



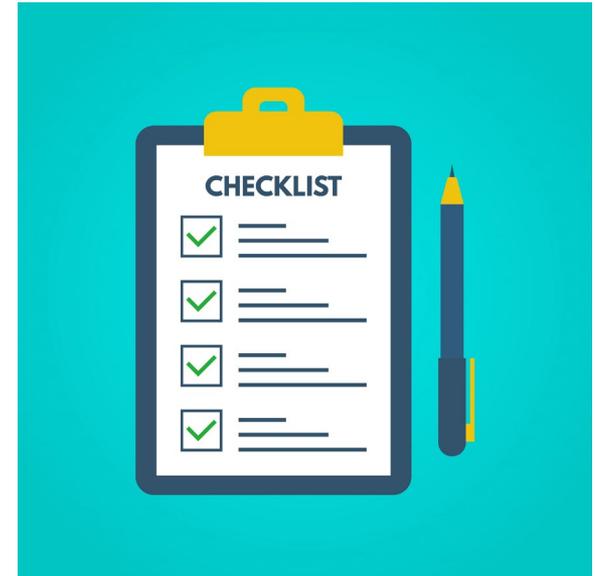
RESEARCH METHODS LEVEL 3

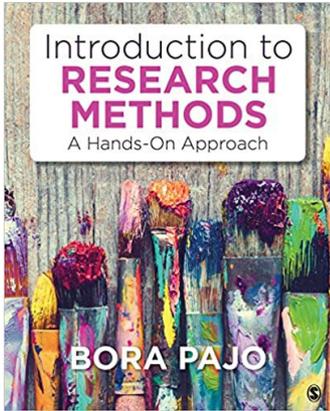
3 A Closer look at Randomised Controlled Trials



Class Outline

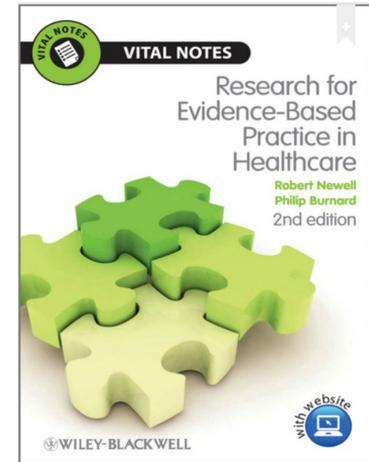
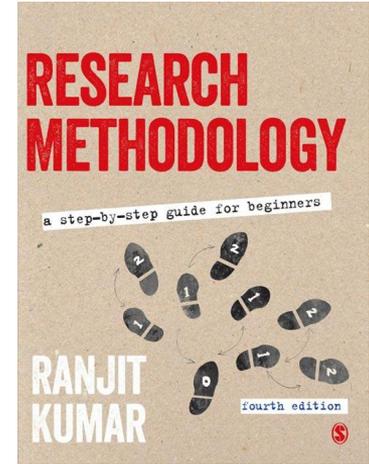
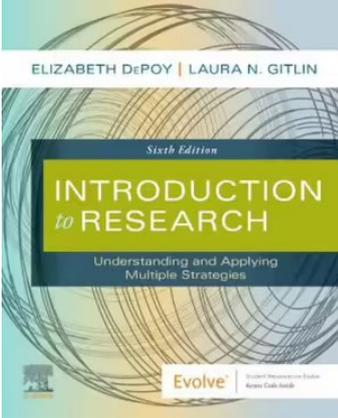
- Quick recap of what is an RCT.
- How is randomisation achieved?
 - Simple randomisation
 - Block randomisation
 - Stratified randomisation
- Types of control studies.
- Main types of RCT:
 - Parallel RCT
 - Crossover RCT
 - Examples
- Blinding





Book References to Support Power Points

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Key publications

- Boff TA, Pasinato F, Ben ÂJ, Bosmans JE, van Tulder M, Carregaro RL. Effectiveness of spinal manipulation and myofascial release compared with spinal manipulation alone on health-related outcomes in individuals with non-specific low back pain: randomized controlled trial. *Physiotherapy*. 2020 Jun 1;107:71-80.
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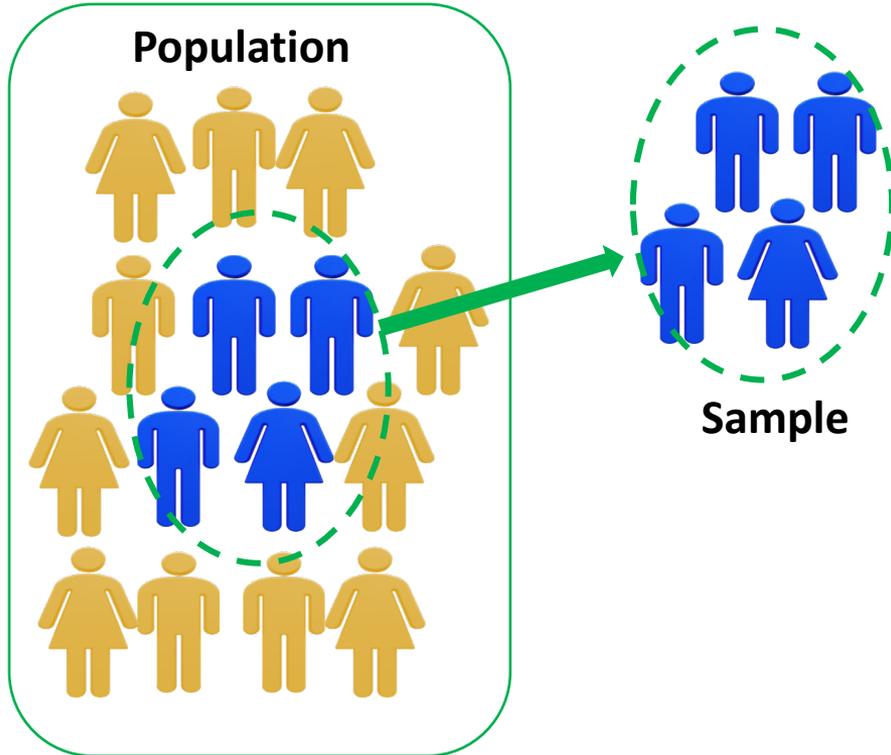
Recap Randomised Controlled Trial (RCT)

- RCT is an experimental study where individuals are allocated at random to either the intervention or control group.
- **It is a gold standard method to investigate treatment/intervention effectiveness for a health outcome (establish cause-and-effect relationships).**
- Three main components of an RCT are: 1) Deliberate conscious manipulation of independent variable, 2) Randomisation, and 3) Control group.
- CONSORT is a minimum set of guidelines to improve the reporting of RCTs or to assess the quality of an RCT.

Randomised Controlled Trial (RCT) cont.

- RCT is the best clinical design to answer cause-and-effect questions about interventions for health care outcomes.
- RCTs minimise bias and provide the highest level of confidence regarding causation of health outcomes.
- RCTs are good for understanding risks or side effects of any health care intervention (due to the requirement to report side effects in an RCT).
- RCTs provide you with cause-and-effect research evidence, efficacy evidence, and evidence about risks of health care interventions.

Population, Sample and Selection bias - and why we randomize group allocation in an RCT



A **population** is the entire group you want to look at and draw conclusions about.

A **sample** is a specific group from a population that you will collect data from.

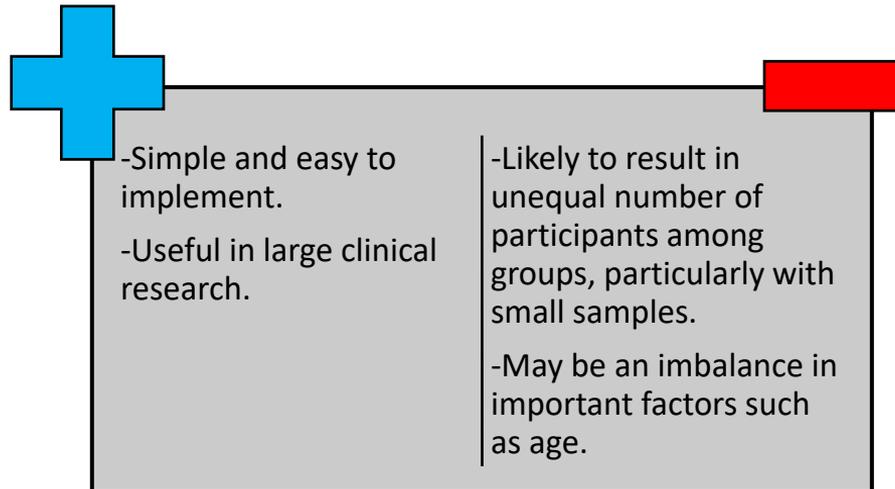
Selection bias is that bias that can be introduced by the selection of individuals, groups, or data for analysis.

Different Randomisation Methods:

- Simple randomisation
- Blocked randomisation
- Stratified randomisation

Simple Randomisation

- Randomises each participant to a group with a known probability:
 - Flipping a coin.
 - Throwing a dice.
 - Random number table.
 - Computer-generated random numbers.



Randomized Controlled Trial > J Manipulative Physiol Ther. 2016 May;39(4):267-78.

doi: 10.1016/j.jmpt.2016.02.003. Epub 2016 Apr 2.

Effectiveness of Chiropractic Care to Improve Sensorimotor Function Associated With Falls Risk in Older People: A Randomized Controlled Trial

Kelly R Holt ¹, Heidi Haavik ², Arier Chi Lun Lee ³, Bernadette Murphy ⁴, C Raina Elley ⁵

Randomization was carried out by an independent assistant, at a distant site, using a computer-generated list of random numbers. Allocation occurred following in-

RESEARCH

Open Access

Immediate effects of a lumbar spine manipulation on pain sensitivity and postural control in individuals with nonspecific low back pain: a randomized controlled trial

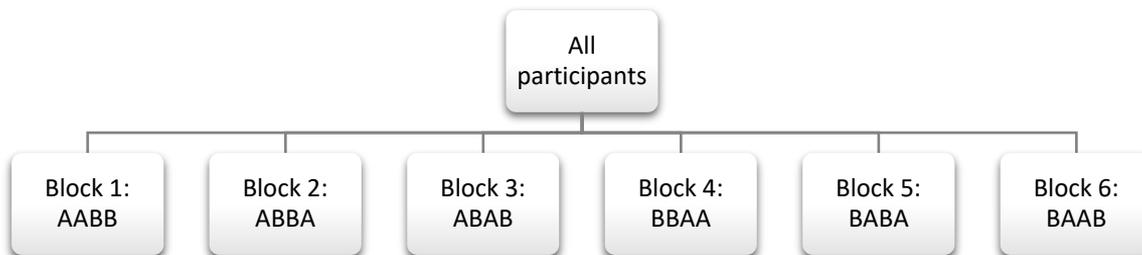


Jefferson Fagundes Loss^{1*}, Luciano de Souza da Silva², Iã Ferreira Miranda¹, Sandro Groisman², Edgar Santiago Wagner Neto¹, Catiane Souza³ and Cláudia Tarragô Candotti¹

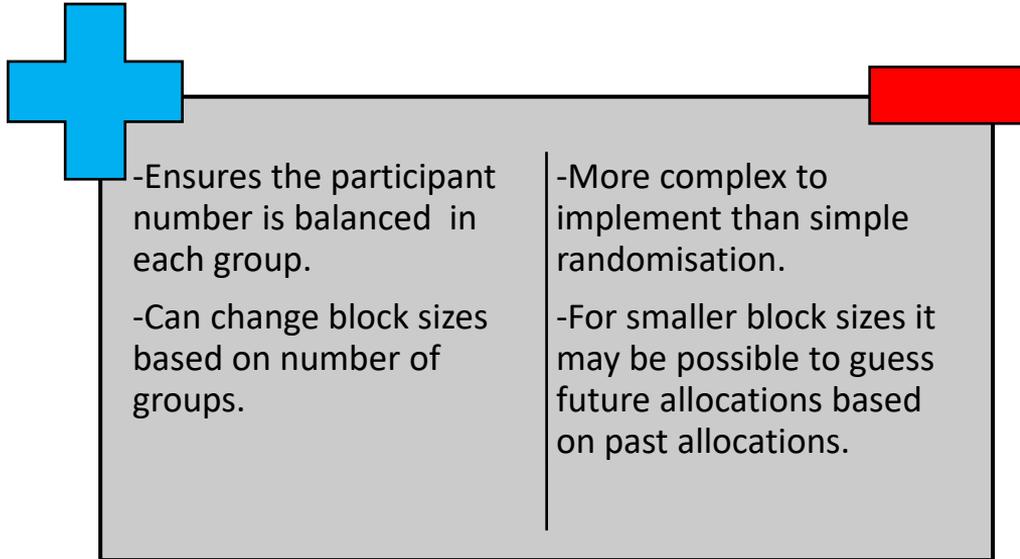
The group randomization was simple and was generated using Random Allocation Software (Informer Technologies, Inc.) by a researcher uninvolved in the subsequent research stages. This same researcher distributed the la-

Block Randomisation

- Randomising participants within blocks such that an equal number are assigned to each treatment.



- Choose a block at random and the first four treatments are allocated according to the permutations in that block. Then a new block is chosen at random and the next four treatments are allocated according to that block. Keep going until the required sample size is recruited. A=spinal adjustment, B=control.



The effect of spinal manipulation on brain neurometabolites in chronic nonspecific low back pain patients: a randomized clinical trial

Daryoush Didehdar¹ • Fahimeh Kamali^{1,2} • Amin Kordi Yoosefinejad^{1,2} • Mehrzad Lotfi³

Received: 22 September 2019 / Accepted: 12 November 2019 / Published online: 26 November 2019
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did not meet the inclusion criteria. Twenty-five patients were randomly assigned to either treatment ($n = 10$, six males and four females) or sham ($n = 15$, eight males and seven females) based on block randomization method (each block was 5)

Spine

SPINE Volume 38, Number 24, pp 2071-2078
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RANDOMIZED TRIAL

Short-Term Usual Chiropractic Care for Spinal Pain

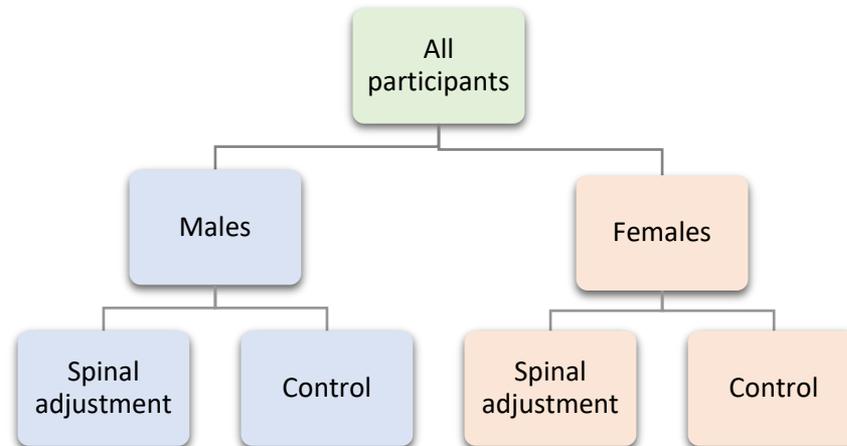
A Randomized Controlled Trial

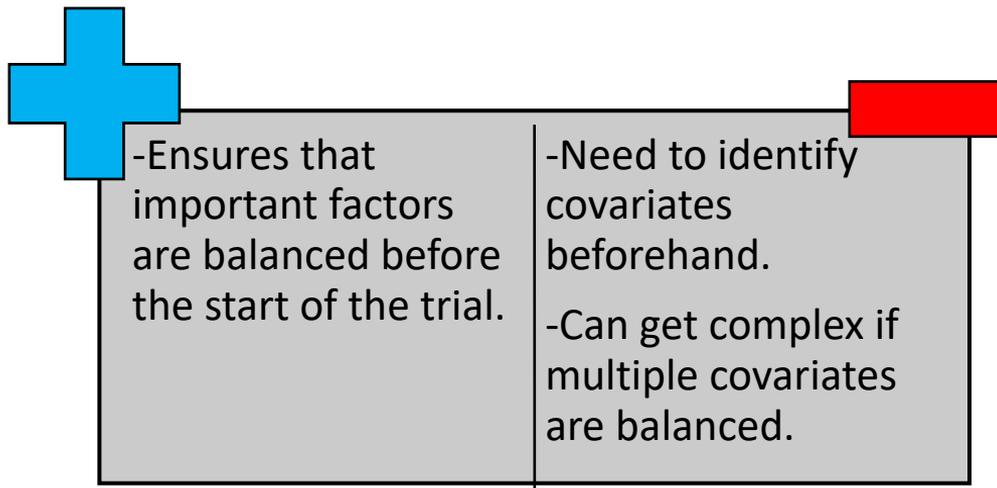
Bruce F. Walker, DC, MPH, DrPH,* Jeff J. Hebert, DC, PhD,† Norman J. Stomski, PhD,*
Barrett Losco, MChiropractic,* and Simon D. French, PhD†

A random number generator was used to create a permuted block randomization list with variable block sizes of 8 to 12. Allocation was concealed with group

Stratified Randomisation

- Participants are identified based on important covariates (gender, age) and then randomisation occurs within the strata.





Example:

Effectiveness of spinal manipulation and myofascial release compared with spinal manipulation alone on health-related outcomes in individuals with non-specific low back pain: randomized controlled trial

Taise Angeli Boff^{a, b}, Fernanda Pasinato^{b, c}, Ângela Jornada Ben^d, Judith E. Bosmans^d, Maurits van Tulder^{d, e}, Rodrigo Luiz Carregaro^{a, b, c, f, g, h}

Randomization was conducted using a random numbers table (Random Allocation Software version 2.0®). Randomization was stratified by gender (ratio of 4 men: 1 woman). Treatment allocation was concealed by using opaque and sealed envelopes,

Inactive Types of Controls

- Inactive control: no treatment-weakest form of control
 - Do little to account for non-specific effects of treatment or from unwanted effects of experiments in general.
 - Impossible to tease out whether any effect is due to intervention or due to non-specific effects such as attention, or placebo effect.
- Example of inactive control: waiting list control
 - Expecting to receive treatment in future may add bias.

2.3.2. *Passive head movement intervention*

The passive head movement intervention was carried out by the same chiropractor who had pre-checked the subjects for spinal dysfunction and who performed the spinal manipulations for the spinal manipulation experiment. The passive head movement intervention involved the subjects' head being passively laterally flexed, and slightly extended and rotated to a position that the chiropractor would normally manipulate that person's cervical spine, and then return the subjects head back to neutral position. This was repeated to both the left and the right. However, the experimenter was particularly careful not to put pressure on any individual cervical segment. Loading a joint, as is done prior to spinal manipulation, has been shown to alter paraspinal proprioceptive firing in anesthetized cats (Pickar and Wheeler, 2001), and was therefore carefully avoided by ending the movement prior to end-range-of-motion when passively moving the subjects' heads. No spinal manipulation was performed during any passive head movement experiment. The passive head movement experiment was not intended to act as a sham manipulation but to act as a physiological control for possible changes occurring due to the cutaneous, muscular or vestibular input that would occur with the type of passive head movement involved in preparing a subject/patient for a cervical manipulation.

Neurophysiological changes from setting up for an adjustment may impact the outcome?



Clinical Neurophysiology 118 (2007) 391–402



www.elsevier.com/locate/clinph

Cervical spine manipulation alters sensorimotor integration: A somatosensory evoked potential study

Heidi Haavik-Taylor *, Bernadette Murphy

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University of Auckland, Private Bag 92019, 261 Morrin Road, Glen Innes, Auckland, New Zealand*

Accepted 11 September 2006
Available online 29 November 2006

Article

The Effects of 4 Weeks of Chiropractic Spinal Adjustments on Motor Function in People with Stroke: A Randomized Controlled Trial

Kelly Holt ¹, Imran Khan Niazi ^{1,2,3,*}, Imran Amjad ^{1,4}, Nitika Kumari ^{1,2}, Usman Rashid ², Jens Duehr ¹, Muhammad Samran Navid ^{1,3}, Muhammad Shafique ⁴ and Heidi Haavik ¹

Psychological changes from interactions with the chiropractor may impact the outcome?

2.3.2. Sham Chiropractic Intervention

Blinding of participants in a trial involving a physical intervention is challenging due to the manual nature of the intervention [36,37]. One advantage of doing this study in Pakistan is that chiropractic is relatively unknown in the country [38]. In a recent survey of university students in Lahore, Pakistan, including pharmacy students, more than two-thirds of respondents were unaware that chiropractic care involved spinal manipulation and that it is used as a treatment for low back pain [38]. This lack of knowledge about chiropractic provides a unique opportunity to study its effects with the enhanced potential of successful participant blinding. In order to reduce the impact of contextual effects on study outcomes, the control group received a sham chiropractic intervention.

Participants in the sham + PT control group saw the same chiropractors, at the same frequency, as those in the experimental group. The chiropractor performed the same assessment for CSMC problems as the experimental group and chiropractic visits were of roughly the same duration as those in the experimental group. However, instead of applying manual or instrument-assisted thrusts to the spine, the chiropractor either positioned participants as if they were going to thrust on the spine, but did not provide a manual thrust, or they placed an adjusting instrument, set to the minimum setting, lateral to the spine or on the chiropractor's hand or arm and produced a clicking sound with the instrument. Communication between the chiropractor and participants was very limited in both groups due to language barriers, so translators were used to ask participants to move into the required positions for the control and experimental procedures. To test the effectiveness of participant blinding, following the 4-week intervention period, participants in both groups were asked to indicate, using a yes or no response, whether they thought they had received active chiropractic care.

Active Types of Controls

- Active types of control groups; provide some form of ‘control’ or ‘sham’ intervention.
 - Do provide some control against any inactive aspects of the treatment.
 - Can provide control against placebo effect.
- Sham interventions can be used as an ‘active’ control.
 - Will help address any effects from the placebo effect.
- Best current available treatment can be used as an active control.
 - Will contain broadly the same non-specific aspects as the novel treatment.

Other benefits of controls is that you can pick up on effects due to the data collection process itself!



SUBCLINICAL NECK PAIN AND THE EFFECTS OF CERVICAL MANIPULATION ON ELBOW JOINT POSITION SENSE

Heidi Haavik, PhD, BSc (Chiro),^a and Bernadette Murphy, PhD, DC^b

ABSTRACT

Objective: The objectives of this study were to investigate whether elbow joint position sense (JPS) accuracy differs between participants with a history of subclinical neck pain (SCNP) and those with no neck complaints and to determine whether adjusting dysfunctional cervical segments in the SCNP group improves their JPS accuracy.

Method: Twenty-five SCNP participants and 18 control participants took part in this pre-post experimental study. Elbow JPS was measured using an electrogoniometer (MLT5700, ADInstruments, New Zealand). Participants reproduced a previously presented angle of the elbow joint with their neck in 4 positions: neutral, flexion, rotation, and combined flexion/rotation. The experimental intervention was high-velocity, low-amplitude cervical adjustments, and the control intervention was a 5-minute rest period. Group JPS data were compared, and it was assessed pre and post interventions using 3 parameters: absolute, constant, and variable errors.

Results: At baseline, the control group was significantly better at reproducing the elbow target angle. The SCNP group's absolute error significantly improved after the cervical adjustments when the participants' heads were in the neutral and left-rotation positions. They displayed a significant overall decrease in variable error after the cervical adjustments. The control group participants' JPS accuracy was worse after the control intervention, with a significant overall effect in absolute and variable errors. No other significant effects were detected.

Conclusion: These results suggest that asymptomatic people with a history of SCNP have reduced elbow JPS accuracy compared to those with no history of any neck complaints. Furthermore, the results suggest that adjusting dysfunctional cervical segments in people with SCNP can improve their upper limb JPS accuracy. (*J Manipulative Physiol Ther* 2011;34:88-97)

Key Indexing Terms: *Proprioception; Upper Extremity; Manipulation, Spinal; Central Nervous System; Posture; Chiropractic*

Other benefits of controls is that you can pick up on effects due to the data collection process itself!

Exp Brain Res
DOI 10.1007/s00221-014-4193-5

RESEARCH ARTICLE

Changes in H-reflex and V-waves following spinal manipulation

Imran Khan Niazi · Kemal S. Türker · Stanley Flavel ·
Mat Kinget · Jens Duehr · Heidi Haavik

European Journal of Applied Physiology
<https://doi.org/10.1007/s00421-018-3799-x>

ORIGINAL ARTICLE

The effects of a single session of spinal manipulation on strength and cortical drive in athletes

Thomas Lykke Christiansen^{1,5} · Imran Khan Niazi^{2,6}  · Kelly Holt² · Rasmus Wiberg Nedergaard² · Jens Duehr² ·
Kathryn Allen² · Paul Marshall³ · Kemal S. Türker⁴ · Jan Hartvigsen^{1,5} · Heidi Haavik²

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SCIENTIFIC REPORTS

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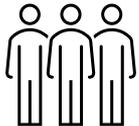
The effects of a single session of chiropractic care on strength, cortical drive, and spinal excitability in stroke patients

Kelly Holt², Imran Khan Niazi^{2,3,4}, Rasmus Wiberg Nedergaard¹, Jens Duehr², Imran Amjad⁴,
Muhammad Shafique⁴, Muhammad Nabeel Anwar⁴, Harrison Ndetan⁴, Kemal S. Türker⁷ &
Heidi Haavik¹

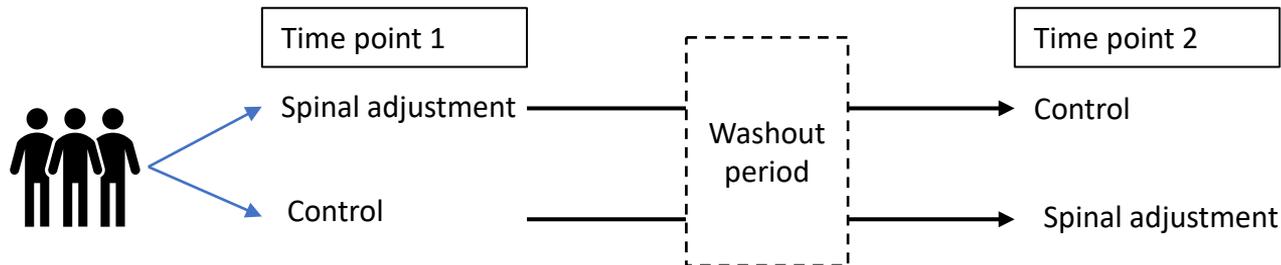


Types of RCT: Parallel or Crossover

- Parallel RCT: Each participant receives one treatment:



- Crossover RCT: Each participant receives both treatments:



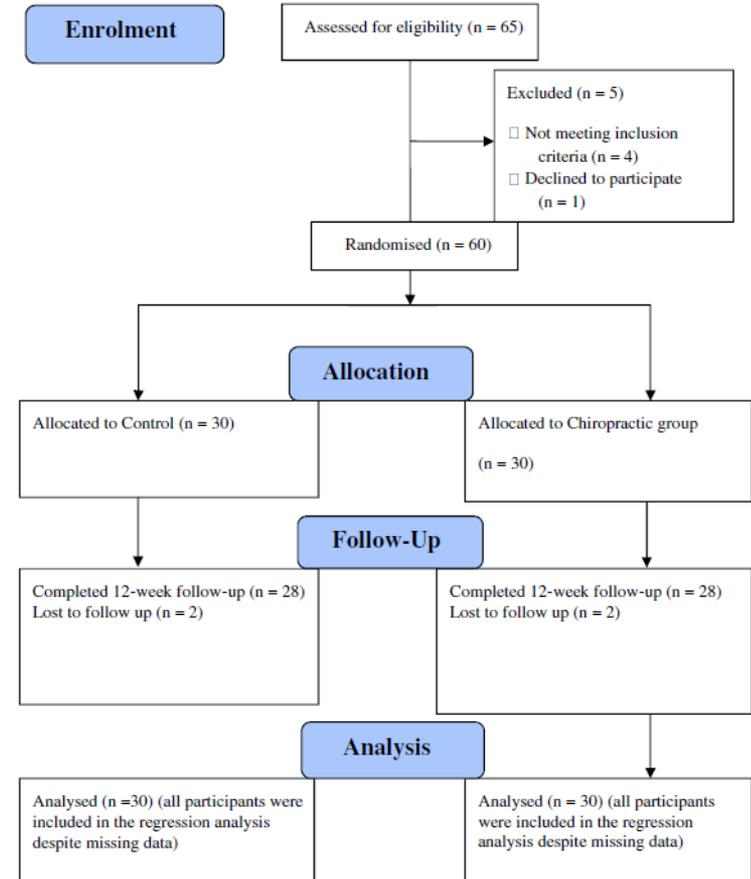
Randomized Controlled Trial > J Manipulative Physiol Ther. 2016 May;39(4):267-78.

doi: 10.1016/j.jmpt.2016.02.003. Epub 2016 Apr 2.

Effectiveness of Chiropractic Care to Improve Sensorimotor Function Associated With Falls Risk in Older People: A Randomized Controlled Trial

Kelly R Holt ¹, Heidi Haavik ², Arier Chi Lun Lee ³, Bernadette Murphy ⁴, C Raina Elley ⁵

Sixty community-dwelling adults older than 65 years were enrolled in the study. Participants were randomised to 12 weeks of chiropractic care (n=30) or a usual care “control”(n=30).



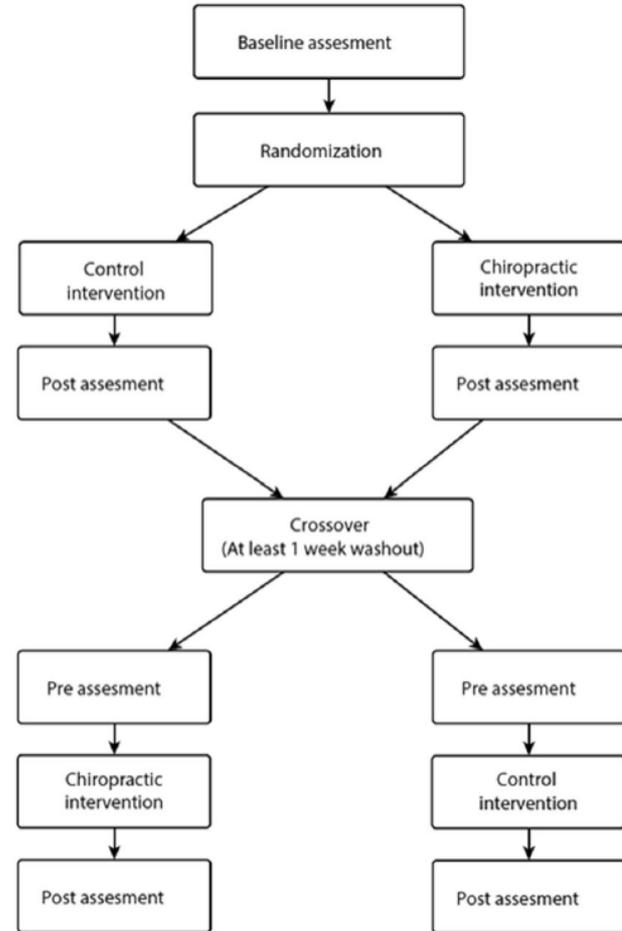
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The effects of a single session of chiropractic care on strength, cortical drive, and spinal excitability in stroke patients

Kelly Holt¹, Imran Khan Niazi^{1,2,3}, Rasmus Wiberg Nedergaard¹, Jens Duehr¹, Imran Amjad⁴, Muhammad Shafique⁴, Muhammad Nabeel Anwar⁵, Harrison Ndetan⁶, Kemal S. Turker⁷ & Heidi Haavik¹

Received: 6 September 2018
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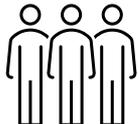
A baseline evaluation was then completed prior to group allocation. The appropriate intervention was then applied and immediately post the intervention the participant was reassessed using the same outcome measurement procedures. **The participants were then reassessed after a minimum seven-day washout period with the alternate intervention applied between pre/post assessments.**



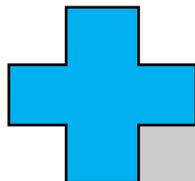
Benefits and Limitations of Parallel design



—————→ Spinal adjustment



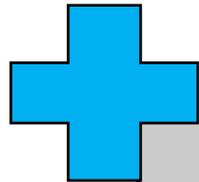
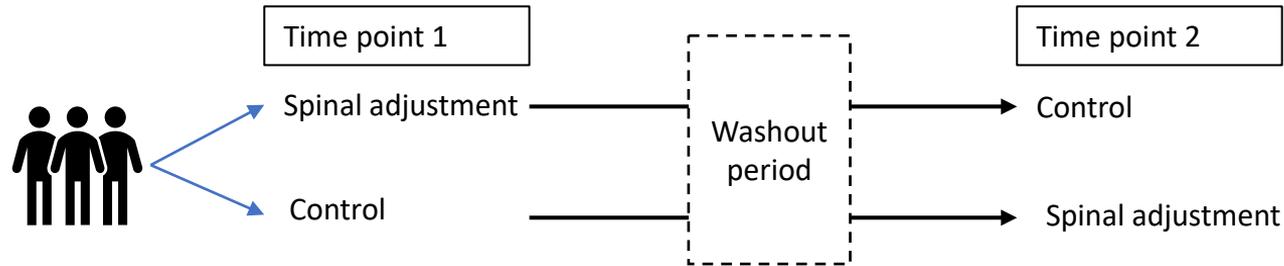
—————→ Control



- Ensures that both groups start at the same baseline.

- Can be influenced by effort if you suspect you are in control group.
- With two different groups there will be more variability so you will need larger sample sizes to find a real difference.

Benefits and Limitations of Cross-over Design



- Reduce variability between the groups as all the same people receive both interventions.
- Each person can basically act as their own control.
- Chiropractic care can have long lasting neurophysiological effects that outlasts the washout period, then they are fundamentally different when they enter the control intervention phase.

Jaw Strength Changes Lasted at Least One Week!

- Jaw clenching strength increased post-adjustment.
- This difference in strength was present one week after the single adjustment session
- Thus a one-week washout period in a cross-over design RCT measuring bite force would mean the participants would be fundamentally different when entering the control period depending on whether or not they had received an adjustment one week prior.
- Do adjustments also lead to other changes that last more than a week or two?



Article

Chiropractic Manipulation Increases Maximal Bite Force in Healthy Individuals

Heidi Haavik¹, Mustafa Görkem Özyurt², Imran Khan Niazi^{3,4,5}, Kelly Holt¹, Rasmus Wiberg Nedergaard^{1,6}, Gizem Yilmaz² and Kemal Sitki Türker^{2,*}

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⁶ Dr. Sid E. Williams Center for Chiropractic Research, Life University, Marietta, GA 30060, USA

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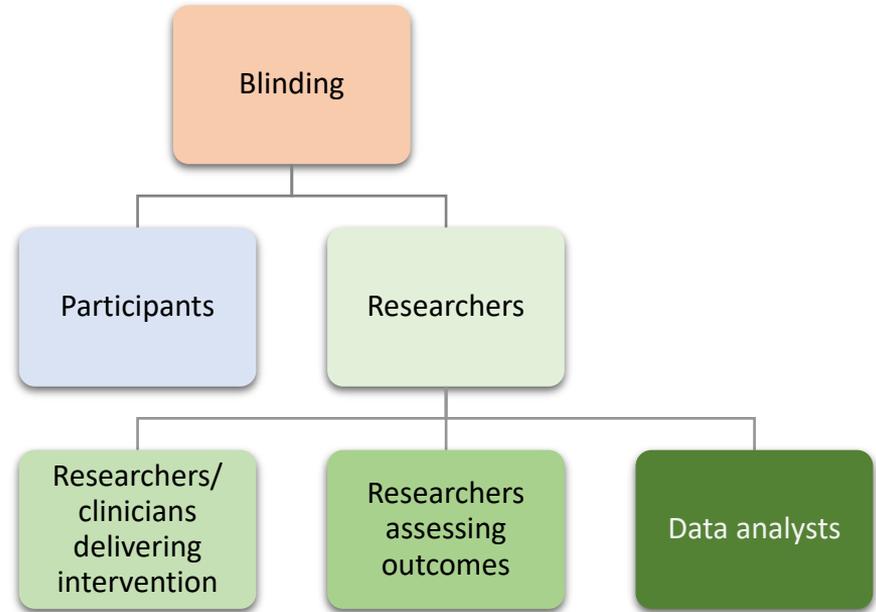
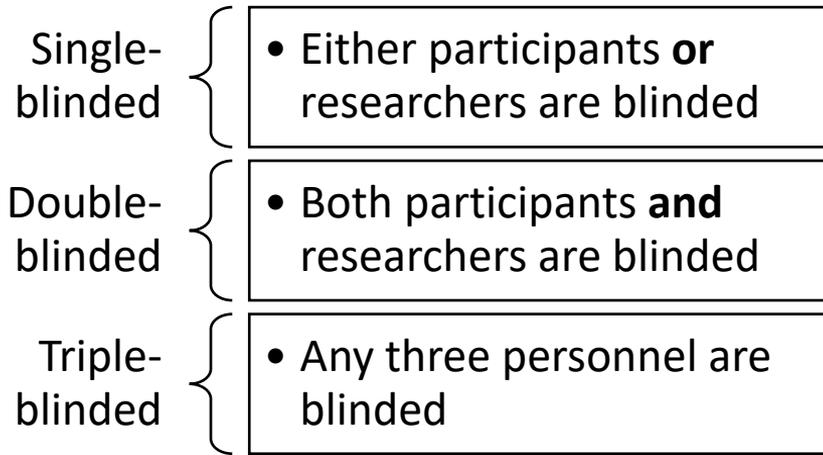
Abstract: Recent research has shown that chiropractic spinal manipulation can alter central sensorimotor integration and motor cortical drive to human voluntary muscles of the upper and lower limb. The aim of this paper was to explore whether spinal manipulation could also influence maximal bite force. Twenty-eight people were divided into two groups of 14, one that received chiropractic care and one that received sham chiropractic care. All subjects were naive to chiropractic. Maximum bite force was assessed pre- and post-intervention and at 1-week follow up. Bite force in the chiropractic group increased compared to the control group ($p = 0.02$) post-intervention and this between-group difference was also present at the 1-week follow-up ($p < 0.01$). Bite force in the chiropractic group increased significantly by 11.0% ($\pm 18.6\%$) post-intervention ($p = 0.04$) and remained increased by 13.0% ($\pm 12.9\%$, $p = 0.04$) at the 1 week follow up. Bite force did not change significantly in the control group immediately after the intervention ($-2.3 \pm 9.0\%$, $p = 0.20$), and decreased by 6.3% ($\pm 3.4\%$, $p = 0.01$) at the 1-week follow-up. These results indicate that chiropractic spinal manipulation can increase maximal bite force.

Do Not Reveal Group Allocation Until You Must!

- Concealment of group allocation:
 - A technique used to prevent selection bias by concealing the allocation sequence from those assigning participants to intervention groups, until the moment of assignment.
 - Prevents researchers from influencing which participants are assigned to a given intervention group.



Blinding of RCT's



Participant Blinding

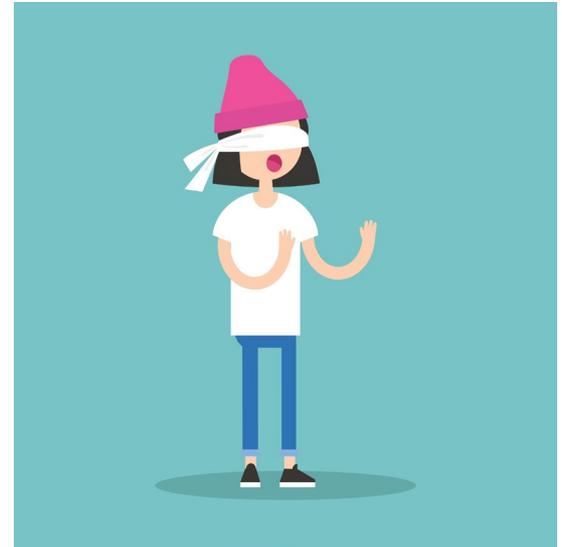
- What would happen if participants know what intervention they are getting?
 - The psychological impact of knowing what intervention group you are in can influence outcomes.

Placebo vs Nocebo



Researcher Blinding

- What would happen if researchers know what intervention participants are getting?
 - Intentionally or unintentionally bias the results:
 - Differentially encourage or discourage participants.
 - Transfer their inclination to participants.
 - Differentially withdraw participants.
 - Unintentionally inform the participants which group they are in.



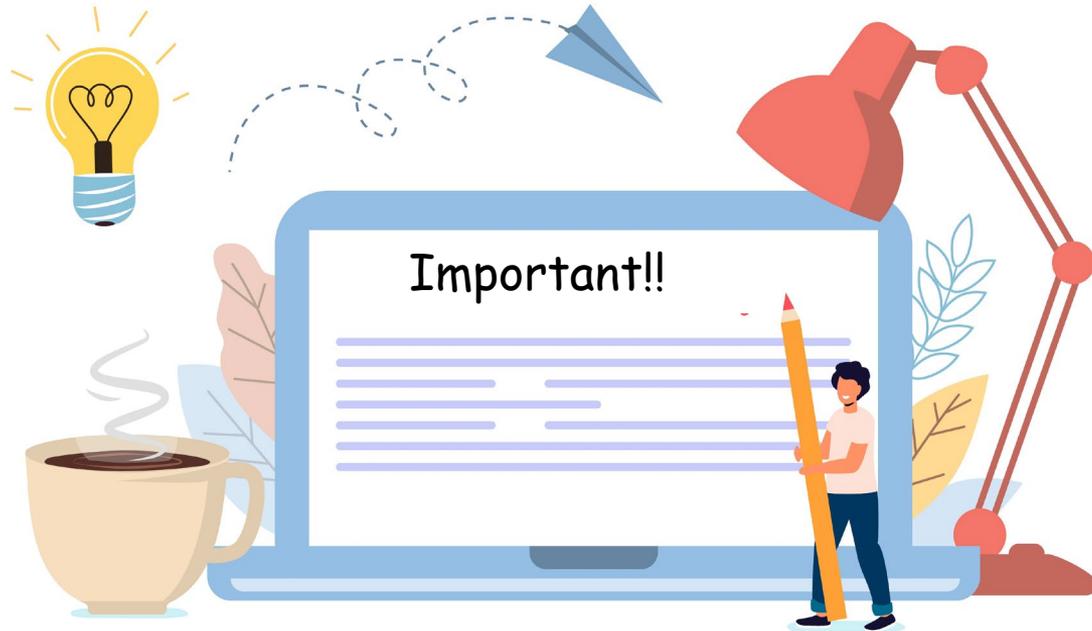


Other Important RCT Factors to Consider

- Multi-site vs single-site studies:
 - Multi-site Benefits: reach larger numbers faster.
 - Multi-site Benefits: can be more generalisable.

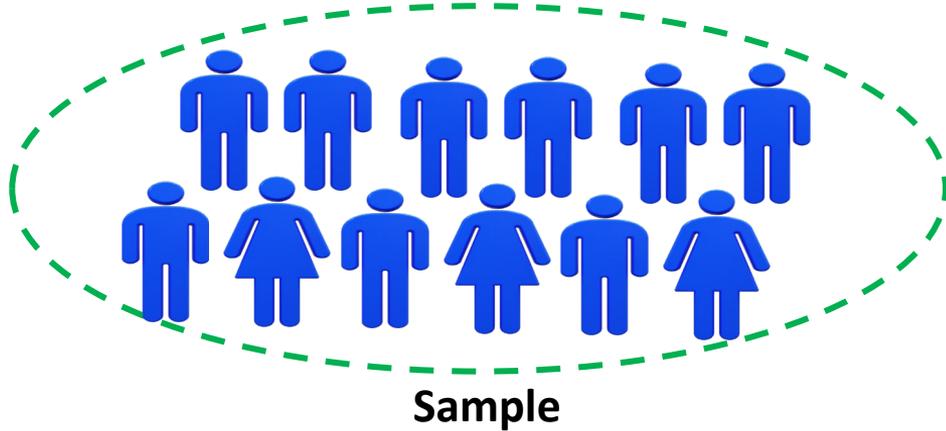
Other Important RCT Factors To Consider

Primary vs Secondary outcomes and Objective vs Subjective measures



Other Important RCT Factors To Consider

The appropriate sample size!



Summary and Take-home Messages

- There are many ways to randomise participants to ensure fair and equal distribution: simple, blocked or stratified randomization.
- Best current available treatment is the preferred control in an RCT.
- In parallel RCT, each participant receives only one treatment, while in a crossover RCT, each participant begins in one group and switches to another during the study.
- Blinding is used to reduce bias in experimental designs.
- Double blinded studies are the strongest design but are not always possible.
- It is vital that you get the appropriate sample size to ensure you find a real finding and do not waste resources.
- Primary outcomes are the measures that best answer the research question.
- Objective measures are not influenced by the participant's or researcher's beliefs or feelings.

Thank You



DR. HEIDI HAAVIK

ENLIGHTENING THE
WORLD ABOUT THE
SCIENCE OF CHIROPRACTIC



Introduction to Chiropractic Care

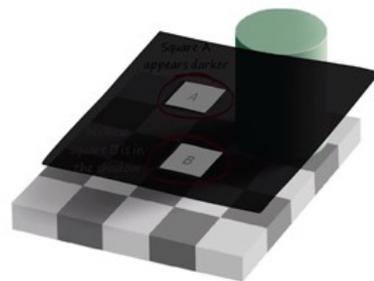
The introduction to chiropractic video series is the perfect way to gain an understanding of why chiropractic care may help you and your family.



The Beginners Guide to Chiropractic

In this first introductory video we explore what chiropractic is all about, and how it works, then we briefly explore the evidence informed effects of chiropractic care.

[View video >](#)



How the Brain Perceives the World

Did you know that your brain and central nervous system are constantly changing? It's quite amazing - from one day to the next your brain is not the same.

[View video >](#)

The Beginners Guide to Chiropractic

The Beginners Guide to Chiropractic

The word chiropractic derives from the Greek words "cheir", meaning hand, and "praktikos" meaning skilled in or concerned with. The origin of the word chiropractic can be traced back to [D.D. Palmer](#) who coined it in 1895 when he founded chiropractic.

Chiropractic care is really about total health and wellbeing

What does a Chiropractor do?

A chiropractor is a healthcare professional who specializes in the health and [function of the spine](#) and nervous system. Because of this focus on the spine, many people think chiropractors can only help with problems such as back pain, [neck pain](#) and [headaches](#). They can often help with these issues but there is much more to chiropractic than just pain.

This is the first video in our animated series "Introduction to Chiropractic". In this video, we outline what a chiropractor does, then we briefly explore the effects of care. It is a perfect one to watch for anyone that is curious about chiropractic care, and how it can help their family.

Video References

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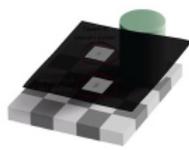




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How the Brain Perceives the World

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[View Video >](#)



Break the Pain Cycle

Did you know that pain is created in your brain to let you know that something is not ok within your body? Feeling pain is good because it is actually helpful and informative.

[View Video >](#)



Chiropractic Care and Migraines

Did you know that 1 in 6 people in the world experience migraines regularly? The World Health Organisation consider them to be the most debilitating of all neurological disorders.

[View Video >](#)



Chiropractic Affects your Brain

Your brain receives information about your body from the environment and your organs. Did you know that the muscles in your body are also sensory organs?

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What is that Pop?

If you have been adjusted before by a chiropractor you may have noticed a strange popping sound. Don't worry - it is just the formation of gas within a joint.

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Lower Back Pain

Scientists have worked out that at any one time, over 500,000,000 people around the world are suffering from low back pain and it is now the leading cause of disability worldwide.

[View Video >](#)



Growing Pains

We've all heard of growing pains right? But did you know that what we call growing pains aren't associated with growing? So they're not actually growing pains at all.

[View Video >](#)



Pain and the Immune System

Research studies have shown that the way you feel pain all depends on what's going on for you - and most importantly - what you think and feel about the situation.

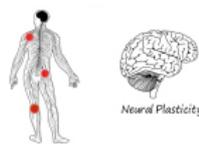
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Chiropractic and Headaches

Headaches are a sign that something is not right. Your brain will create for you the sensation of pain if it thinks there is something wrong or if there is a potential problem.

[View Video >](#)



Pain is Created in Your Brain

Did you know that the scientists now know that the feeling of pain is something your brain decides that you should experience - if it believes that there is a problem?

[View Video >](#)



Chronic Pain

Chronic pain is the second-most common reason people see a doctor and miss work. More than one-third of people with chronic pain become disabled by their pain to some degree.

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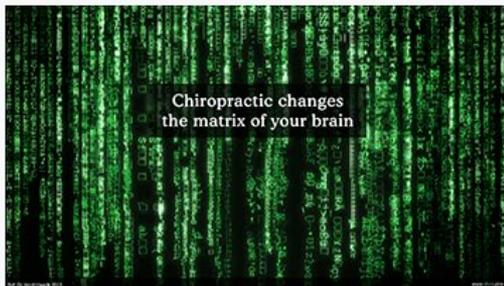
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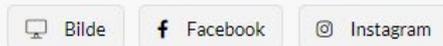


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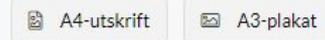
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Chiropractic Research

Research summary articles to read, download and print (members only) all backed by the latest scientific research studies.



Chronic Pain

Chronic pain that has persisted for more than 3 months is no longer protective, nor informative. So, what is chronic pain and what can you do about it?

[Read more »](#)



Pain is in the Brain

Sometimes pain persists long after tissue damage has actually healed. When pain persists for more than three months we call this chronic pain.

[Read more »](#)



Neck Pain

Up to half the world's population suffers from neck pain at some stage. For some, one big problem is that it just keeps coming back, or becomes chronic.

[Read more »](#)



UNDERSTANDING PAIN



Dr. Kelly Holt

BSc, BSc(Chiro), PGDipHSc, PhD

Dr. Heidi Haavik

BSc(Physiol), BSc(Chiro) PhD

Experiencing pain is normal. Everyone experiences pain now and then.¹ Pain is supposed to be protective to make you stop doing things that may be dangerous.² But chronic pain that has persisted for more than 3 months is no longer protective, nor is it helpful.³ So, what is chronic pain and how do we deal with it if you suffer from it?

PAIN IS CREATED IN THE BRAIN



Dr. Kelly Holt

BSc, BSc(Chiro), PGDipHSc, PhD

Dr. Heidi Haavik

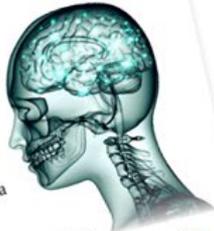
BSc(Physiol), BSc(Chiro) PhD

Did you know that scientists now know the feeling of pain is something your brain decides you should experience if it believes there is some tissue damage in your body? In fact, your brain can decide that you should feel pain even if it only thinks there is a potential threat of tissue damage!!!^{1,2,5}

It may seem strange, but it's totally up to your brain to decide whether you should feel pain or not. Your brain may decide you should experience pain even if you have no actual tissue damage yet,⁶ or your brain may not create the feeling of pain for you when tissue damage has actually occurred!^{7,8}

heals the problem.¹ This pain is helpful and informative.¹ If we listen to our body these pain experiences can be a good thing.

But for some people, pain can persist even after the initial injury that caused it has healed.^{9,11,12} And for some people, the pain in these areas that are not injured at all, become non-



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NECK PAIN AND FALLS RISK



Dr. Kelly Holt

BSc, BSc(Chiro), PGDipHSc, PhD

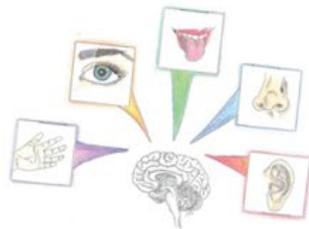
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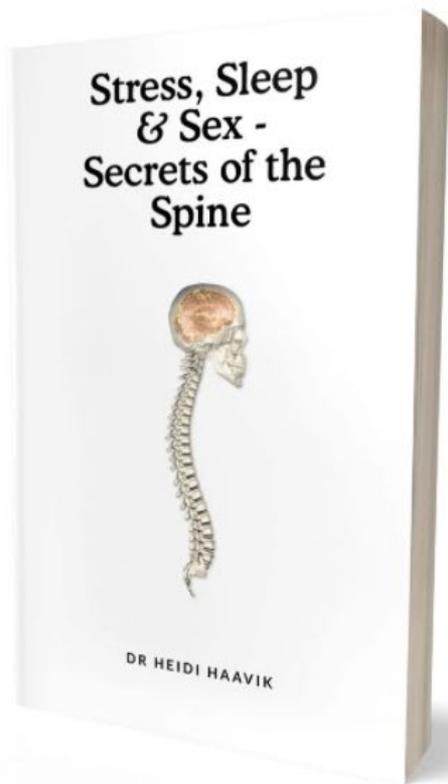
BSc(Physiol), BSc(Chiro) PhD



Neck pain is very common throughout the world.¹ Up to half of all people around the world suffer from neck pain at some stage each year.^{2,5} For some people, one big problem with neck pain is that it just keeps coming back, or becomes chronic, and may even increase their risk of suffering from a fall.^{2,4,6,7}

Scientists know that your brain uses sensory information from your muscles and joints around your spine to help control your balance and posture and to make sure you're moving properly.^{1,2} When your brain takes sensory information and uses it to help guide movements and control muscles we call this sensorimotor function.⁸ One particular study looked at whether neck pain has an impact on proper sensorimotor function in older people.⁷ In this study, the researchers ran a whole lot of tests of sensorimotor function, like how well the study participants controlled the movement of their eyes and how good their balance was, and they took into account their age and other conditions that they suffered from.





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