roytman DC - Yale Center for Medical Informatics, New Haven, USA
Rapid Widespread Adoption of Telehealth for Chiropractic Care in the Department of Veterans Affairs during the COVID-19 Pandemic

B-32 Cecilie K. Øverås PhD Fellow, MSc Chiropractic - University of Southern Denmark, Odense, Denmark
Distribution and prevalence of musculoskeletal pain co-occurring with persistent low back pain: a systematic review

B-33 Jan Hartvigsen PhD - University of Southern Denmark, Odense, Denmark
Leadership and Capacity Building in Chiropractic Research: Report from the first CARL cohort

B-34 Deborah Kopansky-Giles BPHE, DC, FCCS, MSc - Canadian Memorial Chiropractic College, Toronto, Canada
"Hello, how are you?": Keeping patients connected during the COVID19 pandemic

B-35 Daphne To DC - Memorial University of Newfoundland, St. John's, Canada
Exploring barriers and facilitators to fidelity of training and delivery of an intervention to reduce imaging for low back pain: protocol for a qualitative study

B-36 Ben Csiernik - Canadian Memorial Chiropractic College, Toronto, Canada
Frequency of Guideline Recommended Care for Low Back Pain in a Chiropractic Teaching Clinic

B-37 Joshua Plener DC - Canadian Memorial Chiropractic College, Toronto, Canada
Lived Experiences with Symptomatic Degenerative Cervical Radiculopathy: The Patients' Perspectives

B-38 Jérémie Mikhail - Université du Québec à Trois-Rivières, Trois-Rivières, Canada
Minimal clinical datasets for spine related musculoskeletal disorders in primary care and outpatient settings: a scoping review protocol

Scientific posters SESSION 1

Row - Booth

B-41 Diana E De Carvalho DC PhD - Memorial University of Newfoundland, St. John's, Canada
Does Objectively Measured Prolonged Standing for Desk Work Result in Lower Ratings of Perceived Low Back Pain than Sitting? A Systematic Review and Meta-Analysis

B-42 Geronimo Bejarano - Palmer College of Chiropractic, Port Orange, USA
Healthcare student attitudes toward patient centered care: a systematic review protocol

B-43 Casper Glissmann Nim Chiropractor - University of Southern Denmark, Odense, Denmark
The need for specificity of spinal manipulation when treating spinal pain: Myth or reality? A systematic review

B-44 Clare F Halpin - Simply Health, Melbourne, Australia
Comparison of baseline characteristics of chronic pain patients completing chiropractic care versus those who do not complete care in a student clinic setting.

C-11 James Lemieux Doctor of Chiropractic/ Master's Student - University of Alberta, Edmonton, Canada
The feasibility of implementing an English language version of GLA:D Back

C-12 Dorthe Schoeler Ziegler PhD - Spine Surgery and Research, Spine Center of Southern Denmark – part of Lillebaelt Hospital, Middelfart, Denmark
Returning to Work within Two Years after First-time, Single-level, Simple Lumbar Discectomy: A Multifactorial, Predictive Model

C-13 Anser Abbas DC - Canadian Memorial Chiropractic College, Toronto, Canada
The reliability and validity of the Oswestry Disability Index in the elderly with low back pain: a protocol for a systematic review

C-14 Gitte Damsgård Simonsen MSc (Public Health) - Chiro Knowledge Hub, Odense M, Denmark
Reassuring patients with low back pain in chiropractic consultations: Does it happen and does it matter? A ChiCo cohort study

C-21 David McNaughton M.Chiro, M.Reseach, PhD(c) - Macquarie University, Sydney, Australia
The Force Matching Task for Measuring Sensory Attenuation

C-22 Aron S Downie PhD - Macquarie University, Sydney, Australia
Erring on the side of safety: using an active surveillance reporting system to prospectively identify adverse events at the Macquarie University Chiropractic Teaching Clinics. A study protocol.

C-23 Geoffrey M Gelley DC, MSc - University of Manitoba, Winnipeg, Canada
Motor performance of participants with chronic neck pain and asymptomatic participants pre and post spinal manipulation using separate eye and neck movement Fitts' tasks

C-24 Brelyn K Malone BS - Southern California University of Health Sciences, Whittier, CA, USA
The MIBAQ Study: Use of the Musculoskeletal Infant Breastfeeding Assessment Questionnaire for manual therapy and lactation counseling

C-25 Chinsuk John Cho DC, DACBR, RMSK - Parker University, Dallas, USA
Sonographic evaluation of the degree of medial meniscal extrusion during Thessaly test in healthy knees

C-26 Anders G. Bakken MChiro, Doctoral Student - Karolinska Institutet, Stockholm, Sweden
The effect of Spinal Manipulative therapy and home stretching exercises on pain and disability in patients with recurrent or persistent neck pain; a randomized controlled trial

C-27 Dan M Marthick-Hone MSc - RMIT University, Melbourne, Australia
Patient-Centred Outcomes of a Community Clinic Serving Disadvantaged People, a Needed Service and, an Opportunity for the Chiropractic Profession

Scientific posters SESSION 1

Row - Booth

C-28 Anna-Marie Ziegler MM, DC - Palmer College of Chiropractic, Davenport, USA
Learning the neurobiology of pain: A scoping review of pain education from an instructional design perspective

C-31 Alister du Rose - AECC University College, Bournemouth, United Kingdom
Novel assessment of the variation in cervical inter-vertebral motor control in a healthy pain-free population

C-32 Eric J Roseen DC - Boston University, Boston, USA
Initial Management of Acute and Chronic Low Back Pain: Responses From Brief Interviews of Primary Care Providers

C-33 Andrée-Anne Marchand DC, PhD - UQTR, Trois-Rivières, Canada
Effectiveness of active prehabilitation in improving postoperative recovery in patients with lumbar spinal stenosis: a randomized clinical trial

C-34 Corina Ryf BChiroMed - Balgrist University Hospital and University of Zurich, Zurich, Switzerland
Involving patients and clinicians in a pilot randomised clinical trial of spinal manual therapy versus nerve root injection for lumbar radiculopathy: a patient and public involvement project.

C-38 Corrie Myburgh MTech, PhD - University of Southern Denmark, Odense, Denmark
Self-predicted recovery in patients participating in a multi-arm randomized controlled trial; Is the outcome already determined? A mixed methods pilot study

C-41 Carlo Ammendolia PhD - University of Toronto, Toronto, Canada
Nonoperative treatment for lumbar spinal stenosis with neurogenic claudication. An updated systematic review.

Scientific posters SESSION 2

Row - Booth

C-35 Kenneth A Weber DC, PhD - Stanford University, Palo Alto, USA
Multi-Muscle Deep Learning Segmentation to Automate the Quantification of Muscle Fat Infiltration in Cervical Spine Conditions

C-36 Olja Vazic DC, MSc - University of Guelph, Guelph, Canada
Effect of experimentally induced central sensitization on neuromuscular function in healthy adults

C-37 Mana Alaviuon Doctor of Medicine and Chiropractor - Macquarie University, Sydney, Australia
The feasibility of an 8-week self-compassion meditation intervention in chronic low back pain: a protocol

C-42 Kristina Boe Dissing PhD - Chiropractic Knowledge Hub, Odense, Denmark
Profiling headaches in a Danish chiropractic cohort Protocol for an upcoming project

C-43 Michael S Swain MChiro, MPhil, PhD - Macquarie University, Sydney, Australia
Chiropractic students' cognitive dissonance to statements about professional identity, role, setting and future: International perspectives from a secondary analysis of pooled data

C-44 Shane Derbyshire Mchiro - Private practice, Norwich, United Kingdom
"My work is hands on that cannot be done remotely"; An exploration of barriers to the provision of remote consultations by Chiropractors

D-11 Luke Mitchell Ross Master of Chiropractic - Macquarie University, Sydney, Australia
Performance of a hand-held sensor puck versus table-embedded force plate for measurement of HVLA thrust

D-12 Lobke P De la Ruelle - Vrije Universiteit, Amsterdam, Netherlands
What are the perceived barriers and facilitators for chiropractic care in older adults with low back pain

D-13 Rahim Lalji MSc/DC - University of Zurich and Balgrist University Hospital, Zurich, Switzerland
The Swiss chiropractic cohort (Swiss ChiCo) pilot study: a developing practice-based research network project

D-14 Nora Bakaa DC, MSc, PhD (Candidate) - McMaster University, Hamilton, Canada
Understanding Barriers and Facilitators of Exercise Adherence after Total-Knee Arthroplasty

D-21 Nora Bakaa DC, MSc, PhD (Candidate) - McMaster University, Hamilton, Canada
Exercise Adherence & Quality of Reporting of Post-Operative Rehabilitation Interventions for Total Knee Arthroplasty: A Scoping Review

D-22 Ryan Muller B.A., DC (student) - Parker University, Dallas, TX, USA
A literature review of the use of HC-PAIRS as a measure of attitudes, beliefs, and recommendations for chronic low back pain patients.

D-23 Malin B Muehlemann DrMedChiro - Balgrist University Hospital, University of Zurich, Zurich, Switzerland
Descriptive Epidemiology and Costs of Chiropractic Care in Switzerland: A Nationwide Health Insurance Database Analysis

D-24 Léonie Hofstetter M Chiro Med - University of Zurich and Balgrist University Hospital, Zurich, Switzerland
Musculoskeletal health care at a Swiss specialized outpatient hospital chiropractic polyclinic in 2019: a health services research study

D-25 Stine Clausen PhD-fellow - University of Southern Denmark, Odense, Denmark
Prognostic factors of the hip replacement during a 2-year period in participants enrolled in supervised education and exercise therapy: A prognostic study of 3,657 participants with osteoarthritis

D-26 Melanie Häusler MChiroMed - Balgrist University Hospital and University of Zurich, Zurich, Switzerland
Association of a clinical journal club with knowledge, attitudes, and behaviour of evidence-based practice among chiropractic students: a before-and-after pilot study

Scientific posters SESSION 2

Row - Booth

D-27 Peter C. Emary DC, MSc - McMaster University, Hamilton, Canada
The association of chiropractic integration in an Ontario community health centre with prescription opioid use for chronic non-cancer pain: a mixed methods study protocol

D-28 Luana Nyirö DCM - Balgrist University Hospital, Zurich, Switzerland
Does spinal manipulation therapy impact lumbar proprioception? A double-blind randomized controlled trial using a novel outcome

D-31 Luana Nyirö DCM - Balgrist University Hospital, Zurich, Switzerland
The utility of electrical stimulation in quantitative sensory testing: Feasibility and reliability of an electrical stimulation paradigm to induce local experimental low back pain

D-32 Marc W Sanders MSc Chiropractic - AECC University College, Bournemouth, United Kingdom
The use of remote consultations by chiropractors: A UK-based cross-sectional survey during the COVID-19 pandemic.

D-33 Melker S Johansson PhD - University of Southern Denmark, Odense, Denmark
Utilization patterns of prescribed analgesics among patients with knee or hip osteoarthritis before and after exercise therapy and patient education: a descriptive register-based cohort study

D-34 Stine Haugaard Clausen PhD fellow - University of Southern Denmark, Odense, Denmark
Ultrasound imaging in patients with hip pain and suspected hip osteoarthritis. An inter- and intra-rater reliability study

D-35 Sasha L Aspinall PhD, BChiro, BSc (Hons) - Murdoch University, Perth, Australia
Are our lumbar manipulation shams any good? A systematic review protocol of blinding strategies, their effectiveness, and their influence on pain outcomes.

D-36 Melissa J Neave BSc(Hons) MChiro - Macquarie University, Sydney, Australia
Characteristics of Chiropractic Paediatric Practice: Secondary Analysis of the COAST and O-COAST Studies

D-37 Rikke Krüger Jensen PhD - Chiropractic Knowledge Hub, Odense, Denmark
The development in surgery rates for lumbar spinal stenosis in Denmark between 2002 and 2018: A retrospective registry-based cohort study

D-38 Jessica J. Wong DC, MPH - University of Toronto, Toronto, Canada
The effect of back problems on health care utilization and costs in Ontario, Canada: A population-based matched cohort study

D-41 Jessica J. Wong DC, MPH – University of Toronto, Toronto, Canada
The association between back problems and all-cause and premature mortality among adults in Ontario, Canada: A population-based matched cohort study

D-42 Maliheh Hadizadeh MSc PT, PhD Candidate - University of Alberta, Edmonton, Canada
Predicting who responds to spinal manipulative therapy using a short-time frame methodology: Results from a 238-participant study

D-43 Morgan R Price DC - VA Puget Sound Health Care System, Tacoma, USA
The prevalence of suicide prevention training and suicide-related terminology in United States chiropractic training and licensing requirements

D-44 Sasha L Aspinall PhD, BChiro, BSc (Hons) - Murdoch University, Perth, Australia
Is there a gender problem with speakers at scientific chiropractic conferences? A study protocol

E-11 Søren O'Neill PhD - Spine Center, University Hospital of Southern Denmark, Middelfart, Denmark
Low prevalence of end plate junction failure in danish patients with lumbar disc herniation

Scientific posters SESSION 2

Row - Booth

E-12 Steen Harsted DC - University of Southern Denmark, Odense, Denmark
Posterior to anterior spinal stiffness measured in a sample of 127 secondary care low back pain patients

E-13 Laura Sirucek MSc - Balgrist University Hospital, University of Zurich, Zurich, Switzerland
Psychophysical assessment of spinal excitability and descending pain modulation – do sensory afferents from deep tissues differ?

E-14 Martha Funabashi - Canadian Memorial Chiropractic College, Toronto, Canada
Beliefs, perceptions and practices of chiropractors and patients about mitigation strategies for benign adverse events after spinal manipulation therapy

E-21 Zachary A Cupler DC, MS - Butler VA Health Care System, Butler, USA
Suicide prevention, public health, and the chiropractic profession: a call to action

E-22 Simon Dyrløv Madsen MSc - University of Southern Denmark, Odense, Denmark
Low Back Pain Management by Chiropractors, Physiotherapists and General Practitioners: a prospective survey in primary care [preliminary results]

E-23 Zak Monier MS, RD, LD - Parker University, Dallas, USA
Impact of Nutrient-Dense Foods on Chiropractic Students' Performance: a pilot study

E-24 Mette Mouritsen Sørensen - University of Southern Denmark, Odense, Denmark
Are chiropractors' characteristics associated with the number of referred patients from general practitioners? A cross-sectional study of Danish chiropractors.

E-25 Melissa Corso MSc, DC - Ontario Tech University, Oshawa, Canada
Are non-pharmacological interventions delivered through synchronous telehealth effective and safe for the management of patients with musculoskeletal conditions? A systematic rapid review

E-26 Maarten van Ittersum - Welsh Institute of Chiropractic, University of South Wales, Treforest, United Kingdom
Data mining subgroups of low back pain patients

E-27 Lise Hestbæk DC, PhD - The Chiropractic Knowledge Hub, Odense, Denmark
Effectiveness of chiropractic manipulation versus sham manipulation for recurrent headaches in children aged 7-14 years. A randomised clinical trial

E-28 Tanja T Glucina BSc (Psych), BSc (Chiro), BHsc (Hons: first class), Cert TT, PhD Candidate - NZCC Centre for Chiropractic Research, Auckland, New Zealand
Moving towards a contemporary chiropractic professional identity

E-31 Maria Bangash Doctor of Chiropractor - southern california University of Health and Sciences, Whittier, USA
Initial Choice of Spinal Manipulation for Treatment of Chronic Low Back Pain Leads to Reduced Long-term Risk of Adverse Drug Events Among Older Medicare Beneficiaries

E-32 Paul S Nolet DC, MS, MPH - Maastricht University, Maastricht, Netherlands
Exposure to a motor vehicle collision and the risk of future back pain: A systematic review and meta-analysis

E-33 Gordon E. Lawson DC - Canadian Memorial Chiropractic College, Toronto, Canada
Medial Branch Blocks for Diagnosis of Facet Joint Pain Etiology and Use in Chronic Pain Litigation

E-34 Matt Fernandez PhD - Macquarie University, Sydney, Australia
Spinal manipulation for the management of cervicogenic headache: a systematic review and meta-analysis

Scientific posters SESSION 2

Row - Booth

E-35 Mette J Stochkendahl PhD - Chiropractic Knowledge Hub, Odense, Denmark
Using RE-AIM to understand the implementation and use of the SelfBACKapp for people with low back pain: a protocol and preliminary results

E-36 Laura RC Montgomery PhD (Candidate) - University of Sydney, Sydney, Australia
The clinical course of spinal pain in adolescents: a feasibility study protocol

E-37 Katie de Luca PhD - Macquarie University, Sydney, Australia
The burden of low back and neck pain in Australia: findings from the Global Burden of Disease Study 2019

E-38 Michael Lukas Meier PhD - University Hospital Balgrist, Zurich, Switzerland
Fear avoidance beliefs limit lumbar spine flexion during object lifting in pain-free adults – A protective strategy with negative consequences?

E-41 Mona Frey PhD Candidate - Memorial University of Newfoundland, St. John's, Canada
Comparison of Lumbar Spine Sagittal Motion between External Measures and Quantitative Fluoroscopy – Preliminary Results

E-42 Nathan Cashion MS, DC - World Spine Care, Oregon City, USA
Distance Management of Spinal Disorders During the COVID-19 Pandemic and Beyond: Evidence-Based Patient and Clinician Guides From the Global Spine Care Initiative

E-43 Søren Grøn - Chiropractic Knowlegde hub, University of Southern Denmark, Odense, Denmark
Beliefs about low back pain in a clinical population of chiropractic patients with low back pain and the association between beliefs at baseline and pain and disability at 2, 13 and 53 weeks – a ChiCo cohort study.

E-44 Joel Carmichael DC, PhD(c) - University of Colorado School of Medicine, Aurora, USA
Feasibility and Initial Efficacy of a Multimodal Swelling Intervention after Total Knee Arthroplasty: A Pilot Study with Cohort Comparison

CARLOQUIUM 2021

Abstracts of

Scientific Posters

Organized by Booth Number

Booth # A-11

Understanding spinal stenosis through Twitter

Dr Arnold YL Wong BSc

The Hong Kong Polytechnic University, Hong Kong, Hong Kong

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Spinal stenosis is a narrowing of the spinal canal that may compress neurological tissues, resulting in pain and disability. Since social media (e.g., Twitter) is a good platform for people to share information and interact with others, many people with diseases may use social media to express their concerns and seek supports.

Objectives: To evaluate the impacts of spinal stenosis on patients' physical and psychosocial wellbeing through analyzing tweets; and to understand how people use Twitter to facilitate or advance the management of spinal stenosis.

Methods: A social media monitoring and analysis software program (Talkwalker, Talkwalker Luxembourg) was used to search relevant tweets using the keywords 'spinal stenosis' and 'stenosis' between 29 May 2019 and 24 June 2020. Two independent reviewers screened and conducted content analysis of the tweets, and categorized the selected tweets into different themes.

Results: A total of 510 tweets were identified from Talkwalker, and 310 tweets met the inclusion criteria. Based on the content of tweets, five themes were identified: (1) impacts of physical, psychological, and social wellbeing (n = 112); (2) treatments (including medications, injection, surgeries) (n = 81); (3) coping strategies (i.e., seeking help and prayers) (n = 30); (4) evidence-based information from research or scientific information (n = 83); and (5) health policy (n = 4). Most of the tweets revealed that spinal stenosis had negative impacts on patients' physical and psychosocial wellbeing. People with spinal stenosis attempted to share their experiences and seek helps from other Twitter users. Meanwhile, some researchers have used this platform to disseminate relevant information or their research findings.

Conclusions: This is the first study to use social monitoring and analysis software to identify and analyze tweets related to spinal stenosis. Our findings help understand the concerns of people with spinal stenosis in an uncontrolled environment, and guide future research to improve public health through proper interventions or health information sharing on social media.

Booth # A-12

Tele-GLA:D® Back: a feasibility study of implementing a telehealth version of GLA:D® Back

Brandyn J Powelske MScPT, James Lemieux DC, Dr. Greg N Kawchuk PhD

University of Alberta, Edmonton, Canada

Submission categories

Unpublished work (complete or incomplete)

Abstract

Introduction: Practice guidelines for the management of chronic low back pain (cLBP) are infrequently followed. Consequently, healthcare resources are wasted on ineffective low-value care that may increase pain and disability in those patients. GLA:D® Back is a standardized evidence-based program of education and exercise that follows current cLBP guidelines. This program has been shown to improve problems caused by low-value care and is feasible to implement in physiotherapy and chiropractic clinics across Alberta, Canada. Unfortunately, cLBP sufferers living in remote and rural communities, as well as those with travel and transportation barriers, have limited access to this program. Given this need and the barriers amplified by a global pandemic, a telehealth version of the GLA:D® Back, Tele-GLA:D®, was piloted.

Objective: Our primary objective was to assess the feasibility of implementing Tele-GLA:D® Back. Our second objective was to evaluate the patients' and clinicians' beliefs and satisfaction with the Tele-GLA:D® Back program.

Methods: In this observational cohort study, previously certified GLA:D Back® practitioners from across Alberta were recruited to train in Tele-GLA:D® Back. Post-training, program feasibility was evaluated by the number of clinics that ran a Tele-GLA:D® Back session and the number of registered patients at each clinic. Like previous GLA:D® Back studies, our target for feasibility was 50% clinical site adoption of the program and twenty patients. Following the completion of the study, semi-structured phone interviews will be conducted to gather information from clinicians on facilitators and barriers of successfully or unsuccessfully implementing the program at their site. Patient and clinician satisfaction of the program were evaluated by the Telemedicine Satisfaction Questionnaire (TMSQ) sent to the participants post-program completion. The overall timeline for this study is from April 20, 2020 to the end of surveillance March 31, 2021.

Results: At the present time, the study is ongoing. Currently, 40% (4/10) trained clinical sites completed a full Tele-GLA:D® Back program with one more site to begin shortly. Of the sites that adopted Tele-GLA:D® Back so far, clinicians recruited fifteen patients to participate, and 73% (11/15) of these patients attended the final assessment. We expect a total of five clinics and twenty-five patients to participant once the pilot program reaches the end of the surveillance period. So far, TMSQ results show that 50% (6/12) of patients had a mean score of 4 (agreed) and 50% (6/12) a mean score of 5 (strongly-agreed) on the fourteen items. Similarly, 100% (3/3) of clinicians reported a mean TMSQ score of 5 (strongly-agreed). These preliminary results suggest participant satisfaction with the Tele-GLA:D® Back program.

Conclusion**:** Our preliminary results suggest that Tele-GLA:D® Back is a feasible program that can improve access to care for both rural and urban residents managing cLBP in Alberta, Canada. Further research is needed to evaluate the use of telehealth group programs, like Tele-GLA:D. Back, vs. usual care (Physiotherapy and Chiropractic) for persistent and recurrent low back pain.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # A-13

Is there something to those old-school nerve charts? The association between disc herniation and visceral symptoms.

Christel H Grand[1], Jan Hartvigsen Professor[1], Greg Kawchuk Professor[2]

[1]University of Southern Denmark, Odense, Denmark. [2]University of Alberta, Alberta, Canada

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background
The sympathetic and caudal parasympathetic fibres are distributed through spinal segments forming the autonomic nervous system which innervate the viscera. In the early 20th century the chiropractic profession developed spinal manipulation as a means of curing visceral diseases by allegedly relieving stress on the nerves caused by chiropractic subluxations. The Meric chart was developed by chiropractors as an attempt to explain which viscera was impacted when specific spinal segments were subluxated. Today, some chiropractors promote spinal manipulation as a means of curing visceral disease.

Objective
Although used by some chiropractors to this day, we are not aware that the Meric system has been evaluated clinically. While there are no means of clinically confirming the presence of a chiropractic subluxation, disc herniations can be observed through imaging and are known to cause segmental nerve affection. Without creating artificial disc herniations, we propose an evaluation of the medical and chiropractic literature to identify known cases of disc herniation which are thought to impact the autonomic nervous system at specific spinal segments.

Methods
This scoping review aimed to identify cases in the scientific literature which reported concurrent disc herniations and visceral or sympathetic symptoms. Scoping review methodology proposed by Arksey and O'Malley was applied to conduct the review.
A search strategy was developed and databases Embase and Medline were utilized for the search. Studies in English and of experimental and observational nature were included without a limit to the year of publication. All included articles were original articles. Articles reporting of cauda equina syndrome were excluded as were systematic reviews and meta-analysis.

Results
A total of 21 published articles met the inclusion criteria along with 3 conference presentations. All included articles were of medical literature as chiropractic databases were inaccessible. The papers were published between 1969 and 2020. A table was produced to manage articles by charting data for each article e.g. study type, reported disc levels, involved symptoms and number of patients reporting the symptom. A second table was created showing the number of reported disc levels at each spinal level alongside the reported symptom(s). There were a total of 247 reported disc herniations/protrusions

across 15 different disc levels which concurred with 15 different symptoms. Symptoms reported more than once were predominantly related to autonomic dysfunction, such as regional sympathetic dystrophy, altered blood flow, visceral like pain, sexual dysfunction and thermal skin changes. Symptoms were not disc level specific. There were no patterns between the identified disc levels and symptoms which were in accordance with the Meric system.

Discussion
Although disc herniation may affect the autonomic nervous system, they do not appear to do so by impacting viscera as identified in the Meric System.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # A-14

Early-to-moderate disc degeneration does not affect lumbar spine flexion mobility in asymptomatic controls

Prof Alan Clark Breen PhD[1], Dr Fiona Mellor PhD[2], Dr Andrew Morris MBChB[2], Dr Alex Cleveland Breen PhD[2]

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Submission categories

Published work (from 2020 onward)

Abstract

Early disc degeneration (DD) has been thought to be associated with a loss of spine stability and has been implicated in approximately 40% of cases of low back pain. However, before the relationship between low back pain, intervertebral motion and DD can be understood, it is necessary to know the relationship between DD and intervertebral motion in people without pain.

This study aimed to discover if, in the absence of back pain, early to moderate DD is associated with intervertebral motion.

Ten pain free adults, received recumbent and weight bearing MRI scans and video fluoroscopy screenings during passive recumbent and active weight-bearing lumbar flexion bending. Forty individual level and 10 composite (L2-S1) radiographic and MRI DD gradings were recorded and correlated with IV-RoM, translation, laxity, and dynamic motion sharing inequality and variability for both bending protocols.

Kinematic values were similar to previous control studies. DD was evidenced up to moderate levels by both radiographic and MRI grading. Disc height loss correlated slightly, but negatively with IV-RoM during weight bearing flexion (R=-0.356, p=0.0.025). Composite MRI DD and T2 signal loss evidenced similar relationships (R= -0.305, R= -0.267) but did not reach statistical significance (p=0.056, p=0.096). No significant relationships between any other kinematic variables and DD were found.

There was little, if any, correlation between early DD and intervertebral motion in healthy controls. Motion sharing in the absence of pain was also not related to early DD, consistent with previous control studies. Further research is needed to investigate these relationships in patients.

Booth # A-21

Spinal manual therapy versus nerve root injection for lumbar radiculopathy: vanguard phase of the SALuBRITY randomised clinical trial

Dr Cesar A Hincapié DC PhD[1], Léonie Hofstetter MChiroMed[1], Dr Daniel Mühlemann DC[1], Dr Reto Sutter MD[2], Dr Lauren Clack PhD[3], Prof Dr Jan Hartvigsen DC PhD[4], Prof Dr Armin Curt MD[1], Prof Dr Peter Jüni MD[5], Prof Dr Milo A Puhan MD PhD[6], Prof Dr Mazda Farshad MD MPH[7]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background

Spinal manual therapy (SMT) and corticosteroid nerve root injection (NRI) are commonly used to treat patients with lumbar radiculopathy. However, there is uncertainty regarding their effects and a need for high-quality randomised clinical trial evidence. We propose the SALuBRITY trial—a two parallel group, double sham controlled, pragmatic randomised clinical trial, with a vanguard internal pilot phase and a patient and public involvement (PPI) subproject.

Objectives

Vanguard phase – To assess the feasibility of the main trial at 12 weeks after randomisation.

Patient and public involvement subproject – To improve the quality and relevance of the SALuBRITY trial using consultation and collaboration approaches with a small advisory group of patients and primary care clinicians.

Main trial – To compare SMT versus NRI in patients with lumbar radiculopathy in terms of pain impact at 12-weeks after randomisation and assess outcomes over a 1-year follow-up.

Design, setting, and participants

Vanguard phase – 12-weeks randomised, double sham controlled, single centre trial in a Swiss university hospital – comparing SMT and NRI in 40 participants between 18 and 65 years of age with lumbar radiculopathy of less than 12 months duration.

Interventions

Participants will be randomly allocated, in a 1:1 ratio, to active SMT plus sham NRI or active corticosteroid NRI plus sham SMT, each intervention administered during a 12-week treatment period.

Main outcomes and measures

Vanguard phase – Feasibility outcomes include the recruitment rate, completeness of follow-up, compliance with washout scheme for analgesic co-interventions before pain assessment, and blinding success at 12-weeks after randomisation.
Main trial – Primary clinical outcome will be patient-reported radicular leg pain impact at 12-weeks assessed with the PEG scale (a validated 3-item average composite of one pain intensity and two pain interference numeric rating scales). Secondary outcomes include low back pain impact, disability, patient satisfaction, analgesic use, global improvement, quality of life, health care utilization, and adverse events.

Relevance

Our vanguard pilot phase results will inform the feasibility and design of the main trial. The SALuBRITY trial will assist patients, clinicians, and policymakers with decision-making based on high-quality evidence, ultimately helping to optimize healthcare delivery for sciatica in Switzerland and worldwide.

Booth # A-22

Use of electronic patient records and encrypted email patient communication among Swiss chiropractors: a full population cross-sectional study

Dr Cesar A Hincapié DC PhD[1], Léonie Hofstetter MChiroMed[1], Dr Rahim Lalji DC MSc[1], Dr Longin Korner DC[2], Dr Mireille C Schläppi DC[3], Dr Serafin Leemann DC[3]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: The implementation of electronic health information technologies is seen in Europe and worldwide as a key target for health care quality improvement. By supporting the systematic collection and storage of patient data, the electronic patient record (EPR) can help increase completeness and minimise error in patient records; improve the quality of health care (by supporting enhanced adherence to clinical guidelines); and promote increased efficiency in clinical workflows by facilitating structured data sharing within and across organisational and geographic boundaries. Health information exchange technologies (eg, encrypted email communication) also represent a promising approach to improve communication not only between chiropractors, physicians, specialists and hospitals, but also with patients. Reliable data on the use of EPRs and encrypted email communication among Swiss chiropractors were lacking.

Objective: To estimate the prevalence and describe the use of EPRs and encrypted email communication among Swiss chiropractors, and examine factors associated with EPR and email use, as well as survey response.

Methods: We performed a cross-sectional study of all active practising members of the Swiss Chiropractic Association (ChiroSuisse) between December 3, 2019 and January 31, 2020. REDCap® (Research Electronic Data Capture system) was used to design an electronic survey and collect data. We asked about clinician and practice characteristics, EPR use for clinical record keeping, use of encrypted email for patient communication, and information on the manufacturers and specific EPR and encrypted email communication products used. Descriptive statistics were used to summarize data. We used multivariable logistic regression analyses to assess the association between clinician and practice characteristics and (1) EPR use and (2) encrypted email communication use. We also carried out a nonresponse analysis to examine factors associated with survey response versus nonresponse.

Results: Among 286 eligible Swiss chiropractors (193 [68%] men; mean age, 51.4 [SD, 11.2] years), 217 (76%) completed the survey (140 [65%] men; mean age 50.7 [11.2] years). A total of 47% (95% confidence interval [CI], 40% to 54%) of respondents reported using an EPR in their practice, while 60% (95% CI, 54% to 67%) reported using encrypted email communication technology. Our regression analyses found that chiropractors aged ≥60 years (versus those under 40) were 74% less likely to use an

EPR system (OR 0.26, 95% CI 0.08-0.77), while clinicians from practices with 4 or more chiropractors (versus those from solo practices) were over 5 times more likely to report EPR use (OR 5.6, 95% CI 2.1-16.5). Findings for factors associated with encrypted email use were similar. No significant association was found between clinician and practice characteristics and clinician response to the survey.

Conclusions: As of January 2020, less than 50% of Swiss chiropractors used an EPR system in clinical practice. Use of encrypted email communication was more prevalent. Better implementation of EPRs and electronic health information technologies in chiropractic health care in Switzerland is possible and desirable for the purpose of chiropractic health care quality improvement.

Booth # A-23

Assessment of Atlanto-occipital range of motion in the infant: protocol for a scoping review.

Mr Christian J Fludder BChiroSc, MChiro[1], Ms Melissa J Neave BSc(Hons), MChiro[2]

[1]Private Practice, Melbourne, Australia. [2]Macquarie University, Sydney, Australia

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background: The chiropractic profession is predominately focused on the treatment and management of musculoskeletal conditions. However, the paediatric population often present with a variety of non-musculoskeletal complaints. A perceived reduction in passive range of motion (ROM) of the upper cervical spine is often identified as a causative factor for these presentations. Several technique-centric resources and post-graduate paediatric training courses promote assessment of the atlanto-occipital joint for the purpose of identifying aberrant motion, yet none provide normative values for range of motion at the atlanto-occipital joint.

Research question: What evidence exists regarding the normative ROM at the atlanto-occipital joint in infants and children?

Methods: A scoping review will systematically collect and organize relevant information and provide a comprehensive examination of the existing literature regarding infant atlanto-occipital range of motion.

A search of electronic databases MEDLINE, CINAHL and Index to Chiropractic Literature (ICL) and grey literature will be performed using keyword and subject headings relevant to the research question from inception. Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow chart will be used.

Inclusion/exclusion criteria: Eligible studies will include experimental and observational designs as well as book chapters. Clinical and non-clinical populations including cadaveric studies, which report ROM of the upper cervical spine in infants and children under the age of 5 will be included. Studies will be excluded if they are not written in English or where assessment methodology is unclear.

Study selection: Two investigators will review titles and abstracts and retrieve citations that meet inclusion criteria, followed by an independent full text review. Any articles that are met with uncertainty will be discussed with the other investigator before reaching a point of consensus.

Data extraction and synthesis: The following information will be extracted from included studies: 1) study description (design, number of patients), 2) description of the patient population (age, gender), and 3) method/s used to determine range of motion. Quantitative data will be grouped based on age and assessment method where feasible.

Discussion: A scoping review is the most appropriate method to assess the extent of the base of evidence available regarding atlanto-occipital ROM in infant. This review may be used to identify the

value of a full systematic review and stimulate future research projects to guide chiropractors in the assessment and treatment of infants and children.

Booth # A-24

Forces involved in infant manual therapy techniques commonly used by chiropractors

Mr Braden G Keil BAppSc(Chiropractic), MChiroSc(Paediatrics), Mr Christian J Fludder BChiroSc, MChiro

Private Practice, Melbourne, Australia

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Manual therapy is a commonly used procedure for the paediatric population, however, there is a paucity of published data regarding forces utilised in the commonly used manual therapy techniques. Previous literature has reported forces involved with one manual therapy technique for one practitioner.

Forces and manual therapy techniques used in paediatric spine treatment are decided on a case by case basis by the practitioner after taking into account a number of factors. Forces and manual therapy techniques used to treat the paediatric spine are heavily modified from those typically used in the adult patient with the aim of obtaining the best clinical outcome with the least discomfort and risk to the patient.

There is a need to increase the published data relating to forces used when manual therapy is applied to the infant spine.

Aim: To add to the limited published data regarding forces typically used with a number of commonly utilised infant spine manual therapy treatment techniques taught and used clinically within australia.

Methods: The force/time profiles of different infant spine manual therapy treatment techniques applied to a mannequin by two experienced paediatric chiropractors were recorded. Force was recorded using a tekscan flexiforce sensor coupled to a windows operating system running economic load and force (elf) system. Different scenarios were provided to the chiropractors giving instruction for location (cervical/sacral spine) and infant manual therapy technique (drop piece, finger recoil, seated cervical, prone thumb).

Results

Average peak force was recorded as 49.45n for covered thumb (pc1 39.6+/-7.1n, pc2 59.5+/-5.4n), 24.95n for drop-piece (pc1 26.1+/-3.0n, pc2 23.8+/-6.3n), 29.95n for finger recoil (pc1 28.9+/-3.2n, pc2 31.0+/-5.0n), and 28.75n for seated cervical (pc1 29.0+/-3.0, pc2 28.5+/-6.3n). Average time to peak was 0.06s for covered thumb (pc1 0.06+/-0.01s, pc2 0.06+/-0.01s), 0.055s for drop piece (pc1 0.06+/-0.006s, pc2 0.05+/-0.004s), 0.03s for finger recoil (pc1 0.03+/-0.004s, pc2 0.03+/-0.003s), and 0.079s for seated cervical (pc1 0.07+/-0.006s, pc2 0.09+/-0.015s).

Unpaired t-testing for inter-practitioner similarity showed no statistically significant difference between practitioners for all techniques (finger recoil ($t(9)=-1.12$, $p=0.28$), drop piece ($t(9)=1.01$, $p=0.33$), and seated cervical ($t(9)=0.20$, $p=0.84$)) except for prone thumb (($t(9)=-6.99$, $p=<0.001$)).

Intra-practitioner reproducibility was high for all techniques measured (pc1; covered thumb (m=39.6n, sd=7.1n, 95%ci [34.5n, 44.6n]), drop piece (m=26.1n, sd=3.0, 95%ci [23.9n, 28.2n]), finger recoil (m=28.8n, sd=3.2n, 95% ci [26.6n, 31.2n]), seated cervical (m=28.9n, sd=3.0n, 95% ci [26.8n, 31.1n]), pc2; covered thumb (m=59.3n, sd=5.4n, 95%ci [55.4n, 63.1n]), drop piece (m=23.9n, sd=6.3n, 95% ci [19.3n, 28.3n]), finger recoil (m=31.0n, sd=5.1n, 95% ci [27.4n, 34.6n]), seated cervical (m=28.5n, sd=6.3n, 95% ci [24.0n, 33.0n]).

Clinical relevance: Forces recorded for commonly utilised infant manual therapy techniques were similar across the various techniques and across infant spine regions. The forces recorded in this study demonstrated similar ranges to data published within previous literature. Forces recorded demonstrated high reproducibility and similarity between two experienced paediatric practitioners.

Booth # A-31

Roland Morris Disability Questionnaire, Oswestry Disability Index, and Quebec Back Pain Disability Scale: Which has better validity, reliability and responsiveness in Older Adults with Low Back Pain?

PhD Student Alan Jenks DC

Vrije Universiteit, Amsterdam, Netherlands

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background. The aim of this study was to examine 3 commonly used questionnaires for assessing disability in older people with low back pain. The Dutch versions of the modified Oswestry Disability Questionnaire, the Quebec Back Pain Disability Scale, the Roland-Morris Disability Questionnaire were compared in patients undergoing chiropractic care for low back pain.

Subjects and Methods. Two hundred and seventeen patients (113 males and 101 females) with a mean age 66.01 ± 7.1 years were included. Reliability was evaluated using internal consistency (Cronbach's α), test retest reliability (utilizing intraclass correlation coefficient [ICC]), standard error of measurement (SEM), minimal detectable change at 95% confidence level (MDC95%), and 95% limits of agreement (LOA). The construct validity was investigated using a priori hypothesis with other common measures of LBP (using Spearman's rho). Finally, receiver operating characteristic curve was constructed to compute the sensitivity, using the area under the curve (AUC), and the minimum important change (MIC). An alpha level of 0.05 was set for statistical tests and all the psychometric values were tested against a priori hypotheses.

Main outcomes and measures: The RMDQ, ODI and QBPDS showed good internal consistency (Cronbach's α = 0.88, 0.87, 0.94 respectively). The ICC, SEM, MDC95%, between baseline and two days later were 0.84, 0.88, 0.82; 2.05, 5.09, 7.08, respectively. The scale also demonstrated moderate to excellent correlation (rho = 0.54–0.86) with the other four questionnaires. The AUC value of the RMDQ, ODI and QBPDS was 0.76, 0.69, 0.71, respectively, and the MIC was 3 points.

Conclusion and relevance: The RMDQ, ODI and QBPDS demonstrate adequate psychometric properties and can be used to assess disability level in older patients with LBP. RMDQ and ODI are preferred over the QBPDS, as unidementionality was not confirmed and further research is necessary.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # A-32

Spinal manipulative therapy in older adults with chronic low back pain: An individual participant data meta-analysis

PhD (candidate) Alan Jenks DC

Vrije Universiteit, Amsterdam, Netherlands

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Many trials and systematic reviews have reported on the effectiveness of spinal manipulative therapy (SMT) for low back pain (LBP) in adults. There is much less known on the older population, specifically regarding the effect of SMT.

Objective: To assess the effect of SMT on pain and function on older adults with chronic low back pain in an individual participant data (IPD) meta-analysis.

Setting: Electronic databases from 2000 until June 2020, and reference lists of eligible trials and related reviews.

Design and Subjects: Randomized controlled trials (RCTs) which examined the effects of SMT in adults with chronic LBP compared to interventions recommended in international LBP guidelines. Participants aged 55 years and older were included.

Methods: Authors of trials eligible for inclusion in our IPD meta-analysis were contacted to share their data. Two review authors independently conducted the study selection and risk of bias assessment. The primary results were examined in a one-stage mixed model and a two-stage analysis was conducted in order to confirm these findings.

Main outcomes and measures: Pain and functional status, examined at 4, 13, 26 and 52 weeks.

Results: In total, 10 studies were included. Data from 786 individuals could be retrieved. There is moderate quality evidence that SMT results in similar outcomes at 4 weeks (pain: MD: -2.56, 95% confidence interval [CI]: -5.78 to 0.66, scale 0–100 points; functional status: SMD: -0.18, 95% CI -0.41 to 0.05, scale 0-100 points). These results are similar for the other follow-up measurements at 13, 26 and 52 weeks. The second-stage analysis confirmed these findings.

Conclusion and relevance: SMT provides similar outcomes to recommended interventions for pain and functional status in the older adult with chronic LBP. Therefore, SMT should be considered a treatment option for this patient population.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # A-33

The Research Enterprise at Canadian Memorial Chiropractic College – an analysis incorporating textual and social network analyses

Mark Fillery BSc, MSc, Dr. Brian S Budgell DC, PhD

Canadian Memorial Chiropractic College, Toronto, Canada

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Finely granulated information about growth of research at the Canadian Memorial Chiropractic College (CMCC) is critical for long-term planning.

Objective: Therefore, the purpose of this study was to collate objective, quantitative information on the research capacity of CMCC and its current scholarly output to determine congruence with the needs of the 5 research streams identified by CMCC in its 2017 Strategic Plan.

Methods: In-house publication records for the years 2012 to 2020, were combined with literature searches through Web of Science, PubMed and the Index to Chiropractic Literature (ICL) to identify all primary-data peer-reviewed articles attributed to CMCC from December 31, 2020 back to first citations in Web of Science and Pubmed, and back to January 2001 in ICL. From the combined corpus of retrieved references, funders and affiliations were identified and numbers of publications per year and publications per journal were calculated. From each article, journal name, funding agencies, collaborating institutions and co-authors were also recorded and correlated using the bibliometric/social analysis programmes VosViewer and Gephi. Titles and abstracts were analyzed for lexical trends using VosViewer, Gephi and WordSmith Tools, supplemented by the analytical features in Web of Science.

Results: There was a sharp rise in peer-reviewed publications from approximately 2010 to 2015, followed by a plateauing. On the other hand, citations of CMCC publications have continued to rise steadily. Of the 456 publications between 2012 and 2020, the largest numbers were published in the JCCA (129), JMPT (45) and the European Spine Journal (40), out of 99 journals in total. Authors cited 292 funding agencies, with the CIHR, CMCC, NCMIC, CCRF and the Skoll Foundation being the most commonly cited in the PubMed corpus of CMCC articles. While numbers of salaried researchers have remained in the low teens, hundreds of co-authors were identified. The dominant research themes were largely in the area of musculoskeletal care. Cross-department collaborations within CMCC were common.

Discussion: In terms of productivity, CMCC 'punches above its weight' by leveraging a small research faculty to recruit the effort of large numbers of external researchers who have access to significant funders. CMCC-affiliated research reaches a broad audience through a diverse suite of journals, and, based on rates of citation, appears to be relatively influential. Output is not evenly distributed across the core research streams of the institution, with some supposedly core areas of research quite unproductive. Plateauing of publication numbers in the last several years suggests that peak productivity has been approached with current resources.

Booth # A-34

Mapping the Global Chiropractic Research Enterprise – A Protocol

Dr. Shari Wynd DC, PhD[1], Mark Fillery BSc, MSc[2], Dr. Brian S Budgell DC, PhD[2]

[1]Texas Chiropractic College, Pasadena, USA. [2]Canadian Memorial Chiropractic College, Toronto, Canada

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background: To inform research agendas in general, a number of meta-researchers in other sub-disciplines of health care have used diverse approaches, including social network analysis (SNA), to characterize research networks; particularly to identify key researchers, collaborations and drivers of research. However, with the exception of a recent study of the Canadian chiropractic research enterprise, there has been no quantitative assessment of the allocation of resources and the research output attributable to the chiropractic profession worldwide. Furthermore, little attention has been paid to the dynamics of the chiropractic research enterprise: how researchers interact with each other across the diverse global community. Without understanding the behaviours of the research community, it is difficult to identify those behaviours which are successful in terms of serving the needs of stakeholders.

Objective: Hence, the purpose of this study is to quantify and characterize the research output attributable to the chiropractic profession worldwide for the decade 2011-2020, and to examine, using social network analysis, interactions between researchers, research institutions, funders and publishers, with a view to identifying successful patterns of behaviour.

Methods:

Scope: This study will survey the peer-reviewed research literature published from 2011 to 2020, inclusive, and attributable to i) chiropractor-researchers regardless of institutional affiliation and ii) non-chiropractic researchers affiliated with chiropractic institutions.

Collaborators: The collaborating team will consist of a core executive for the study, key-informants, regional/institutional research leads and local research assistants. All accredited chiropractic educational institutions and chiropractor-researchers in the world are welcome to participate!

Literature Searches: Literature searches would be conducted by or under the supervision of each regional/institutional research lead using the model search string (("2011/01/01"[Date - Publication] : "2020/12/31"[Date - Publication])) AND (xxx chiropractic college[Affiliation]). Additionally, each institutional research lead will obtain from their institutional office of research administration the list of all publications attributable to their institution and published between 2011/01/01 and 2020/12/31, inclusive. Data will be extracted and entered into a worksheet and duplicates eliminated. Among the key data to be extracted will be title, abstract (with navigational sub-headings removed), authors (and their affiliations and countries of residence), journal name (and impact factor), and funding agencies. Once

the quality of the data has been checked, the core executive team will aggregate spreadsheets and eliminate duplicates. Prior to data analysis, authors would be anonymized and authors' names will not be reported in any publications by the research team. Relationships between researchers, institutions, journals and funding bodies will be analyzed using social network analysis software to identify naturally occurring communities and to obtain measures of *centrality* which reflect the roles of researchers, institutions, journals and funding bodies in the total network. The various measures of *centrality* provide some indication of which members of the network act as what might be thought of as 'influencers' or 'brokers' within the network.

Results (anticipated): Community analyses will reveal which researchers or institutions form lasting and productive collaborations. Additionally, by constructing a time-series, we will identify which researchers or research teams contribute to the network by spawning new researchers.

Booth # B-11

Spine pain changes in individuals with osteoarthritis following chiropractic care at a publicly funded healthcare facility in Canada

Amber Reichardt[1], Associate Professor Steven Passmore DC, PhD[1], Audrey Toth DC[2], Gerald Olin DC, CDir[3]

[1]University of Manitoba, Winnipeg, Canada. [2]Mount Carmel Clinic, Winnipeg, Canada. [3]Manitoba Chiropractors Association, Winnipeg, Canada

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Osteoarthritis (OA) is one of the most prevalent and disabling musculoskeletal diseases worldwide. There is preliminary evidence from experimental studies and consensus documents that chiropractic management may alleviate OA related pain in the short term. The burdens of OA associated pain may be disproportionately more impactful on a socioeconomically disadvantaged population.

Objective: To determine if a pragmatic course of chiropractic management including SM was associated with decreased pain in a socioeconomically disadvantaged population reporting OA.

Method: A retrospective analysis of prospectively collected quality assurance data from the chiropractic program at a publicly funded healthcare facility was conducted. Patients with a diagnosis of OA (N=76) were identified between January 2011 and August 2018. The primary outcomes were pain numeric rating scores (NRS) of each spinal region at baseline and discharge, and a change score was determined. Separate Student's T-tests were applied comparing the baseline and discharge score for each spinal region.

Results: Patients diagnosed with OA were adults (*M*=56.7 years of age, range 33 to 96, *SD*=11.7), primarily identified as female (64.5%), were considered obese (BMI *M*=33.9 kg/m^2, *SD*=9.1), and were referred to the clinic by their primary care physician (68.4%). Statistically and clinically significant (MCID) improvement in mean pain NRS scores, were demonstrated by point change reductions from the baseline to discharge visits. Change scores exceeding an MCID of "2-points" were present in the sacroiliac (-2.91), extremity (-2.84), cervical (-2.73), thoracic (-2.61), and lumbar (-2.59) regions.

Discussion: Individuals with OA in a socioeconomically disadvantaged population responded favourably through reductions in pain to a course of publicly funded chiropractic care. Future prospective research should explore the implications of a course of chiropractic care on the functionality, disability, and quality of life in socioeconomically disadvantaged individuals with OA.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # B-12

The association between guideline adherent radiographic imaging by chiropractic students and the diagnostic yield of clinically significant findings

Miss Shangavi Parthipan M. Chir, Mr Chris Bowles M. Chir, Dr Katie De Luca PhD, Dr Hazel Jenkins PhD

Macquarie University, NSW, Australia

Submission categories

Published work (from 2020 onward)

Abstract

Background: Radiographic guidelines aim to increase the diagnostic yield of clinically relevant imaging findings whilst minimising risk. This study assessed the appropriateness of radiographic referrals made by student chiropractors and explored the association between guideline appropriate imaging and clinically significant radiographic findings.

Methods: Radiographic referral and report findings (n=437) from 2018 were extracted from Macquarie University chiropractic clinics. Appropriateness of radiographic referrals was assessed according to current radiographic guidelines. Radiographic findings were assessed for clinical significance. The association between guideline appropriate radiographic referral and clinically significant radiographic findings was assessed using logistic regression analysis and odds ratios were estimated.

Results: The proportion of guideline appropriate imaging was 55.8% (95%CI: 51.2-60.4). An association between guideline appropriate radiographs and clinically significant findings was found (OR: 2.2; 95%CI: 1.3-4.1).

Conclusions: Approximately half of all radiographic referrals made by chiropractic students were guideline concordant. Guideline appropriate imaging was associated with an increase in clinically significant radiographic findings.

Keywords: Chiropractic; Radiographs; Guidelines; Diagnostic yield; Appropriate use

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree), Student (currently in a clinical or graduate training program)

Booth # B-13

What are the effects of diagnostic imaging on clinical outcomes in patients with low back pain presenting for chiropractic care: a matched observational study

Hazel J Jenkins PhD, MChir[1], Alice Kongsted[2], Simon French[1], Tue Secher Jensen[2], Klaus Doktor[2], Jan Hartvigsen[2], Mark Hancock[1]

[1]Macquarie University, Sydney, Australia. [2]Southern Denmark University, Odense, Denmark

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Evidence suggests that routine imaging for low back pain does not improve care but this has not been investigated in patients presenting to chiropractors.

Objectives: To determine if diagnostic imaging affects clinical outcomes in patients with low back pain presenting for chiropractic care.

Methods: A matched observational study using prospective longitudinal observational data with one year follow up was performed in ten primary care chiropractic clinics in Denmark. Participants included low back pain patients presenting for chiropractic care, who were either referred or not referred for diagnostic imaging during their initial visit. Patients were excluded if they were less than 18 years old, had a diagnosis of underlying pathology, or had previous imaging relevant to their current clinical presentation. Coarsened exact matching was used to match patients referred for diagnostic imaging with patients not referred for diagnostic imaging on baseline variables including patient demographics, pain characteristics, and clinical history. Mixed linear and logistic regression models were used to assess the effect of imaging on back pain intensity and disability at two-weeks, three-months, and one-year, and on global perceived effect and satisfaction with care at two-weeks.

Results: 2,162 patients were included, with 24.1% referred for imaging. Near perfect balance between matched groups was achieved for baseline variables except age and leg pain. Patients referred for imaging had slightly higher back pain intensity at two-weeks (0.4, 95%CI: 0.1, 0.8) and one-year (0.4, 95%CI: 0.0, 0.7), and disability at two-weeks (5.7, 95%CI: 1.4, 10.0). No difference between groups was found for the other outcome measures.;

Discussion: Diagnostic imaging did not result in better clinical outcomes in patients with low back pain presenting for chiropractic care. The results support that current guideline recommendations against routine imaging apply equally to chiropractic practice.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # B-14

The Detect trial: Do X-rays for spinal pain in patients receiving chiropractic care change patient outcomes? A pilot randomised controlled trial.

Miss Anika Young M Res, Dr Hazel Jenkins PhD, Prof Simon French PhD, Dr Aron Downie PhD, Dr Craig Moore PhD, Dr Stephney Whillier PhD, Prof Mark Hancock PhD

Macquarie University, Sydney, Australia

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background

Current imaging guidelines for the chiropractic profession recommend that X-rays should only be used when there is clinical suspicion of underlying serious pathology. However, studies informing these guidelines have been performed in general medical practice and some chiropractors believe that X-rays are important within chiropractic practice to screen for contraindications to spinal manipulative therapy and inform chiropractic technique selection and application. In a chiropractic setting, we have a limited understanding of whether diagnostic X-ray use, for reasons not indicated by guidelines, affects patient outcomes.

Objectives

The primary aim of this pilot study is to assess the feasibility of performing a large-scale randomised controlled trial. The fully powered trial will test whether X-rays for spinal pain in patients receiving spinal manipulative therapy affect patient outcomes or change the frequency or degree of adverse events.

Methods

A pilot randomised controlled trial will be conducted. Chiropractors from Sydney, Australia who regularly refer patients for spinal X-rays will be recruited by convenience sampling. Chiropractor demographics and imaging behaviour will be collected via an online survey.

Participating chiropractors will recruit patients with a new episode of spinal pain. Patients will be eligible if the chiropractor intends to refer them for X-rays and use spinal manipulative therapy as a treatment modality. Patients will be excluded if they are under 18 years old or there is clinical suspicion of underlying serious pathology. Patients will be randomised to either receive or not receive an X-ray. Subsequent treatment will not be impacted by inclusion in the study. At baseline, and 2-weeks, 6-weeks and 12-weeks post-randomisation patients will complete online surveys on pain, disability, satisfaction, adverse events and whether they obtained X-rays, and chiropractors will complete online surveys for each patient recruited on treatment modalities used, adverse events, and subsequent imaging referral.

The primary outcome measures will report recruitment rates of chiropractors and patients, the number of patients lost to follow-up in intervention and control groups, and patient cross-over between intervention and control groups. Secondary outcome measures will report preliminary clinical outcome data, including whether the patient received spinal manipulative therapy or had any adverse events, and patient-reported pain and disability.

Discussion

This study will provide critical feasibility data that will inform a large-scale study, including recruitment and retention rates of chiropractors and patients, cross-over between intervention and control groups, and preliminary clinical outcome data to inform sample size calculations.

Results from the planned fully-powered randomised controlled trial will directly inform chiropractic clinical practice. If results demonstrate that X-ray use improves patient outcomes and/or reduces adverse events, clinical practice guidelines will need to be revised. Conversely, if X-ray use is not shown to improve patient outcomes or reduce adverse events, better certainty of the limited benefits of X-ray use will foster chiropractors' compliance with current recommendations in clinical practice guidelines.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # B-21

Prevalence of multimorbid degenerative lumbar spinal stenosis with knee and/or hip osteoarthritis: protocol for a systematic review and meta-analysis

James J Young DC, MSc[1], Jan Hartvigsen DC, Phd[1], Rikke K Jensen MSc (Clin Biomech), PhD[1], Ewa M Roos Pt, PhD[1], Carlo Ammendolia DC, PhD[2], Carsten B Juhl Pt, PhD[1]

[1]University of Southern Denmark, Odense, Denmark. [2]Mount Sinai Hospital, Toronto, Canada

Submission categories

Published work (from 2020 onward)

Abstract

Background: Lumbar spinal stenosis (LSS) and knee and hip osteoarthritis (OA) are prevalent conditions in the aging population and published literature suggests they share many symptoms and often are present at the same time in patients. However, no prevalence estimates of multimorbid LSS and knee and/or hip OA are currently available. The primary objective of this systematic review is therefore to estimate the prevalence of multimorbid LSS with knee and/or hip OA using radiological, clinical, and combined case definitions.

Methods: This systematic review protocol has been designed according to the guidelines from the Cochrane Collaboration and are reported according the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols. A comprehensive search will be performed in the following databases: MEDLINE, EMBASE, CENTRAL, and CINAHL. Forward citation tracking will be performed in Web of Science. No restriction for publication data and language will be applied in the literature search, but only articles in English will be included. The search strategy will include the following domains: LSS, knee OA, and hip OA. Retrieved citations will be screened by two authors independently. Disagreements will be discussed until consensus, and a third reviewer will be consulted if consensus cannot be reached. Data extraction and assessment of methodological quality will be done by two authors independently, using a standardized data extraction form and a modified Risk of Bias Tool for Prevalence studies. Meta-analysis estimating prevalence with 95% CI will be performed using a random effects model. Meta-regression analyses will be performed to investigate the impact of the following covariates: LSS clinical presentations, sample population, healthcare setting, risk of bias, and other patient characteristics on prevalence estimates for multimorbid LSS and knee and/or hip OA.

Discussion: The results of this review will provide the first estimates of the prevalence of multimorbid LSS and hip and knee OA based on various case definitions. The impact of covariates such as LSS clinical presentations, sample population, healthcare setting, risk of bias, and patient characteristics on prevalence estimates will also be presented.

Systematic review registration: Submitted to PROSPERO, awaiting registration

Booth # B-22

Repetitive in vivo manual loading of the spine elicits cellular responses in porcine annuli fibrosi

John Matyas PhD[1], Claudia Klein PhD[2], Dragana Ponjevic PhD[1], Neil Duncan PhD[1], Gregory N Kawchuk DC, PhD[3]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Back pain and intervertebral disc degeneration are prevalent, costly, and widely treated by manual therapies, yet the underlying causes of these diseases are indeterminate as are the scientific bases for such treatments.

Objective: The present studies characterize the effects of repetitive in vivo manual loads on porcine intervertebral disc cell metabolism using RNA deep sequencing.

Methods: A single session of repetitive manual loading applied to the lumbar spine induced both up- and down-regulation of a variety of genes transcribed by cells in the ventral annuli fibrosi. The effect of manual therapy at the level of loading was greater than at a level distant to the applied load. Gene ontology and molecular pathway analyses categorized biological, molecular, and cellular functions influenced by repetitive manual loading, with over-representation of membrane, transmembrane, and pericellular activities. Weighted Gene Co-expression Network Analysis discerned enrichment in genes in pathways of inflammation and skeletogenesis.

Results: The present studies support previous findings of intervertebral disc cell mechanotransduction, and are the first to report comprehensively on the repertoire of gene targets influenced by mechanical loads associated with manual therapy interventions.

Discussion: The present study defines the cellular response of repeated, low-amplitude loads on normal healthy annuli fibrosi and lays the foundation for future work defining how healthy and diseased intervertebral discs respond to single or low-frequency manual loads typical of those applied clinically.

Booth # B-23

Prevalence and management of patients with headache in chiropractic practice - development and preliminary testing of a questionnaire

Associate Professor Henrik Hein Lauridsen D.C., M.Sc., Ph.D.[1], Chiropractor Martin Ellehave Jensen M.Sc.[2], Chiropractor Mikkel Møller Christensen M.Sc.[2], Senior researcher Kristina Boe Dissing M.Sc., Ph.D.[1]

[1]Department of Sports Science and Clinical Biomechanics, Odense, Denmark. [2]Private chiropractic practice, Copenhagen, Denmark

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background
Headache is a global problem rated as the second most frequent cause of years lived with disability, and nearly one in three adults seek help in the Danish healthcare system during their lifetime for a headache disorder. The consequences of headaches are numerous with the most important being patient suffering, impaired working capacity and participation in social activities, and sick leave.
Headache patients are seen and managed by chiropractors, and in Denmark it is estimated that 8% of the patients report with headache. The management often involves treatment with manipulation, patient education, soft tissue therapy and advise.
Despite this our knowledge about headache prevalence, utilisation of diagnostic categories and criteria, adherence to clinical guideline recommendations and treatment types offered in chiropractic practice is sparse.

Objectives
The objective of this study was to develop and preliminarily test a comprehensive questionnaire for headache patients seen in chiropractic practice.

Methods
The method consisted of three phases: 1) a literature search, 2) a development phase, and 3) a testing phase. The literature search aimed at identifying existing questionnaires developed with the intent of uncovering the epidemiology of headaches. The development phase followed an iterative process using the COSMIN methodology for constructing a new questionnaire. An item bank with candidate items in six areas was developed: a) demographic questions, b) headache prevalence questions (including a logbook registration sheet), c) headache classification questions, d) treatment monitoring and outcome questions, e) management questions, and f) questions about multidisciplinary care. Item formulation and selection was carried out by an expert group and subsequently evaluated using cognitive interviews with chiropractors. The testing phase included a pilot study with four weeks of data recording followed by semi-structured interviews.

Results
The literature study identified one questionnaire (ACORN) and one clinical guideline which contributed

questions to the item bank. A total of 45 questions (31 from ACORN and 14 from the clinical guideline) were included in the questionnaire. In addition, a logbook for registering relevant headache prevalence variables was created. The participants in the interview study found the questionnaire items comprehensive and relevant, and no items were removed or added. A total of 33 issues required amendments (28 pertained to the questionnaire and 5 to the logbook). The issues were grouped in four main domains: 1) recall issues, 2) issues with the answer categories, 3) issues with the layout, and 4) issues with the duration of answering the questionnaire. All issues were addressed and documented, and examples are given in Table 1.
The pilot study included 12 participants of which 11 answered the questionnaire. Both the questionnaire and the logbook were found to be comprehensive, relevant and comprehensible, and no further changes were implemented.

Table 1. Examples of issues found in the cognitive interviews.
-- To be included in the poster --

Conclusion
We have developed a novel, feasible and comprehensive questionnaire measuring prevalence, utilisation of diagnostic categories and criteria, adherence to clinical guideline recommendations and treatment types in patients with headaches seen by chiropractors.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # B-24

What happens to patients after an Emergency Department visit for a spine related diagnosis?

Dr Brian R Anderson DC, MPH, PhD[1], Mr Steve McClellan MS[2]

[1]Palmer College of Chiropractic, Davenport, USA. [2]Integrative Musculoskeletal Care, Tallahassee, USA

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Spine related disorders are among the most common reasons for emergency department (ED) visits in the US, accounting for over 3 million yearly visits. Some experts classify spinal pain as one of the most avoidable reasons for ED visits, because a significant portion of patients receive no treatment, but are referred to other providers for follow up care. Current studies which follow patients after an ED visit for spine pain are focused on pain and/or disability scores to determine the course of these variables over time. A natural progression of this research is to investigate the type of care received following an ED visit.

Methods: Spine-related ED visits were identified from an insurance claims database representing the covered members of a large fortune-500 company (2012-2019). Episodes of care were identified by 90 day claim free periods, and only the initial episode of care was included in our analysis. Episodes including more than one spinal region were excluded, as were diagnoses related to fracture. Since provider identifier codes were not available, procedure codes 98940-98942 were used as markers for chiropractic care. Similarly, procedure codes 97161-97164 were used as markers for physical therapy. The absence of these procedure codes placed the patient into the medical management care group. Demographic variables were collected, along with spinal region, opioid medication use and ED diagnosis. Pearsons Chi-square (categorical variables) and independent samples t-tests (continuous variables) were utilized to examine significant differences among these variables in patients receiving follow up care vs no follow up care.

Results: A total of 706 ED visits were identified during the first episode of a spine-related diagnosis. Most diagnoses were classified as either generic (44%) or soft tissue related (41%), with lumbar spine being the predominant spinal region (52%). Over half (55%) of those patients visiting the ED for a spinal pain disorder received no follow up care within 90 days. The remaining forty five percent did receive follow up care, which was classified as either medical management (n=210), physical therapy (n=63) or chiropractic (n=22). Those receiving follow up care (vs not) tended to be older males with higher median comorbidity scores and diagnoses that were generic, or nerve related. Approximately twice as many patients receiving follow up care (vs. none) utilized opioid medications within 90 days of their ER visit (25% vs 12%, respectively).

Conclusions: Surprisingly, few patients received any follow up care within 90 days of an ED visit for a spine related diagnosis. This result is consistent with the opinion that the ED is overutilized regarding spine related conditions. A larger sample size would improve generalization of our findings.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # B-25

Immediate impact of extremity manipulation on dual task performance: a randomized, crossover clinical trial

Dr. Christopher A Malaya DC[1], Dr. Joshua Haworth PhD[2], Dr. Katherine Pohlman DC, MS, PhD[1], Dr. Dean Smith DC, PhD[3]

[1]Parker University, Dallas, USA. [2]Oakland University, Rochester, USA. [3]Miami University, Oxford, USA

Submission categories

Published work (from 2020 onward)

Abstract

Background

Previous research demonstrated that manipulation of the extremities was associated with changes in multi-segmental postural sway as well as improvement in a lower extremity balancing task. We were interested if these effects would extend to an upper extremity task.

Objective

Our aim in this study was to investigate whether extremity manipulation could influence dual task performance where the explicit suprapostural task was balancing a water filled tube in the frontal plane.

Methods

Participants were healthy volunteers (aged 21–32 years). Upper- or lower extremity manipulations were delivered in a participant and assessor blinded, randomized crossover, clinical trial. Postural (center of pressure) and suprapostural (tube motion) measurements in the frontal plane were made pre-post manipulation under eyes open and eyes closed conditions using a BTrackS™ force plate and a Shimmer inertial measurement unit, respectively. Pathlength, range, root mean square and sample entropy were calculated to describe each signal during the dual task performance.

Results

There was no main effect of manipulation or vision for the suprapostural task (tube motion). However, follow-up to interaction effects indicates that roll pathlength, range and root means square of tube motion all decreased (improvement) following lower extremity manipulation with eyes open. Regarding the postural task, there was a main effect of manipulation on mediolateral center of pressure such that pathlength reduced with both upper and lower extremity manipulation with larger decreases in pathlength values following upper extremity manipulation.

Discussion

Our findings show that manipulation of the extremities enhanced stability (e.g., tube stabilization and standing balance) on performance of a dual task. This furthers the argument that site-specific

manipulations influence context specific motor behavior/coordination. However, as this study focused only on the immediate effects of extremity manipulation, caution is urged in generalizing these results to longer time frames until more work has been done examining the length of time these effects last.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # B-26

Effect of 4 weeks of spinal manipulation plus physical therapy Vs physical therapy alone, on motor function in stroke

Dr Kelly Holt PhD[1], Dr Imran Khan Niazi PhD[1], Dr Imran Amjad PT,PhD[1], Dr Nitika Kumari PT,PhD[1], Dr Usman Rashid PhD[2], Dr Jens Duehr Chiropractor[1], Dr Muhammad Shafique PhD[3], Dr Heidi Haavik PhD[1]

[1]New Zealand College of Chiropractic, Auckland, New Zealand. [2]Auckland University of Technology, Auckland, New Zealand. [3]Riphah International University, Islamabad, Pakistan

Submission categories

Unpublished work (complete or incomplete)

Abstract

Study Objectives: The primary objective of this study was to investigate the effects of 4 weeks of spinal manipulation(SM) plus physiotherapy(PT), compared to physiotherapy alone, on motor function in chronic stroke patients.
Methods and material: This pragmatic parallel-group randomised controlled trial was conducted in a hospital setting in Rawalpindi, Pakistan. Participants, clinical assessors, and data analysts were blinded to group allocation. One hundred stroke patients were screened, 63 chronic stroke patients (minimum time: >12 weeks post-stroke and scored less than 80 on a combined upper and lower extremity Fugl-Meyer Assessment) patients met the inclusion criteria, with ongoing motor weakness participated in the trial. Participants were randomly allocated to receive either four weeks of conventional physical therapy alone or four weeks of conventional physical therapy combined with four weeks of spinal manipulation provided by a chiropractor. The primary outcome measure was the Fugl-Meyer Assessment of Motor Recovery after Stroke (FMA) assessed at baseline, after four weeks of care, and post eight weeks (retention). Secondary outcome measurements Stroke specific Quality of Life, Time up and go, Modified Rankin Scale, Sit-to-Stand Test**,** were also recorded. A post-hoc responder analysis was performed to investigate the potential clinical significance of between-group differences in the upper and lower extremities FMA. Groups were compared using linear mixed regression models.
Results: Fifty-five participants completed the 4-week assessment (n=28 in the SM+PT group, n=27 in the sham+PT group) and 38 completed the 8-week assessment (n=19 in each group)After four weeks of care the group receiving spinal manipulation plus physiotherapy estimated mean improved in the FMA was 23.2 points (95% CI 19.2-27.3)of the physical therapy alone group improved by 17.1 points (95% CI 13.0-21.2). The between-group difference (6.1 CI 0.4-11.9) was significant (p=0.04) in favour of the group receiving spinal manipulation plus physiotherapy. At eight weeks (4.5 CI -2.2-11.2] there was no significant difference between groups in the primary FMA measure. when using the higher (7.25) FMA-UE minimum clinically important difference(MCID) score, combined with the FMA-LE cut-off MCID of 6, there was a significant between-group difference (chiro + PT = 96%, sham + PT = 78%, $X2$ (1, N =55) = 4.3, p = 0.04).There was no significant difference between groups in secondary measures.

Conclusion: In a group of chronic stroke patients, 4 weeks of spinal manipulation combined with physical therapy, resulted in improvements in motor function compared to 4 weeks of physical therapy alone.

Booth # B-27

Chiropractic COVID-19 Global Survey: analysis of impact and response

Dr Craig Shane Moore PhD[1], Dr Arnold Wong PhD[2], Dr Katie de Luca PhD[1], Dr Diana De Carvalho PhD[3], Dr Melker Johansson PhD[4], Dr Katherine Pohlman PhD[5], Dr Amy Miller BSc (Hons) Human Sciences, MSc Chiropractic[6], Dr Martha Funabashi PhD[7], Dr Paul Doherty PhD[8], Dr Simon French PhD[1], Dr Jon Adams PhD[9], Dr Greg Kawchuk PhD[10], Dr Jan Hartvigsen[4]

[1]Macquarie University, Sydney, Australia. [2]Polytechnic University, Hong Kong, Hong Kong, China. [3]Memorial University of Newfoundland, St John's, Canada. [4]Southern Denmark University, Odense, Denmark. [5]Parker University, Dallas, USA. [6]Bournemouth University, Bournemouth, United Kingdom. [7]Canadian Memorial Chiropractic College, Toronto, Canada. [8]VA Finger Lakes Healthcare System, Canandaigua, USA. [9]University of Technology Sydney, Sydney, Australia. [10]University of Alberta, Edmonton, Canada

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Coronavirus (COVID-19) is a highly transmissible disease that has spread throughout every continent in less than 12 months, representing a global public health challenge. To date, there has been over 110 million confirmed cases and over 2.5 million deaths related to coronavirus worldwide. Limited information is available to understand the impact and response by the chiropractic workforce to the COVID-19 pandemic. This knowledge may offer valuable insights helpful to improving infectious disease procedures within chiropractic settings.

Objective(s): Describe the impact and response by chiropractors to the COVID-19 pandemic; and explore the COVID-19 related patient management factors associated with chiropractors practicing under a non-surgical spine/musculoskeletal paradigm.

Methods: A 36 item online survey was distributed to chiropractors internationally via professional associations, professional online publications and social media (October 6th - December 19th, 2020) exploring the changes to patient management, business performance and the personal life of chiropractors as a result of the COVID-19 pandemic. Multiple logistic regression was used to explore the COVID-19 patient management factors associated with chiropractors with a non-surgical spine/musculoskeletal paradigm.

Results: A total of 2061 chiropractors across 5 continents completed the survey. The vast majority initiated COVID-19 infectious control changes within their practice setting, including increased disinfecting of their hands (93.2%), provision of hand sanitizer (92.6%), disinfecting of treatment equipment (94.2%) and frequent contact areas (93.8%) and social distancing of patients (88.7%). A total of 79.5% of chiropractors believed they had followed all that had been advised on the use of PPE in response to the COVID-19 pandemic, while 20.4% reported following only some or none/rarely what had been advised.

The COVID-19 patient management factors associated with chiropractors practicing under a non-surgical spine/musculoskeletal paradigm are: implementing some/all government advice on patient use of PPE during COVID-19 (OR = 3.252; 95%CI: 1.568, 6.741); implementing some/all of the government advice on chiropractor use of PPE during COVID-19 (OR = 2.591; 95%CI: 1.323, 5.076); rescheduling patients presenting with COVID-19 or similar flu-like symptoms (OR = 2.161; 95%CI: 1.181, 3.953); identifying government advice on the need for patients to wear cloth/standard surgical masks (OR = 2.096; 95%CI: 1.040 to 4.219); identifying government advice on the need for chiropractors to wear protective garments/clothing (OR = 1.561; 95%CI: 1.041, 2.341); initiating patient consultation using telehealth (OR = 1.460; 95%CI: 1.023, 2.083); not believing government advice required patients to wear face and/or eye shielding (OR = 0.469; 95%CI: 0.291, 0.757); not increasing face-to-face treatment during the worst weeks of COVID-19 outbreak (OR = 0.360; 95%CI: 0.200, 0.648).

Discussion: While the vast majority of chiropractors made substantial infectious control changes within their practice setting in response to COVID-19, one in 5 chiropractors failed to implement all government advice on their personal use of PPE during COVID-19. Chiropractors identifying with a spine/musculoskeletal paradigm were associated with initiating several important COVID-19 infectious control changes. As the global threat of COVID-19 continues, it is critical to improve the knowledge and behaviours of chiropractors in response to COVID-19 to help to reduce the spread of the pandemic.

Booth # B-28

Manipulative and manual therapies in the management of patients with prior lumbar surgery: A systematic review

Dr. Clinton J Daniels DC, MS[1], Dr. Zachary A Cupler DC, MS[2], Dr. Jordan A Gliedt DC[3], Sheryl Walters MLS[4], Dr. Alec L Schielke DC[5], Dr. Nathan A Hinkeldey DC[6], Dr. Derek J Golley DC, MHA[7], Dr. Cheryl Hawk DC, PhD[8]

[1]VA Puget Sound Health Care System, Tacoma, USA. [2]Butler VA Health Care System, Butler, USA. [3]Medical College of Wisconsin, Milwaukee, USA. [4]Logan University, Chesterfield, USA. [5]VA Palo Alto Health Care System, San Jose, USA. [6]VA Central Iowa Health Care System, Des Moines, USA. [7]VA Western New York Health Care System, Buffalo, USA. [8]Texas Chiropractic College, Pasadena, USA

Submission categories

Published work (from 2020 onward)

Abstract

Background and Purpose:

Pain and disability may persist following lumbar spine surgery and patients may subsequently seek providers trained in manipulative and manual therapy (MMT). This systematic review investigates the effectiveness of MMT after lumbar surgery through identifying, summarizing, assessing quality, and grading the strength of available evidence. Secondarily, we synthesized the impact on medication utilization, and reports on adverse events.

Methods:

Databases and grey literature were searched from inception through August 2020. Article extraction consisted of principal findings, pain and function/disability, medication consumption, and adverse events.

Results:

Literature search yielded 2025 articles,117 full-text articles were screened and 51 citations met inclusion criteria. The majority of included studies were case reports or case series (n =38), followed by randomized controlled trials (n = 7), systematic reviews (n = 3), scoping review (n = 1),narrative review (n = 1) and a cross-sectional survey (n = 1). The most common reason for exclusion was due to care not involving MMT (n = 35). Four of the seven randomized controlled trials were sufficiently powered, of which three were low-risk of bias and 1 was moderate risk of bias.

Conclusion:

There is moderate evidence to recommend neural mobilization and myofascial release after lumbar fusion, but inconclusive evidence to recommend for or against most manual therapies after most surgical interventions. The literature is primarily limited to low-level studies. More high-quality studies are needed to make recommendations.

Booth # B-31

Rapid Widespread Adoption of Telehealth for Chiropractic Care in the Department of Veterans Affairs during the COVID-19 Pandemic

Dr. Gregory Roytman DC[1], Dr. Brian C Coleman DC[1], Dr. Kelsey Corcoran DC[1], Dr. Cynthia Long PhD, PStat[2], Dr. Christine Goertz DC, PhD[3], Dr. Anthony Lisi DC[1]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: The proliferation of COVID-19 pandemic in the United States, beginning in March 2020, required the Veterans Health Administration (VHA) to respond and adapt to a rapidly changing situation. With necessary distancing restrictions, VHA staff employed telehealth to reach their patients.

Objective: To assess the use of face-to-face and telehealth chiropractic care in the VHA during the early stages of the COVID-19 pandemic.

Methods: A serial cross-sectional analysis of VHA administrative data, including the number of unique patients, visits, and procedural codes for face-to-face and/or telehealth (video and telephone) chiropractic care from June 2019 to July 2020.

Results: From June 2019 to January 2020, face-to-face and telehealth use remained stable. From February to April 2020, face-to-face patients decreased from 21,228 to 1,009 (-21-fold) and visits decreased from 29,899 to 1,262 (-24-fold).Telehealth use rose over the same period from 24 to 4,144 patients (+173-fold) and 24 to 4,879 visits (+203-fold). By July 2020, face-to-face use rose by 7,893 patients (+8-fold) and 10,532 visits (+8-fold). Telehealth declined over the same period by 1,596 patients (-3-fold) and 2,015 visits (-2-fold). The most frequent procedural code categories in telehealth visits were evaluation and management, patient education/self-care, and therapeutic exercises.

Discussion: Face-to-face visits decreased early in the pandemic but began to increase after April 2020. Telehealth use rapidly increased during the early stage of the COVID-19 pandemic, and decreased later, but has remained higher than pre-pandemic levels.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # B-32

Distribution and prevalence of musculoskeletal pain co-occurring with persistent low back pain: a systematic review

Cecilie K. Øverås PhD Fellow, MSc Chiropractic[1], Melker S. Johansson PhD[1], Tarcisio F. de Campos PhD[2], Professor Manuela L. Ferreira PhD[3], Professor Bård Natvig PhD[4], Professor Paul J. Mork PhD[5], Professor Jan Hartvigsen PhD[1]

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Submission categories

Published work (from 2020 onward)

Abstract

Background: Co-occurring musculoskeletal pain is common among people with persistent low back pain (LBP) and associated with more negative consequences than LBP alone. The distribution and prevalence of musculoskeletal pain co-occurring with persistent LBP has not been systematically described, which hence was the aim of this review.

Methods: Literature searches were performed in MEDLINE, Embase, CINAHL and Scopus. We considered observational studies from clinical settings or based on cohorts of the general or working populations involving adults 18 years or older with persistent LBP (≥4 wks) and co-occurring musculoskeletal pain for eligibility. Study selection, data extraction and risk of bias assessment were carried out by independent reviewers. Results are presented according to study population, distribution and location(s) of co-occurring pain.

Results: Nineteen studies out of 5744 unique records met the inclusion criteria. Studies were from high-income countries in Europe, USA and Japan. A total of 34,492 people with persistent LBP were included in our evidence synthesis. Methods for assessing and categorizing co-occurring pain varied considerably between studies, but based on the available data from observational studies, we identified three main categories of co-occurring pain - these were axial pain (18 to 58%), extremity pain (6 to 50%), and multi-site musculoskeletal pain (10 to 89%). Persistent LBP with co-occurring pain was reported more often by females than males, and co-occurring pain was reported more often in patients with more disability.

Conclusions: People with persistent LBP often report co-occurring neck pain, extremity pain or multi-site pain. Assessment of co-occurring pain alongside persistent LBP vary considerable between studies and there is a need for harmonisation of measurement methods to advance our understanding of how pain in different body regions occur alongside persistent LBP.

Systematic review registration: PROSPERO CRD42017068807.

Protocol published: https://doi.org/10.1186/s13643-017-0656-7

Published paper: Øverås CK, Johansson MS, de Campos TF, Ferreira ML, Natvig B, Mork PJ, Hartvigsen J. Distribution and prevalence of musculoskeletal pain co-occurring with persistent low back pain: a systematic review. BMC Musculoskelet Disord. 2021 Jan 18;22(1):91. doi: 10.1186/s12891-020-03893-z

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # B-33

Leadership and Capacity Building in Chiropractic Research: Report from the first CARL cohort

Professor Jan Hartvigsen PhD[1], Professor Greg N Kawchuk PhD[2], Senior Researcher Alexander Breen PhD[3], Assistant Professor Diana de Carvalho PhD[4], Associate Professor Andreas Eklund PhD[5], Lecturer Matthew Fernandez PhD[6], Senior Researcher Martha Funabashi PhD[7], PhD student Michelle M Holmes MSc[8], Post Doc Melker S Johansson PhD[1], Lecturer Katie de Luca PhD[6], Lecturer Craig Moore PhD[6], Assistant Professor Isabelle Pagé PhD[9], Associate professor Kathrine A Pohlman PhD[10], Senior Lecturer Michael S Swain PhD[6], Associate Professor Arnold YL Wong PhD[11], Professor Jon Adams PhD[12]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

The Chiropractic Academy for Research Leadership (CARL) was formed in 2016 in response to a need for a global network of early career researchers and leaders in the chiropractic profession. Thirteen fellows were accepted competitively and have since worked together at residentials and virtually on many research and leadership projects. In 2020, the CARL program ended for this first cohort, and it is now timely to take stock and reflect on the achievements and benefits of the program.

The first cohort of 13 fellows met at yearly residentials and more regularly via videoconferences. A CARL publication or conference presentation was defined as being the result of a collaborative CARL project with at least two fellows and one mentor as co-authors. CARL I projects collectively produced 38 international peer-reviewed papers published in 20 different journals with an average impact factor of 2.582. CARL fellows had a total of 81 conference abstracts accepted (43 podium presentations, 32 posters and 6 workshops). Of the 24 conferences where CARL fellows presented, 10 were national and 14 were international meetings.

A broad range of leadership activities originated from CARL including 15 conference organizations, 18 memberships of councils and/or boards, 10 editorial board memberships, three themed meetings about women in chiropractic, conveners in research sessions at conferences, media activity about CARL and academic course or workshop leadership. The 13 CARL fellows were awarded a total of US $559,366.29 in research or travel grants during the three years (2016-2020). Six CARL fellows were awarded PhD degrees while participating on the program. Collectively, the fellows received 17 research awards, and 14 new professional academic appointments or promotions were obtained amongst the fellows since their participation on the program

CARL has significantly contributed to the global research capacity in chiropractic through publication of original scientific papers, conference presentations, and leadership activities. Importantly, the CARL fellows have become a tightly knit, supportive group of successful and highly capable early career researchers who have the potential to further grow and shape the global research agenda for chiropractic over future decades.

Booth # B-34

"*Hello, how are you*?": Keeping patients connected during the COVID19 pandemic

Professor Deborah Kopansky-Giles BPHE, DC, FCCS, MSc[1], Dr. Noor Ramji MD[2], Dr. Mo AlHaj MD[2], Gail Summagang RN[2], Brenda Chang PharmD[2], Kari Fulton NP[2], Dr. Karen Weyman MD[2]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Unprecedented times during the COVID-19 pandemic resulted in social distancing and isolation, posing an increased risk for primary care patients from lack of opportunity for in-person interaction with their health team, particularly for those who are vulnerable and at high risk.

Objectives: a) To ensure that vulnerable/high-risk patients/families continue to be connected to and supported by the family health team during COVID-19; b) To understand patient concerns and provide resources to support their physical/mental health; c) To understand the viability and impact of this program on participating providers and the health care team.

Design: Iterative program evaluation using Stufflebeam's CIPP approach (Context, Input, Process/Methods, Product) with both quantitative and qualitative data collection. Setting: Inner city, integrated hospital-based family health team (FHT). Participants: Department health professionals and patients prioritized as 'high risk' during the COVID-19 pandemic. Intervention: Wellness Check-In (WCI) callers (FHT IHPs) preventatively connected with high-risk patients (seniors, underhoused, mental health, those on social assistance identified through EMR search). Subject Matter Experts (SMEs) followed up with patients identifying specific concerns focused around social determinants of health (SDOH). Weekly debriefs were conducted to support iterative improvement. Initial and mid-point consultation occurred with the Patient and Family Advisory Committee. Outcome measures: Data collection included: # of patients reached, length of call, desire for follow-up call, # of calls escalated to SMEs, context of patient concern, and satisfaction with the call from the perspective of both the patient and the caller.

Results: 4500 high-risk patients were identified. Over 2000 patients were contacted by 18 WCI callers and 10 SMEs in the first 4 months of COVID-19 restrictions. Patients were highly satisfied with the calls (98.5%). Caller perspectives indicated primarily very positive (65.4%), positive (21.4%), neutral (12%) and few negative (1.2%) interactions. 85% of patients felt supported and were coping well and no further action was required. 2.6% were connected with their primary contact provider (MD or NP), 6.6% were referred to the urgent RN, and 5.7% were referred to another department health provider. Patient concerns were categorized as: None, medical (including prescription drugs), senior-specific, mental health, food security, housing, income security and musculoskeletal.

A shift was seen between early (April) and later data collection (June) to reflect an improvement in self management and report of feeling supported and understanding COVID guidelines.

Qualitative feedback also indicated that an increasing majority of patients were coping much better at 3 months, that they felt well connected to the team and that they had good support at home. WCI callers reported feeling valued by patients, improved team strengthening by the collaborative work and that they enjoyed this enhancement of their professional role. The health team benefitted from enhanced patient demographic data, the inclusion of a COVID toolbar in the electronic health record, an accessible pandemic SDOH resource and enhanced team cohesion.

Conclusions:

The WCI program resulted in positive outcomes from the perspective of patients, and enhanced opportunities to connect between patients and the health care team during the COVID19 pandemic.

Booth # B-35

Exploring barriers and facilitators to fidelity of training and delivery of an intervention to reduce imaging for low back pain: protocol for a qualitative study

Dr. Daphne To DC[1], Dr. Diana De Carvalho DC, PhD[1], Ms. Andrea Pike MSc[1], Dr. Holly Etchegary PhD[1], Dr. Elaine Toomey PhD[2], Dr. Amanda Hall PhD[1]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background: Within behaviour change research, intervention fidelity refers to the methodological strategies used to monitor and enhance the reliability and validity of behavioural interventions and involves five areas: design, training, delivery, receipt, and enactment. Intervention fidelity can have an impact on both the internal and external validity of effectiveness trials. For example, if intervention fidelity was not assessed, it would be unknown if ineffective interventions were truly ineffective or were ineffective due to poor delivery of an effective intervention. Many interventions aimed at reducing non-indicated imaging for low back pain (LBP) have been developed, but with variable effectiveness. Many trials did not assess intervention fidelity, which may impact the interpretation of the results. Such interventions are necessary, as the inappropriate use of imaging for LBP remains common in primary care practices.

Objective: The purpose of this study is to explore barriers and facilitators to fidelity of training and delivery of an intervention aimed at reducing non-indicated imaging for LBP by general practitioners (GPs) and chiropractors in Newfoundland and Labrador (NL), Canada.

Methods: Semi-structured interviews will be conducted with clinicians across NL. Interviews will include a presentation on proposed strategies to enhance and assess fidelity of training and delivery, followed by questions related to (i) clinicians' attitudes towards the intervention material, (ii) clinicians' views on how to enhance and assess fidelity of clinician training by the research team, and (iii) clinicians' views on how to enhance and assess fidelity of intervention delivery by clinicians to patients. Ten to twenty interviews will be conducted and analysed until saturation has been reached. Inductive thematic analysis will be used to analyse the interviews, followed by a secondary deductive analysis using the Theoretical Domains Framework, which was originally designed to explore influences on health professional behaviour related to the implementation of evidence-based recommendations.

Results (anticipated): We expect to determine barriers (e.g., in person training, time, rigid script) and facilitators (e.g., virtual training, accommodation of learner differences, booster sessions) related to the training method, use of a training manual, use of a provider script for intervention delivery, and patient factors affecting the provider's ability to deliver the intervention.

Discussion: Without knowledge of intervention fidelity, there is a risk of inappropriately applying ineffective interventions in clinical settings or prematurely discarding effective interventions, which are costly for both patients and the healthcare system. This study will inform the development and

evaluation of strategies to enhance the fidelity of training and delivery within a theory-informed intervention aimed at reducing non-indicated imaging for LBP that will be implemented by GPs and chiropractors in NL. This intervention will consist of clinician training, a decision aid, and an education booklet with patient-specific recommendations.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # B-36

Frequency of Guideline Recommended Care for Low Back Pain in a Chiropractic Teaching Clinic

Ben Csiernik[1], Dr Ali Smith Doctor of Chiropractic[1], Dr Joshua Plener Doctor of Chiropractic[1], Dr Anthony Tibbles Doctor of Chiropractic[1], Dr James Young Doctor of Chiropractic, MSc[2]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Frequency of Guideline Recommended Care for Low Back Pain in a Chiropractic Teaching Clinic

Ben Csiernik[1], Ali Smith[1], Joshua Plener[1], Anthony Tibbles[1], James Young[1,2]

[1] Canadian Memorial Chiropractic College, Toronto, Canada

[2] Center for Muscle and Joint Health, University of Southern Denmark, Odense, Denmark.

Background: Low back pain (LBP) is the most commonly treated condition by chiropractors. Evidence from other professions suggests clinicians do not follow clinical practice guidelines in the management of LBP. However, there is limited evidence evaluating if chiropractors follow clinical practice guidelines when managing LBP. The primary objective of this study is to evaluate the frequency of use of specific interventions in the management of LBP by chiropractic interns. The secondary objective is to estimate the proportion of treatment plans for LBP that contain interventions that are recommended, not recommended, and have no recommendation, based on two clinical practice guidelines.

Methods: This is a retrospective review of patient data retrieved from the Canadian Memorial Chiropractic College (CMCC) patient database. All new patients with a primary complaint of LBP at first presentation to the CMCC teaching clinic between January 1, 2019, and December 1, 2019 will be included. One research team member (BC) will screen, identify and classify all patient files, and a second reviewer (AS) will be consulted if information is unclear. Each included patient file will be categorized as acute (less than or equal to 12 weeks duration), or chronic (greater than 12 weeks duration). All interventions utilized in the first four weeks of treatment, to a maximum of three follow-up appointments, will be recorded. The frequency and proportion of intervention use will be reported. Each intervention included in the treatment plan will then be classified according to two guidelines: the Clinical practice guidelines for the noninvasive management of low back pain (OPTIMa LBP guidelines), and the Low back pain and sciatica in over 16s: assessment and management (NICE LBP guidelines). Using both guidelines, interventions will be categorized as recommended, not recommended, or as having no recommendation. The proportion of treatment plans using each intervention will be calculated. Additionally, the proportion of treatment plans containing recommended, not

recommended, and interventions with no recommendation, according to both guidelines, will be presented.

Impact: The results of this retrospective chart review will help demonstrate which interventions are most commonly used by chiropractic interns in the management of LBP, as well as evaluate if the interventions used are recommended, not recommended, or have no recommendation, as defined by two clinical practice guidelines. This review will help determine to what extent chiropractic interns in a chiropractic teaching clinic follow clinical practice recommendations, and inform strategies to maximize the use of clinical practice guidelines among chiropractic students.

Pre-registration: A full pre-registration of this project can be found at: https://osf.io/r4yba/

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # B-37

Lived Experiences with Symptomatic Degenerative Cervical Radiculopathy: The Patients' Perspectives

Dr Joshua Plener DC[1], Dr. Carlo Ammendolia DC, PhD[2], Dr. Silvano Mior DC, PhD, FCCSC[1], Dr. Sheilah Hogg-Johnson PhD[1], Dr. Pierre Côté DC, PhD[3]

[1]Canadian Memorial Chiropractic College, Toronto, Canada. [2]University of Toronto, Toronto, Canada. [3]Ontario Tech University, Toronto, Canada

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background: Cervical radiculopathy from degenerative disorders is defined as "pain in a radicular pattern in one or both upper extremities related to compression and/or irritation of one or more cervical nerve roots". Common symptoms include severe pain, paresthesia and motor weakness, which can lead to significant morbidity and disability, resulting in a poorer quality of life. Conservative management is considered the first-line treatment for degenerative cervical radiculopathy (DCR), with surgery reserved for non-responsive cases. However, despite an increase in degenerative spinal conditions, there is a lack of high quality research examining conservative management for DCR. Previous research has demonstrated that the utilization of patient experiences to inform program and guideline development has been successful. One framework that incorporates patient experiences is intervention mapping, which is a 6-step guide for intervention/program development and implementation. This framework outlines a comprehensive and systematic process involving the population of interest as well as program implementers and key stakeholders to ensure relevant needs are met. The first step of intervention mapping is a needs assessment, which aims to increase understanding of the health problem encountered by the population of interest.

Objectives: To understand the everyday experiences of adults living with DCR to help inform the development of a patient-centered, evidence based non-operative intervention.

Theoretical approach: A descriptive phenomenological approach will be utilized within a social constructivist framework in order to understand participants' experiences.

Methods and Procedures: Purposeful sampling methods will be utilized to recruit participants from different clinical settings (e.g. neurosurgery, chiropractic) in order to study a wide spectrum of this disorder. Participants will be: 1) >=55 years of age; and 2) currently symptomatic as a consequence of DCR with arm/hand pain, paresthesia, and/or motor weakness. Other conditions that can result in similar symptoms such as fracture, tumour, and/or neurodegenerative diseases will be excluded. Participants will be assessed with the World Health Organization Disability Assessment Schedule (WHODAS) into low disability (scores <=36/60) and high disability focus groups (scores >36/60). The WHODAS is a 12-item self-administered questionnaire derived from the biopsychosocial oriented International Classification of Functioning, Disability and Health (ICF) framework. The ICF framework describes disability and functioning as a relationship between the health condition and environmental and personal factors. In order to gain a comprehensive understanding of the impact of DCR on the lives

of the participants, the ICF framework will be used to inform the semi structured interview guide for the online focus groups. Emerging themes identified through analysis will be mapped onto the 5 domains of the ICF, which comprise of 1) body functions, 2) body structures, 3) activity limitations, 4) participation, and 5) environmental factors.

Significance: The findings of this study will aid in uncovering the biopsychosocial impact that DCR has on patients' lives, thus providing clinicians and researchers with a greater understanding of this phenomenon. This work will lay the foundation for the subsequent intervention mapping steps that once complete, will result in a high quality, patient-centered treatment intervention informed by key stakeholders.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # B-38

Minimal clinical datasets for spine related musculoskeletal disorders in primary care and outpatient settings: a scoping review protocol

Jérémie Mikhail[1], Léonie Hofstetter MChiroMed[2], Dr Pierre Côté DC, PhD[3], Andrea C Tricco PhD[4], Dr Isabelle Pagé DC, PhD[1], Dr Cesar A Hincapié DC, PhD[2]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background

Musculoskeletal (MSK) disorders are a leading cause of disability worldwide, with spine disorders key contributors of this burden. While the amount of research on low back pain and neck pain has increased, the lack of standardized data collection may lead to avoidable waste in MSK-related research and impact. To improve the quality and relevance of collected data, initiatives to develop standardized sets of health data elements have been increasing. Although there have been numerous efforts to establish core outcome sets for clinical trials and research, little is known about the availability and characteristics of minimal clinical datasets for spine related MSK disorders and their utility for improving healthcare quality in primary and outpatient care settings.

Objective

To identify and map current literature on minimal clinical datasets for measuring and monitoring health status in patients with spine related MSK disorders in primary and outpatient healthcare settings.

Methods

Our scoping review protocol was developed in accordance with the 2020 JBI methodology for scoping reviews. The review will consider studies that include minimal clinical datasets on spine related MSK disorders designed for primary care and outpatient clinical practice settings. We define a minimal clinical dataset as a standardized set of elements covering key data and patient-centered outcomes that should be minimally reported and measured. They should be practical and time efficient to use during routine clinical care in an outpatient or primary care setting. We anticipate that consensus-based studies (e.g., Delphi studies), interventional, observational, feasibility, and linguistic validation studies may be the most common designs identified in this literature.

Eight databases will be searched for studies published in English, German, French, Italian, or Spanish. Two independent reviewers will screen and identify relevant studies on the basis of prespecified eligibility criteria. We will chart and map the eligible scoping review data using a standardized extraction form created through an iterative process with the research team. Each item of the eligible minimal clinical datasets will be classified by health and health-related domains using the World Health Organisation International Classification of Functioning, Disability and Health. We will present our findings as a qualitative narrative summary.

Relevance

Our review will map the current literature, identify research gaps, and inform areas of future research with respect to minimal clinical datasets for spine related MSK disorders in primary care. This may lead to enhancing the quality of routinely collected healthcare data in primary care and outpatient settings, and to facilitating more reliable and valid measurement and monitoring of patient health status in primary MSK healthcare.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # B-41

Does Objectively Measured Prolonged Standing for Desk Work Result in Lower Ratings of Perceived Low Back Pain than Sitting? A Systematic Review and Meta-Analysis

Dr Diana E De Carvalho DC PhD

Memorial University of Newfoundland, St. John's, Canada

Submission categories

Published work (from 2020 onward)

Abstract

Background: Prolonged sitting has been shown to induce transient low back pain (LBP). Height adjustable office desks now present the opportunity to replace sitting with standing in the workplace. Since standing has also been associated with LBP, this may not be an advisable alternative.

Objective: To determine if objectively measured prolonged exposures to desk work while standing, compared to sitting, results in lower perceived LBP in healthy adults.

Methods: A systematic search of several databases was conducted. Two independent reviewers screened titles/abstracts and conducted a quality assessment. The results of three studies were pooled using an inverse variance random-effects meta-analysis. Heterogeneity was tested using the Chi-squared test and I^2 statistic.

Results: Objectively measured prolonged standing postures during desk work did not induce significantly less perceived LBP compared to seated postures (standardized mean difference 0.60, 95% CI -0.68 to 1.87, p = 0.36.) There was significant heterogeneity, I^2=90%).

Conclusions: It appears that replacing seated desk work postures with standing for prolonged periods of time would not be recommended. Larger studies, including a wider age range and health history, conducted in the field with objective measures is recommended to obtain more generalizable data on which to base ergonomic standards for work postures.

Booth # B-42

Healthcare student attitudes toward patient centered care: a systematic review protocol

Geronimo Bejarano[1], Ben Csiernik[2], James J Young[3], Kent Stuber[2], Joshua R Zadro[4]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background:

Patient centered care (PCC) is a fundamental component of quality healthcare and is recommended in clinical practice guidelines. A PCC approach can lead to improved outcomes and potentially reduced costs. Evaluation of healthcare student attitudes towards PCC could lead to curricular changes that could eventually lead to improved attitudes toward and implementation of more PCC among health care professionals. However, previous studies assessing healthcare student attitudes towards PCC have mixed findings.

Objective

The objective of this systematic review is to: 1) identify and describe the instruments used to assess healthcare student attitudes towards PCC; 2) determine and report estimates of healthcare student attitudes towards PCC; and 3) identify factors associated with attitudes towards PCC among healthcare students.

Methods:

This systematic review will be reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P). An electronic database search strategy will be developed with a research librarian, reviewed using the PRESS checklist and searches conducted in MEDLINE, EMBASE, CINAHL from inception with no language restriction. Search terms will be developed based on previous reviews on PCC and healthcare students. Forward citation and backward citation tracking will be performed. Two authors will screen retrieved citations independently. Disagreements will be discussed until consensus is reached, with a third reviewer available to resolve differences. We will include studies that quantitatively assess healthcare students' attitudes towards PCC with any measurement tool. We will exclude qualitative studies and studies including qualified health professionals. Data extraction and methodological quality assessment of the included studies will be performed by two authors independently, using a standardized extraction form and a modified version of the Downs and Black checklist, with disagreements discussed until consensus is reached. Pooled estimates of healthcare student attitudes towards PCC will be performed, if possible. Factors associated with attitudes towards PCC will be extracted and summarized between predictor variables and PCC attitudes.

Discussion:

This review will describe the instruments used to assess healthcare student attitudes towards PCC and provide estimates of their attitudes. The impact of student characteristics on attitudes towards PCC will also be presented. The findings of this review may identify the need to improve attitudes toward PCC among healthcare students, and if there are any factors that predict particular student groups who might benefit from interventions to improve PCC attitudes.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # B-43

The need for specificity of spinal manipulation when treating spinal pain: Myth or reality? A systematic review

Mr Casper Glissmann Nim Chiropractor

University of Southern Denmark, Odense, Denmark

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background:

Spinal manipulative therapy (SMT) is a popular treatment for spinal conditions. However, it is being applied and taught as a specific intervention targeting specific spinal structures. Numerous in-vivo animal studies support the notion that SMT is target-dependent. However, three systematic reviews indicate that thoracic SMT is effective for neck pain. Furthermore, spinal non-thrust mobilization is not superior when applied to a specific target compared to a random target. Whether the same applies to SMT is currently unknown. This review aimed to investigate whether the effect of SMT is superior when applied to a clinically relevant vertebral joint than to a supposedly clinically irrelevant joint.

Methods:

In this systematic review, we searched the literature in four databases (origin to September 15th, 2020). We included randomized controlled trials comparing SMT at a specific target versus a comparator target. Two authors independently reviewed the literature and assessed the studies for risk of bias using a modified Cochrane Risk of bias tool. Study quality was rated based on reproducibility of intervention and analysis, the reliability of the outcome, and clinician experience. We extracted between-group differences for all patient-reported outcomes or calculated effect sizes from the within-group changes when the between-group differences were not reported. Finally, we interpreted the results for comparisons i) at the same vertebral level, ii) the same spinal region, or iii) remote regions. We prioritized methodologically robust studies to influence our conclusions.

Results:

Nine studies were included that reported on 28 between-group differences. One study reported comparisons at the same vertebral level, four within the same spinal region, and five studies dealt with comparisons between regions. The risk of bias was assessed as low or moderate for eight out of the nine studies, and the quality was rated as acceptable for all nine studies. Only one study reported a small but statistically significant difference, favoring the clinically relevant treatment. However, the risk of bias was high in this study and the sample size was small. The remainder did not report any between-group difference for any patient-reported outcomes.

Conclusions:

There is considerable good quality evidence that target specificity in SMT does not confer superior clinical results. This is in stark contrast to clinical practice and educational programs, emphasizing the importance of SMT specificity.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # B-44

Comparison of baseline characteristics of chronic pain patients completing chiropractic care versus those who do not complete care in a student clinic setting.

Dr Clare F Halpin[1], Dr Dawn Wong Lit Wan[2], Dr Julie Kendall[3], Dr Sam Harman[3], Dr Zhen Zheng[3]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Chronic pain is when a person experiences pain for longer than 3 months and it is associated with interfering with functioning and/or emotional distress. It is governed not just by tissue damage and nociception but by a range of different factors. These factors include, but are not limited to, a patient's mood, their understanding of the mechanism of pain, their level of catastrophising and pain related attitudes and beliefs. Completion of a treatment program is often a major problem when treating chronic pain patients. Patients who do not complete care often have poor outcomes. There is currently no reliable way of predicating who will complete a course of care and who will not.

Objective

This study is a secondary analysis of a prospective study on chronic pain and patient engagement. It aims to determine whether there is any difference in patient baseline characteristics in chronic pain patients who completed care (at least four chiropractic sessions) in a student clinic setting compared to those who did not complete care.

Methods

43 participants from RMIT Health Clinic were included in this study. Clinical variables including duration of pain in years; pain intensity; self-efficacy level; level of catastrophising; patient activation and pain knowledge levels were collected via questionnaires. These baseline characteristics were used in a comparison between those who completed care and those who did not using a MANOVA.

Results

The difference between those who completed care and those who did not complete care was not statistically significant (p=0.171). 34.8% of participants completed care; 27.9% of participants did not return after the first visit and only 44.2% of participants attended their third visit. The average number of years in pain was 6.43 ± 8.65 years. Pain intensity was mild to moderate with a mean score of 3.85 out of 10 ± 1.72. The self-efficacy score was also mild with an average score of 47.88 ± 11.07 placing them in the minimal severity category. The average pain catastrophizing score of 12.65 ± 11.42 placing

them in the mild severity category. The two groups had a median patient activation score of 3 placing them in the level three category. The average patient knowledge score was 5.81 out of 12 ± 1.89.

Discussion

There were no statistically significant differences in the baseline characteristics between the completed care group and the did not complete care group in a student clinic setting. This may be because patients who presented had low levels of pain, mild catastrophising and had positive levels of patient activation. To examine the reasons for chronic pain patients not continuing beyond the first and second visits, future studies should include a mixed methods approach, documenting both qualitative and quantitative data to explore other reasons for non-compliance.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-11

The feasibility of implementing an English language version of GLA:D Back

Dr James Lemieux Doctor of Chiropractic/ Master's Student[1], Dr Greg Kawchuk PhD[1], Dr Alice Kongsted PhD[2], Dr Jan Hartvigsen PhD[2], Dr Allyson Jones PhD[1]

[1]University of Alberta, Edmonton, Canada. [2]Southern Denmark University, Odense, Denmark

Submission categories

Published work (from 2020 onward)

Abstract

Background: Evidenced-based clinical guidelines for the treatment of low back pain (LBP) consistently suggest educating patients about their back pain, its natural course, and providing advice to keep active and continue working. Despite this evidence, clinicians routinely do not follow these recommendations resulting in ineffective and fragmented care. GLA:D® Back, a standardized care package, was originally developed in Denmark to assist clinicians in implementing evidence-based care. This study will evaluate the feasibility of implementing the English version of Danish GLA:D® Back program in Alberta, Canada.

Methods: Thirty-five clinicians from nineteen clinics in Alberta, Canada participated. Feasibility of program implementation, our primary objective, was evaluated within 3 months. Feasibility success was defined as 50% clinician/clinic adoption in addition to 66 - 88 enrolled participants registered in the database. Our secondary objectives included collecting data pertaining to clinician confidence, attitudes, and behavior of treating patients, perceived barriers, and facilitators of the program in addition to collecting patient- data regarding pain, function, general health, and self-efficacy.

Results: The majority of the clinics (15/19, 79%) offered GLA:D® Back to their patients within the study period. Of the participating clinicians, GLA:D® Back was delivered by (25/35, 71%) of clinicians. In total, 78 patients were enrolled in the program, and (69/78,88%) participants attended the final assessment. Secondarily, clinicians demonstrated a biomedical and behavioral orientation along with high confidence when treating LBP patients while patient outcomes trended toward improvement.

Conclusion: The English translation of the Danish GLA:D Back program was feasible for Albertan clinicians to implement into practice in both urban and rural settings.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # C-12

Returning to Work within Two Years after First-time, Single-level, Simple Lumbar Discectomy: A Multifactorial, Predictive Model

Chiropractor Dorthe Schoeler Ziegler PhD[1], Senior researcher Rikke Krüger Jensen PhD[2], Occupational physician Gert Frank Thomsen Cand.Med.[3], Adjunct professor Leah Carreon M.Sc.[4], Professor Mikkel Oesterheden Andersen Cand.med.[4]

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Submission categories

Published work (from 2020 onward)

Abstract

Background: Among otherwise gainfully employed individuals an inability to work has large socioeconomic and individual negative health consequences. Of patients undergoing discectomy up to 15% report continued symptoms and work incapacitation 2 years after surgery. Thus, identification of factors associated with sustained return to work (RTW) after lumbar discectomy is needed. Prior studies of biopsychosocial factors associated with sustained RTW were primarily based on patient-reported outcome data and have shown conflicting results among others because of small study samples.

Objectives: In patients with labor market attachment prior to first-time, single-level, simple lumbar open or micro-endoscopic discectomy, we describe the time to sustained RTW within two years after surgery using national administrative outcome data from a public database and identify pre- and peri-operative factors associated with sustained RTW within two years by developing and validating a predictive multivariable model

Methods: A longitudinal observational cohort study using prospectively collected registry data from DaneSpine research database, Statistics Denmark, and electronic patient journals. The time to a sustained RTW within two years after surgery was described using a Kaplan-Meier plot. A temporal validated Cox proportional hazards model examined associations between biopsychosocial factors and RTW.

Variables included were socio-demographics, VAS, ODI, EQ-5D, SF-36, and patient-reported pre-operative expectations towards future LMA, pre-operative and post-operative duration of leg and back pain, and data on surgical approach and peri-operative complications. A four-week period of work presence defined a sustained RTW covering return to part-time, fulltime as well as changed work functions. Inclusion period was 2010-2013.

Results: In a study population of 512 (out of 891) consecutive operated patients undergoing surgery, who were on sick-leave >3 weeks around the time of surgery (mean 10 (21) weeks), 66% returned to work (median 15 weeks). The probability of sustained return to work was associated with a high educational level, positive expectations towards future labor market attachment, pre-operative stabile labor market attachment with the past two years, pre-operative higher physical quality of life, and less disability. Model performance was good (c-statistics > 0.7).

Discussion: This study identifies factors associated with sustained return to work after first-time lumbar discectomy through the development and validation of a predictive model, among those a number of patient-related factors, whereas most disease-related clinical findings were not associated with the outcome.
The lack of data on sick-leaves less than 3 or 4 weeks within the time of surgery is important to the generalizability. It is however fair to argue that patients with only short sick-leaves are of no interest to the overall aim, as these patients most likely return to work without interference from external stakeholders.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-13

The reliability and validity of the Oswestry Disability Index in the elderly with low back pain: a protocol for a systematic review

Dr. Anser Abbas DC[1], Dr. Pierre Cote DC, PhD[2]

[1]Canadian Memorial Chiropractic College, Toronto, Canada. [2]Ontario Tech University, Oshawa, Canada

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background: Low back pain (LBP) is the leading causes of disability globally. The annual prevalence of LBP ranges from 36-70% in older adults and 43-63% of all functional limitations in this population can be attributed to back symptoms. Historically, the Oswestry Disability Index (ODI) has been used to measure disability in patients with low back pain. Although the ODI is widely used, most studies on its psychometric properties were conducted in younger populations. However, older adults may experience and report disability differently than their younger counterparts. It is thus necessary to assess the reliability and validity of the ODI in older adults.

Objective: This systematic review aims to examine the reliability and validity of the ODI in the elderly population with LBP.

Methods: We will search MEDLINE, CINAHL, SPORTDiscus, Embase, Cochrane Library, and AgePlus from 1980 to December 2020. Search strategies will focus on the key concepts of LBP, elderly patients, and the Oswestry Disability Index. For all steps of evidence selection, a detailed list with eligibility criteria will be determined a priori. Original articles evaluating the reliability and validity of the ODI in adults over the age of 65 with low back pain will be eligible. Independent reviewers will screen and critically appraise studies using the COSMIN (COnsensus-based Standards for the selection of health Measurement INstruments) Risk of Bias checklist, with input from a third reviewer in cases of disagreement.

Results: Evidence tables will be generated for study characteristics and measurement properties. Evidence from low-risk-of-bias studies will be synthesized according to best evidence synthesis principles.

Discussion: The reliability and validity of the ODI for measuring disability in older adults will be assessed. Findings of this systematic review will inform the assessment of low back pain-related disability in older adults, a population that is particularly vulnerable to both low back pain and related functional limitations.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # C-14

Reassuring patients with low back pain in chiropractic consultations: Does it happen and does it matter? A ChiCo cohort study

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Chiro Knowledge Hub, Odense M, Denmark

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Non-specific low back pain (LBP) affects a very large number of people every day. It is a leading cause of disability and for people to seek care worldwide. An important part of treatment guidelines for LBP is to provide reassurance. However, there is little quantitative evidence on levels of perceived reassurance in LBP patients or the possible associations between levels of perceived reassurance and outcomes. The Consultation-based Reassurance Questionnaire (CRQ) was developed to measure patients' perceived reassurance after health care consultations on four sub-domains including data-gathering, relationship-building, generic reassurance and cognitive reassurance.

Objectives

The objectives of this study were to investigate associations between the level of reassurance and outcomes of pain, disability and Global Perceived Effect in a large chiropractic cohort. Also, the study investigated if associations differed between groups of patients with different psychological risk profiles.

Methods

This study is a prospective cohort study based on the Danish Chiropractic back pain Cohort (ChiCo). Adult patients consulting chiropractors with LBP were emailed the CRQ directly after the consultation. Outcomes were Global Perceived Effect (GPE) after 2 weeks, and pain (NRS) and disability (Roland Morris) after 2 weeks and 3 months. Associations with GPE were tested in logistic mixed models. Associations between each reassurance domain and pain and disability were tested in longitudinal analyses using linear mixed models. Moderations by risk profile as measured by the STarT Back Screening Tool (SBST) were tested by introducing an interaction between risk groups and reassurance level. All models were controlled for several potential confounders.

Results

2,056 patients were included in the study and 81% completed 3-months follow-up. Associations between reassurance level and improvement in pain and disability were weak but positive and not moderated by risk profile. The association between reassurance level and GPE was positive and reassurance level tended to have a stronger association with GPE for patients with a low-risk profile.

Discussion

This study is the largest to date investigating reassurance levels in LBP patients with a validated instrument like the CRQ and the first to collect data within few days of the consultation that patients were asked to report on. The associations observed between the CRQ and pain and disability were positive but weak, whereas the observed associations between the CRQ and GPE was of a magnitude that seems clinically relevant. Levels of reassurance were generally high and it is possible that stronger relationships between reassurance and patient outcomes would be present in samples with more people reporting lower levels of reassurance.

The associations between all four CRQ-subscales and GPE were stronger for patients in the SBST low-risk group compared to the medium- and high-risk groups indicating that the potential importance of reassuring communication should not be underestimated in patients with non-complex LBP.

The causal relationship is unclear, but with communication always present in a chiropractic consultation, these results suggest that efforts to optimize clinician-patient communication might be worthwhile.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-21

The Force Matching Task for Measuring Sensory Attenuation

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Macquarie University, Sydney, Australia

Submission categories

Unpublished work (complete or incomplete)

Abstract

In this paper we describe the design, development and functionality of a haptic force-matching device. This device measures precise sensorimotor perception by determining a subject's ability to successfully attenuate incoming sensory signals. Sensory attenuation provides a novel method of investigating psychophysical aspects of perception and may help to formulate neuro-cognitive models that may account for maladaptive interoceptive processing. A number of similar custom-made devices have been reported in the literature, however a clear description of the mechanical engineering necessary to build such a device is lacking. Subjects (N=25) were asked to match a target force on their right index finger; first by pressing directly on their finger with their other hand, then by controlling the device through an external potentiometer to control the force (indirectly) though a torque motor. Our device functions consistent to work in the field.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-22

Erring on the side of safety: using an active surveillance reporting system to prospectively identify adverse events at the Macquarie University Chiropractic Teaching Clinics. A study protocol.

Dr Aron S Downie PhD[1], Christopher Burrell MRes[1], Dr Katie de Luca PhD[1], Dr Katherine Pohlman PhD[2], Dr Martha Funabashi PhD[3], A/Prof Rosemary Giuriato DC DO[1]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background

The reporting of adverse events (AE) is essential to improve patient safety in the chiropractic profession. In Australia, uptake of an AE reporting system has been fragmented, with no dedicated research to test, implement and evaluate such a system. In North America, the SafetyNET active surveillance reporting system (SafetyNET) has been developed and successfully implemented in a variety of chiropractic clinical settings. Importantly, the system involves patient participation to self-report their symptom change information. Conducting an active surveillance reporting system at Macquarie University Chiropractic (MUC) teaching clinics is fundamental not only to elucidate the symptom change and safety of chiropractic care in this setting, but also to test the use of an AE reporting system in Australia.

Aims

(i) To describe immediate and short-term changes in case symptomatology following a student intern chiropractic treatment; (ii) to report the frequency and severity of AE following a student intern chiropractic treatment; and (iii) to explore patient and chiropractor factors associated with AE following a student intern chiropractic treatment.

Methods

This prospective active surveillance reporting system study will record immediate and short-term (2-7days) changes in case symptomatology following a student intern chiropractic treatment at the MUC teaching clinics. Supervising clinicians and student interns from the MUC teaching clinics will be invited to participate, clinic supervisors and student interns will provide written consent, complete a demographic questionnaire and attend a study training session.

Consecutive patients of participating student interns will be invited to participate in this study by the clinic shift student receptionists. A sample size of 525 patient treatments is required (anticipated moderate/serious AE =5%; α=0.05; intra-provider cluster correlation of 0.001). To account for potential response rate/dropout of 50-60% a total of 900 patient visits is planned. This will allow for projected collection of approximately 45 AEs (moderate severity or higher).

Data will be collected using SafetyNET's current electronic active surveillance forms (REDCap) and SMS. Data collection will comprise: 1 x pre-treatment survey [iPad] (patient: demographic, symptoms); 2 x post-treatment surveys [iPad] (intern: treatment provided, patient: symptoms, NRS); 7 x daily surveys [SMS] (patient: symptoms, NRS); and follow-up survey [email] (patient: satisfaction with care, symptom change).

Participating patients will be stratified by AE event severity (none, mild, moderate, severe, serious) then compared. Frequency (%) of AE occurrence will be stratified by AE severity. Change in participant patient symptomatology will be calculated by comparing severity of symptoms reported by participant patients before, and immediately after treatment with multivariate regression to explore change in symptom severity associated with important patient-level factors chosen a priori. Pain trajectories over seven days post-treatment will be modelled using growth mixture modelling, which is a statistical method to uncover a finite number of unique recovery patterns.

Conclusion

The collection of immediate and short-term data on changes in case symptomatology will allow us to document AEs with patient response for the first seven days after treatment. This has not been done before in any SafetyNET studies and will add value to the existing SafetyNET system.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-23

Motor performance of participants with chronic neck pain and asymptomatic participants pre and post spinal manipulation using separate eye and neck movement Fitts' tasks

Dr. Geoffrey M Gelley DC, MSc, Dr. Brian J MacNeil PhD, Dr. Steven Passmore DC, PhD

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Spinal manipulation is a guideline-based recommendation as an intervention for chronic neck pain. The exact mechanisms responsible for the clinical benefits of spinal manipulation are theorized, but it remains uncertain whether it is primarily biomechanical or neurophysiological in nature. Previous Fitts' task studies that measured motor performance in participants with chronic neck pain have reported improved neck movement time but have not specified a biomechanical or neurophysiological underpinning for the altered motor performance.

Objective: To quantify motor performance, this study will expand on previous reports of cervical manipulation and neck movement by comparing the response to a neck Fitts' task between asymptomatic and symptomatic participants. Further, this study will include an eye movement Fitts' task to determine if this motor task, that has no direct mechanical relationship, is impacted by cervical manipulation.

Method: This is an observational study that involves a pre/post cervical spine manipulation intervention on participants (n=20) with chronic neck pain and asymptomatic controls (n=20). In a counterbalanced order, all participants will complete an eye movement and neck movement Fitts' task before and after cervical spine manipulation to identify any changes in eye and neck movement time, eye and neck peak velocity, and time to peak eye and neck velocity.

Anticipated results: The hypothesis for the eye movement Fitts' task is that eye movement time will lengthen with larger amplitudes and will not be affected by target width, or index of difficulty. It is anticipated that eye movement time will shorten in the neck pain group following manipulation to a greater extent in comparison to the asymptomatic group. We hypothesize that during the neck movement Fitts' task, neck pain participants will experience a greater decrease in neck movement time as compared to the asymptomatic group after cervical manipulation.

Discussion: The novel aspect of this study is the use of an eye movement Fitts' task, which is not biomechanically related to the clinical intervention, to quantify motor performance before and after cervical spine manipulation in patients with and without chronic neck pain. This study also concurrently attempts to replicate neck movement findings that have been reported in previous studies. Any change in eye movement parameters would indicate a potential for neurophysiological mechanisms rather than a direct physical mechanism. In contrast, any changes in neck movement parameters could involve multiple mechanisms, not the least being a direct effect on connective tissues. The results will aid in understanding the interplay of specific biomechanical or general neurophysiologic components

underlying cervical spine manipulation. Determination of the relative contributions of the two different types of components in populations with and without pain may elucidate potential approaches to treatment and our understanding of treatment effects.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-24

The MIBAQ Study: Use of the Musculoskeletal Infant Breastfeeding Assessment Questionnaire for manual therapy and lactation counseling

Professor Cheryl K Hawk DC, PhD, CHET, LMT[1], Brelyn K Malone BS[2], Dr. Sharon Vallone DC, FICCP[3], Dr. Jessie Young DC, IBCLC[4], Dr. Valerie Lavigne DC, MSc[5]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Introduction:

The purpose of this project is to assess short-term outcomes of manual therapy and lactation counseling interventions for infants with musculoskeletal dysfunction and suboptimal breastfeeding using the outcome assessment instrument developed in our study published in 2020—the Musculoskeletal Infant Breastfeeding Assessment Questionnaire (MIBAQ) https://jccponline.com/Hawk2020.pdf .

Methods:

This project was approved by the lead institution's Institutional Review Board in October 2020

Design. This is a descriptive cohort study conducted among the patients/clients of Doctors of Chiropractic (DCs) and International Board-Certified Lactation Consultants (IBCLCs). We will use the methods of practice-based research (PBR). PBR is a well-established method to gather observational data from multiple clinical practices.

Study population. This consists of a sample of convenience of practicing DCs who by self-report emphasize care of infants and have specialized training in such care and IBCLCs who self-report seeing infants with musculoskeletal dysfunctions contributing to their suboptimal breastfeeding. Participants will be drawn from their clinics' regular patient population. Parents of the treated infants will be the study participants.

Inclusion: Mother/parent of currently or recently breastfeeding infant age ≤ 3 months who brings infant for care at participating offices.

Exclusion: Mother/parent who declines to participate (that is, declines to fill out the forms).

Procedures:

The infant's parent must read and sign an informed consent prior to data collection.

Three types of information will be collected:

1. Infant age, sex and history of tongue-tie and related medical treatment.

2. Relevant aspects of infant's current breastfeeding behavior. The MIBAQ is based on a) relevant questionnaires published in the literature and b) the investigators' clinical experience. We will also include the "patient's global impression of change" (PGIC) scale in the post-assessment. The PGIC is used frequently in clinical settings for assessing change, although it is suggested that it be combined with domain-specific instruments.

3. A discharge and treatment summary from the participating DC or IBCLC.

Each infant's mother/parent will be asked to complete the questionnaire prior to treatment of the infant and/or consultation with the mother. She will be asked to complete the questionnaire about the baby's nursing behavior 1-2 weeks after the first treatment to compare any changes. We will analyze the results using descriptive statistics.

We will collect data on patients presenting at participating offices; we will not directly recruit participants. No personal identifiers will be collected at any time. We will use an electronic survey conducted via SurveyMonkey, which will be administered by staff at the offices, who will also follow up with participants to ensure they complete pre- and post-surveys.

Currently 11 DCs and 10 IBCLCs, which include 2 RNs, 1 MD and 1 NP, altogether representing 4 countries (US, Canada, France and China, for which the questionnaire has already been translated) have expressed interest in participating. The data collection period will be 3 months. Data collection has been delayed due to the pandemic but is planned to begin by May 2021.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # C-25

Sonographic evaluation of the degree of medial meniscal extrusion during Thessaly test in healthy knees

Assistant professor Chinsuk John Cho DC, DACBR, RMSK[1], Assistant professor Lauren Tollefson DC, DACBR[2], Associate professor Ken Reckelhoff DC, DACBR, RMSK[3]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Objective:

The Thessaly test is a well-described orthopedic test for meniscus tear evaluation. The study's objective is to evaluate the degree of medial meniscal extrusion during different loading phases of the Thessaly test.

Methods:

A convenience sample of 60 healthy knees (35 participants) was examined. Sonographic measurement of the degree of physiologic extrusion of the medial meniscus deep to the medial collateral ligament by two examiners at six different loading phases: supine, standing, 5° knee-flexion with internal (IR)/external (ER) rotation and 20° knee-flexion with IR/ER. The difference in meniscal extrusion by knee position was compared with ANOVA. Interrater reliability assessment was analyzed using intraclass correlation coefficient.

Results:

The mean meniscal extrusion for each position was - supine: 2.3±0.5mm, standing: 2.8±0.8mm, 5° IR: 2.3±0.9mm, 5° ER: 2.4±0.7mm, 20° IR: 1.9±0.8mm, and 20° ER: 2.3±0.7mm. Significant increase in extrusion was observed from supine to standing ($p<0.05$) and from 20° IR to 20° ER ($p=0.015$). Significant decreased measurement was observed from standing to 5° IR ($p<0.05$), 5° ER ($p<0.05$), 20° IR ($p<0.05$) and 20° ER ($p<0.05$). There is no significant change between 5° IR and 5° ER ($p=1.0$). Interrater reliability of the measurements across the six positions was poor to moderate (0.35-0.57, $p<0.05$).

Conclusion:

Our study's novel findings showed clear dynamic changes during Thessaly test, which implies increase in compressive stress across the medial meniscus and a potential mechanism for pain generation during this test. Further testing is needed to address the poor-moderate reliability and confirm findings.

Booth # C-26

The effect of Spinal Manipulative therapy and home stretching exercises on pain and disability in patients with recurrent or persistent neck pain; a randomized controlled trial

Doctoral Student Anders G. Bakken MChiro[1], PhD Andreas Eklund DC[1], PhD Søren O'Neill DC[2], PhD Iben Axén DC.[1]

[1]Karolinska Institutet, Stockholm, Sweden. [2]Spine Centre Southern Denmark, Odense, Denmark

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Recurrent or persistent neck pain is affecting a vast number of people globally, leading to reduced quality of life and high societal costs. Clinically, it is a challenging condition to manage and has been found to be an intermittent life-long condition. Activity and manual therapy are the basics of most treatment guidelines. However, home stretching exercises and spinal manipulative therapy vs home stretching exercises alone in a clinical setting have not been investigated.

Method/Design

A multicentre randomized controlled clinical trial was carried out in multidisciplinary primary care clinics. The treatment modalities utilized were spinal manipulative therapy and home stretching exercises compared to home stretching exercises alone for a two-week period.

The subjective pain experience was investigated by assessing pain intensity (NRS-11) measured using daily SMS, and the affective quality of pain (McGill Pain Questionnaire) measured with a questionnaire at baseline, after 1 week, and after two weeks. Neck disability, using Neck Disability Index, and health status, using EQ5D, were measured in the same questionnaire.

Group differences in change were estimated using linear regression. The percentages attaining MCIC were calculated. The difference between groups in the probability of attaining MCIC was estimated using logistic regression. For linear and logistic regression analysis, both an unadjusted model and a model adjusted for baseline pain values were used. Side effects were reported for both groups.

This is the first part in a series of three articles investigating the relationship between changes in pain and Heart Rate Variability following manual treatment. Therefore, the study was designed to allow for HRV measurements taken at baseline, one and two weeks.

Results

131 subjects were randomized to one of the two treatment groups. A decrease in pain of 1,3/10 in NRS-11 for the intervention group and 0,9/10 for the control group was found. McGill questionnaire showed 1,1/45 improvement in the intervention group and a 1,2/45 improvement in the control group. EQ5D

had a 0,006919 (scale 0-1.000) worsening in the intervention group and a 0,006400 improvement in the control group. For NDI, the intervention group had a mean improvement of 2,5/50 and the control group 2/50. There were no statistically significant differences between the two groups for any measurement.

The proportion of subjects that reached MCID for NRS11 was similar for both groups with 37% (intervention group) and 38% (control group). 24% of the intervention group reached MCID for McGill, and 19% of the control group. For EQ5D, 21% of the intervention group reached MCID, and 29% of the control group. 22% reached MCID in the intervention group for NDI, 28% in the control group.

Conclusion

There was no statistically significant difference between the treatment groups in any of the outcome measures. Adding four treatments of Spinal Manipulative Therapy to home stretching exercises did not improve the outcome of pain and disability after two weeks for patients with persistent or recurrent NP.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # C-27

Patient-Centred Outcomes of a Community Clinic Serving Disadvantaged People, a Needed Service and, an Opportunity for the Chiropractic Profession

Mr. Dan M Marthick-Hone MSc[1], Prof. Kerrie Doyle PhD[2], Prof Gerard Kennedy PhD[3], Dr. Dein Vindigni PhD[1], Dr. Barbara I Polus PhD[1]

[1]RMIT University, Melbourne, Australia. [2]University of Western Sydney, Sydney, Australia. [3]Federation University, Ballarat, Australia

Submission categories

Unpublished work (complete or incomplete)

Abstract

Introduction:

Chiropractic care is a mostly privatised service within Australia, with those experiencing disadvantage typically not having access due to financial barriers. However, some universities within Australia offer outreach community clinics where students can offer their services to those living with disadvantage. Experiencing higher rates of chronic conditions, musculoskeletal complaints, and co-morbidities, this is a demographic of people who need subsidisation to access privatised care. This need also offers opportunity for the chiropractic profession to work within community healthcare teams.

Aim:

A mixed-methods observational study was used to investigate the outcomes of clients attending a community student chiropractic clinic and how this setting may influence outcomes of clients.

Methods:

Three patient reported outcome measures were chosen to investigate client outcomes including the Measure Yourself Medical Outcome Profile (MYMOP), the European Five Domain Five Level Quality of Life Questionnaire (EQ-5D-5L) and the Patient Enablement Instrument (PEI). These measures were completed by clients attending the community clinic for chiropractic care. Interviews were conducted with clients receiving or who had received chiropractic care, chiropractic students, clinical supervisors, and staff of the clinic. Interviews were conducted to offer insight as to what outcomes were important to patients and what may have influenced those outcomes. Interview data were analysed using thematic analysis and codes and themes were formed using Bronfenbrenner's ecological systems theory.

Results:

Thirty-seven participants were recruited and 17 completed follow-ups. A total of 71.97% of participants nominated their primary complaint to be chronic. Significant change was noted in general health and wellbeing for the MYMOP, pain and disability for the EQ-5D-5L and index scores for the EQ-5D-5L, indicating improved health and wellbeing. Most clients experienced higher levels of enablement because of their treatment. Twelve participants were interviewed, and five themes emerged from the

interview data. It was found that clients often found their lived experiences impacted their health problems and that attending the clinic offered benefits beyond the improvement of pain and disability.

Conclusion:

This study showed that because of of a short course of treatment clients experienced better levels of health and wellbeing and decreased levels of pain and disability. Interview data suggested that this may be due to a combination of therapy, setting and the relationships formed within that setting. These findings indicate that those who experience disadvantage may receive significant benefit from attending community centres that offer chiropractic care, suggesting that services such as these should be made more widely available to those living with disadvantage.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-28

Learning the neurobiology of pain: Protocol for a scoping review of pain education from an instructional design perspective

Dr. Anna-Marie Ziegler MM, DC, Dr. Amy Minkalis DC, Emma Rae Langdon BA, Dr. Robert Vining DC, DHSc

Palmer College of Chiropractic, Davenport, USA

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Introduction:

Pain education is designed to help people with chronic pain better understand modern neurobiology concepts to interpret symptoms more accurately, leading to more informed healthcare decisions and improved self-management. Evidence suggests positive clinical outcomes result from pain education programs for persons with chronic neuromusculoskeletal pain. However, the instructional design characteristics of pain education programs have not been systematically documented.

Objective:

The objectives of this scoping review are to: 1) identify, organize, and report characteristics of neurobiology-focused educational programs for patients with chronic musculoskeletal pain; 2) inform development of evidence-based instructional programs and materials; 3) identify opportunities for additional research; and 4) make recommendations to enhance reporting and implementation of future education programs.

Inclusion criteria:

Articles reporting characteristics of chronic neuromusculoskeletal pain education programs for adult patients published in English will be included. Also eligible are clinical trials reporting pre- and post-outcomes and including pain education as a specific intervention. Publications containing expert recommendations for pain education program characteristics, and studies reporting characteristics of pain education programs from participant perspectives are also eligible.

Methods:

This review process will follow PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), specifically, the extension for scoping reviews (PRISMA-ScR) and was prospectively registered with AsPredicted.org. The databases PubMed, Medline, and CINHAL will be searched from 1990 to 2020. Articles will be independently reviewed against predetermined eligibility criteria. Three authors will determine article eligibility using a staged process beginning with title, abstract, and finally full text review. Discrepancies will be resolved through a consensus process. Reference lists of articles meeting eligibility criteria and protocols describing potentially eligible clinical trials will be hand-

searched. Included clinical trials will be reviewed for protocols not identified in the original search. Data synthesis will include identifying, documenting, and summarizing characteristics of pain education programs such as: the most important concepts to include and how described, instructional methods such as number and length of training sessions, key learning outcomes, learning assessment practices, learning support materials used (e.g., handouts, booklets, and electronic resources), as well as a critical analysis of reporting gaps. Current expert recommendations regarding instructional design will be summarized and important factors that promote or impede learning from patient/participant perspectives will also be identified.

Results:

This review is currently in the data abstraction phase. The original search yielded 5,140 articles. After duplicates were removed, we identified 3,760 articles. After title, abstract, and full-text review, 37 articles remained. The final included article number will be determined following a hand-search process.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree), Student (currently in a clinical or graduate training program)

Booth # C-31

Novel assessment of the variation in cervical inter-vertebral motor control in a healthy pain-free population

René Lindstrøm[1], Alexander Breen[2], Ning Qu[1], Alister du Rose[2], Victoria Blogg[1], Alan Breen[2]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Intervertebral spinal control is dependent on interactions between active, passive and neural elements. However, this has previously been outside the reach of clinical assessment. This study used fluoroscopy during repeated unconstrained flexion and return neck movements to calculate intersegmental motor control (MC).

Objective

To determine normative values for MC at individual levels and their variability.

Methods

Twenty male volunteers aged 19 to 29 received fluoroscopic screening during 4 repetitions of neutral to full flexion and return motion. Vertebral images from C0-C1 to C6-C7 were tracked using cross-correlation codes written in Matlab. MC for each level was defined as the mean of the absolute differences between each repetition's angular path and their mean and its variability (SD). 1-way ANOVA and Tukey multiple comparisons were used to identify significant contrasts between levels.

Results

The mean MC differences and SDs were highest at C1-2, suggesting that this level has the least control and the most variability. Results at this level were highly significant (F-ratio 10.88 and 9.79 $P<0.0001$). Significant contrasts were only found between C1-C2 and all other levels.

Discussion

This study is the first to quantify intervertebral MC in the cervical spine in asymptomatic people. These data provide a baseline to which symptomatic patients can be compared. Studies of neck pain patients are merited.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-32

Initial Management of Acute and Chronic Low Back Pain: Responses From Brief Interviews of Primary Care Providers

Eric J Roseen DC

Boston University, Boston, USA

Submission categories

Published work (from 2020 onward)

Abstract not included in conference proceeding

Booth # C-33

Effectiveness of active prehabilitation in improving postoperative recovery in patients with lumbar spinal stenosis: a randomized clinical trial

Andrée-Anne Marchand DC, PhD[1], Marième Houle MSc[1], Julie O'Shaughnessy DC, MSc[1], Claude-Édouard Châtillon MD, FRCSC[2], Vincent Cantin PhD[1], Martin Descarreaux UQTR[1]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Lumbar spinal stenosis is the most common reason for spine surgery in older adults, but the effects of prehabilitation on perioperative outcomes among these patients have not been investigated. This study aims to evaluate the effectiveness of a preoperative exercise-based intervention program compared with usual care on the improvement of clinical status, physical capacities and postoperative recovery of patients awaiting surgery for lumbar spinal stenosis.

Methods

This study is a single-centre, parallel-group, randomized controlled clinical trial. The 68 consecutively included participants had been diagnosed with central LSS causing neurogenic claudication between February 2015 and June 2019. Following enrollment, participants were randomised to receive either a 6-week supervised exercise-based prehabilitation program or hospital usual care.

The primary outcomes were back and leg pain intensity, and back-related disability. Secondary outcomes included clinical outcomes (LSS-related disability, quality of life, kinesiophobia, and depression) and physical outcomes (lumbar extensor muscles endurance, trunk flexor and extensor muscle strength, knee extensor muscle strength, lumbar ranges of motion, and walking capacities). Data collection occurred at post-intervention, and 6 weeks, 3 and 6 months post-surgery. Missing data were dealt with using multiple imputations and an intention-to-treat analysis was conducted.

Results

A total of 68 participants (mean [SD] age, 68.9 [9.1] years; 28 women [41.2%]) were allocated to supervised exercise (35 [51.5%]) or usual care (33 [48.5%]). Significant but small improvements (ηp^2=0.07 to 0.15) were found in favour of the experimental group at the post-intervention assessment for pain intensity, LSS-related disability, kinesiophobia, lumbar strength in flexion, low back extensor muscles endurance, total ambulation time, and sit to stand. A significant difference (ηp^2=0.06) in favor of the intervention group was found starting at the 3 -month postoperative follow-up for low back-related disability. No adverse events were reported.

Conclusion

Results show that exercise-based prehabilitation can improve both clinical status and physical capacities prior to surgery in patients with lumbar spinal stenosis. The effectiveness of the intervention on improving short-term postoperative recovery remains equivocal.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-34

Involving patients and clinicians in a pilot randomised clinical trial of spinal manual therapy versus nerve root injection for lumbar radiculopathy: a patient and public involvement project.

Corina Ryf BChiroMed[1], Léonie Hofstetter MChiroMed[1], PhD Lauren Clack PhD[2], DC PhD Cesar Hincapié DC PhD[3]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background

Spinal manual therapy (SMT) and corticosteroid nerve root injection (NRI) are commonly used to treat patients with lumbar radiculopathy. However, there is uncertainty regarding their effects and a need for high-quality randomised clinical trial evidence. The SALuBRITY pilot trial—a two parallel group, double sham controlled, pragmatic pilot randomised clinical trial—is being developed to assist patients, clinicians, and policymakers with healthcare decision-making based on high-quality evidence. Embedded within the SALuBRITY trial, we will carry out a patient and public involvement (PPI) subproject to improve the research quality and relevance of both the pilot and the future main trial.

Objective

To gather patients' and clinicians' perspectives and involve them in research discussions and decisions related to the research question and objectives, proposed trial recruitment processes and methods, and the trial's proposed outcome measures.

Methods

We will involve a small group of patients (n=4) with lived experience of lumbar radiculopathy and primary care clinicians (n=4) with care provider experience of patients with lumbar radiculopathy, who will act as patient and clinician advisors, respectively. The Critical Outcomes of Research Engagement (COREs)—a PPI framework for assessing the impact of patient engagement in research on study approaches and outcomes—will guide our PPI project. Patient and clinician advisors will be involved mainly through consultation and collaboration approaches (qualitative methods) to help inform the relevance, acceptability and sensitivity of our proposed trial objectives, methods, recruitment strategies, outcomes, and information documents for patients and collaborating primary care clinicians.

An initial kickoff event will prepare and empower the patient and clinician advisors for involvement in the project, followed by semi-structured interviews. Brief vignettes covering key PPI topics will be used

to introduce the PPI topics of interest. Interviews will be analysed, and the summarised PPI content fed back to patient and clinician advisors during a member-checking process to ensure accurate interpretation of patient and clinician input. Any modifications to the pilot or future main trial methods as a result of PPI input will be thoroughly documented. At the conclusion of participation activities, patient and clinician advisors will complete a survey to assess their satisfaction with the PPI experience.

Relevance

Our PPI project will help to enhance the quality and relevance of the SALuBRITY pilot and future main trial. Accounting for patients' and clinicians' experience and expertise will ensure that research is focused on their needs and concerns. Patient and clinician advisors will provide unique insights, personal knowledge, and advice, which is an important step for keeping research relevant to end-users, improving its translation into real-world clinical practice, and ensuring high quality research.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # C-35

Multi-Muscle Deep Learning Segmentation to Automate the Quantification of Muscle Fat Infiltration in Cervical Spine Conditions

Dr. Kenneth A Weber DC, PhD[1], Dr. Rebecca Abbott DPT[2], Dr. Vivie Bojilov DC[1], Dr. Andrew C Smith DPT, PhD[3], Marie Wasielewski[2], Dr. Trevor J Hastie PhD[1], Dr. Todd B Parrish PhD[2], Dr. Sean Mackey MD, PhD[1], Dr. James M Elliott PT, PhD[4]

[1]Stanford University, Palo Alto, USA. [2]Northwestern University, Chicago, USA. [3]University of Colorado Denver, Denver, USA. [4]TheUniversity of Sydney, Sydney, Australia

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Muscle fat infiltration (MFI) is observed in cervical spine disorders. The quantification of MFI requires time-consuming and rater-dependent manual segmentation techniques.

Objectives: To develop a segmentation model to automate the extraction of MFI from multiple cervical spine muscle groups.

Methods: This is a secondary analysis of a prospective observational longitudinal study exploring recovery from whiplash using magnetic resonance imaging (MRI) datasets from 84 participants (61 females, 23 males, age = 34.2 ± 10.7 years) from the first (< 2 weeks post motor vehicle collision (MVC)) and fourth (12 months post MVC) study time points. A convolutional neural network (CNN) model was trained to segment seven cervical spine muscle groups (left and right muscles segmented separately, 14 muscles total) from high-resolution fat-water Dixon MRI datasets (34 training datasets, n = 17, 14 females, 3 males, age = 33.7 ± 11.4 years). The performance of the trained CNN was assessed in an independent testing dataset (n = 18, 11 females, 7 males, age = 31.7 ± 9.6 years). Then in 84 participants imaged within two weeks following an MVC (61 females, 23 males, age = 34.2 ± 10.7 years), differences in MFI between the muscle groups and relationships between MFI and sex, age, and body mass index (BMI) were explored.

Results: The CNN MFI measures demonstrated high test reliability and accuracy. Averaging across all muscles, females had significantly higher MFI than males ($p < 0.026$). The deep cervical muscles demonstrated significantly greater MFI than the more superficial muscles ($p < 0.001$), and only MFI within the deep cervical muscles was moderately positively correlated to age ($r > 0.300$, $p < 0.01$).

Discussion: CNN's allow for the accurate and rapid, quantitative assessment of cervical spine muscle composition, which may have diagnostic, prognostic, and predictive value in disorders of the cervical spine.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-36

Effect of experimentally induced central sensitization on neuromuscular function in healthy adults

Dr. Olja Vazic DC, MSc[1], Dr. Nicholas T. Antony DC, BSc, MSc[2], Dr. Bernadette Murphy DC, PhD[2], Dr. John Z Srbely DC, PhD[1]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Introduction: Chronic musculoskeletal (MSK) pain is a leading cause of disability worldwide, with one in five Canadian adults affected. The prevalence of chronic MSK pain increases with age, leading to decreased work productivity, increased disability, loss of independence, and a lower quality of life. As the Canadian population ages, the proportion of those living with disabling chronic pain will increase, further burdening the individual, society and the healthcare system. Chronic myofascial pain is characterized by the presence of localized contractures within affected muscles, called myofascial trigger points (MTrP), although their underlying mechanisms are still poorly understood. The Neurogenic Hypothesis suggests that central sensitization (CS), a state of central nervous system hyperexcitability, may be an important mechanism facilitating the formation of muscle hypertonicity and MTrP by enhancing the excitability of the motor unit pool of affected muscles. To date, no one has investigated the relationship between the experimental induction of central sensitization and motor unit pool excitability.

Aim: To investigate if experimentally induced central sensitization leads to enhanced motor unit pool excitability in young healthy individuals.

Methods: This is a multi-site, double-blind randomized controlled experimental study. A convenience sample of 40 healthy adults (age 18-60 years, equal male/female ratio) with no musculoskeletal complaints will be recruited from the University of Guelph and University of Ontario Institute of Technology communities. Participants will be randomly allocated to a test group receiving topical sensitizing cream applied to a 10x5 cm target dermatome (C5-C6) on the lateral arm. Controls will receive a topical non-sensitizing cream intervention to the same region. Successful induction of central sensitization will be validated using weighted pinpricks applied to the region of secondary hyperalgesia surrounding the target C5-C6 dermatome. Participants will produce three @ 20% MVC ramp isometric contractions of the right biceps brachii muscle using a custom built force-transducer apparatus. Individual motor unit activity will be recorded from the biceps brachii (C5-C6) using high definition surface electromyography technique Motor unit activity and weighted pinprick analyses will be performed at baseline (prior to topical intervention), 10, 20 and 30 minutes post-intervention.

Statistical Analysis: The average force (mN) at recruitment (Recruitment Force Threshold, RFT) for each identified motor unit will be calculated over each of the three 20% ramp contraction trials, at each time point. Ratio of change from baseline for each RFT post-intervention (rRFT) will represent the primary outcome measure. Statistical analysis will investigate the effect of time and intervention on rRFT and

firing frequency (Hz), with post-hoc analyses assessing differences between groups at each post-intervention time point.

Expected Results: We expect to observe significant effects of time and intervention on rRFT and firing frequency, with significant decreases in test (sensitized) group rRFT and increased firing frequency when compared with controls at all time points. The findings of this study will offer further evidence supporting the mechanistic role of CS in the pathophysiology of muscle hypertonicity and MTrP associated with chronic myofascial pain, and may inform future therapeutic and management directives.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-37

The feasibility of an 8-week self-compassion meditation intervention in chronic low back pain: a protocol

Dr Mana Alaviuon Doctor of Medicine and Chiropractor, Dr Stephney Whillier BSc(Hons), B.Ed(Hons Specialist), PhD, SFHEA, Dr Hazel Jenkins Dr, PhD

Macquarie University, Sydney, Australia

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background:

Chronic back pain is a common health problem worldwide. It is the leading cause of work absenteeism and morbidity, and contributes immensely to government expenditure and economic burden. Research has shown psychological therapies such as self-compassion meditation can decrease pain intensity and improve quality of life for patients with chronic pain, but it is unknown if an online intervention directed specifically at chronic low back pain will be effective.

Aim:

This research will investigate the feasibility and acceptability of a novel online self-compassion meditation intervention, in people with chronic low back pain (CLBP).

Method:

This is a protocol of a single arm feasibility study with no control group.

Twenty-seven adult participants will be selected from community dwellers responding to poster or online advertisements. Participants will be included if they have been diagnosed with CLBP with a self-reported intensity of at least 3 out of 10 on the Numeric Rating Scale (NRS).

Participants will sign a digital consent form before starting the 8-week self-compassion intervention, which includes online delivery of daily meditations.

Participants will receive a daily survey link via REDCap which will contain a 20-minute daily meditation provided by Kristin Neff, an Associate Professor at the University of Texas at Austin, and Co-Founder of the Centre for Mindful Self-Compassion. Participants will also complete online questionnaires at the beginning and the end of the intervention.

Outcome Measures:

1. Baseline data measures.

2. Feasibility measures related to recruitment, study flow and timing (primary data), including study adherence and participant retention.

3. Feasibility measures related to the acceptability of the intervention, and whether participants would continue using this form of psychological intervention.

4. Clinical outcome measures, including a Numerical Rating Scale (NRS) for pain, The Roland-Morris Low Back Pain and Disability Questionnaire (RMQ) for level of disability, and The Pain Catastrophising Scale (PCS) for emotional functioning.

Discussion:

A review of research shows that meditation can decrease chronic pain. To the best of our knowledge, this will be the first attempt to assess the feasibility of delivering an online self-compassion intervention for CLBP. This feasibility trial will inform a future fully powered randomised controlled trial.

Online interventions have the advantage of being available to a broader population and have increased flexibility of delivery compared to face-to-face interventions. Online interventions can also potentially provide care to patients who have limited mobility due to the severity of their pain, comorbidities, or due to other social factors such as stigmas associated with visiting a counsellor or therapist. Therefore, online access to psychological interventions may help to diminish some of the barriers of access and provide patients with a convenient alternative to face-to-face consultations.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-38

Self-predicted recovery in patients participating in a multi-arm randomized controlled trial; Is the outcome already determined? A mixed methods pilot study.

Dr Corrie Myburgh MTech, PhD[1], Prof Gregory Neil Kawchuk DC, PhD[2], Ms Maliheh Hadizadeh MSc[2], Prof Julie Fritz PT, PhD[3]

[1]University of Southern Denmark, Odense, Denmark. [2]University of Alberta, Edmonton, Canada. [3]University of Utah, Salt Lake City, USA

Submission categories

Unpublished work (complete or incomplete)

Abstract

Objective

To determine if self-predicted recovery in low back pain patients foretells their post-intervention improvement in self-reported disability.

Methods

A subset of fourteen participants enrolled in a larger NIH randomized controlled trial were interviewed by a blinded evaluator after completing a self-perceived recovery questionnaire and prior to receiving a trial intervention. From this pre-intervention information, themes were derived then used to determine the likelihood of recovery expressed as a 50% change in Oswestry Disability Index (ODI) scores.

Results

Four themes were abstracted from the text-derived data, these being: 'a process of adaptation', 'the cognitive load of persistent pain', 'an established internal locus of control' and 'a personal explanatory framework helpful for recovery'. Based on the direction of these thematic responses, seven individuals were dichotomised as 'likely to recover' and seven 'unlikely to recover'. When compared to a ³ 50% change in ODI score rule, matches were observed in 5/7 (71%) respondents for both dichotomization categories. Comprehensive mismatches were observed in two cases.

Discussion

These preliminary results show promise in using self-predicted recovery as a tool to predict the actual likelihood of disability improvement. This information may help facilitate the identification of treatment responders and/or non-responders. We also note the determinants as modifiable, which has implications for future intervention studies.

Booth # C-41

Nonoperative treatment for lumbar spinal stenosis with neurogenic claudication. An updated systematic review.

Dr Carlo Ammendolia PhD[1], Dr Corey Hofkirchner DC[2], DR Joshua Plener DC[3], Dr Andre Bussieres PhD[4], Dr Michael Schneider PhD[5], Dr James Young DC MSc[6], Dr Andrea Furlan MD PhD[1], Dr Kent Stuber DC MSc[3], Dr Aksa Ahmed DC[7], Dr Carol Cancelliere DC PhD[8], Dr Aleisha Abeboyejo DC[3], Dr Joesph Ornelas DC PhD[9]

[1]University of Toronto, Toronto, Canada. [2]private practice, TORONTO, Canada. [3]Canadian Memorial Chiropractic College, Toronto, Canada. [4]University of Quebec, Trois Rivières, Canada. [5]University of Pittsburgh, Pittsburgh, USA. [6]University of Southern Denmark, Odense, Denmark. [7]Sinai Health, Toronto, Canada. [8]Ontario Tech University, Toronto, Canada. [9]Rush University, Chicago, USA

Submission categories

Unpublished work (complete or incomplete)

Abstract

Study Design. Systematic review.

Objective. To systematically review and update the evidence for the effectiveness of nonoperative treatment of lumbar spinal stenosis with neurogenic claudication.

Summary of Background Data. Neurogenic claudication can significantly impact quality of life and independence in older adults. Our original review found only low or very low-quality evidence limiting our ability to make conclusions on effective nonoperative treatments.

Methods. We updated our search in CENTRAL, MEDLINE, EMBASE, CINAHL, and ICL databases from February 2012 to September 2020 for randomized controlled trials published in English, in which at least 1 arm provided data on nonoperative treatments. Risk of bias in each study was independently assessed by 2 reviewers using 12 criteria. Quality of the evidence was evaluated using Grades of Recommendations, Assessment, Development, and Evaluation (GRADE).

Results. From the 13,817 citations screened, 156 were assessed and 23 new trials were identified and added to the original 21 trials. There is now moderate quality evidence from 1 trial that manual therapy and exercise provides superior and clinically important short-term improvement in symptoms and function compared to medical care or community exercise. There is moderate quality evidence from another trial that manual therapy, education and exercise demonstrates superior and clinically important improvements in walking distance in the immediate, short, intermediate and long-term compared to self-directed home exercises. There is moderate quality evidence from 1 trial that glucocorticoid plus lidocaine injection is more effective than lidocaine alone in improving pain and function in the short-term but not in the intermediate or long-term. The short-term outcomes were not considered to be of clinical importance.

There is low and very quality evidence assessing calcitonin, oral medication, other physical therapy/multimodal treatment, other epidural injections, surgery compared to physical therapy, acupuncture and spinal manipulation.

Conclusion. There is moderate quality evidence that a multimodal approach that includes manual therapy and exercise, with or without education is a safe and effective treatment, and that epidural steroids are not effective for the management of LSS causing neurogenic claudication. All other nonoperative interventions studied provided insufficient quality evidence, limiting the ability to make conclusions on their effectiveness

Booth # C-42

Profiling headaches in a Danish chiropractic cohort: Protocol for an upcoming project

Senior researcher Kristina Boe Dissing PhD[1], Senior researcher Rikke Krüger Jensen PhD[1], CEO Henrik Wulff Christensen PhD[1], Associate Professor Henrik Hein Lauridsen PhD[2]

[1]Chiropractic Knowledge Hub, Odense, Denmark. [2]University of Southern Denmark, Odense, Denmark

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background

Headache is among the top 10 causes of disability worldwide and every third person in Denmark has been seeking treatment for headache in primary care at some point in their life.

In Denmark, chiropractors are part of the national healthcare system, and a survey among Danish chiropractors from 2002 reported that 8% of the patients seen in chiropractic practice were suffering from headache.

However, there is only superficial knowledge about the management of headache in chiropractic clinics including diagnosis of headache types, the profile of patients who seek care and the types of treatment offered. Due to the severe consequences caused by headaches in terms of patient suffering and societal sick leave expenditure and treatment costs, it is of great importance to develop this area of research. In order to do so, a research plan for an upcoming project has been developed, focusing on two areas:

Part one

The aims of this study are twofold: 1) to investigate headache diagnoses and their prevalences made in chiropractic practice, and 2) to investigate how Danish chiropractors manage and treat patients with headache. This part of the project has the potential to provide the public, health care professionals and stakeholders with knowledge on the present status of patients with headache consulting chiropractic clinics in Denmark. The results will be used to build future research strategies by forming the basis for larger cohort studies and randomised clinical trials to assess the healthcare needs and treatment effects for patients with headache diagnoses.

Part two

This part of the project will explore the characteristics of patients seeking care for headache in chiropractic practice. It has the potential to identify important characteristics and features of patients with headache which can be used as potential predictors of outcome and in selecting types of treatment for the benefit of the patient.

Method

Data will be collected using information from electronic medical record systems, Danish national registries, quantitative surveys and qualitative interviews with both chiropractors and patients from Danish chiropractic practices. A questionnaire will be developed and validated, concerning headache diagnosis, management strategies and different types of treatments applied for patients with headache.

Prospects

The project will commence in March 2021 and data collection, analyses and publication of results are estimated to run over three years. It is based at the Chiropractic Knowledge Hub in Denmark and will be conducted in collaboration with the University of Southern Denmark (SDU).

Project leader will be Kristina Boe Dissing, PhD, senior researcher, at Chiropractic Knowledge Hub and chiropractor in private practice. The project is funded by the Danish Chiropractic Foundation.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # C-43

Chiropractic students' cognitive dissonance to statements about professional identity, role, setting and future: International perspectives from a secondary analysis of pooled data

Dr Michael S Swain MChiro, MPhil, PhD[1], Dr Jordan A Gliedt DC, PhD(c)[2], Dr Katie de Luca BAppSci(Ex&SpSci), MChiro, PhD[1], Prof Dave Newell PhD[3], Dr Michelle Holmes BSc, MRes, PhD(c)[3]

[1]Macquarie University, Sydney, Australia. [2]Logan University College of Chiropractic, Chesterfield, USA. [3]AECC University College, Bournemouth, United Kingdom

Submission categories

Published work (from 2020 onward)

Abstract

Background: Chiropractic students demonstrate philosophically opposing views about the chiropractic profession. The primary aim was to describe chiropractic students' responses to statements about chiropractic identity, role, setting, and future direction. A secondary aim was to describe the frequency of internally conflicting responses.

Methods: Three datasets from Europe, North America, and Australia/New Zealand were pooled in a secondary data analysis. Chiropractic students from 25 chiropractic training institutions completed interrelating surveys (combined response rate 21.9%) between 2013 and 2018. The survey instrument investigated student viewpoints about chiropractic professional identity, role, practice setting and future direction of chiropractic practice. Student attitudes about chiropractic were described using weighted proportions to adjust for unequal population sampling across the three geographical regions. The frequency of concordant and discordant student responses was described by combining identity items with items that explored responses about practice role, setting and future direction. The relationship between student characteristics (age, sex, education, association membership and geographical region) and ideologically conflicting responses were assessed using the Chi-squared test and Cramér's V.

Results: Data from 2,396 student chiropractors (50.8% female; from Europe 36.2%, North America 49.6% and Australia/New Zealand 14.5%) were analysed. For identity, nearly half of the chiropractic students (weighted 45.1%) agreed that it is important for chiropractors to hold strongly to the traditional chiropractic theory that adjusting the spine corrects "dis-ease" and agreed (weighted 55.5%) that contemporary and evolving scientific evidence is more important than traditional chiropractic principles. The frequency of discordant (ideologically conflicting) student responses ranged from 32.5% for statements about identity versus role, to 51.4% for statements about identity versus future. There was no association between student age, sex and internally conflicting responses. Chiropractic students' professional association membership status, pre-chiropractic education and geographical region were associated with ideologically conflicting responses.

Conclusions: Chiropractic students in this analysis show traditional and progressive attitudes towards the chiropractic profession. Individual student responses frequently contradict in terms of professional ideology, but most (approximately half) students demonstrate concordant progressive and mainstream

attitudes. Ideological conflict may raise concerns about some students' ability to learn and make clinical judgements, and potential for disharmony in the chiropractic fraternity.

Booth # C-44

"My work is hands on that cannot be done remotely"; An exploration of barriers to the provision of remote consultations by Chiropractors

Mr Shane Derbyshire Mchiro[1], Dr Jonathan Field DC, PhD[2], Professor Dave Newell Bsc, PhD molecular biology[2], Dr Jane Vennik DC, PhD[2]

[1]Private practice, Norwich, United Kingdom. [2]University of Southampton, Southampton, United Kingdom

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Remote consultations (RCs) enable clinicians to continue to support patients when face to face appointments are not possible. Restrictions to face to face care during the COVID-19 pandemic has accelerated a pre-existing trend for their adoption. This is true for many health professionals including some chiropractors. Whilst the majority of chiropractors in the UK have used remote consulting in some form during the pandemic, others have not. This study seeks to understand the views of chiropractors not using remote consulting and to explore potential barriers.

Methods

A national online survey was completed by 534 UK chiropractors. Respondents had the opportunity of providing open-ended responses concerning lack of engagement in remote consulting during the Covid-19 pandemic. Textual responses obtained from 137 respondents were coded and analysed using thematic analysis.

Results

The use of remote consulting provided an opportunity for chiropractors to deliver ongoing care during the Covid pandemic. However, many chiropractors expressed concern that remote consulting misaligned with their strong professional identity of providing 'hands on' care. Chiropractors also perceived that patients expect physical chiropractic treatment and thus considered a lack of demand when direct contact is not possible. In the absence of a physical examination, chiropractors can have concerns about potential misdiagnosis, and perceive a lack of diagnostic cues with which to guide treatment. Clinic closures and change in working environment led to practical difficulties of providing remote care.

Conclusion

The COVID-19 pandemic may accelerate changes in the way healthcare is provided with RC becoming more commonplace in primary healthcare provision. Barriers have been identified to chiropractors adopting RCs some of which appear fundamental to their perceived identity whilst others are likely amenable to change with training and experience.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # D-11

Performance of a hand-held sensor puck versus table-embedded force plate for measurement of HVLA thrust

Mr Luke Mitchell Ross Master of Chiropractic[1], Dr Aron Downie PhD[1], Dr Katie De Luca PhD[1], Dr Martha Funabashi PhD[2], Dr Steven Tran Master of Chiropractic[2], Dr David Starmer DC[2]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

BACKGROUND

Low back pain and musculoskeletal (MSK) conditions are among the leading causes of disability around the world. Chiropractic has utilised high velocity, low amplitude spinal manipulative therapy (HVLA SMT) to treat a range of musculoskeletal conditions and health related conditions since the early 1900s. HVLA SMT is a central part in patient management as it has been shown to decrease pain and improve function.

Chiropractors apply different techniques based on purported differences in kinematics of thrust style. The magnitude of force delivered during HVLA SMT is particularly important when considering the efficacy of therapy and safety of the patient. Previous studies have quantified the force-time profile of HVLA SMT, but have used multiple measurement devices, sensor placement, and heterogeneous study designs, which renders between-study comparison unfeasible. For example, force sensing technology embedded into a treatment table can record Diversified prone thrust but is not suited to record other thrust styles (e.g. Terminal Point Technique). In order to compare force-time profiles for multiple thrust styles, a single measurement device is proposed.

AIMS

This study aims to compare the performance of a novel hand-held force sensing load cell ("puck") against the embedded force-sensing table technology (FSTT®) during a standardised HVLA SMT thrust.

METHODS

A series of 10 prone thrusts were delivered via the hand-held puck into the FSTT® force plate, recoded simultaneously by both devices. This procedure was repeated with different mediums between the puck and FSTT® (none, treatment table cushion ± thrust mannequin) to explore impact of sensor placement in relation to the "subject". An intra-class correlation coefficient (ICC) calculated the level of agreement between puck and FSTT® for each medium.

RESULTS

Accuracy of both measurement devices is ± 0.01N at a sampling rate of 2kHz. Raw captures were averaged (5 points = 2.5ms duration) for each peak thrust force delivered. The level of agreement (ICC) between devices (10 repetitions) with no medium was 0.99. Similarly, agreement of puck and FSTT® with the cushion was 0.97, and the agreement of puck and FSTT® with both cushion and mannequin was 0.98.

DISCUSSION

Level of agreement (ICC) in peak force magnitude observed between puck and FSTT® was rated as "excellent" (>0.90) across all mediums, which suggests that force-time profiles measured at the puck are comparable to those measured by the FSTT® when tested without a live patient. Future studies will use the puck to explore force-time profiles of different thrust styles independent of the FSTT®, and to explore differences in force-magnitude between puck and FSTT® when a live patient is present. The information gained from comparing force-time profiles using a universal measurement device will advance knowledge relating to thrust style and treatment options based on force-time profile. In addition, comparison of different thrust styles has the potential to optimise psychomotor learning within chiropractic programs.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-12

What are the perceived barriers and facilitators for chiropractic care in older adults with low back pain

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background*:* Low back pain (LBP) is a pandemic which has a disproportional effects on older adults. One effective form of care for LBP is chiropractic care. However, as with many interventions, much is known about the effect of treatment in those between 18 and 65 years of age, but relatively less in those older than 65. Given that older adults may experience treatment different than their younger counterparts, it is vital to examine this patient population in more detail. As chiropractic in the Netherlands is a small and not well-known profession, elderly patients may not consider chiropractic care as an option for the treatment of their LBP. One recent qualitative study examined barriers and facilitators, but this paper focused on manual therapy and neck pain; therefore, these remain unclear for older adults seeking chiropractic care for low back pain.

Objectives: To evaluate the perceived barriers and facilitators which influence care seeking behaviour in older patients with LBP with respect chiropractic care.

Design: A qualitative explorative study

Methods: Participants of 56 years of age and older with chronic LBP) who seek chiropractic care as well as those with LBP who seek care from an allied professional (e.g. physical therapist) are to be included. These two populations were chosen in order to provide detailed information on the factors that stimulate or impede care seeking behaviour. Participants choosing for chiropractic care will provide information on facilitators while participants not choosing for chiropractic care will inform us of the barriers for seeking care from a chiropractor. Those with underlying pathology regarding the low back, previous surgery related to the low back, or insufficient mastery of the Dutch language will be excluded. Participants will be recruited through the network of chiropractic patients in the clinics of the researchers. Those who do not present to a chiropractor will be recruited from the network of the interviewed participants, researchers and colleagues of researchers. Purposive sampling will be used.

The study will be conducted in two stages.
Stage 1: We expect 5-10 semi-structured interviews with the participants that seek chiropractor care as well as 5-10 semi-structured interviews with participants that do not consult a chiropractor will be necessary. Data will be collected until saturation has been reached, meaning no new themes have been identified.
Stage 2: A focus group with the purpose of discussing the themes which were identified in the first stage will be held.

All interviews and the focus group will be online, voice recorded and transcribed verbatim.

These barriers and facilitators will be synthesized in an iterative process with the help of a thematic analysis.

Discussion: Past qualitative studies on chiropractic and elderly have focussed on multidisciplinary approach or co-management and not on facilitators and barriers. Results from this study will give a better insight into the factors that influence care seeking behaviour in older adults with LBP.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # D-13

The Swiss chiropractic cohort (Swiss ChiCo) pilot study: a developing practice-based research network project

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Introduction: MSK pain conditions are included in the Swiss Federal Council's 2016 National Strategy for the Prevention of Non-communicable Diseases as a priority in the context of disease management and prevention. Although the literature on MSK pain is substantial, little is collected from primary care settings. The lack of clinically collected data creates gaps in patient-centered healthcare and barriers to knowledge translation and implementation in clinical settings. To help bridge this divide we propose the Swiss chiropractic cohort (Swiss ChiCo) pilot study.

Objectives: The Swiss ChiCo pilot aims to **(1)** initiate the development of a nationwide Swiss chiropractic practice-based research network (PBRN); **(2)** describe the recruitment and retention of chiropractic clinics, clinicians, and community-based chiropractic patients; **(3)** assess the feasibility of studying the clinical course of patients with MSK pain conditions over 12 weeks.

Methods: Project development has been guided by an advisory group which includes patients, clinicians, researchers, and policy advisors (ChiroSuisse and Pro Chiropractic Switzerland). Research priorities, selection of outcome measures, and sampling approaches have been chosen through consultation with these stakeholders. Participatory loops will be established to provide project background and receive subsequent recommendations from participating clinicians and patients.

This study uses a cross-sectional study design to collect information on clinician characteristics at the time of inception into the PBRN, followed by an observational prospective cohort study of practice-based patients with MSK pain seeking chiropractic care. We aim to recruit 20 chiropractic clinics and 100 patients using a sampling approach based on Swiss chiropractic clinician distribution across the 3 main language regions of Switzerland (German, French, and Italian). Data collection will be performed using the web application REDCap. Enrolled clinicians will be asked about demographics, practice characteristics, practitioner confidence, attitudes and beliefs about MSK pain, and motivation for involvement. Patient participants will be provided survey questions relating to demographics, method of referral, activity level, level of pain, level of MSK disability, pain medication use, use of diagnostic imaging, psychological profile, and quality of life related to the COVID-19 pandemic. Follow up questionnaires will be sent to patients at 2 weeks, 6 weeks and 12 weeks following baseline.

Feasibility will be evaluated by assessing the proportion of enrolled clinics among those contacted to participate, survey response time, non-response analysis, and participant loss to follow-up.

Practitioner confidence and beliefs and attitudes about MSK pain will be reported with means and standard deviations. Patient characteristics will be reported with raw numbers, percentages, means, and standard deviations. Pain intensity and MSK health status will be reported as means and standard deviations at baseline, 2 weeks, 6 weeks, and 12 weeks.

Relevance: This study will help develop the preliminary infrastructure for a Swiss MSK focused chiropractic PBRN and provide pilot phase results to inform the feasibility and design of the future main Swiss ChiCo study.

Presenter Training Status

Student (currently in a clinical or graduate training program), Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # D-14

Understanding Barriers and Facilitators of Exercise Adherence after Total-Knee Arthroplasty

Dr Nora Bakaa DC, MSc, PhD (Candidate), Ms Lu Hsi Chen BHSc(Candidate), Dr. Lisa Carlesso PT, PhD, Dr Julie Richardson PT, PhD, Dr. Luciana Macedo PT, PhD

McMaster University, Hamilton, Canada

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: While the literature highlights the benefits of exercise for Total Knee Arthroplasty (TKA), there is little evidence surrounding patient adherence to exercise, which may lead to poor post-operative outcomes, including increased pain and functional disability. Understanding the patient perceived barriers to exercise adherence will allow clinicians to apply a multi-modal and comprehensive approach in managing TKA.

Objective: The purpose of this qualitative study was to understand the perceived patient barriers and facilitators of post-surgical exercise adherence in patients undergoing TKA.

Methods: We used an interpretive description approach to identify patterns and themes within each interview. Data collection and analysis proceeded concurrently, with each step informing the other. Inductive thematic analysis was used to analyze and report study findings. Data was gathered using semi-structured qualitative interviews. Participants were interviewed at 8 weeks post-operatively to capture physical, psychological, social and contextual changes and information. Topics that were explored included participants' experience with physical activity and exercise, motivation to perform physical activity, beliefs that exercise will reduce pain, and factors that limited their ability to engage in exercise.

Results: Self-regulation, knowledge of exercise, post-operative complications, comorbidities, social support, and lack of guidance from health care providers were identified as personal and environmental characteristics that influence exercise adherence. The identified themes were then mapped onto the 4 domains within the World Health Organization's (WHO) adherence framework: patient-related factors, condition-related factors, health care system, and social support.

Conclusion: Exercise adherence is a multidimensional, interconnected construct and future research should focus on understanding the factors, particularly surrounding health care providers, that impact adherence.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-21

Exercise Adherence & Quality of Reporting of Post-Operative Rehabilitation Interventions for Total Knee Arthroplasty: A Scoping Review

Dr. Nora Bakaa DC, MSc, PhD (Candidate), Ms Lu Hsi Chen BHSc (Candidate), Dr. Lisa Carlesso PT, PhD, Dr Julie Richardson PT, PhD, Dr Luciana Macedo PT, PhD

McMaster University, Hamilton, Canada

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Rehabilitation after total knee arthroplasty (TKA) is considered a crucial process in achieving optimal outcomes (e.g., decreased pain, increased function and walking capability, quality of life, etc.). Studies that have assessed rehabilitation after TKA often lack detailed descriptions of the intervention (e.g., exercise adherence, dosage, frequency, intensity, duration, etc.), thereby limiting translation to clinical practice.

Objective: The aim of this study was to evaluate exercise adherence and quality of reporting of exercise interventions delivered as part of clinical trials examining post-operative total knee replacement (TKA) rehabilitation.

Methods: A literature search was conducted in PubMed, EMBASE, AMED, CINAHL, SPORTDiscus and Cochrane Library.All randomized controlled trials (RCT) that examined post-operative exercise-based interventions were eligible for inclusion. Studies that were multifactorial or contained exercise interventions for both hip and knee arthroplasty were included. The definition, type of measurement used and outcome for exercise adherence were collected and analyzed descreptively. Quality of exercise interventions were assessed using the Consensus for Exercise Reporting Tool (CERT) and the Cochrane Risk of Bias Tool.

Results: The majority of RCTs (63%, N=71) did not report exercise adherence. Only 23% (N=15) of studies provided a definition of adherence. RCTs were of poor quality, with 85% (N=95) of studies having high or unclear risk of bias. Reporting of exercise interventions was poor, with only 4 items (of 19) (21%) of the CERT adequately reported (88-99%), with other items not fulfilled on at least 60% of the RCTs. There were no RCTs that had fulfilled all the criteria for the CERT.

Conclusion: RCTs inadequately report exercise adherence, as well as the overall exercise intervention in post-operative TKA rehabilitation. Future RCTs should use valid and reliable measures of adherence and a proper tool for reporting of exercise interventions.

Pre-registration: OSF: https://osf.io/9ku8a/

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-22

A literature review of the use of HC-PAIRS as a measure of attitudes, beliefs, and recommendations for chronic low back pain patients.

Dr. Jesse Cooper DC[1], Dr. Andreas Eklund DC, MSc, PhD[2], Ryan Muller B.A., DC (student)[3], Dr. Jordan Gliedt DC[4], Dr. Katie Pohlman PhD, DC[3]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Attitudes and beliefs of patients appear to have a strong influence over functional outcomes in chronic pain conditions. Healthcare providers' (HCPs) understanding of chronic pain, and subsequent related clinical interactions with patients, may play an appreciable role in associated outcomes of individuals with chronic low back pain (CLBP). In 1995, Rainville et al. created the Health Care Providers' Pain and Impairment Relationship Scale (HC-PAIRS) to measure HCPs' attitudes and beliefs because of interviews with CLBP patients suggesting their attitudes were from their HCPs. The HC-PAIRS is a 15-item measurement tool that has been shown to be a valid and reliable assessment tool for HCPs.

Objective

In this literature review, we evaluated the HC-PAIRS scores from the variety of populations (i.e., professions and students status) before and after educational interventions.

Methods

Search Strategies

To ensure a comprehensive search, manuscripts were searched with two approaches in September 2018 and then updated in November 2020. Manuscripts from the first approach were identified from the PubMed database. The second approach involved the PubMed "Find related data" and "Related Information" features.

Data Extraction and Analysis

Data extraction from identified studies was conducted by one author and verified by another. The extracted HC-PAIRS scores were standardized to 15-questions and categorized by profession, student status, and pre/post educational intervention.

Results

From the 33 articles included, a total of 7974 individuals (n=3402 professionals and n=4572 students) had taken the survey, with 1335 individuals (n=519 and n=816 students) completing the questionnaire after an educational intervention. The non-student scores by professions who commonly work with back pain were: physiotherapists, mean:2.80, osteopathic physicians, mean:3.26; mixed musculoskeletal physicians, mean:3.27; and medial physicians, mean:3.63. Professions that don't commonly deal with musculoskeletal pain scores were: non-healthcare providers, mean:3.71; nurses, mean:4.44.

Students in their first 2 years of their professional training were found to have higher scores compared to those in their final years (First years:4.31, range 4.06-4.61; Final years:3.79, range 3.07-4.43), which again was to be expected. Non-students had an average score of 3.32 with a range from 2.11 to 4.54.

For the 17 studies that explored an educational intervention to assess change, all but one study had a decrease in the HC-PAIRS scores. For students (n=913), the average decrease was 0.43 points with the post-intervention score being 3.45 (range:2.88-4.33). For the nons-students (n=519), the average decrease was 0.35 points with the post-intervention score being 2.65 (range:1.84-3.43).

Discussion

When first established, the optimal score was from functional restorative providers, which was found in this study to be much lower than professions overall, but similar to scores after an educational intervention. As to be expected, students' scores were higher than the non-students. However, those students in professions that will be most likely to treat musculoskeletal conditions had scores similar to their respective non-students.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-23

Descriptive Epidemiology and Costs of Chiropractic Care in Switzerland: A Nationwide Health Insurance Database Analysis

Dr. med. chiro. Malin B Muehlemann DrMedChiro[1], Lea S Glaus MChiroMed[1], Dr. Lukas Brunner PhD[2], Andri Signorell MSc[2], Dr. Thomas Bauer PhD[2], Dr. Longin Korner DC[3], Dr. Taco Houweling DC, PhD[4], Dr. med. Eva Blozik MD[2], Dr. J. David Cassidy DC, PhD, DrMedSc[5], Dr. Cesar Hincapié DC, PhD[6]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: While several studies have undertaken economic evaluations of chiropractic care in different health systems around the world, the epidemiology and costs of chiropractic care in the Swiss health system have yet to be studied. Switzerland has a mandatory health insurance system, with residents able to choose between 58 different health insurance providers. Among the largest of these is Helsana, insuring approximately 15% of the entire Swiss population across all regions and age groups. As most patients seek chiropractic care because of musculoskeletal (MSK) complaints, and chiropractic services are covered by Swiss mandatory basic health insurance, sources of administrative health data such as Helsana present a useful approach to study the epidemiology, utilisation, and costs of chiropractic care in the Swiss population.

Objective: To examine the descriptive epidemiology and costs of chiropractic care in Switzerland using Helsana's nationwide health insurance data.

Methods: We propose a historical observational study about chiropractic care epidemiology and costs in Switzerland using Helsana's health insurance claims database from 2012 to 2020. The study population includes Swiss residents of all ages with mandatory health insurance coverage by Helsana, with at least one chiropractic care claim record within the database. Descriptive statistics will be used to summarise characteristics of individuals seeking chiropractic care. All reimbursed claims during the study period will be used to estimate the annual direct medical costs, the annual number of chiropractic consultations per patient, the average cost per consultation, and the annual cost of chiropractic care per patient. We will calculate health utilisation proportions with corresponding 95% confidence intervals (CIs) and describe costs (means, standard deviations, medians and interquartile ranges, 95% CIs) across characteristics (age group, gender and comorbidities) and language regions to determine characteristics associated with higher or lower costs. The utilisation of different tariff billing codes will be analyzed to identify and better characterize patterns of health care use across these groups.

Relevance: With the large burden of MSK pain conditions in Switzerland and worldwide, a better understanding of the epidemiology and costs of chiropractic care is warranted and needed. Our study will help to advance fundamental epidemiologic and health economic knowledge of Swiss chiropractic care and may potentially inform evidence-based health system policies to help reduce the burden and costs of MSK pain both in Switzerland and abroad.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # D-24

Musculoskeletal health care at a Swiss specialized outpatient hospital chiropractic polyclinic in 2019: a health services research study

Léonie Hofstetter M Chiro Med, Melanie Häusler M Chiro Med, Malin Mühlemann DCM, Luana Nyirö DCM, Daniel Mühlemann DC, Cesar Hincapié DC PhD

Department of Chiropractic Medicine, Faculty of Medicine, University of Zurich and Balgrist University Hospital, Zurich, Switzerland

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: The chiropractic profession in Switzerland is highly integrated into mainstream health care, being one of five academic health professions and having good interprofessional collaboration with other Swiss health care professions. Despite a promising infrastructure and the important burden due to MSK disorders, research is still regrettably rare for patients with MSK conditions seeking chiropractic care. The Balgrist University Hospital, affiliated with the University of Zurich, is an academic hospital focused on MSK disorders. A chiropractic polyclinic, integrated in this interdisciplinary setting, provides chiropractic care to a broad patient population with MSK conditions. This setting presents an excellent opportunity to undertake a health services research project for the joint purposes of quality assurance and clinical epidemiological aims of investigating characteristics of MSK chiropractic care in a Swiss specialized outpatient hospital setting.

Objective: To advance understanding of chiropractic health care service at the Balgrist chiropractic polyclinic for quality assurance and health care quality improvement.

Methods: An observational clinical cohort database analysis at the chiropractic polyclinic at Balgrist University Hospital from January 1, 2019 to December 31, 2019 was performed. The records of all initial visits and their subsequent visits in this period were used to create the database. All initial consultations or returning initial visits (with >3 months since last visit at the polyclinic) were considered as the eligible study population. Data collected included demographic characteristics, diagnoses, imaging data, conservative treatments, surgeries, and other clinical care data. Discrete data were analyzed with calculations of counts and proportions with 95% confidence intervals (CI), and continuous data as means and standard deviations, or medians and interquartile ranges, as appropriate.

Results: 1844 distinct patients (52% female, mean age 48 ± 17 years) were eligible and included in our clinical database. 1742 patients had a single initial visit, 101 had 2 initial visits, and 1 patient had 3 initial visits during the study period. The most common main diagnoses were: low back pain (41%), neck pain (21%), thoracic pain (8%), back pain with multiple locations (7%), lumbar radiculopathy (4%), and cervical radiculopathy (2%). 6% of the diagnoses were trauma or injury related; 29% had an acute (<4 weeks) symptom duration, 10% subacute (4 to 12 weeks), and 52% chronic (>12 weeks). Patients averaged 7 chiropractic visits during their episode of care, with an average duration of 52 days. Only 49% (95%CI, 47% to 52%) of patient records had a programmatically extractable clinical outcome.

Discussion: Our health services research study provides an initial understanding of the patient characteristics and MSK clinical care delivered in a Swiss university-based specialized outpatient hospital setting and areas for clinical data quality assurance. Deeper insights into health care services and outcomes will help to facilitate a health quality improvement initiative by identifying clinical data and health care quality gaps, and establishing overall aims and targets for improvement.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # D-25

PROGNOSTIC FACTORS OF HIP REPLACEMENT DURING A 2-YEAR PERIOD IN PARTICIPANTS ENROLLED IN SUPERVISED EDUCATION AND EXERCISE THERAPY: A PROGNOSTIC STUDY OF 3,657 PARTICIPANTS WITH HIP OSTEOARTHRITIS

chiropractor Stine Clausen PhD-fellow[1], Professor Jan Hartvigsen[1], Eleanor Boyle[1], Professor Ewa Roos[1], Dorte Thalund Grønne[1], Martin Thomsen Ernst[2], Bodil Arnbak[1], Professor Søren Thorgaard Skou[1]

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Submission categories

Unpublished work (complete or incomplete)

Abstract not included in conference proceeding

Booth # D-26

Association of a clinical journal club with knowledge, attitudes, and behaviour of evidence-based practice among chiropractic students: a before-and-after pilot study

Melanie Häusler MChiroMed[1], Léonie Hofstetter MChiroMed[1], Cesar A Hincapié DC PhD[2]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background: Evidence-based practice (EBP) has been conceptualised as the interpretation of the best research evidence with clinical expertise and the patient's values and preferences. Courses and training have been implemented internationally into undergraduate medical curricula and medical residency programs with the aim of instilling lifelong learning and evidence-based healthcare practice. The implementation and effect EBP have been described in different subspecialities in postgraduate medical education, including physical therapy settings. To date, however, little is known about the knowledge, attitudes, and application of EBP among chiropractic healthcare students and trainees, and especially, in Switzerland.

Objective: To assess the association of the implementation of a new chiropractic clinical journal club with knowledge, attitudes, and application of EBP among chiropractic healthcare students and trainees in a Swiss university chiropractic education setting.

Methods: We will carry out a before-and-after pilot study with 5th and 6th year chiropractic students and postgraduate residents (n~30), between February 1, 2021 and July 31, 2021. A brief survey measuring participant characteristics and EBP knowledge, attitudes, and application will be distributed via email within 1 week before the first journal club session and within 1 week after the last journal club session for the Spring 2021 semester. A validated EBP measurement instrument will be used as the main outcome measure of four factors: EBP knowledge, attitudes toward EBP, personal application and use of EBP, and future use of EBP. Data collection will be done via the REDCap® electronic data capture tool hosted at Balgrist University Hospital. Descriptive statistics will be used to describe the participants' characteristics. For continuous data this comprises means, SDs, medians, interquartile ranges, and the minimal and maximal values. Categorical variables will be summarised using numbers and proportions. We will estimate within-group differences in before-after mean factor scores and carry out exploratory stratified analyses.

Relevance: Our pilot study will help inform the further development of evidence-based practice teaching within the chiropractic medicine curriculum at the University of Zurich and Balgrist University Hospital.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-27

The association of chiropractic integration in an Ontario community health centre with prescription opioid use for chronic non-cancer pain: a mixed methods study protocol

Dr. Peter C. Emary DC, MSc[1], Dr. Mark Oremus MSc, PhD[2], Dr. Lawrence Mbuagbaw MD, MPH, PhD[1], Dr. Jason W. Busse DC, MSc, PhD[1]

[1]McMaster University, Hamilton, Canada. [2]University of Waterloo, Waterloo, Canada

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background: Emerging evidence from a number of primary care centres suggests that integration of chiropractic services into chronic pain management is associated with improved clinical outcomes and high patient satisfaction, as well as reductions in physician visits, specialist referrals, use of advanced imaging and prescribing of analgesics. However, formal assessments of the integration of chiropractic services into chronic pain management are sparse, and the impact on healthcare costs and prescription opioid use in primary care remains uncertain.

Objective: To help address this knowledge gap, we will conduct a mixed methods health services evaluation of an integrated chiropractic back pain program in an urban community health centre in Ontario, Canada. This centre provides services to vulnerable populations with high unemployment rates, multiple co-morbidities, and musculoskeletal disorders that are commonly managed with prescription opioids.

Methods and Analysis: We will use a sequential explanatory mixed methods design, which consists of a quantitative phase followed by a qualitative phase. In the quantitative phase, we will conduct a retrospective cohort study and explore the relationship between chiropractic integration at the centre with opioid prescriptions for chronic pain (i.e., opioid fills, number of refills, and dosages) and reductions in opioid prescriptions. In the qualitative phase, we will conduct in-depth, one-on-one interviews of patients and their general practitioners to explore perceptions of chiropractic integration and its impact on opioid use.

Ethics and Dissemination: This study has been approved by the Hamilton Integrated Research Ethics Board at McMaster University (approval number 2021-10930). The results will be disseminated via peer-reviewed publications, conference presentations, and in-person or webinar presentations to community members and healthcare professionals.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-28

Does spinal manipulation therapy impact lumbar proprioception? A double-blind randomized controlled trial using a novel outcome

Luana Nyirö DCM, Petra Schweinhardt MD, PhD, Michael Meier PhD

Department of Chiropractic Medicine, Balgrist University Hospital, University of Zurich, Zurich, Switzerland

Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background: Impairments in lumbar proprioception have been reported in low back pain (LBP) patients. A potential mechanism underlying the effectiveness of spinal manipulation therapy (SMT) might be related to sustained changes in lumbar proprioceptive function following SMT. Balance control as a measure of proprioceptive function presupposes a complex interplay involving the precise integration of proprioceptive inputs and motor outputs that can be tracked by analyzing postural sway on a force plate.
However, postural sway has been shown to be insensitive to changes of lumbar proprioceptive function, perhaps because postural sway relies on afferent input from various body locations and tissues. This can be overcome with a more direct assessment of proprioceptive function, achieved by using vibrotactile stimulation in combination with balance control measures. Vibration applied at frequencies between 60-80Hz can selectively disturb proprioceptive signaling (mediated through primary (Ia) and secondary (II) muscle spindle afferents). The balance control system must identify and selectively focus on sensory inputs providing the most reliable information, a process called proprioceptive reweighting (PW). Differences in PW have been observed between healthy subjects and LBP patients by applying paraspinal and ankle muscle vibrotactile stimulation during a balance control task. Importantly, a more "ankle-focused" strategy seems to increase the risk for developing or having recurrences of mild LBP in young healthy individuals.

Objective: To test potential specific and sustained effects of SMT on lumbar proprioceptive function, we aim to 1) assess SMT-induced changes in PW over a two-week period and 2) use a rigorous approach to control for non-specific effects.

Methods: We will perform the planned experiments in healthy subjects because this will demonstrate a potential specific effect of SMT on lumbar proprioceptive function without the need to control for possible confounding effects of pain/nociception on proprioception as it would be the case for pain patients.
The study design consists of a four-arm (1:1:1:1 ratio) randomized controlled trial. 120 healthy subjects (age between 18 and 50 years) will undergo two visits within a two-week period, including three postural sway sessions and an intervention consisting of either lumbar manipulation (LMANIP), thoracic manipulation (TMANIP, control for location effect of SMT), lumbar mobilization (LMOB, control for manipulation effect) or no intervention (NI, control for natural history).
Postural sway session I&II will be performed immediately before and after the intervention,

respectively. In each subject, postural sway session III will be performed 7 days later. Bilateral vibrotactile stimulations will be applied on paraspinal and ankle muscles while standing on a stable and unstable surface (using a foam pad).
Primary outcomes are changes of postural sway in anterior-posterior direction and proprioceptive weighting (PW) ratios. Data will be analyzed using linear mixed models. Main and interaction effects will be modelled according to the defined hypotheses and respective post-hoc tests will be performed.

Relevance: This experiment will allow to draw conclusions with respect to an isolated effect of SMT on lumbar proprioceptive function, providing a clear mechanism for SMT-induced changes in sensorimotor function and a solid basis for further investigations in different LBP populations.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth D-31

The utility of electrical stimulation in quantitative sensory testing: Feasibility and reliability of an electrical stimulation paradigm to induce local experimental low back pain

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background: To promote mechanism-targeted treatments, the mechanisms underlying low back pain (LBP) have to be better understood. Nociceptive fibers in deep spinal tissues may contribute to the pathophysiology of LBP. However, in experimental pain research, primary afferent fibers from deep tissues are often neglected relative to superficial afferents, despite their clinical importance. There is evidence that nociceptive information from muscle and skin might be processed differently at the spinal level; activation of nociceptors from deep tissue seems to result in a longer lasting and more intense activation of dorsal horn neurons than activation of cutaneous nociceptors.
One way to study LBP mechanisms is to use human experimental models in which time and location of nociceptive stimuli applied to tissues of the lower back can be standardized.

Objective: To develop a reliable experimental paradigm in which time and location of nociceptive stimuli applied to tissues of the lower back can be standardized.

Methods: 20 healthy volunteers (10 males and 10 females) will undergo two visits separated by 10 +/- 5 days. During the visit, two unipolar concentric needle electrodes (0.34mm^2 stimulation area) will be bilaterally placed in the deep fascia of the erector spinae muscle (level L4/5) with a distance of 10 mm between the needle tips. Insertion will be ultrasound-guided.
Three up-and-down staircase stimulations will be used to determine electrical detection thresholds (EDT). Each staircase consists of a series of single rectangular electrical impulses (200 Hz) of 0.04 ms duration, with increasing intensity starting from 0 mA and increased by 0.2 mA until a threshold is reached, and reciprocally, until the sensation is lost. A between stimulus resting period of 3–5 s will be used.
Electrical pain thresholds (EPT) will be determined using nine single stimuli with fixed stimulus intensities between 9 and 45 mA. A maximum stimulation intensity of 45 mA is designated for safety reasons. The stimuli will be applied in ascending order until the first perception of pain will be detected. EPT will then be determined using the “method of limits”. The final threshold will be the geometric

mean of three series of ascending and descending stimuli intensities.
EDT and EPT on left and right side of the lower back will be assessed twice during each of both visits. All measurements will be performed by the same investigator. To investigate short and long-term reliability of EDT and EPT, differences between measurements, correlation coefficients, intraclass correlation coefficients (ICCs), Bland–Altman plots (limits of agreement), and standard error of measurement will be used.

Relevance: This experiment will assess whether electrical stimulation is a feasible method to induce local nociceptive low back pain. Moreover, defining a statistically meaningful change is possible, which is a prerequisite for the use of the paradigm in clinical research as well as in long-term investigations.

Booth # D-32

The use of remote consultations by chiropractors: A UK-based cross-sectional survey during the COVID-19 pandemic.

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Contemporary communications technology has increasingly facilitated a variety of new approaches to healthcare including the ability for clinicians to communicate with patients remotely via voice or video in remote consultations (RC). There is good evidence for comparable safety and clinical outcomes between RCs and face to face care across a range of healthcare specialties. They are popular with patients and clinicians and with the advent of the COVID-19 pandemic precluding traditional chiropractic consultations some in the profession have engaged with this approach to support patients. No previous studies were found that explored the usage and experiences of chiropractors using telehealth. This study aimed to explore the use of RCs by UK chiropractors pre and during the COVID-19 pandemic (May 2020-June 2020) and also explored their plans post-lockdown.

Methods

All registered practicing chiropractors in the UK were sent an invitation to complete an online survey. This survey collected information on 1) chiropractor demographics, 2) use of remote consultations by chiropractors, and 3) views of chiropractors towards remote consultations. Descriptive and inferential statistics were used to explore frequencies and potential associations/differences within the data.

Results

The response rate was 17.1% (534/3131). A third of respondents (32.5%) had been mostly using telephone RCs rather than video RCs prior to the pandemic, with older chiropractors being more likely to have used this approach. This rose to two thirds (67.2%) during the period of restricted face to face care and included uptake of video consultations alone or in combination with phones, with a similar proportion (58.6%) planning to continue use of such approaches after the restrictions on practice were lifted. Whilst just under half of the respondents (47.8%) felt RC would not be as effective as face to face care, around the same proportion (50.1%) stated they were engaging more in supporting their patients with active care (self-help advice and exercises) than they would have been otherwise. However, only around a half of the respondents (52.5%) were confident in carrying out an assessment and providing support remotely.

Discussion

To our knowledge this is the first time the chiropractic profession has been surveyed about the use of RCs. This survey provides preliminary usage and views data on remote consultations delivered by UK chiropractors. Usage of RCs by a subset of chiropractors significantly increased during the COVID-19 crisis and some are planning on using this care delivery method in some form in the future. Through necessity during the COVID-19 crisis, RCs have now become a legitimate method of care delivery for chiropractors in the UK and worldwide, and future research should continue to inform how, when, and how often chiropractors could use these digital approaches for the benefit of patients.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # D-33

Physical behaviours and disability, health care utilisation, and use of prescribed analgesics among individuals with persistent musculoskeletal pain: a protocol for a research project

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background:
Exercise and recommendations to remain physically active are core elements in clinical guidelines for the management of musculoskeletal disorders. However, not all physical activity is beneficial, since occupational physical activity can increase the risk of musculoskeletal disorders. It is, therefore, important to consider the domain when studying health effects of physical activity.

Current knowledge about how physical behaviours (i.e., physical activity and sedentary behaviour) are associated with musculoskeletal disorders has important limitations. Firstly, most studies are based on self-reported data, which are prone to measurement error, and device-based measurements that only provide information about intensity. Secondly, durations of daily physical behaviours are co-dependent, and few studies have taken this into account.

Objectives:
To investigate how physical behaviours during leisure and work are associated with persistent musculoskeletal pain and consequences thereof, including disability, health care utilisation and use of prescribed analgesics.

Methods:
We will use data from the fifth examination of the Copenhagen City Heart Study (CCHS) linked with routinely collected health data.

All study participants filled out a questionnaire that included questions regarding persistent or recurrent pain and disability. Individuals answering 'Yes' to 'Have you experienced persistent or recurrent pain within the last 6 months?' will be considered to have persistent musculoskeletal pain.

To measure physical behaviours, all participants (*N* = 4543) were asked to wear two accelerometers for seven days (24 hours/day, skin attached to right frontal thigh and right iliac crest). The participants were instructed to keep a record of their leisure time, working hours, and time in bed in a diary. The MATLAB-software, Acti4, was used to detect and derive time spent in physical activity types and body postures

(e.g., sitting, standing, walking, running, and cycling) from the accelerometer raw data. Of 2335 participants giving consent to wear accelerometers, about 1700 participants have ≥5 days of measurements with ≥16 h of accelerometer recordings/day (minimum wear time criteria).

Using a unique personal identification number, we will link data from the CCHS with national health register data about primary and secondary health care contacts and dispensed prescriptions for analgesics.

We will investigate associations between physical behaviours during leisure and work, and persistent musculoskeletal disorders and consequences thereof using different types of regression models (type depending on outcome) within a compositional data analysis framework, which accounts for the co-dependency between physical behaviours.

Results:
This project will improve our knowledge about how physical behaviours are associated with persistent musculoskeletal pain and related consequences. This can inform evidence-based recommendations about physical activity in clinical settings, as well as physical activity-promoting public health interventions, which, potentially, can improve the prevention and treatment of musculoskeletal disorders.

Discussion:
We will use reliable measurements of physical activity types and body postures, and an analytical approach that takes the co-dependency between durations of physical behaviours into account to overcome common limitations of most previous studies and contribute with an improved understanding of the association between physical behaviours and muscle and joint health.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # D-34

Ultrasound imaging in patients with hip pain and suspected hip osteoarthritis. An inter- and intra-rater reliability study.

Stine Haugaard Clausen PhD fellow[1], Søren Geill Kjær[2], Ulrich Fredberg[2], Lene Terslev[3], Jan Hartvigsen[1], Bodil Arnbak[1]

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Submission categories

Published work (from 2020 onward)

Abstract not included in conference proceeding

Booth # D-35

Are our lumbar manipulation shams any good? A systematic review protocol of blinding strategies, their effectiveness, and their influence on pain outcomes.

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background
Blinding is widely recognised as crucial to the acceptability of clinical trial outcomes. Blinding participants and therapists in clinical trials of spinal manipulative therapy (SMT) is an unresolved challenge. Many clinical trials have investigated SMT's clinical effectiveness, however, results are often indistinguishable from bias due to lack of or suboptimal blinding. We therefore aim to summarise sham-controlled high-velocity low-amplitude (HVLA) SMT trials and provide recommendations towards maximising blinding effectiveness in future trials.

Objectives
This study has two overarching objectives: 1) to describe sham lumbar HVLA SMT blinding methods and assess the impact of various strategies on blinding effectiveness, and 2) to assess the impact of the quality and effectiveness of blinding procedures on pain outcomes.

Methods

A comprehensive search strategy will include seven databases and one trial registry from inception until the current date, using search terms related to SMT, lumbar or lumbosacral spine, and sham or placebo. Included studies will be those with a prospective experimental design comparing HVLA SMT in the lumbosacral region against a sham SMT that is intended to mimic the active intervention for the purpose of blinding. We will include studies with symptomatic and asymptomatic human adult populations. Studies investigating manipulation under anaesthesia or instrument-assisted manipulation will be excluded.

A standard screening process will be used with two reviewers independently screening titles and abstracts, then full texts for inclusion. A third reviewer will be used in cases of disagreement. Data to be extracted includes characteristics of the participants, therapists, SMT procedure, sham procedure, and specific blinding strategies. Where available, we will also extract data relating to blinding effectiveness and subjective pain outcomes. Risk of bias (RoB) will be assessed using the Cochrane RoB tool. Data extraction and RoB for each article will be assessed by two independent reviewers with arbitration by a third in cases of disagreement.

Blinding strategies will be reported descriptively. Blinding effectiveness will be summarised using available blinding data, with a blinding index computed where possible. We will use meta-analysis to investigate the relationship between blinding effectiveness and prospectively defined trial variables and blinding strategies. For example, whether the sham mimics/conceals the cavitation noise during SMT or the positioning during SMT, and participant naivety to SMT. The impact of blinding on subjective pain outcomes will be assessed in three ways: a) blinding effectiveness - the influence of blinding effectiveness, using the blinding index, on pain will be investigated using meta-regression, b) blinding adequacy - RoB domains related to blinding will be used to perform a subgroup meta-analysis to explore the influence of adequate versus inadequate blinding procedures on pain, and c) blinding plausibility - blinding of participants and therapists will be assessed for plausibility using an expert panel (experts in SMT and sham design) and a meta-analysis will be used to explore the influence of plausible versus implausible blinding protocols on pain.

Results

We anticipate being able to make recommendations to assist with improving blinding effectiveness of HVLA lumbar sham procedures, and quantifying the impact of blinding on pain outcomes.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # D-36

Characteristics of Chiropractic Paediatric Practice: Secondary Analysis of the COAST and O-COAST Studies

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: There is a paucity of high level evidence about the safety and efficacy of chiropractic treatment of children. Despite this, parents continue to seek out chiropractic treatment for their children, with an estimated 12 month median utilisation rate of 8% worldwide. From two cross-sectional studies in Australia and Canada, 16% and 13% of all patients seen by chiropractors in the studies were aged between 0 and 24 years. Information is limited about the reasons that parents take their children to a chiropractor, the health conditions that chiropractors treat for their paediatrics patients, and the modalities chiropractors used for the treatment of paediatrics patients of various ages.

Aim: To describe the characteristics of paediatric patients who present to chiropractors, and to discover the reasons for seeking chiropractic treatment, conditions diagnosed by the chiropractor, and the treatments used across three different age strata.

Methods: The Chiropractic Observation and Analysis Study (COAST) and the Ontario Chiropractic Observation and Analysis Study (O-COAST) were cross sectional observational studies designed to provide a better understanding of current chiropractic practice and trends in their respective locations. In both studies, chiropractors were asked to record patient encounter data by hand on standardized paper encounter recording forms for 100 consecutive encounters. Patient encounters of individuals under the age of 18 were identified and extracted for secondary analysis. Paediatric patients were separated into three age strata based on neurodevelopmental and musculoskeletal maturation stages: 0-24 months, 2-10 years and 10-17 years. Data regarding patient characteristics, reason for encounter, and treatment received from the chiropractor were tabulated for analysis.

Results: Data on 670 paediatric encounters from a total 605 paediatrics patients were analysed. Of all paediatric encounters, 20% were aged 0-24 months, one third (33%) were aged 2-10 years and approximately half (47%) were aged 10-17 years. The majority of paediatric patients (92%) received one chiropractic treatment during data collection; 11 patients across all age strata recorded three or more treatments. “Health maintenance” was the most common reason for encounter in each age stratum at a rate of 61, 58 and 35 per 100 encounters, respectively. Non-musculoskeletal problems were most common in the 0-24 months stratum, such as sleep (19/100 encounters), gastrointestinal (12/100 encounters) and feeding problems (11/100 encounters). Chiropractors most frequently diagnosed “back problems” in each age stratum at a rate of 39, 62 and 67 per 100 encounters, respectively. Manual therapy was the most common treatment delivered overall (72%).

Discussion: We have described the reasons paediatric patients seek chiropractic treatment, and the conditions diagnosed by the chiropractor. "Health maintenance" was the most common reason for encounter across all age strata, however “back problems” were the most common problem diagnosed by chiropractors across all age strata, highlighting an incongruence between the reasons paediatric patients seek chiropractic care and the diagnosis chiropractors make. Understanding the characteristics of paediatric patient groups and the patterns of presentation and treatment will aid in designing relevant research, to inform teaching programs, and to implement evidence-based health policies.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-37

The development in surgery rates for lumbar spinal stenosis in Denmark between 2002 and 2018: a retrospective registry-based cohort study

Associate Professor Rikke Krüger Jensen PhD[1], Professor Berit Schiøttz-Christensen PhD[2], Data analyst Christian Volmar Skovsgaard PhD[3], Dr. Mathias Thorvaldsen MD[4], Dr. Rune Mygind Mieritz PhD[4], Dr. Andreas Andresen MD[5], CEO Henrik Wulff Christensen PhD[1], Professor Jan Hartvigsen PhD[6]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Treatment for degenerative lumbar spinal stenosis (LSS) ranges from non-surgical approaches with exercise and treatment with manual techniques, to invasive solutions such as surgical decompression. Decompression surgery is the most commonly performed procedure in spine surgery in people over 65 years of age. Over the last decades there has been an increase in rates of surgery for LSS in both Australia, USA and in some of the Scandinavian countries.

Purpose

The purpose of this study was to describe trends in LSS surgery in Denmark between 2002 and 2018.

Methods

Diagnostic ICD10-codes and surgical procedure codes were collected from the Danish National Patient Register. Inclusion criteria were patients 18 years or older diagnosed with LSS, who were admitted to private or public hospitals in Denmark between 2002 and 2018. Patients with a diagnosis of LSS and those with surgical procedure codes for decompression surgery with or without fusion were identified. Annual surgical rates were stratified on type of surgery, sex and age.

Results

During this 17-year period, 132,138 patients diagnosed with ICD-10 DM48.0 and 43,454 surgical procedures for LSS were identified. The total number of surgical procedures for LSS increased by 144% from 22.8 to 55.5 procedures per 100,000 inhabitants. The rate of surgery for patients diagnosed with LSS was around 33%, which was stable over time. Decompression without fusion increased by 128% from 17.7 to 40.2 per 100,000 inhabitants and decompression with fusion increased by 199% from 5.1 to

15.3 per 100,000. Women had fusions more often than men and this difference became larger with increasing age except for the oldest age group.

Conclusion

Both the prevalence of LSS diagnosis and LSS surgery rates more than doubled in Denmark between 2002 and 2018, however the proportion of patients diagnosed with LSS who received surgery remained stable. Decompression surgery with fusion increased at a higher rate than decompression without fusion.

Booth # D-38

The effect of back problems on health care utilization and costs in Ontario, Canada: A population-based matched cohort study

Dr Jessica J Wong DC, MPH[1], Professor Pierre Côté DC, PhD[2], Dr. Andrea C Tricco MSc, PhD[3], Tristan Watson MPH[4], Dr. Laura Rosella PhD, MHSc[1]

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Submission categories

Published work (from 2020 onward)

Abstract

Background: Back pain is the leading cause of years lived with disability globally. However, few studies have comprehensively quantified the burden of back pain at the health-system level, particularly in the Canadian context.

Objective: The objective was to assess the effect of back problems on healthcare utilization and costs in a population-based sample of adults in Ontario within a single-payer health system.

Methods: We conducted a population-based cohort study of Ontarian respondents aged 18 years or older of the Canadian Community Health Survey (CCHS) from 2003 to 2012. CCHS data were individually-linked to health administrative data, including Ontario Health Insurance Plan and hospitalizations data, to measure healthcare utilization and costs up to March 31, 2018. We propensity-score matched (hard-matched on sex) adults with self-reported back problems to those without back problems, accounting for sociodemographics, comorbidities, health-related and behavioural factors. We evaluated cause-specific and all-cause healthcare utilization and costs adjusted to 2018 Canadian dollars (CAD) using negative binomial and linear (log-transformed) regression models.

Results: After propensity-score matching, we identified 36,806 pairs (women: 21,054; men: 15,752) of CCHS respondents with and without back problems (mean age of 51 years, standard deviation=18). Compared to propensity-score matched adults without back problems, adults with back problems had two times the rate of cause-specific visits (rate ratio $[RR]_{women}$ 2.06, 95% confidence interval (CI) 1.88-2.25; RR_{men} 2.32, 95% CI 2.04-2.64), slightly more all-cause physician visits (RR_{women} 1.12, 95% CI 1.09-1.16; RR_{men} 1.10, 95% CI 1.05-1.14), and 1.2 times the costs (women: 1.21, 95% CI 1.16-1.27; men: 1.16, 95% CI 1.09-1.23). Incremental annual per-person costs were higher in adults with back problems than those without back problems (women: $395, 95% CI $281-$509; men: $196, 95% CI $94-$300). This corresponded to $532 million for women and $227 million for men (adjusted to 2018 CAD) annually in Ontario given the high prevalence of back problems.

Discussion: Adults with back problems had higher cause-specific and all-cause health care utilization and costs compared to adults without back problems. Given the high health system burden, new strategies to effectively prevent and treat back problems and thus potentially reduce the long-term costs are warranted.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-41

The association between back problems and all-cause and premature mortality among adults in Ontario, Canada: A population-based matched cohort study

Dr. Jessica J Wong DC, MPH[1], Professor Pierre Côté DC, PhD[2], Dr. Andrea C Tricco MSc, PhD[3], Tristan Watson MPH[4], Dr. Laura Rosella PhD, MHSc[1]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Back pain is the leading cause of years lived with disability globally, and a driver of high health care utilization across health systems. Emerging evidence suggests that back pain influences the risk of mortality in adults; however, previous studies had inconsistent results on the association between back pain and mortality.

Objective: The objective was to assess the association between back problems and all-cause and premature (before 75 years of age) mortality in a population-based sample of adults in Ontario.

Methods: We conducted a population-based cohort study of Ontario respondents aged 18 years or older of the Canadian Community Health Survey (CCHS) from 2003 to 2012 (n=150,537). CCHS data were individually-linked to death records to measure mortality up to March 31, 2018. Back problems were defined as a self-reported back problem diagnosed by a health professional. We propensity-score matched (hard-matched on sex) adults with back problems to those without back problems, accounting for sociodemographics, comorbidities, health-related and behavioural factors. Cox proportional hazards models were used to assess time to all-cause and premature mortality separately. We restricted premature mortality models to individuals aged <75 years at interview date (n=132,335) and modeled survival up to 75 years of age.

Results: For all-cause mortality models, we identified 36,806 pairs (21,054 for women, 15,752 for men) of adults with and without back problems after propensity-score matching (mean age of 51 years, standard deviation=18). For premature mortality models, we identified 31,440 pairs (17,476 for women, 13,964 for men) of propensity-score matched adults with and without back problems (mean age of 48 years, standard deviation=14). There were no differences between propensity-score matched adults with and without back problems in time to all-cause mortality (women: hazard ratio (HR)=0.98, 95% confidence interval (CI) 0.91-1.05; men: HR=1.08, 95% CI 0.99-1.16) or time to premature mortality (women: HR=0.88, 95% CI 0.77-1.00; men: HR=0.90, 95% CI 0.80-1.02). Sensitivity analyses to assess potential misclassification of the exposure provided similar results when combining self-reported data with diagnostic information to define back problems.

Discussion: Time to all-cause mortality or premature mortality did not differ between adults with and without back problems. As a high prevalence condition and leading cause of disability, back problems do

not appear to affect survival. Study findings have implications for health care delivery and resource planning to improve population health.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-42

Predicting who responds to spinal manipulative therapy using a short-time frame methodology: Results from a 238-participant study

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Submission categories

Published work (from 2020 onward)

Abstract

Background

Spinal manipulative therapy (SMT) is among the nonpharmacologic interventions that has been recommended in clinical guidelines for patients with low back pain, however, some patients appear to benefit substantially more from SMT than others. Several investigations have examined potential factors to modify patients' responses prior to SMT application.

Objective

The objective of this study was to determine if the baseline prediction of SMT responders can be improved through the use of a restricted, non-pragmatic methodology, established variables of responder status, and newly developed physical measures observed to change with SMT.

Methods

We conducted a secondary analysis of a prior study that provided two applications of standardized SMT over a period of 1 week. After initial exploratory analysis, principal component analysis and optimal scaling analysis were used to reduce multicollinearity among predictors. A multiple logistic regression model was built using a forward Wald procedure to explore those baseline variables that could predict response status at 1-week reassessment.

Results

Two hundred and thirty-eight participants completed the 1-week reassessment (age 40.0± 11.8 years; 59.7% female). Response to treatment was predicted by a model containing the following 8 variables: height, gender, neck or upper back pain, pain frequency in the past 6 months, the STarT Back Tool, patients' expectations about medication and strengthening exercises, and extension status. Our model had a sensitivity of 72.2% (95% CI, 58.1–83.1), specificity of 84.2% (95% CI, 78.0–89.0), a positive likelihood ratio of 4.6 (CI, 3.2–6.7), a negative likelihood ratio of 0.3 (CI, 0.2–0.5), and area under ROC curve, 0.79.

Discussion

Our results suggest that it is possible to predict response to treatment before application of SMT in low back pain patients. The 8 variable model presented in this study was able to predict SMT response with an overall classification accuracy of 81.5%. Given these results, and that 7 model variables can be collected prior to clinician engagement, future validation of the model is warranted. Our model may benefit both patients and clinicians by reducing the time needed to re-evaluate an initial trial of care.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # D-43

The prevalence of suicide prevention training and suicide-related terminology in United States chiropractic training and licensing requirements

Dr. Morgan R Price DC[1], Dr. Clinton J Daniels DC, MS[1], Dr. Zachary A Cupler DC, MS[2]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

According to the Centers for Disease Control, self-directed violence continues to be among the top ten causes of death with over 50,000 deaths reported annually since 2008. As portal of entry providers, Doctors of Chiropractic (DCs) have a duty to engage in suicide prevention despite most often being consulted for spinal and musculoskeletal conditions. It is suspected that portal of entry providers--such as DCs--may encounter a high rate of patients with risk factors associated with suicide including chronic pain, depression, anxiety, post-traumatic stress disorder, substance use disorder, a sense of hopelessness, or a sense of helplessness.

To date, it is not known to what extent suicide prevention education (SPE) is provided within the United States (US) Doctor of Chiropractic programs (DCPs), Doctor of Chiropractic residency programs (DCRPs), diplomate training programs (DTPs), or institutional affiliated continuing education (CE). There is a paucity of succinct knowledge base describing the educational requirements for suicide prevention training for DCPs, DCRPs, DTPs, and US state licensing requirements as well as a lack of knowledge to the availability of such programs that may be state-dependent.

Objective

To summarize the prevalence of SPE and suicide risk factor terminology in US DCPs, DCRPs, CE, DTPs, and US licensure requirements. A secondary objective was to provide recommendations to enhance SPE for the profession.

Methods

A review of public-facing electronic documents and websites occurred from April to May 2020 for DCPs, DCRPs, institutional CE, DTPs, and state licensing requirements. Data was extracted to tables and descriptive statistics were used to report the findings.

Results

Of 19 DCPs, 58 courses were relevant. None specifically mentioned SPE, but risk factor-related terminology was highlighted. For the 10 DCRPs, their mandatory training included SPE. Two states

required SPE as part of re-licensure; these were attainable through 4 CE courses. No DTP handbooks included requirements of SPE, although risk-factor terminology was described in some.

Discussion

SPE in the chiropractic profession is largely lacking and widely varied at this time in the US. The development of profession-specific SPE, both institutional CEs and curriculum development in the DCPs, would better prepare chiropractors for recognizing patients with suicidal ideation.

Booth # D-44

Is there a gender problem with speakers at scientific chiropractic conferences? A study protocol

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract

Background

Gender diversity has been identified as a problem in many clinical and scientific disciplines. The chiropractic profession has historically been gendered, with the vast majority of chiropractors being men. However, increasing numbers of women are graduating chiropractic courses globally. The proportion of chiropractors who identify with another gender is unknown.

We are unaware of previous investigations of gender diversity in the chiropractic scientific community. In order to explore one aspect of gender diversity within chiropractic, we plan to investigate the gender distribution of speakers at scientific chiropractic conferences globally.

Research Questions

1. What is the gender distribution of speakers at scientific chiropractic conferences between the years of 2010 to current?

2. What factors are associated with the gender distribution of speakers?

Methods

This will be a cross-sectional study with pre-defined research questions, and an exploratory aspect with post-hoc research questions potentially added depending on the availability of data.

We will include chiropractic conferences with some type of peer-review of abstracts for oral and/or poster presentations, from 2010 to current. We will collect data on each conference, its advertised speakers (keynotes, oral, and poster presenters), and associated organising and scientific committees.

Gender of speakers and committee members will be determined by the authors based firstly on pronoun usage presented in conference material, secondly based on online biographical material, thirdly based on names or publicly available photographs, and finally by direct contact with the speaker.

This method may limit gender categories to gender neutral (they/them), woman (she/her), and man (he/him), though more specific gender information will be used if available.

Data will be presented descriptively and in aggregate. Appropriate statistical tests may be used post-hoc to assess factors associated with the gender distribution of speakers, such as the gender distribution of organising or scientific committees.

Limitations

We respect that gender is a non-binary construct that may change over time. We acknowledge that our method of assigning gender is inherently limited in various ways, but particularly because it does not allow each speaker to nominate their own gender for this study.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-11

Low prevalence of end plate junction failure in danish patients with lumbar disc herniation

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Submission categories

Published work (from 2020 onward)

Abstract

The present study was undertaken to determine the prevalence of endplate junction failure in a smaller cohort of Danish patients with lumbar disk herniation and compare this to the previously published data from India. Consecutive patients seen in a large regional hospital spine-care unit, with a clinical presentation suggesting a lumbar disk herniation with concomitant radiculopathy and confirmatory recent MRI were included. Additional imaging by CT was performed as part of the study and these were analyzed with specific attention to endplate junction failures. For ethical reasons, the number of participants was kept to a minimum and a total of 26 patients were included. The prevalence (n = 5) of endplate junction failure was found to be statistically significantly lower than that previously reported. Our findings do not echo those previously reported in an Indian population: Endplate junction failure was indeed observed, but at a significantly lower rate. We discuss potential reasons for the difference in findings with due attention to the weaknesses of the current study.

Booth # E-12

Posterior to anterior spinal stiffness measured in a sample of 127 secondary care low back pain patients

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Submission categories

Unpublished work (complete or incomplete)

Abstract

BACKGROUND: The sensation of spinal stiffness is a commonly reported symptom among back pain patients, and a clinical assessment of spinal stiffness usually constitutes a part of the decision making in the manual treatment of low back pain. Any relationship between spinal stiffness and low back pain is likely to be multifactorial, however, the previous exploration of this relationship has been overly simplistic (e.g., univariate regression analyses). The purpose of this study was to take a broader approach to compare instrumented measures of spinal stiffness to demographic characteristics, pain phenotypes, psychometrics, and spine-related disability in a sample of secondary care low back pain patients using multivariate regression analysis.

METHODS: Instrumented spinal stiffness measures from 127 patients were used to calculate terminal and global spinal stiffness scores. A best subset approach was used to find the subsets of 14 independent variables that most accurately predicted stiffness based on the evaluation of the adjusted R-square, Akaike Information Criteria, and the Bayesian Information Criteria.

FINDINGS: In the multivariate models, sex ($p < 0.001$) and age ($p < 0.001$) were the primary determinants of terminal stiffness, while global stiffness was primarily determined by age ($p = 0.003$) and disability ($p=0.024$).

INTERPRETATION: Instrumented measures of spinal stiffness are of a multifactorial nature, and future research into this area should make use of multivariate analyses.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-13

Psychophysical assessment of spinal excitability and descending pain modulation – do sensory afferents from deep tissues differ?

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: One suggested mechanism contributing to the chronification of low back pain (LBP) is a hyperexcitable central nervous system. This so-called central sensitization can psychophysically be assessed by temporal summation of pain (TSP) and conditioned pain modulation (CPM) paradigms. TSP, which refers to increased pain perception over time in response to repetitive stimulation, is a psychophysical measure of spinal excitability. CPM is a psychophysical read-out of descending pain modulation, investigated by simultaneous or sequential application of a noxious test stimulus and a heterotopically applied noxious conditioning stimulus. Combined TSP-CPM paradigms allow investigation of the interplay between ascending spinal and descending supraspinal pain modulatory mechanisms. Altered TSP and/or CPM have been reported in chronic LBP. However, most TSP assessments focus on superficial sensory nerve fibers. Considering the contribution of musculoskeletal tissues to chronic LBP, knowledge about deep sensory nerve fibers is crucial in chiropractic research.

Objective: The present study compared TSP in the lower back evoked by pressure, heat and pinprick stimulation and investigated how the different modalities were modulated in a CPM paradigm.

Methods: Forty pain-free subjects performed a combined TSP-CPM paradigm, in which three test stimulus modalities were applied over the erector spinae muscle (level L2-L4) in separate, randomized blocks: (1) deep mechanical (pressure), (2) superficial mechanical (pinprick) and (3) superficial thermal (heat) stimulation. In each block, immersion of the hand in a cold-water bath (9°C±0.5) served as conditioning stimulus. TSP evoked by twelve repetitive stimuli as well as pain thresholds were measured for all modalities before, during and immediately after the cold-water bath. General linear mixed models were used for analysis.

Results: TSP was evoked by all test stimulus modalities ($p<0.001$), with highest TSP magnitudes for pinprick (significant difference compared to heat: $p=0.02$). No CPM effect on TSP magnitudes was shown for any test stimulus modality. In contrast, modality-specific CPM effects on pain ratings and pain thresholds were observed. Pain ratings were reduced during the cold-water bath for pressure and heat compared to before the cold-water bath (pressure: $p=0.005$, heat: $p<0.001$), with heat pain ratings remaining decreased after the cold-water bath ($p<0.001$). Pain thresholds were increased during and after the cold-water bath for all test stimulus modalities (pressure – during: $p=0.007$, after: $p=0.031$; heat – during: $p<0.001$, after: $p<0.001$; pinprick – during: $p<0.001$, after: $p<0.001$). Again, heat showed a distinct CPM effect ($p=0.02$) with continuously increasing heat pain thresholds over time, while pressure and pinprick pain thresholds partially returned to baseline values after the cold-water bath.

Discussion: The present results show that TSP magnitudes differ depending on test stimulus modality. CPM effects on pain ratings and pain thresholds also appear to be modality-specific. Next, the same paradigm will be performed using a non-noxious SHAM water bath (i.e., 32°C) to investigate whether repeated-measures effects contributed to the observed results. Modality-specific differences in TSP and/or CPM need to be considered for appropriate study designs and for comparisons across studies with different test stimuli. Expanding this study to LBP patients holds the potential to better understand mechanisms underlying LBP.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # E-14

Beliefs, perceptions and practices of chiropractors and patients about mitigation strategies for benign adverse events after spinal manipulation therapy

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Submission categories

Published work (from 2020 onward)

Abstract

Background: Approximately 50% of patients who receive spinal manipulative therapy (SMT) experience some kind of adverse event (AE), typically benign and transient in nature. Regardless of their severity, mitigating benign AEs is important to improve patient experience and quality of care. The aim of this study was to identify beliefs, perceptions and practices of chiropractors and patients regarding benign AEs post-SMT and potential strategies to mitigate them.

Methods: Clinicians and patients from two chiropractic teaching clinics were invited to respond to an 11-question survey exploring their beliefs, perceptions and practices regarding benign AEs post-SMT and strategies to mitigate them. Responses were analyzed using descriptive statistics.

Results: A total of 39 clinicians (67% response rate) and 203 patients (82.9% response rate) completed the survey. Most clinicians (97%) believed benign AEs occur, and 82% reported their own patients have experienced one. For patients, 55% reported experiencing benign AEs post-SMT, with the most common symptoms being pain/soreness, headache and stiffness. While most clinicians (61.5%) reported trying a mitigation strategy with their patients, only 21.2% of patients perceived their clinicians had tried any mitigation strategy. Clinicians perceived that patient education is most likely to mitigate benign AEs, followed by soft tissue therapy and/or icing after SMT. Patients perceived stretching was most likely to mitigate benign AEs, followed by education and/or massage.

Discussion: This is the first study comparing beliefs, perceptions and practices from clinicians and patients regarding benign AEs post-SMT and strategies to mitigate them. This study provides an important step towards identifying the best strategies to improve patient safety and improve quality of care

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-21

Suicide prevention, public health, and the chiropractic profession: a call to action

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Suicide is a major public health concern that has wide-reaching implications on individuals, families, and society. Efforts to respond to a public health concern as a portal-of-entry provider can reduce morbidity and mortality of patients.

Objective

The objective of this commentary is a call to action to initiate a dialogue regarding suicide prevention and the role the chiropractic profession may play.

Methods

We present the state of the chiropractic profession and suicide prevention through a literature review.

Results

This public health burden requires chiropractors to realize current strengths and recognize contemporaneous deficiencies in clinical, research, and policy environments. With this better understanding, only then can the chiropractic profession strive to enhance knowledge and promote clinical acumen to target and mitigate suicide risk to better serve the public.

Discussion

We implore the profession to transition from bystander to actively engaged in the culture of suicide prevention beholden to all aspects of the biopsychosocial healthcare model. Suicide prevention improves the health and wellness of one's community while also impacting the broader public health arena.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # E-22

Low Back Pain Management by Chiropractors, Physiotherapists and General Practitioners: a prospective survey in primary care [preliminary results]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background
The content of usual care for low back pain (LBP) has been reported for general practitioners (GPs) and hospital care. However, patients with LBP also frequently seek care from different healthcare professionals (HCPs) like chiropractors (DCs) and physiotherapists (PTs). Inconsistencies in guideline-endorsed management have been widely reported, but with little attention to differences between HCPs. Therefore, a description of usual care for LBP amongst three different HCPs is highly relevant.

Objectives

1) To determine the three most frequent actions carried out by DCs, PTs and GPs meeting LBP patients in primary care

2) To investigate the heterogeneity in actions within and between HCPs

Methods
All DCs, PTs and GPs in the Region of Southern Denmark were invited to participate in a prospective survey of all consecutive LBP consultations with registration of patient and consultation characteristics in first consultations. Consultation characteristics included 'actions', defined as the HCPs' use of management and treatment modalities, and referrals to other primary care HCPs and diagnostic imaging. Data were analyzed descriptively using proportions and ranges.

Preliminary results
From October to December 2019, 43 DCs, 67 PTs and 34 GPs registered 1,140 first consultations regarding LBP (DCs (n=683); PTs (n=308); and GPs (n=149)). For DCs, the top three most frequently used actions were manual treatment (95.7%), information about LBP and prognosis (76.3%), and advice on self-management (79.1%). The PTs' top three were information (73.7%), advice (84.1%), and exercise instructions (80.2%), and the GPs' were information (44.2%), advice (61.9%), and prescription of pain medication (33.6%). We generally observed large variations between clinicians within all three groups with some of the above-mentioned treatment modalities being used in 0-100% of the patients. As an example, for both DCs and PTs, exercise instructions were used in 0-100% of consultations by different clinicians. GPs made the most referrals to other HCPs with 39.6% to PTs and 14.6% to DCs. DCs referred equally to GPs (5.4%) and PTs (5.5%), while PTs referred the least to both GPs (2.7%) and DCs (2.0%). Referral to magnetic resonance imaging was 6.9% for GPs and 0.7% for DCs while DCs performed X-rays

on 4,9% of the patients. The heterogeneity of use of actions await further analysis using advanced statistical methods. Final results are expected by end of 2021.

Discussion

We have described usual care for LBP patients in three HCP groups in primary care. Most first consultation actions are in accordance with guideline recommendations, but we have identified large variations in their use. The variation cannot be explained by differences in patient characteristics alone, but a full elucidation of these aspects awaits further analyses. Follow-up qualitative studies will investigate how and why management approaches are reported with such variation, which will help us gain an understanding of the challenges of implementing guideline endorsed management for LBP.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-23

Impact of Nutrient-Dense Foods on Chiropractic Students' Performance: a pilot study

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Both the American Dietetic Association and the American College of Sports Medicine take the position that athletic performance can be increased by optimal nutrition. The American College of Sports Medicine also states that if adequate nutrition is available through food intake, supplementing with vitamins and minerals is likely not necessary. For collegial athletes, unless one is part of a DI or DII team, there is limited nutrition-related resources, leaving nutritional decisions to be made by those they have frequent contact (e.g., coaches, fellow athletes, strength/conditioning specialists), albeit their limited nutritional training.

Objectives: To evaluate the management and outcomes of a randomized, cross-over clinical trial (RCT) of nutrient-dense food diet on athletic performance compared to regular dietary practices.

Methods: Participants were volunteer chiropractic student athletes. (NOTE: The study was designed as a cross-over RCT, but due to the study being shut down to follow COVID-19 regulations, it was modified to be just a parallel RCT). The food group were asked to consume 3 nutrient-dense products per day for 4-weeks versus the regular diet group who were asked to continue their normal dietary habits. Dietary supplementation was excluded for both groups. Athletic performance was measured at baseline and week-5 with a standardized, timed (in seconds [s]) performance test: 500m-row, 40-air squats, 30-situps, 20-pushups, 10-pullups (modifications available for participant and repeated at both time points). Nutrient-dense food consumption and exercise were monitored for compliance. Inflammatory marker (C-reactive protein [CRP]) was recorded at baseline and week-5.

Results: Sixteen/17 participants (mean age: 25.4 $\pm$ 3.6 years, 35% female) completed the study protocol (n=8/group). The food group consumed 86% of their products. No differences were found between groups for the number of times they exercised per week (food: 5.3 $\pm$ 1.4, regular: 5.1 $\pm$2.6 per week). There was a larger decrease in performance test time in the food group (-0:27.6 $\pm$ 43.5s, 95%CI: -14.01, 8.01) compared to the control group (-0:17.0 $\pm$ 37.1 s, 95%CI: -8.73, 63.98), but it was not statistically significant (p=0.607). There was no difference found in CRP between the food and no food group (0.10 and -0.05 mg/L, respectively).

Discussion: This pilot-study found that a strict food and exercise regimen could be followed by student athlete. It was unfortunate that the original cross-over study design could not be completed and should be conducted in the future. For athletes, there is a literature gap between nutritional knowledge, dietary intake, and athletic performance, leaving athletes confused and spending money and valuable time trying experimental products to try and increase athletic performance. The clinically meaningful

decrease, yet not statistically significant change, supports the need for a larger sample sized study to help better understand nutrient-dense supplementation impact on athletic performance.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-24

Are chiropractors' characteristics associated with the number of referred patients from general practitioners? A cross-sectional study of Danish chiropractors.

PhD Marc-André Blanchette[1], MSc Nina Engmark[2], MSc Mette Mouritsen Sørensen[2], PhD Silvano Mior[3], PhD Mette Jensen Stochkendahl[4]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background:

Interprofessional collaboration has been shown to optimize patient care and Danish chiropractors are encouraged to collaborate with other healthcare professionals from the mainstream healthcare system like general practitioners (GPs). To facilitate the collaboration between the two professions it is advised that Danish GPs and chiropractors make written referrals when referring a patient to the other profession. The percentage of musculoskeletal patients referred to a chiropractor from their GP is increasing in Denmark. It could be an indicator that collaboration between chiropractors and GPs are improving.

Objective

This study seeks to quantify the number of patients referred weekly from Danish GPs to chiropractors and to identify Danish chiropractors' characteristics associated with the number of referrals.

Methods:

We used a cross-sectional survey design. The 600 active members of the Danish Chiropractic Association were invited to participate in an online survey. The survey questionnaire was divided into five domains: 1) description of the chiropractors, 2) description of the clinics, 3) clinical day, 4) new patients, and 5) collaborative practices. Descriptive statistics were produced for all categorical and continuous variables. We used negative binomial regression in order to perform the bivariable and multivariable analysis to evaluate the association between predetermined characteristics and the weekly number of patients referred by GPs. The multivariable analysis was conducted in order to identify the most significant predictors of referrals.

Results:

A total of 364 (61%) chiropractors completed the survey, and data from 286 (47.7%) were analyzed. On average, Danish chiropractors reported receiving 2.5 (SD ± 2.2) patient referrals from GPs per week. Most referrals were verbal, 12% were written. The following characteristics were associated with significantly more GP referrals in the bivariable analysis: clinics with more than one chiropractor; expertise in one of the following: sports injuries/extremities, geriatrics, diagnostic ultrasound or shockwave therapy; and having access to radiography or diagnostic ultrasound. The characteristics associated with receiving fewer referrals were graduating from United Kingdom, having between 21 and 30 years of experience, cooperating with acupuncturists and focusing on preventing and treating dysfunctions/subluxations. In the multivariable analysis the characteristics having more than one chiropractor in the clinic, expertise in geriatrics, access to diagnostic ultrasound, more new patients per week, and referring more patients to GP's were statistically significantly associated with more GP referrals.

Conclusion:

Danish chiropractors reported an average of 2.5 referrals from GP's per week. The characteristics working at a clinic with more than one chiropractor, more new patients per week, expertize in geriatrics, access to diagnostic ultrasound and referring more patients to GP's were associated with more GP referrals to Danish chiropractors.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-25

Are non-pharmacological interventions delivered through synchronous telehealth effective and safe for the management of patients with musculoskeletal conditions? A systematic rapid review

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Submission categories

Unpublished work (complete or incomplete)

Abstract not included in conference proceeding

Booth # E-26

Data mining subgroups of low back pain patients

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Introduction

Meta-analyses of randomised controlled trials on treatment options for low back pain (LBP) are restricted by their inability to include all data in the analysis due to the heterogeneity of study protocols. One area of concern is the difficulty in deciding how to subgroup based on the condition's aetiology. Although it does not appear possible to use pathoanatomical causes for the creation of subgroups in non-specific LBP patients, it might be possible to create subgroups based on fluctuations in pain over time, known as a pain trajectory. A multi-level classification system based on pain trajectories would make it possible to separate LBP patients based on whether their pain was ongoing, recurrent or self-limiting. Cluster analyses approaches typically yield non-comparable trajectories due to the data-driven nature of these analyses. There exists an opportunity to use pre-determined pain trajectories; however this process is yet to be automated. Once LBP patients can be classified based on their pain trajectory, the distribution of patients over the trajectories can be used as result parameter in moderator analyses and to compare treatment modalities. Combining the capability of assessing the pain trajectory of LBP patients with an automated moderator analysis would, in theory, make it possible to start a more inclusive data mining process where multidimensional subgroups can be analysed. This study is a proof-of-concept to determine the feasibility of creating such a system.

Methods

A novel pattern recognition algorithm based on suggested standards of trajectories was created to assess pain trajectories and successfully validated against known trajectories from a previous study, which used weekly collected pain-intensity data. Since most LBP patient data currently available lacks weekly pain intensity data, we wanted to assess whether the algorithm could use less frequently collected data. To determine this, 17 datasets were created by systematically reducing an existing dataset to reflect a range of data collection strategies. This enabled the testing of

the novel algorithm in different datasets and testing the accuracy of individual parts of the algorithm using truth tables.

Results

The algorithm showed a high degree of accuracy in assessing pain trajectories in datasets with many pain intensity data points. Although datasets with fewer pain intensity data points recorded per patients appear more challenging for the algorithm, a number of different ways have been identified which may increase the algorithm's accuracy in such datasets. Sensitivity and specificity from the novel algorithm were 100% for all data. This reduced to 57% and 95% and further to 51% and 90% when 50% and 75% of the data points were removed, respectively.

Conclusion

We have presented a novel algorithm that helps in classifying patients' trajectories. We have evidence to suggest that the algorithm is robust when facing missing patient data points and hence can be used across a wide range of setups. The combination of the algorithm assessing the pain trajectory of a patient, with various methods to create and compare subgroups, suggests that data mining subgroups of LBP patients is possible in heterozygous datasets.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # E-27

Effectiveness of chiropractic manipulation versus sham manipulation for recurrent headaches in children aged 7-14 years. A randomised clinical trial

Chiropractor Susanne Lynge DC[1], Assistant professor Kristina B Dissing DC, PhD[2], Professor Werner Vach PhD[3], Director Henrik W Christensen DC, PhD[4], Senior researcher Lise Hestbæk DC, PhD[4]

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Submission categories

Published work (from 2020 onward)

Abstract

Background

To investigate the effectiveness of chiropractic spinal manipulation versus sham manipulation in children aged 7-14 with recurrent headaches.

Methods

Design: A two-arm, single-blind, superiority randomised controlled trial.

Setting: One chiropractic clinic and one paediatric specialty practice in Denmark, November 2015 to August 2020.

Participants: 199 children aged 7 to 14 years, with at least one episode of headache per week for the previous 6 months and at least one musculoskeletal dysfunction identified.

Interventions: All participants received standard oral and written advice to reduce headaches. In addition, children in the active treatment group received chiropractic spinal manipulation and children in the control group received sham manipulation for a period of 4 months. Number and frequency of treatments were based on the chiropractor's individual evaluation in the active treatment group; the children in the control group received approximately eight visits during the treatment period.

Primary outcome measures: 'Number of days with headache', 'pain intensity' and 'medication' were reported weekly by text messages, and global perceived effect by text message after 4 months. A planned fixed sequence strategy based on an initial outcome data analysis was used to prioritize outcomes. 'Number of days with headache' and 'pain intensity' were chosen as equally important outcomes of highest priority, followed by global perceived effect and medication. The significance level for the first two outcomes was fixed to 0.025 to take multiplicity into account.

Results

Chiropractic spinal manipulation resulted in significantly fewer days with headaches (reduction of 0.81 vs. 0.41, p=0.019, NNT=7 for 20% improvement) and better global perceived effect (dichotomized into

improved/not improved, OR=2.8 (95% CI: 1.5-5.3), NNT=5) compared with a sham manipulation procedure. There was no difference between groups for pain intensity during headache episodes. Due to methodological shortcomings, no conclusions could be drawn about medication use.

Conclusions

Chiropractic spinal manipulation resulted in fewer headaches and higher global perceived effect, with only minor side effects. It did not lower the intensity of the headaches.

Since the treatment is easily applicable, of low cost and minor side effects, chiropractic spinal manipulation might be considered as a valuable treatment option for children with recurrent headaches.

Trial registration

ClinicalTrials.gov, identifier NCT02684916, registered 02/18/2016 – retrospectively registered. https://clinicaltrials.gov/ct2/show/NCT02684916

Booth # E-28

Moving towards a contemporary chiropractic professional identity

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Submission categories

Published work (from 2020 onward)

Abstract

Since the inception of the chiropractic profession, debate has continued on differing practice objectives and philosophical approaches to patient care. While the political and academic leaders of the profession continue to dominate the discourse, little is known on the perspectives of the everyday practising chiropractor on their professional identity. In this paper, professional identity within the profession of chiropractic was evaluated using a systematised search strategy of the literature from the year 2000 through to May 2019. Initially 562 articles were sourced, of which 24 met the criteria for review. The review confirmed three previously stated professional identity subgroups; two polarised approaches and a centrist or mixed view. The musculoskeletal biomedical approach is in contrast to the vertebral subluxation vitalistic practice approach. Whilst these three main chiropractic identity subtypes exist, within the literature the terminology used to describe them differs. Research aimed at categorising the chiropractic profession identity into exclusive subtypes found that at least 20% of chiropractors have an exclusive vertebral subluxation focus. However, deeper exploration of the literature shows that vertebral subluxation is an important practice consideration for up to 70% of chiropractors. Patient care with a musculoskeletal spine focus is dominant in clinical practice. This review found that practising chiropractors consider themselves to be primary care or primary contact practitioners with a broad scope of practice across a number of patient groups not limited to musculoskeletal management. Across the research, there is a marked difference in the categories of practice objectives evaluated, and future research could examine the relatedness of these. Additionally, future research could explore the professional identity construct over time and within different practice contexts to help facilitate the progression of the profession.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-31

Initial Choice of Spinal Manipulation for Treatment of Chronic Low Back Pain Leads to Reduced Long-term Risk of Adverse Drug Events Among Older Medicare Beneficiaries

Student researcher Maria Bangash Doctor of Chiropractor, Dr Scott Haldeman, Dr James Whedon, Dr Anupama Kizhakkeveettil

southern california University of Health and Sciences, Whittier, USA

Submission categories

Unpublished work (complete or incomplete)

Abstract

Introduction

Chronic low back pain (cLBP) has a prevalence of approximately 23% and is a cause of disability in 11-12% of the population. Opioid Analgesic Therapy (OAT) and Spinal Manipulative Therapy (SMT) are regimens used to treat cLBP, but the long-term risk of adverse drug events (ADE) for both are uncertain. We compared the long-term ADE of SMT and OAT among older adults with cLBP.

Methods

We conducted a retrospective study using nationally representative Medicare claims data spanning the years 2012-2016. We analyzed the long-term ADE for treatment of cLBP via OAT vs. SMT, and approximated the adjusted incidence rate ratio using Poisson regression, controlling for patient characteristics, and accounting for selection bias through propensity scoring.

Results

The risk of ADE was higher in the OAT cohort (n 21,731) vs. SMT cohort (n 6,429). With weighted propensity scoring the adjusted rate of ADE was more than 42 times higher for initial choice of OAT vs. SMT (Rate Ratio 42.85, 95% CI 34.16-53.76, p <.0001).

Conclusion

Among older Medicare beneficiaries who received long-term care for cLBP via OAT, the adjusted rate of experiencing an ADE was much higher than those who received long-term management with SMT.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # E-32

Exposure to a motor vehicle collision and the risk of future back pain: A systematic review and meta-analysis

Dr. Paul S Nolet DC, MS, MPH[1], Dr. Peter C Emary DC, MSc[2], Dr. Vicki L Kristman PhD[3], Mr. Kent Murnaghan MA, MISt[4], Prof Maurice P Zeegers PhD[1], Dr. Michael D Freeman DC, MedDr, PhD[1]

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Submission categories

Published work (from 2020 onward)

Abstract

Objective: The purpose of this study is to summarize the evidence for the association between exposure to a motor vehicle collision (MVC) and future low back pain (LBP).

Literature survey: Persistent low back pain (LBP) is a relatively common complaint after acute injury in a MVC, with a reported 1 year post-crash prevalence of at least 31% of exposed individuals. Interpretation of this finding is challenging given the high incidence of LBP in the general population that is not exposed to a MVC. Risk studies with comparison control groups need to be examined in a systematic review.

Methodology: A systematic search of five electronic databases from 1998 to 2019 was performed. Eligible studies describing exposure to a MVC and risk of future non-specific LBP were critically appraised using the Quality in Prognosis Studies (QUIPS) instrument. The results were summarized using best-evidence synthesis principles, a random effects meta-analysis and testing for publication bias.

Synthesis: The search strategy yielded 1136 articles, three of which were found to be at low to medium risk of bias after critical appraisal. All three studies reported a positive association between an acute injury in a MVC and future LBP. Pooled analysis of the results resulted in an unadjusted relative risk of future LBP in the MVC exposed and injured population versus the non-exposed population of 2.7 (95 % CI [1.9, 3.8]), which equates to a 63 % attributable risk under the exposed.

Conclusions: There was a consistent positive association in the critically reviewed literature that investigated the risk of future LBP following an acute MVC-related injury. For the patient with chronic low back pain who was initially injured in a MVC, more often than not (63% of the time) the condition was caused by the MVC. These findings are likely to be of interest to clinicians, insurers, patients, governments and the courts. Future studies from both general and clinical populations would help strengthen these results.

Presenter Training Status

Student (currently in a clinical or graduate training program)

Booth # E-33

Medial Branch Blocks for Diagnosis of Facet Joint Pain Etiology and Use in Chronic Pain Litigation

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Canadian Memorial Chiropractic College, Toronto, Canada

Submission categories

Published work (from 2020 onward)

Abstract

Background: A commonly disputed medicolegal issue is the documentation of the location, degree, and anatomical source of an injured plaintiff's ongoing pain, particularly when the painful region is in or near the spine, and when the symptoms have arisen as result of a relatively low speed traffic crash.

Purpose: Provide health and legal practitioners with strategies to identify the source of cervical pain and to aid triers of fact (decision makers) in reaching better informed conclusion.

Methods: Clinical literature search strategy developed with a health science librarian and conducted in PubMed. Search terms consisted of subject headings and free text words relevant to facet joints. Similar strategy was employed to search cases and legislation in several legal research services.

Conclusions: There is convincing scientific medical evidence that the results of cervical facet blocks provide reliable objective evidence of chronic post-traumatic spine pain, suitable for presentation to an adjudicative decision maker.

Booth # E-34

Spinal manipulation for the management of cervicogenic headache: a systematic review and meta-analysis

Dr Matt Fernandez PhD[1], Dr Craig Moore PhD[1], Dr Jinghan Tan MChiro[1], Dr Derrick Lian MChiro[1], Dr Jeremy Nguyen MChiro[1], Dr Andrew Bacon MChiro[1], Dr Brie Christie MChiro[1], Dr Isabella Shen MChiro[1], Dr Thomas Waldie MChiro[1], Dr Danielle Simonet MChiro[1], Prof André Bussières Ph[2]

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Submission categories

Published work (from 2020 onward)

Abstract

Background: Spinal manipulative therapy (SMT) is frequently used to manage cervicogenic headache (CGHA). No meta-analysis has investigated the effectiveness of SMT exclusively for CGHA.

Objective: Evaluate the effectiveness of SMT for CGHA.

Databases and Data Treatment: Five databases identified randomized controlled trials comparing SMT with other manual therapies. The PEDro scale assessed the risk-of-bias. Pain and disability data were extracted and converted to a common scale. A random effects model was used for several follow-up periods. GRADE described the quality of evidence.

Results: Seven trials were eligible. At short-term follow-up, there was a significant, small effect favouring SMT for pain intensity (mean difference [MD] -10.88 [95% CI, -17.94, -3.82]) and small effects for pain frequency (standardized mean difference [SMD] -0.35 [95%CI, -0.66, -0.04]). There was no effect for pain duration (SMD -0.08 [95%CI, -0.47, 0.32]). There was a significant, small effect favoring SMT for disability (MD -13.31 [95% CI, -18.07, -8.56]). At intermediate follow-up, there was no significant effects for pain intensity (MD -9.77 [-24.21 to 4.68]) and a significant, small effect favoring SMT for pain frequency (SMD -0.32 [-0.63 to -0.00]). At long-term follow-up, there was no significant effects for pain intensity (MD -0.76 [-5.89 to 4.37]) and for pain frequency (SMD -0.37 [-0.84 to 0.10]).

Conclusion: For CGHA, SMT provides small, superior short-term benefits for pain intensity, frequency and disability but not pain duration, however, high-quality evidence in this field is lacking. The long-term impact is not significant.

Significance: CGHA are a common headache disorder. SMT can be considered an effective treatment modality, with this review suggesting it providing superior, small, short-term effects for pain intensity, frequency and disability when compared to other manual therapies. These findings may help clinicians in practice better understand the treatment effects of SMT alone for CGHA.

Booth # E-35

Using RE-AIM to understand the implementation and use of the SelfBACK app for people with low back pain: a protocol and preliminary results

Malene J Svendsen MSc[1], Charlotte D.N. Rasmussen PhD[2], Mette J Stochkendahl PhD[3], The SelfBack Consortium led by Paul J Mork PhD[4]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background:

Self-management is often recommended as an important element of living with a chronic health condition such as low back pain. Key elements of self-management are structured, multicomponent interventions that support autonomy and involve education and training with the aim of promoting adherence to self-management behaviors. These elements include efforts that many patients find challenging without support. With the increased integration of digital technologies in our daily lives, smartphone apps have been suggested as a promising platform for supporting self-management.

selfBACK is a decision support system that provides users with weekly self-management plans for low back pain. These plans are delivered through a smartphone app and tailored to individual user by using a knowledge-driven artificial intelligence method. In a multicenter RCT recently conducted in Denmark and Norway (the selfBACK project), we compared selfBACK in addition to usual care with usual care alone.

Objective: Implementation and process evaluation are vital for understanding how interventions function in different settings, including if and why interventions have different effects or do not work at all. We present a protocol and preliminary results of an implementation and process evaluation embedded in the RCT.

Methods: We used a convergent mixed-methods implementation and process evaluation of the selfBACK intervention by following the reach, effectiveness, adoption, implementation, and maintenance (RE-AIM) framework. We evaluated the implementing of selfBACK as an intervention in primary care and investigated how participants use the intervention in daily life. The evaluation also covered the intervention's reach, health care provider willingness to adopt it, and participant satisfaction. We performed a qualitative exploration of the implementation using semi-structured interviews, questionnaires and data analytics measures on app usage. Data for the nine months follow-up period has been collected, and a full report of the results are expected by the end of 2021.

Preliminary results: The trial randomized 461 low back pain patients from primary care and an outpatient spine center from March to December 2019. We interviewed 34 participants (26 from the intervention group and eight from the control group) and 20 health care practitioners. Preliminary results from the app analytics indicated an overall high level of use of the app, and the interviews gave insights into positive appraisals of the app (e.g. time-saving, convenient, trustworthy content from a reliable source, repeated information, and motivation by feedback and reward system). Technical problems, such as step synchronisation and log-in issues, were the main reason for not using the app.

Discussion: This study provides a detailed understanding of how self-management of low back pain can be improved and how a digital health intervention can be used as an add-on to usual care to support patients to self-manage their low back pain. We provide knowledge that can be used to explore the possibilities of extending the generic components of the selfBACK system and key drivers that could be of use in other conditions and diseases where self-management is an essential prevention or treatment strategy.

Trial Registration: ClinicalTrials.gov NCT03798288;
https://www.clinicaltrials.gov/ct2/show/NCT03798288

International Registered Report Identifier (IRRID): DERR1-10.2196/20308

Booth # E-36

The clinical course of spinal pain in adolescents: a feasibility study protocol

Ms Laura RC Montgomery PhD(Candidate)[1], Dr Michael S Swain PhD[2], Professor Steven J Kamper PhD[1], Ms Amber M Beynon PhD(Candidate)[3], Associate Professor Katherine A Pohlman PhD[4], Professor Lise Hestbaek PhD[5], Professor Mark J Hancock PhD[2], Professor Simon French PhD[2], Professor Chris G Maher PhD[1]

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Submission categories

Planned work (protocols, ideas to discuss)

Abstract not included in conference proceeding

Booth # E-37

The clinical profile of older adults seeking chiropractic care: A secondary analysis of COAST and O-COAST studies

Dr. Katie de Luca PhD[1], Prof Sheilah Hogg-Johnson PhD[2], Dr Martha Funabashi PhD[2], Prof Silvano Mior PhD[2], Prof Simon French PhD[1]

[1]Macquarie University, Sydney, Australia. [2]CMCC, Toronto, Canada

Submission categories

Unpublished work (complete or incomplete)

Abstract

BACKGROUND: Globally, musculoskeletal conditions contribute to 8% of the total disease burden in older adults. Musculoskeletal conditions are the primary reason older adults seek general medical care, resulting in older adults as the highest consumers of health care services. While there is high use of chiropractic care by older adults, there is no recent, specific data on why older adults seek chiropractic care and how chiropractors manage conditions. Therefore, the purpose of this study was to describe the demographic characteristics of older adults seeking chiropractic care, and to report problems diagnosed by chiropractors and the treatment provided to older adults who seek chiropractic care.

METHODS: A secondary data analysis from two, large cross-sectional observational studies conducted in Australia (COAST) and Canada (O-COAST). Patient encounter and diagnoses were classified using the International Classification of Primary Care, 2nd edition (ICPC-2), using the Australian ICPC-2 PLUS general practice terminology and the ICPC-2 PLUS Chiro terminology. Descriptive statistics were used to summarize chiropractor, patient and encounter characteristics. Encounter and patient characteristics were compared between younger (<65 years old) and older (≥65 years old) adults using χ^2 tests or t-tests, accounting for the clustering of patients and encounters within chiropractors.

RESULTS: A total of 6,781 chiropractor–adult patient encounters were recorded. Of these, 1,067 encounters were for persons aged >65years (16%), from 897 unique older patients. The most common diagnosis within older adult encounters was a back problem (56%), followed by neck problems (10%). Soft tissue techniques were most frequently used for older patients (85 in every 100 encounters) and in 29 of every 100 encounters, chiropractors recommended exercise to older patients as a part of their treatment.

CONCLUSIONS: From 6,781 chiropractor–adult patient encounters across two countries, one in seven adult chiropractic patients were >65 years. Of these, nearly 60% presented with a back problem, with

neck pain and lower limb problems the next most common presentation to chiropractors. Musculoskeletal conditions have a significant burden in terms of disability in older adults and are the most commonly treated conditions in chiropractic practice. Future research should explore the clinical course of back pain in older patients seeking chiropractic care and compare the provision of care to older adults across healthcare professions.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-38

Fear avoidance beliefs limit lumbar spine flexion during object lifting in pain-free adults – A protective strategy with negative consequences?

Dr Michael Lukas Meier PhD[1], Deborah Knechtle MSc[1], Magdalena Suter MSc[1], Dr Petra Schweinhardt PHD[1], Dr. Stefan Schmid PhD, PT[2]

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Submission categories

Published work (from 2020 onward)

Abstract

Background & Objectives

There is a long-held belief that physical activities such as lifting with a flexed spine is harmful for the back and causes low back pain (LBP), potentially contributing to pain-related fear (PRF). In LBP patients, it has been demonstrated that elevated PRF is linked to less lumbar flexion during object lifting, probably to protect the back. Such a protective strategy is suggested to predispose individuals to persistent back problems in the long term. It is unknown if such protective strategies already exist in pain-free individuals which would yield potential insights into how a person might react when they experience LBP. Therefore, this study aimed at investigating a potential relationship between PRF and and spine kinematics during lifting in pain-free subjects.

Material & Methods

57 pain-free adults (mean age=29.5y, 27 females) completed the "Tampa Scale for Kinesiophobia" questionnaire for the general population (TSK-G). Task-specific PRF was evaluated using the "Photograph Daily Activities Series" scale (PHODA), including a picture of a person lifting an object with a flexed back (PHODA-lift).Participants were equipped with 58 retro-reflective markers, including markers on the spinous processes of C7,T3,T5,T7,T9,T11 as well as L1-L5 and the sacrum. A system with 20 infrared cameras was used to derive the 3D trajectories of the markers for the calculation of sagittal spinal curvature angles. Subsequently, subjects were asked to lift (lifting-up) and put back down (putting-down) a 5kg-box. Mutiple linear regression analyses were carried out using one-dimensional Statistical-Parametric-Mapping (SPM 1D, alpha-level=0.05) which permitted time-sensitive analyses.

Results

A significant negative relationship between the PHODA-lift score and lumbar curvature angles during the lifting-up (time window: 9-92%, $-0.313 \leq r \geq -0.310$,$p=0.007$) and putting-down cycles (time window: 17-60%,$-0.315 \leq r \geq -0.306$,$p=0.028$) was found. Additional analysis revealed that these time-dependent relationships were driven by motion of the lower lumbar region (L4-L5). No relationships were found for thoracic curvature angles. Furthermore, no significant relationships between TSK-G, PHODA-total score and spinal curvature angles were found.

Conclusions

Our results indicate that protective movement strategies can be driven by distinct beliefs about the harmfulness of daily activities such as lifting with a flexed spine, in the absence of (experimental) pain.

Booth # E-41

Comparison of Lumbar Spine Sagittal Motion between External Measures and Quantitative Fluoroscopy – Preliminary Results

Mona Frey PhD Candidate[1], Professor Alan Breen DC, PhD[2], Senior Research Fellow Alex Breen PhD[2], Associate Professor Martha Funabashi PhD[3], Professor Greg Kawchuk DC, PhD[4], Assistant Professor Isabelle Pagé DC, PhD[5], Jonathan WIlliams PhD[6], Assistant Professor Arnold Wong PhD[7], DC, PhD Diana De Carvalho Assistant Professor[1]

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Submission categories

Unpublished work (complete or incomplete)

Abstract not included in conference proceeding

Booth # E-42

Distance Management of Spinal Disorders During the COVID-19 Pandemic and Beyond: Evidence-Based Patient and Clinician Guides From the Global Spine Care Initiative

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Submission categories

Published work (from 2020 onward)

Abstract

Background: The COVID-19 pandemic has greatly limited patients' access to care for spine-related symptoms and disorders. However, physical distancing between clinicians and patients with spine-related symptoms is not solely limited to restrictions imposed by pandemic-related lockdowns. In most low- and middle-income countries, as well as many underserved marginalized communities in high-income countries, there is little to no access to clinicians trained in evidence-based care for people experiencing spinal pain.

Objective: The aim of this study is to describe the development and present the components of evidence-based patient and clinician guides for the management of spinal disorders where in-person care is not available.

Methods: Ultimately, two sets of guides were developed (one for patients and one for clinicians) by extracting information from the published Global Spine Care Initiative (GSCI) papers. An international, interprofessional team of 29 participants from 10 countries on 4 continents participated. The team included practitioners in family medicine, neurology, physiatry, rheumatology, psychology, chiropractic, physical therapy, and yoga, as well as epidemiologists, research methodologists, and laypeople. The participants were invited to review, edit, and comment on the guides in an open iterative consensus process.

Results: The Patient Guide is a simple 2-step process. The first step describes the nature of the symptoms or concerns. The second step provides information that a patient can use when considering self-care, determining whether to contact a clinician, or considering seeking emergency care. The Clinician Guide is a 5-step process: (1) Obtain and document patient demographics, location of primary clinical symptoms, and psychosocial information. (2) Review the symptoms noted in the patient guide. (3) Determine the GSCI classification of the patient's spine-related complaints. (4) Ask additional questions to determine the GSCI subclassification of the symptom pattern. (5) Consider appropriate treatment interventions.

Conclusions: The Patient and Clinician Guides are designed to be sufficiently clear to be useful to all patients and clinicians, irrespective of their location, education, professional qualifications, and experience. However, they are comprehensive enough to provide guidance on the management of all spine-related symptoms or disorders, including triage for serious and specific diseases. They are

consistent with widely accepted evidence-based clinical practice guidelines. They also allow for adequate documentation and medical record keeping. These guides should be of value during periods of government-mandated physical or social distancing due to infectious diseases, such as during the COVID-19 pandemic. They should also be of value in underserved communities in high-, middle-, and low-income countries where there is a dearth of accessible trained spine care clinicians. These guides have the potential to reduce the overutilization of unnecessary and expensive interventions while empowering patients to self-manage uncomplicated spinal pain with the assistance of their clinician, either through direct in-person consultation or via telehealth communication.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-43

Beliefs about low back pain in a clinical population of chiropractic patients with low back pain and the association between beliefs at baseline and pain and disability at 2, 13 and 53 weeks – a ChiCo cohort study.

Søren Grøn[1], Rikke Krüger Jensen[2], Tue Secher Jensen[3], Alice Kongsted[2]

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Submission categories

Unpublished work (complete or incomplete)

Abstract

Background

Beliefs about back pain might play and important role in nonspecific low back pain (LBP) becoming persistent and causing disability, but evidence from longitudinal studies is limited. Back beliefs can be measured using the Back Belief Questionnaire (BBQ) which is a widely used and previously validated instrument. The aim of this study was to explore back beliefs among a large clinical population with LBP consulting to chiropractors and investigate associations between baseline back beliefs and disability and pain intensity at 2, 13 and 52 weeks of follow-up.

Methods

This study is part of The Danish Chiropractic Low Back Pain Cohort (ChiCo). It consists of adult patients recruited from private chiropractic practices, who consulted with a new episode of LBP with or without radicular symptoms. BBQ (range 9 - 45, higher scores indicating more positive beliefs) was measured at baseline and at 13- and 52 weeks follow-up alongside pain-scores (Numerical Rating scale 0-10) and disability-scores (Roland Morris Disability Questionnaire 0-100), which were also measured after 2 weeks. We used linear regression to analyze cross sectional associations between baseline patient characteristics and BBQ scores, and mixed methods longitudinal linear regression models to investigate associations between baseline BBQ score and pain and disability at follow-up.

Results

The cohort consisted of 2,734 patients. The median BBQ sum scores at baseline, 13 weeks and 52 weeks were 32 [Inter Quartile Range 29 – 36], 33 [IQR 29–37] and 32 [IQR 28– 36] respectively. Severe disability at baseline had the strongest association with baseline BBQ sum score (-4.1 lower score (95% CI -4.7; -3.5) than no disability). We found a weak statistically significant ($p<0.05$) association between baseline BBQ score and pain at follow-up but not with disability. We found an increase in BBQ of 1 point

to account for an additional reduction in pain of -0.02 (95% CI -0.04; -0.0002), -0.03 (95% CI -0.04; -0.008) and -0.03 (95% CI -0.05; 0.01) at 2 weeks, 13 weeks and 52 weeks respectively. For the associations between single items of the BBQ at baseline and pain at 13 weeks we found that "*Back trouble means periods of pain for the rest of one's life*" had the strongest association with future pain.

Conclusion

Back beliefs among our population of chiropractic patients were generally positive and relatively constant over time. More positive beliefs at baseline were weakly associated with better outcomes regarding pain but not disability. Future research should investigate to what extend the BBQ, or similar instruments, are measuring the most relevant beliefs and cognitions regarding LBP.

Presenter Training Status

Early Career Researcher (within 5 years of obtaining your Masters or Doctorate degree)

Booth # E-44

Feasibility and Initial Efficacy of a Multimodal Swelling Intervention after Total Knee Arthroplasty: A Pilot Study with Cohort Comparison

Dr. Joel Carmichael DC, PhD(c), Dr. Michael Bade DPT, PhD, Dr. Jennifer Stevens-Lapsley PT, PhD

University of Colorado School of Medicine, Aurora, USA

Submission categories

Unpublished work (complete or incomplete)

Abstract

Background: Swelling after total knee arthroplasty (TKA) is profound and nearly universal, increasing by 10% per day for the first three postoperative days, and reaching an average peak increase of 35% over pre-surgical levels within six to eight days. Swelling overloads the lymphatic drainage system and interstitial spaces where leaked proteins and inflammatory exudates collect. This results in increased joint and soft tissue pain and tension. Increased pressure within the edematous soft tissue progressively impedes venous return. Both lymphatic and venous drainage systems are overwhelmed resulting in increased fluid retention encompassing the entire limb.

Postoperative swelling after TKA may persist for six months or more. Moreover, swelling is associated with a cascade of functional deficits observed after surgery including reduced strength and range of motion and slower walking speeds over the first 90 days, as well as pain. Swelling after TKA carries a higher risk of deep venous thrombosis (DVT), infection, and wound dehiscence. Given the significant, detrimental impact associated with swelling after TKA, effective interventions are needed.

Objective: Investigate the feasibility and initial efficacy of a multimodal swelling intervention (MSI) to control swelling after total knee arthroplasty (TKA) compared to historical control group (CONTROL). Widely prescribed swelling treatments, including cryotherapy and elastic compression stockings (e.g., thrombo-embolic deterrent (TED) hose), do not control swelling after TKA. Our laboratory has developed a novel multimodal swelling intervention (MSI) that can be introduced very early after TKA. This self-administered home intervention consists of an inelastic, adjustable compression garment (CG), manual lymph drainage massage (MLD), and specific home exercises (HEP). We hypothesized that MSI would demonstrate initial efficacy in swelling reduction compared to CONTROL and would be feasible.

Design: Prospective feasibility study with cohort comparison.

Setting: Research laboratory in a regional medical center, and patients' homes.

Participants: Individuals with end-stage knee osteoarthritis undergoing TKA (MSI group: N = 16; mean age, 64.7 ± 7.1y); CONTROL group: N = 56; mean age, 64.3 ± 9.3y)

Interventions: All participants completed 18 days of MSI through postoperative day 21 (D21) consisting of an inelastic adjustable compression garment, manual lymph drainage (MLD) massage, and a home exercise program.

Main Outcome Measures: Feasibility measures included safety, patient satisfaction, and adherence to MSI. Swelling was measured by Single Frequency Bioelectrical Impedance Assessment (SF-BIA) ratio at D4, D7, D14, D21, and for rebound swelling due to intervention withdrawal, at D42. Initial efficacy was evaluated with effect size estimates derived from swelling measures.

Results: Patient satisfaction was 93% with no adverse events. CG wear time was 85% of the 12-hour/day goal. Adherence to MLD and HEP were 99% and 97% respectively. Peak effect of MSI occurred at D21 (Hedges' g effect size estimate = 1.53 at D21 (95% CI 0.92, 2.14)).

Conclusions: The self-administered MSI program is feasible, demonstrating strong initial efficacy to control swelling after TKA. MSI exerted swelling reduction early in the intervention. Minimal rebound swelling was observed once MSI was withdrawn. Self-applied MLD did not reduce swelling independently. Future studies should examine the efficacy of inelastic adjustable compression applied immediately postoperatively.

Presenter Training Status

Student (currently in a clinical or graduate training program)