Can Systematic Review Findings on Treatment Effectiveness Be Trusted? The Case of Pilates Exercise and Chronic Low Back Pain

Cherie Wells^{1*}, Gregory S Kolt¹, Paul Marshall¹, Bridget Hill² and Andrea Bialocerkowski²

¹School of Science and Health, University of Western Sydney, Locked Bag 1797, Penrith, NSW, Australia

²Griffith Health Institute, Griffith University, Gold Coast, Qld, Australia

Evidence based practice (EBP) is the integration of the best available research evidence, expert clinical reasoning and client values in treatment-decision making [1]. While most clinical practitioners will aim to practice from a context of a strong evidence base, it is a challenge to keep up-to-date and informed regarding the evidence-base underlying different interventions [2,3]. It takes considerable time, effort and skill to search for, and critically review the available research evidence. Moreover, clinicians must reflect on the relevance of the research evidence to individual client presentations and preferences [2,4].

Systematic reviews provide an efficient method for clinicians to ascertain the evidence-base for various treatments [5]. In a systematic review, a comprehensive search of the literature is undertaken to answer a focused research question. Specifically, the search strategy, criteria for selection and critical appraisal of evidence are defined, quantitative rather than qualitative results are reported and evidence-based inferences are made [6,7]. Systematic reviews are often considered to represent the highest level of evidence on hierarchies of evidence [6,7]. Their methodological quality, however, can vary, and as such, affect the credibility of results [8,9]. Clinicians should, therefore, critically appraise the methodological quality of a systematic review before accepting the conclusions [4,9].

An obvious indication for clinicians to appraise the methodological quality of systematic reviews is when the results of systematic reviews on the same topic are different. An example of conflicting systematic review findings is found when examining the evidence underpinning the use of Pilates exercise to treat people with chronic low back pain (CLBP). Over the last six years, five systematic reviews have been published on the efficacy of this approach [10-14]. All of these systematic reviews report variable findings of effectiveness of Pilates exercise in people with CLBP, despite having similar research questions, and including, in many cases, the same primary studies [8].

To gain an understanding of how interpretation of the same evidence can produce different conclusions, it can be helpful to appraise the level of evidence and methodological quality of systematic reviews [8]. According to the National Health and Medical Research Council of Australia's hierarchy of evidence, systematic reviews that include only randomised controlled trials represent higher levels of evidence than systematic reviews that include non-randomised controlled trials [15]. When examining systematic reviews of Pilates exercise in people with CLBP, all five reviews included non-randomised controlled trials [8]. This means that the overall level of evidence represented by these reviews is lower than expected, and findings may provide information regarding trends of effectiveness, rather than definite measures of effectiveness [8,15]. Another example where a systematic review is unable to provide definitive findings on effectiveness due to the inclusion of non-randomised controlled trials is in relation to the chiropractic treatment of pregnancy-related low back pain [16].

To appraise the methodological quality of the Pilates systematic reviews, we used the Revised Assessment of Multiple Systematic

Reviews (R-AMSTAR) critical appraisal tool [8,17]. Four of the five systematic reviews on Pilates exercise in people with CLBP received high scores for methodological quality [10,12-14]. The methodological quality of several included primary studies, however, was poor [8]. The risk of bias in systematic review findings was, therefore, increased due to the inconsistency in methodological quality of primary studies [8,15,17,18]. A similar situation is observed when appraising evidence underlying massage for low back pain, where systematic review findings are compromised by poor quality primary studies [19].

Another factor that challenged the validity of three of the five Pilates systematic review findings was the inappropriate use of meta-analyses [10,12,13]. Meta-analyses provide an estimate of the effect size of an intervention by pooling together findings from multiple primary studies [5]. If primary studies are clinically and/or statistically heterogeneous meta-analyses may provide misleading results [20,21]. In the case of Pilates exercise in people with CLBP, primary studies varied in their application of Pilates exercise and comparison treatments [8]. This meant that the pooling of results in meta-analyses could not provide a realistic estimate of treatment effect for Pilates exercise, even when a random effects model was used to account for the statistical heterogeneity [8]. When examining research evidence for acupuncture in people with chronic low back pain, the clinical heterogeneity of primary studies also decreases the validity of meta-analysis findings regarding efficacy [22].

In our systematic review of systematic reviews, we concluded that the effectiveness of Pilates exercise in people with CLBP cannot be supported by current research evidence [8]. This is due to the small number, variable methodological quality and heterogeneity of primary studies [8]. We, therefore, recommend that clinicians carefully consider the potential for bias in all research studies, including systematic reviews, before using findings to direct clinical practice. Systematic reviews traditionally may represent the highest level of evidence, but their ability to provide credible results can, in some circumstances, be compromised by the inclusion of non-randomised controlled trials, primary studies of poor methodological quality and the inappropriate use of meta-analyses.

***Corresponding author:** Cherie Wells, School of Science and Health, University of Western Sydney, Locked Bag 1797, Penrith, NSW, Australia, Tel: +612 4620 3835; Fax: + 612 4620 3792; E-mail: c.wells@uws.edu.au

Received July 26, 2013; **Accepted** August 30, 2013; **Published** September 02, 2013

Citation: Wells C, Kolt GS, Marshall P, Hill B, Bialocerkowski A (2013) Can Systematic Review Findings on Treatment Effectiveness Be Trusted? The Case of Pilates Exercise and Chronic Low Back Pain. J Yoga Phys Ther 3: 142. doi:[10.4172/2157-7595.1000142](https://doi.org/10.4172/2157-7595.1000142)

Copyright: © 2013 Wells C, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

References

1. Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS (1996) Evidence based medicine: What it is and what it isn't. *BMJ* 312: 71-72.
2. Heiwe S, Kaljermo KN, Lenne R, Guidetti S, Samuelsson M, et al. (2011) Evidence based practice: Attitudes, knowledge and behaviour among allied health care professionals. *Int J Qual Health Care* 23: 198-209.
3. Iles R, Davidson M (2006) Evidence based practice: A survey of physiotherapists' current practice. *Physiother Res Int* 11: 93-103.
4. Shea B, Grimshaw J, Wells G, Boers M, Andersson N, et al. (2007) Development of AMSTAR: A measurement tool to assess the methodological quality of systematic reviews. *BMC Med Res Methodol* 7: 10.
5. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009) Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med* 6: e1000097.
6. Cook DJ, Mulrow CD, Haynes RB (1997) Systematic reviews: Synthesis of best evidence for clinical decisions. *Ann Intern Med* 126: 376-380.
7. Collins JA, Fauser BC (2005) Balancing the strengths of systematic and narrative reviews. *Human Reprod Update* 11: 103-104.
8. Wells C, Kolt GS, Marshall P, Hill B, Bialocerkowski A (2013) Effectiveness of Pilates exercise in treating people with chronic low back pain: A systematic review of systematic reviews. *BMC Med Res Methodol* 13: 7.
9. Gagnier JJ, Kellam PJ (2013) Reporting and methodological quality of systematic reviews in the orthopaedic literature. *J Bone Joint Surg Am* 95: 771-777.
10. Aladro-Gonzalvo AR, Araya-Vargas GA, Machado-Diaz M, Salazar-Rojas W (2012) Pilates-based exercise for persistent, non-specific low back pain and associated functional disability: A meta-analysis with meta-regression. *J Bodyw Mov Ther* 17: 125-136.
11. La Touche R, Escalante K, Linares MT (2008) Treating non-specific chronic low back pain through the Pilates Method. *J Bodyw Mov Ther* 12: 364-370.
12. Lim EC, Poh RL, Low AY, Wong WP (2011) Effects of Pilates-based exercises on pain and disability in individuals with persistent non-specific low back pain: A systematic review with meta-analysis. *J Orthop Sports Phys Ther* 41: 70-80.
13. Pereira LM, Obara K, Dias JM, Menacho MO, Guariglia DA, et al. (2012) Comparing the Pilates method with no exercise or lumbar stabilisation for pain and functionality in patients with chronic low back pain: Systematic review and meta-analysis. *Clin Rehabil* 26: 10-20.
14. Posadzki P, Lizis P, Hagner-Derengowska M (2011) Pilates for low back pain: A systematic review. *Complement Ther Clin Pract* 17: 85-89.
15. National Health and Medical Research Council (2009) NHMRC additional levels of evidence and grades for recommendations for developers of guidelines. National Health and Medical Research Council, Canberra, Australia.
16. Stuver KJ, Smith DL (2008) Chiropractic treatment of pregnancy-related low back pain: A systematic review of the evidence. *J Manipulative Physiol Ther* 31: 447-454.
17. Kung J, Chiappelli F, Cajulis OO, Avezova R, Kossan G, et al. (2010) From systematic reviews to clinical recommendations for evidence-based health care: Validation of revised assessment of multiple systematic reviews (RAMSTAR) for grading of clinical relevance. *Open Dent J* 4: 84-91.
18. Furlan AD, Pennick V, Bombardier C, van Tulder M (2009) 2009 updated method guidelines for systematic reviews in the Cochrane Back Review Group. *Spine* 34: 1929-1941.
19. Kumar S, Beaton K, Hughes T (2013) The effectiveness of massage therapy for the treatment of nonspecific low back pain: A systematic review of systematic reviews. *Int J Gen Med* 6: 733-741.
20. Slavin RE (1995) Best evidence synthesis: An intelligent alternative to meta-analysis. *Clin Epidemiol* 48: 9-18.
21. Tobin MJ, Jabran A (2008) Meta-analysis under the spotlight: Focused on a meta-analysis of ventilator weaning. *Crit Care Med* 36: 1-7.
22. Lam M, Curry P, Galvin R (2013) The effectiveness of acupuncture for non-specific chronic low back pain: A systematic review and meta-analysis. *Spine*.

Citation: Wells C, Kolt GS, Marshall P, Hill B, Bialocerkowski A (2013) Can Systematic Review Findings on Treatment Effectiveness Be Trusted? The Case of Pilates Exercise and Chronic Low Back Pain. *J Yoga Phys Ther* 3: 142. doi:[10.4172/2157-7595.1000142](https://doi.org/10.4172/2157-7595.1000142)

Submit your next manuscript and get advantages of OMICS Group submissions

Unique features:

- User friendly/feasible website-translation of your paper to 50 world's leading languages
- Audio Version of published paper
- Digital articles to share and explore

Special features:

- 250 Open Access Journals
- 20,000 editorial team
- 21 days rapid review process
- Quality and quick editorial, review and publication processing
- Indexing at PubMed (partial), Scopus, EBSCO, Index Copernicus and Google Scholar etc
- Sharing Option: Social Networking Enabled
- Authors, Reviewers and Editors rewarded with online Scientific Credits
- Better discount for your subsequent articles

Submit your manuscript at: <http://www.omicsonline.org/submission>