



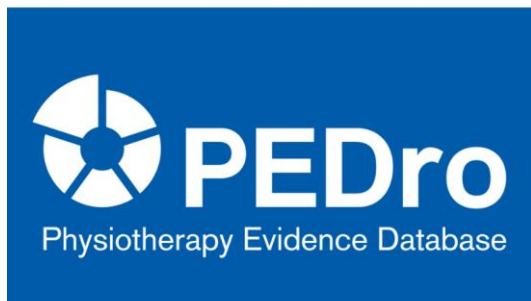
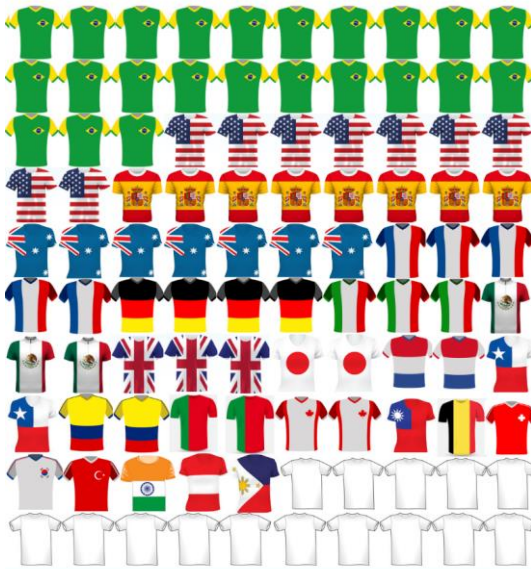
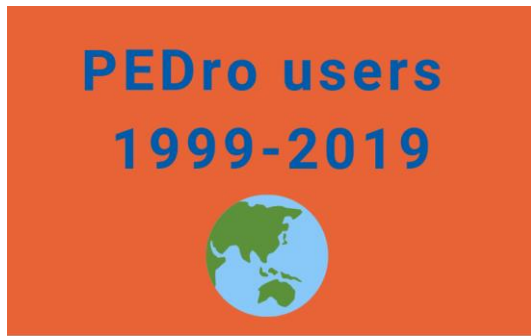
A. PEDro update (2 September 2019)

PEDro contains 44,597 records. In the 2 September 2019 update you will find:

- 34,835 reports of randomised controlled trials (34,015 of these trials have confirmed ratings of methodological quality using the PEDro scale)
- 9,089 reports of systematic reviews, and
- 673 reports of evidence-based clinical practice guidelines.

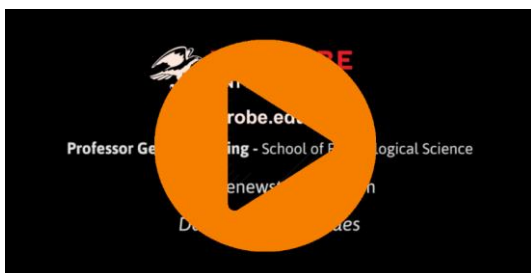
PEDro was updated on 2 September 2019. For latest guidelines, reviews and trials in physiotherapy visit [Evidence in your inbox](#).

B. PEDro celebrates World Physical Therapy Day



World Physical Therapy Day is on 8 September, the theme for 2019 is chronic pain. Chronic pain is a significant global health burden. It is estimated that 1.5 billion people, around 20% of the world's population, experience a chronic pain condition. Physiotherapists play a key role in the prevention and management of chronic pain. There are 4,600+ articles reporting the results of clinical practice guidelines, systematic reviews and randomised controlled trials evaluating the effects of physiotherapy interventions for chronic pain. To stay up to date with the latest research, physiotherapists can subscribe to [PEDro's Evidence In Your Inbox feed](#) for 'chronic pain'.

C. #MyPTArticleOfTheMonth resource – the dance of the p-values



One of issues that has prompted statisticians and journals to call for the use of significance testing and hypothesis testing to be discontinued is that p-values are not replicable. That is, if you repeat an experiment (each time randomly drawing

a new sample from the population) you are likely to get a very different p-value. Emeritus Professor Geoff Cumming from La Trobe University (in Melbourne, Australia) has illustrated this nicely in a video titled "[dance of the p-values](#)". Viewed nearly 50,000 times, this video illustrates just how unpredictable p-values are.

Many people think about p-values as being a measure of how strong the evidence is in a study. For example, very small p-values like $p < 0.01$ have been called 'highly significant', 0.01-0.05 'significant', 0.05-0.10 'approaching significance', and > 0.10 'non-significant'. The problem is that p-values tell us almost nothing about what will happen if an experiment is replicated. When computer simulation is used to replicate an experiment, the p-value varies widely.

Professor Cumming, like many other statisticians, recommends that p-values no longer be at the centre of our thinking about drawing conclusions from research because no single p-value can be trusted. A much better alternative is using confidence intervals. Estimation using confidence intervals is much more informative because confidence intervals tell us what is likely to happen if we repeat the experiment. For example, 95% confidence intervals from a sample tell us that if we repeat the experiment 100 times, in about 95 of the 100 repeats the confidence interval will include the mean difference for the population.

You may also be interested in viewing two more recent videos on this topic from Professor Cumming: "[Significance Roulette 1](#)" and "[Significance Roulette 2](#)".

If you are interested in perusing the numbers and formulas on which the "dance of the p-values" is based, we recommend you read the following article:

[Cumming G. Replication and p intervals: p values predict the future only vaguely, but confidence intervals do much better. *Perspect Psychol Sci* 2008;3\(4\):286-300.](#)

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.

D. #MyPTArticleOfTheMonth – what is Cornelia Barth reading?



Cornelia A Barth is a physiotherapist with Master of Science qualifications from University College London. She spent the last decade in humanitarian missions in countries in Africa and the Middle East. Cornelia is currently the Physiotherapy

Advisor for the International Committee of the Red Cross in Geneva. This position involves supervising physiotherapists in about 150 rehabilitation projects world-wide. These projects are being conducted in the most challenging contexts of low resources and protracted crisis. Cornelia has recently done some reading to inform her work in the prevention of diabetes and cardiovascular disease.

[Shirinzadeh M, et al. The effect of community-based programs on diabetes prevention in low- and middle-income countries: a systematic review and meta-analysis. *Global Health* 2019;15\(10\):Epub](#)

The prevalence of type 2 diabetes mellitus is increasing in low-income and middle-income countries. While community-based programs that address diet, physical activity and health behaviour have been shown to prevent or manage diabetes in high-income countries, effectiveness in lower income countries has not been systematically evaluated. The aim of this systematic review and meta-analysis was to determine if community-based programs can reduce the risk of developing diabetes in at-risk populations in low- and middle-income countries. Six trials published in 2008-2018 were included in the analysis. There was moderate quality evidence that community-based interventions reduced body weight, fasting blood glucose and HbA1C compared to control interventions. The effects on the incidence of diabetes were less clear because the 95% confidence interval for the risk ratio included a harmful effect (1.06) and a very large beneficial effect (0.03). More well-designed and long-term trials are required to improve the precision of this estimate. Cornelia says: “it is encouraging to read that the same simple and low-cost interventions that are effective in high-income countries were also effective in low- and middle-income countries. This is important because medication and patient education interventions are scarce and the prevalence of diabetes is increasing at an alarming rate in low- and middle-income countries. We should promote these evidence-based interventions among the global physiotherapy community as well as at the primary health care level world-wide.”

[van de Vijver S, et al. Review of community-based interventions for prevention of cardiovascular diseases in low- and middle-income countries. *Ethn Health* 2012;17\(6\):651-76](#)

Cardiovascular disease is also on the rise in low- and middle-income countries. This review aimed

to identify the kinds of interventions used to prevent cardiovascular disease in low- and middle-income countries. The second aim was to evaluate the effectiveness of these interventions, but meta-analysis was not performed. The interventions used included education, health promotion, training of health care staff, and implementation of treatment guidelines. Many of the studies reported improvements in weight, physical activity, diet or smoking, but the lack of control groups and the diversity of the settings make generalisation of results difficult. Cornelia says: “this review indicates that a variety of health professionals need to work hand in hand to prevent cardiovascular disease in low- and middle-income countries. But we need better research so that we can design and implement evidence-based programs.”

E. TRANSFORM2019 Physiotherapy Conference

The Australian Physiotherapy Association’s [TRANSFORM2019 Physiotherapy Conference](#) will be held in Adelaide, Australia on 17-19 October 2019. PEDro will be participating in the Conference scientific program and exhibition.

At 13:15-13:30 on Thursday 17 October 2019 a paper entitled “PEDro searching to answer questions about the effects of neurological physiotherapy could be improved” will be presented by Anne Moseley in the Neurology 3B session in Hall E1.

At 11:55-12:10 on Friday 18 October 2019 a paper entitled “Evidence-based practice among physiotherapists: knowledge, skills and barriers” will be presented by Leora Harrison in the Educators 6 session in the Riverbank 5 room.

At 11:05-11:35 on Saturday 19 October 2019 a “How to” session entitled “How to search PEDro to answer clinical questions” will be presented by Anne Moseley and Joshua Zadro in the Musculoskeletal 9A session in room Hall A. This session aims to enhance knowledge and skills in asking clinical questions and acquiring evidence using PEDro.

Please come and visit PEDro at Booth 121 in Exhibition Hall J. The PEDro team will be available during the Welcome Reception plus the morning tea, lunch and afternoon tea breaks to give guided tours of PEDro and answer any questions you may have.

F. Support for PEDro comes from the Singapore Physiotherapy Association

We thank [Singapore Physiotherapy Association](#), who have just renewed their partnership with PEDro for another year.

G. Systematic review found that neuromuscular training reduces anterior cruciate ligament injury in female athletes

This systematic review compared neuromuscular training to any other intervention for preventing anterior cruciate injury in female athletes. Women were the focus of this evaluation because they are about three times more likely than men to injure their anterior cruciate ligament. The primary outcome was the number of anterior cruciate ligament injuries, but a precise definition of what was considered an anterior cruciate ligament injury was not provided. Meta-analysis was used to compare neuromuscular training to control conditions. In addition to determining the effectiveness of neuromuscular training, this review aimed to identify the common and effective components of anterior cruciate ligament neuromuscular training programs using meta-regression.

Prospective controlled trials were identified using sensitive searches in two databases (PubMed/Medline and CINAHL Plus). The PEDro scale was used to evaluate the risk of bias of the included trials. The review included 18 articles reporting the results for 20 trials (26,925 participants), 11 randomised controlled trials and nine non-randomised controlled trials. The mean PEDro score was 5.5 out of 10 (standard deviation 2.3). The average training dose was 57 sessions over 18.2 hours (or 24 minutes/session for 2.5 sessions/week). All neuromuscular training programs included instruction on proper program implementation for those carrying out the training. The included trials were conducted in soccer (n=7), handball (n=5), basketball (n=3), floorball (n=1) and mixed (n=4) sports in school (n=10), professional (5 trials), university (3 trials) and mixed-level (2 trials) athletes.

Compared to control interventions, neuromuscular training reduced the risk of anterior cruciate ligament injury from 1 in 54 to 1 in 111 (odds ratio 0.51; 95% confidence interval (CI) 0.37 to 0.69). Unfortunately the outcomes were not reported relative to exposure. Meta-regression indicated that the dose of neuromuscular training did not impact on injury risk, but the timing of training may be important. Neuromuscular training conducted only in the pre-season did not reduce the risk of anterior cruciate ligament injury (OR 0.59, 95% CI 0.16 to 2.15), while in-season only or combined pre-season and in-season training did reduce the risk of injury (OR 0.50, 95% CI 0.36 to 0.70). Programs targeting school-aged athletes had a larger effect (OR 0.38, 95% CI 0.24 to 0.60) than in older athletes (OR 0.65, 95% CI 0.48 to 0.89). Programs that contained knee stabilisation during landing and lower limb strengthening exercises were more effective than programs that did not contain these exercises. Programs that included balance, core-strengthening, stretching, or agility

exercises were no more effective than programs that did not incorporate these components.

The review concluded that neuromuscular training reduces anterior cruciate ligament injury in female athletes. Data from the meta-regression were used to produce a best-practice checklist that can be used to evaluate neuromuscular training programs.

Petushek EJ, et al. Evidence-based best-practice guidelines for preventing anterior cruciate ligament injuries in young female athletes: a systematic review and meta-analysis. *Am J Sports Med* 2019;47(7):1744-53

Read more on [PEDro](#).

H. A reminder to guide practice using information from the full-text (not abstract) of research articles

Earlier this year [a study](#) assessed the accuracy of abstracts of articles reporting the results of randomised controlled trials evaluating physiotherapy interventions for low back pain. The main findings were that abstracts were often incomplete, contained spin, and were inconsistent with the full-text of the article. The authors concluded that physiotherapists should not rely on abstracts when using trials to guide practice and that journals could improve the accuracy of abstracts by increasing the word count and providing education. In response to these data, the [Archives of Physical Medicine and Rehabilitation journal](#) has revised some of its editorial policies. The changes include increasing the word limit of abstracts to 300 words for original research and systematic review articles and enhancing education efforts for authors, reviewers and editors in order to minimise spin and assure that abstracts fully reflect the findings – and limitations – reported in the manuscripts.

A recent study has extended this evaluation of abstracts to articles reporting the results of systematic reviews. The aim of this study was to determine if abstracts of articles reporting the results of systematic reviews evaluating physiotherapy interventions for low back pain contain spin and if abstracts consistently represent the full-text of the article. Spin was defined as an “overstated interpretation of study results.”

Systematic reviews indexed in PEDro in January 2018 were included in the analysis if they: (a) evaluated a physiotherapy intervention for the treatment of low back pain; (b) were published in 2015-2017; and, (c) were written in English, Spanish, or Portuguese. Spin was assessed using a 7-item checklist. Consistency between the abstract and full-text was determined by completing the spin checklist separately for the abstract and the full-text then calculating agreement between the two sections using Kappa coefficients. The methodological quality of the included reviews was measured using the AMSTAR-2 (A MeaSurement Tool to Assess systematic Reviews).

Sixty-six systematic reviews were included in the analyses. The methodological quality of the included reviews ranged from 'critically low' to 'high.' There was some form of spin in 80% of abstracts. Selective reporting of harm outcomes for the experimental intervention was the most common type of spin (73% of abstracts), and the title claiming a beneficial effect that was not supported by the findings was the least common (0% of abstracts). One item of the 7-item checklist (safety based on non-statistically significant results) had 'substantial' agreement between the abstract and full-text (Kappa = 0.62). All other items had 'fair' to 'moderate' agreement (Kappa = 0.27-0.55).

Interestingly, there were stark differences in quality, spin and agreement between the abstract and full-text when Cochrane reviews were compared to non-Cochrane reviews. The quality of Cochrane reviews ranged from 'moderate' to 'high,' while the quality of non-Cochrane reviews ranged from 'critically low' to 'low.' Compared to non-Cochrane reviews, the abstracts of Cochrane reviews contained less spin (6/57 non-Cochrane reviews and 7/9 Cochrane reviews were free from spin) and had higher consistency (Kappa = 0.27-0.60 for non-Cochrane reviews, 0.78-1.00 for Cochrane reviews). An incidental finding was that four of the nine Cochrane reviews had also been republished in other journals. Compared to the original Cochrane versions of the reviews, the republications had lower AMSTAR-2 ratings and contained more spin in the abstract.

These results have implications for journals publishing the results of physiotherapy research, authors seeking to get their research published, and physiotherapists using research articles to guide practice. Editorial processes and peer review could be enhanced to ensure that abstracts do not contain spin. One simple strategy could be for journals mandate the use of reporting checklists like the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for abstracts checklist. Authors should write the abstract only when the manuscript is completed, paying due attention to consistency and the omission of spin. Physiotherapists need to read beyond the abstract when using systematic reviews to guide practice and seek out Cochrane reviews, when available, to answer their clinical questions.

[Nascimento DP, et al. The abstracts of systematic reviews evaluating physiotherapy interventions for low back pain need improvement. *J Orthop Sports Phys Ther* 2019 Aug 23: Epub ahead of print](#)

I. Next PEDro update (October 2019)

The next PEDro update is on Tuesday 8 October 2019.

Proudly supported by



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