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## A. PEDro update (5 August 2019)

PEDro contains 44,309 records. In the 5 August 2019 update you will find:

- 34,619 reports of randomised controlled trials (33,782 of these trials have confirmed ratings of methodological quality using the PEDro scale)
- 9,004 reports of systematic reviews, and
- 686 reports of evidence-based clinical practice guidelines.

PEDro was updated on 5 August 2019. For latest guidelines, reviews and trials in physiotherapy visit [Evidence in your inbox](#).

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## B. PEDro indexes 44,000+ reports



# 44000+

trials, reviews, guidelines

[www.pedro.org.au](http://www.pedro.org.au)



We are pleased to announce that PEDro has just achieved a new milestone for the amount of evidence. There are now 44,000+ reports of trials, reviews and guidelines indexed on [PEDro](#).

## C. #MyPTArticleOfTheMonth – response to the campaign so far

Many physiotherapists have taken up the #MyPTArticleOfTheMonth challenge and have been sharing their reading with the global physiotherapy community. Most posts have been articles reporting the results of randomised controlled trials. There have also been posts about reviews, large cohort studies, and diagnostic studies. The importance of evaluating treatment fidelity and the reporting of 95% confidence intervals in trials.

Do you need some ideas for your monthly reading? Here's what others have been reading during the challenge:

### **Trials** (all score 8/10 on the PEDro scale)

- [Effectiveness of isolated hip exercise, knee exercise, or free physical activity for patellofemoral pain: a randomized controlled trial](#)
- [Is hip strengthening the best treatment option for females with patellofemoral pain? A randomized controlled trial of three different types of exercises](#)
- [Rehabilitation after immobilization for ankle fracture: the EXACT randomized clinical trial](#)
- [Education plus exercise versus corticosteroid injection use versus a wait and see approach on global outcome and pain from gluteal tendinopathy: prospective, single blinded, randomised clinical trial](#)
- [Effect of a four-week virtual reality-based training versus conventional therapy on upper limb motor function after stroke: a multicenter parallel group randomized trial](#)
- [Kinesio Taping does not provide additional benefits in patients with chronic low back pain who receive exercise and manual therapy: a randomized controlled trial](#)

### **Reviews**

- [The efficacy of lower extremity mirror therapy for improving balance, gait, and motor function poststroke: a systematic review and meta-analysis](#)
- [Assessment of outcomes of inpatient or clinic-based versus home-based rehabilitation after total knee arthroplasty: a systematic review and meta-analysis](#)
- [Effect of Pilates exercise for improving balance in older adults: a systematic review with meta-analysis](#)

## Large cohort study

- [Beneficial associations of low and large doses of leisure time physical activity with all-cause, cardiovascular disease and cancer mortality: a national cohort study of 88,140 US adults](#)

## Diagnostic study

- [Conundrum of mechanical knee symptoms: signifying feature of a meniscal tear?](#)

## Evaluating treatment fidelity

- [Using mixed methods to assess fidelity of delivery and its influencing factors in a complex self-management intervention for people with osteoarthritis and low back pain](#)

## Reporting 95% confidence interval

- [Showing confidence \(intervals\)](#)

Your ability to read scientific articles will improve with practice. Make the commitment to read at least one article per month and share your reading with the global physiotherapy community in #MyPTArticleOfTheMonth.

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## D. #MyPTArticleOfTheMonth – what is Lou James reading?



Lou James (MNZM) is a New Zealand physiotherapist with expertise in oncology. The number of people surviving or living longer after a cancer diagnosis is increasing and is projected to rise to 21.7 million by 2029. While cancer treatments are lengthening lives, they are also creating a whole host of new problems that can affect a person's ability to work, their

emotional and social well-being, and their long-term health. In response to this, Lou founded [PINC & STEEL International](#) in 2008 to develop a world-class program for cancer survivorship. In collaboration with international experts she has created the PINC & STEEL,

Next Steps and PaddleOn cancer rehabilitation programs plus the Cancer Rehabilitation Physiotherapy Education Program. The programs are now available in 12 counties and have supported thousands of people. In 2017 Lou was recognised for her pioneering work in this field, being appointed a Member of the New Zealand Order of Merit (MNZM) for services to people with cancer.

Lou's rehabilitation and education programs are based on the rapidly expanding body of high-quality clinical research evaluating the effects of exercise for people with cancer. Lou has recently read two articles on the topic.

[Cormie P, et al. The impact of exercise on cancer mortality, recurrence, and treatment-related adverse effects. \*Epidemiol Rev\* 2017;39:71-92](#)

This article reports the results of two systematic reviews. The first included 32 cohort studies and four randomised controlled trials that evaluated the impact of exercise on cancer mortality and recurrence. The second included 40 meta-analyses and 23 randomised controlled trials that assessed the impact of exercise on cancer treatment-related adverse effects. The cohort studies indicate a reduced risk of cancer mortality and recurrence in people who exercise more. This was not supported by the randomised controlled trials, but the trials were not designed or powered to evaluate mortality and recurrence. Some of the randomised controlled trials concluded that exercise participation reduced cancer treatment-related adverse effects (including bone health, cognitive health, bowel and bladder function, and hot flushes and anaemia). The included systematic reviews indicated that exercise reduces fatigue and psychosocial distress. Lou says: "This article supports the view that exercise is an important adjunct therapy in the management of cancer. This is significant for physiotherapists as many people affected by cancer are not meeting physical activity guidelines and this has implications for not only their quantity, but also their quality of life."

[Hilfiker R, Exercise and other non-pharmaceutical interventions for cancer-related fatigue in patients during or after cancer treatment: a systematic review incorporating an indirect-comparisons meta-analysis. \*Br J Sports Med\* 2018;52\(10\):651-8](#)

Cancer-related fatigue is a common problem (prevalence 25% to 99%) and can persist for years after completion of cancer treatment. This large (245 randomised controlled trials) network meta-analysis evaluated the impact of exercise and other non-pharmacological interventions on cancer-related fatigue during or after cancer treatment for any type of

cancer. The types of exercise evaluated included aerobic (34 trials), combined aerobic and resistance (23), yoga (10), resistance training (10), multimodal training (exercise and psychosocial combined; 6), and dance (2). All forms of exercise reduced fatigue compared to the control conditions. For example, aerobic exercise reduced fatigue compared to control by a standardised mean difference of 0.53 (95% confidence interval 0.26 to 0.80) during cancer treatment, and by 0.33 (0.16 to 0.51) after cancer treatment. Lou says: “This is important for physiotherapists as we have a significant role in addressing fatigue management for the individual’s impacted. We can have a really positive impact on the management of fatigue symptoms and improving functional status and quality of life for people diagnosed with curable or incurable cancer.”

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### E. Changes in the top 10 countries using PEDro over 10 years (2010-2019)



We have animated the [10 countries with the highest PEDro usage each year for the last 10 years](#). Data are from 2010 to 2019. This video is fascinating to watch. Keep your eye on “Brazil”!

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### F. Support for PEDro comes from the Cerebral Palsy Alliance and Hong Kong Physiotherapy Association

We thank Cerebral Palsy Alliance and Hong Kong Physiotherapy Association who have just renewed their partnership with PEDro for another year.

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### G. *Lancet* series on gender equality, norms and health

One of the United Nation's '[Sustainable Development Goals of 2030](#)' is gender equality. The focus is on equitable access to economic independence, technology, education, as well as general and reproductive healthcare for all.

The *Lancet* recently published a series of five papers on '[Gender Equality, Norms, and Health](#)'. The series provides in depth analysis about health inequalities related to gender, with

calls to action for governments and institutions, leaders in the health sector, researchers, and the community.

Gender inequity and restrictive gender norms (ie, the often unspoken rules that govern the attributes and behaviours that are valued and considered acceptable for men, women, and gender minorities) are determinants of health. However, the relationship between gender and health is complex because gender interacts with other social determinants (including race, class, age, and ability), and these interactions are commonly multiplicative rather than additive. The series illustrates several examples of this. Families living in poverty are less likely to seek treatment for daughters for communicable diseases, and adolescent women in developing countries are at particularly increased risk of maternal mortality due to inadequate access to healthcare.

Gender norms result in differential exposure to disease, disability, and injury. Men are more likely to experience work-related and road accidents, as well as traumatic injuries. They are more likely to experience substance abuse and develop lung cancer, due to a perceived sense of masculinity related to alcohol, smoking, and risk-taking behaviour. Health promotion activities aimed at dispelling these stereotypes are essential in reducing harm to the individual and burden on healthcare systems.

As physiotherapists, it is important to be aware of our own gender biases in how we interact with our patients, as well as the systemic gender bias in our healthcare systems. The series provides evidence that women around the world receive poorer pain management, are screened for disease less often, receive less aggressive treatment, and substandard follow-up. It is our role as physiotherapists to advocate for adequate assessment and treatment of women in pain, and promote appropriate screening for neglected conditions such as heart disease in women.

Research supports the notion that more equal and diverse societies result in better health outcomes and life expectancy for both men and women. This should inform the design and implementation of healthcare programs worldwide. Increasing equitable gender representation in positions of leadership and governance, as well as integrating modules of sex and gender-based medical concepts in medical and public health training would contribute to the United Nation's goal of gender equality.

Researchers also need to consider gender bias in health research at various stages.

Sampling, design and analysis of randomised controlled trials as well as population-based surveys needs to ensure equitable representation, unbiased framing of survey questions, and consideration of gender as a significant variable in health research.

A podcast of *Lancet* Executive Editor Jocalyn Clark talking with Gary Darmstadt (Stanford University, USA), the lead author of the *Lancet* series on gender and health, is available [here](#).

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## **H. Systematic review found that exercise may have similar effects to antihypertensive medications in reducing blood pressure**

This systematic review evaluated how different types and intensities of exercise compared against different classes and doses of antihypertensive medications in lowering systolic blood pressure levels. The review included randomised controlled trials that were conducted in adults with or without hypertension but no cardiovascular disease, cerebrovascular disease, diabetes or other chronic condition such as cancer. Any form of structured exercise and antihypertensive medication was considered to be included as the experimental intervention. Interventions were compared against usual practice (no exercise), other exercise regimens, or medications. Risk of bias was evaluated with the Cochrane risk of bias tool. A network meta-analysis was performed to compare the multiple interventions simultaneously.

The review included 197 trials of exercise (n = 10,461 participants) and 194 trials testing antihypertensive drugs (n = 29,281), totalling 391 trials included in the analysis (n = 39,742). No trials directly compared exercise and antihypertensive drugs. The average systolic blood pressure at baseline was 132 mmHg for participants in trials of exercise interventions, whereas in trials of antihypertensive medications it was consistently over 150 mmHg. The majority of trials tested endurance interventions (n = 135), such as walking, running, cycling or aquatic exercise.

Across all populations, both exercise interventions (mean difference -5 mmHg, 95% confidence interval -6 to -4) and antihypertensive medications (-9 mmHg, -10 to -8) were effective in lowering systolic blood pressure compared with control. Populations receiving medications achieved greater reductions in systolic blood pressure compared with those participating in exercise interventions (-4 mmHg, -5 to -3). All types of exercise lowered blood pressure in a similar fashion, with exception of the combination of endurance and resistance training which was more effective than dynamic resistance exercise alone (-3 mmHg, -5 to -1). A dose-response effect was observed for medications, but there was substantial

uncertainty for effects of different intensities of exercise.

This review showed that the effect of exercise on lowering systolic blood pressure appears to be similar to that of commonly used antihypertensive medications across diverse populations and settings. The possibility of confounding due by the observed differences in trial populations and characteristics cannot be ruled out.

Network meta-analysis is explained in a [PEDro blog](#) from 2018.

Naci H, et al. How does exercise treatment compare with antihypertensive medications? A network meta-analysis of 391 randomised controlled trials assessing exercise and medication effects on systolic blood pressure. Br J Sports Med 2019;53(14):859-69

Read more on [PEDro](#).

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## **I. Time to move from significance testing to estimation**

A Research Note published in the latest issue of the Journal of Physiotherapy argues the case for moving away from significance tests and hypothesis tests in health research. The central reason is that p-values and claims of statistical significance (that is, the products of null hypothesis statistical tests), have some inherent flaws and are often misused and misinterpreted. The problems are difficult to describe succinctly. The Research Note addresses each of them under the headings: p-values do not indicate the probability that a hypothesis is true (or not), p-values are not evidence, significance findings are not replicable, and the null hypothesis is false in most clinical research.

For a long time, leading statisticians have argued that the concept of statistical significance should be abandoned. However, researchers in laboratory and clinical settings have continued to use null hypothesis statistical tests – presumably because it was what they are taught, it is what many journals expect, and because they were unaware of the benefits of alternative approaches to analysis. This year, however, articles in The American Statistician and Nature have strongly recommended that it is time to stop using ‘statistically significant’ and related terms.

One widely recommended alternative to significance tests and hypothesis tests in randomised controlled trials is to report the size of the effect (or point estimate) and the



precision of the effect (or confidence interval). Trialists could then interpret the size of the point estimate, that is, is the point estimate large enough to be clinically worthwhile. The lower and upper values for the confidence interval can then be considered in the same way. For example, if both the lower and upper values for the confidence interval are large enough to be clinically important, the trial provides a clear answer.

The migration to confidence intervals has already begun in many journals. [The proportion of physiotherapy trials that are using confidence intervals instead of \(or as well as\) reporting statistical significance and p-values has been increasing steadily over the past few decades](#). The migration from p-values to confidence intervals is more common among higher quality trials. This increases the need for physiotherapists to understand confidence intervals if they are to keep abreast of the available evidence.

Stopping using 'statistically significant' and related terms has implications for many groups. These include journal editors and editorial policies, reporting checklists (eg, CONSORT Checklist), and critical appraisal tools that include a reporting component (eg, PEDro scale). A group of member journals of [The International Society of Physiotherapy Journal Editors](#) will soon be releasing their new policy on this issue. We will keep PEDro users informed of developments in this area.

Please consider reading the Research Note, which is freely available in full text via the link below, to ensure you understand the reasons for this shift in the approach to statistical analysis.

[Herbert R. Research note: significance testing and hypothesis testing: meaningless, misleading and mostly unnecessary. \*J Physiother\* 2019;65\(3\):178-81](#)

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## **J. Next PEDro update (September 2019)**

The next PEDro update is on Monday 2 September 2019.

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