

**Effectiveness of psychological intervention as add-on to standard cardiac rehabilitation
Time to adopt new methods or keep doing more of the same?**
Pedersen, Susanne S; Doyle, Frank

Published in:
European Journal of Preventive Cardiology

DOI:
10.1177/2047487319840176

Publication date:
2019

Document version:
Accepted manuscript

Citation for published version (APA):
Pedersen, S. S., & Doyle, F. (2019). Effectiveness of psychological intervention as add-on to standard cardiac rehabilitation: Time to adopt new methods or keep doing more of the same? *European Journal of Preventive Cardiology*, 26(10), 1032-1034. <https://doi.org/10.1177/2047487319840176>

Go to publication entry in University of Southern Denmark's Research Portal

Terms of use

This work is brought to you by the University of Southern Denmark.
Unless otherwise specified it has been shared according to the terms for self-archiving.
If no other license is stated, these terms apply:

- You may download this work for personal use only.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying this open access version

If you believe that this document breaches copyright please contact us providing details and we will investigate your claim.
Please direct all enquiries to puresupport@bib.sdu.dk

EDITORIAL

Is psychological intervention worthwhile as an add-on to standard cardiac rehabilitation?

Susanne S. Pedersen (PhD)^{1,2*} and Frank Doyle (PhD)³

¹ Department of Psychology, University of Southern Denmark, Odense, Denmark

² Department of Cardiology, Odense University Hospital, Denmark

³ RCSI Health Psychology, Royal College of Surgeons in Ireland

Cardiac rehabilitation (CR) is a multi-disciplinary and multi-faceted effort focused on physical training, risk factor management, and patient education targeted to minimize the impact of heart disease on patient outcomes and restore physical capacity and health as far as it is possible. The evidence for CR is consistent, with significant cardiovascular mortality reductions even in the era of acute revascularization and improved pharmacotherapy ¹. Hence, in the European Guidelines on cardiovascular disease prevention, CR is indicated with a Class Ia recommendation, which is the highest level of evidence ^{2,3}.

In this issue of the *Journal*, Albus et al. published a systematic review and meta-analysis on CR controlled trials and controlled cohort studies to evaluate the additional benefit of psychological interventions, in comparison to exercise-based CR (ebCR) alone, on depression, anxiety, quality-of-life and cardiovascular morbidity and cardiovascular and all-

* **Corresponding author:** Susanne S Pedersen (PhD), Department of Psychology, University of Southern Denmark, Odense, Denmark. *Phone:* +45 65 50 79 92. *Email:* sspedersen@health.sdu.dk

cause mortality⁴. The authors are to be commended for this effort and it provides much food for thought for CR researchers, psychologists and other mental health professionals in the field.

In 20 studies of 4,450 patients, they showed non-significant trends, with small to moderate effect sizes, for reducing depression and cardiovascular morbidity, with no evident associations with other outcomes. As the authors rightly point out, there are a number of limitations to these findings, including the low to moderate quality of the included studies, and heterogeneity with respect to the interventions in terms of content, duration, intensity – both in the intervention and comparator groups – outcomes and follow-up periods.

Furthermore, interpretation of the findings is especially problematic given that the psychological content of both the intervention and comparator groups is difficult to discern, define, and quantify. Given the heterogeneity across almost all methodological aspects that need to be considered when designing a randomised controlled trial and the level of quality of the studies, it is important, however, that we do not jump to the conclusion that psychological interventions in the context of CR are not worthwhile. This would be tantamount to throwing away the baby with the bathwater.

In 2018, Richards et al. published a systematic review and meta-analysis in this *journal*⁵ based on their 2017 Cochrane review⁶ on the effectiveness of psychological interventions as sole intervention in patients with coronary heart disease. The systematic review and meta-analysis had similar problems [e.g. low to moderate quality of studies included, heterogeneity across studies etc.] to the current systematic review and meta-analysis by Albus et al.⁴, as indicated in an associated editorial⁷. The Richards et al review and meta-

analysis found an effect on cardiovascular mortality but only small to moderate improvements in anxiety, depression, and stress and no effects on total mortality and major adverse cardiac events.

On a broader level, the results of these two state-of-the art systematic reviews and meta-analyses leave the question open whether we see a progression in the literature, or whether we are merely repeating the same mistakes? When we design new studies, we base the power calculation on the effect sizes of existing studies that may be underpowered or not be comparable with respect to the methodological aspects that were found to be heterogenous in the Albus et al. review. From that point of view, we are producing “more of the same” ⁷.

The Albus et al. review contains many low to moderate quality studies, suggesting that there is an urgent need for higher quality, multi-center and multi-country studies ⁴. This may also warrant that we look at the methodologies that we use and look to other fields of inquiry to determine if the literature and methods in CR – with or without added psychological intervention – can be enhanced. This may provide a firmer basis for determining the true effectiveness of psychological interventions in CR.

A first step may be to adopt more sophisticated network meta-analytic (NMA) techniques, which allow not only direct comparisons of interventions, but also indirect comparisons. Indeed, Albus et al. cited an earlier version of this technique in CR ⁸, but rightly point out that exercise was confounded across comparators. There are currently ongoing NMAs which address outcomes in cardiac patients ⁹, but also those undergoing CR ¹⁰. Again, however, the grouping of studies may be problematic and lead to considerable heterogeneity, which provides a significant barrier for drawing conclusions about effectiveness.

A second area of inquiry which could address the limitations of grouping may be to actually quantify the content and intensity in both intervention and comparator groups more accurately. This is vital when looking at exercise interventions, as it is known that their efficacy varies considerably with type and intensity ¹¹. However, usual care or standard practice often differ between settings, and if the quality of usual care is high, or if the provision of lifestyle and mood advice is brief but effective, then this may mask the effect of any additional psychological intervention if present. Such effects of standard care have clearly been demonstrated in the area of adherence to highly active antiretroviral therapy adherence interventions ¹², with ongoing similar work in smoking cessation ¹³. Using an established taxonomy and by coding the content of both intervention and comparator groups from protocols and contacting authors to complete checklists, the authors showed that a substantial proportion of interventions (38%) could already in fact be contained within the comparator groups, but this was highly variable among studies. Thus, as standard care comparators increase in complexity and effectiveness, the effects of any (additional) intervention reduces. There are very likely similar issues within the current CR literature, which may indeed confound the findings of Albus et al. For example, to what degree do ebCR programmes contain (brief) lifestyle or mood advice, and which intensity levels of exercise were effective for depression, beyond which psychological intervention yields little effect? An in-depth investigation of the content of both intervention and comparator groups could yield more appropriate effect sizes for ebCR versus comprehensive CR. Arguably, it is only meaningful to compare intervention effects in meta-analyses after accounting for variability in comparator groups ¹². This information will at a minimum facilitate that we are

better able to estimate the “real” efficacy of psychological interventions and in future meta-analyses will also be able to control for this variability ¹²

An important but different avenue to pursue is to keep working on strategies to optimize uptake in CR [and psychological interventions] and reduce dropout, as dropout from CR is high with up to 56% ¹⁴. Patients who are distressed and suffer from anxiety and depression are more likely to refuse enrolment in a CR program in the first place and also more likely to drop out ¹⁵. Potentially this means that studies included in systematic reviews like that of Albus et al. ⁴ tend to include patients who are highly motivated to participate and have less serious mental health problems ¹⁶, which will dilute the potential effect of CR combined with psychological intervention.

While we take some time to digest the gaps and challenges in the field, as pointed out in the seminal review and meta-analysis of Albus et al.⁴, it should be clear that we do not need more meta-analyses if the individual studies will be more of the same. Instead we need to focus our efforts and resources on providing high-quality, high-fidelity, multi-center international studies. The adoption of *standardised* therapist-assisted internet interventions targeting depression and anxiety in CR populations could be worth a try as an add-on to standard CR. Targeting depression and anxiety in our patients is paramount as depression comprises a barrier for CR participation, increases risk of drop-out and is a risk factor in its own right ¹⁵, and internet-delivered therapy for common mental disorders has been shown to be as effective as face-to-face treatment ¹⁷⁻²⁰. Internet-based programs could be supported by the use of ecological momentary assessments that measure patients’ mood in

real-time that could help guide treatment and enhance patient empowerment, while also increasing ecological validity ²¹.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

References

1. Anderson L, Oldridge N, Thompson DR, et al. Exercise-Based Cardiac Rehabilitation for Coronary Heart Disease: Cochrane Systematic Review and Meta-Analysis. *J Am Coll Cardiol* 2016; 67: 1-12. 2016/01/15. DOI: 10.1016/j.jacc.2015.10.044.
2. Piepoli MF, Hoes AW, Agewall S, et al. 2016 European Guidelines on cardiovascular disease prevention in clinical practice: The Sixth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of 10 societies and by invited experts)Developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR). *Eur Heart J* 2016; 37: 2315-2381. DOI: 10.1093/eurheartj/ehw106.
3. Selskab DC. 29. Hjerterehabilitering. <http://nbvcardiok/hjerterehabilitering> 2017.
4. Albus C, Herrmann-Lingen C, Jensen K, et al. Additional effects of psychological interventions on subjective and objective outcomes compared with exercise-based cardiac rehabilitation alone in patients with cardiovascular disease: A systematic review and meta-analysis. *European Journal of Preventive Cardiology* 2019.

5. Richards SH, Anderson L, Jenkinson CE, et al. Psychological interventions for coronary heart disease: Cochrane review and metaanalysis. *European Journal of Preventive Cardiology* 2018; 25: 247-259. DOI: doi: 10.1177/2047487317739978.
6. Richards SH, Anderson L, Jenkinson CE, et al. Psychological interventions for coronary heart disease. *Cochrane Database Syst Rev* 2017; 4: CD002902. DOI: 10.1002/14651858.CD002902.pub4.
7. Pedersen SS and Andersen CM. Minding the heart: Why are we still not closer to treating depression and anxiety in clinical cardiology practice? *Eur J Prev Cardiol* 2018; 25: 244-246. 2017/11/24. DOI: 10.1177/2047487317744367.
8. Welton NJ, Caldwell DM, Adamopoulos E, et al. Mixed treatment comparison meta-analysis of complex interventions: psychological interventions in coronary heart disease. *Am J Epidemiol* 2009; 169: 1158-1165. DOI: 10.1093/aje/kwp014.
9. Doyle F, Freedland KE, Carney R, et al. Network meta-analysis of randomised trials of pharmacological, psychotherapeutic, exercise and collaborative care interventions for depressive symptoms in patients with coronary artery disease: systematic review of systematic reviews protocol. *Systematic Reviews* in press.
10. Huang R, Palmer SC, Cao Y, et al. Cardiac rehabilitation interventions for adults with coronary heart disease: a bayesian network meta-analysis, http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42018094998 (2018, accessed 25 July 2018).
11. Vanhees L, Rauch B, Piepoli M, et al. Importance of characteristics and modalities of physical activity and exercise in the management of cardiovascular health in individuals with cardiovascular disease (Part III). *European Journal of Preventive Cardiology* 2012 2012/05/29. DOI: 10.1177/2047487312437063.
12. de Bruin M, Viechtbauer W, Schaalma HP, et al. Standard care impact on effects of highly active antiretroviral therapy adherence interventions: A meta-analysis of randomized controlled trials. *Arch Intern Med* 2010; 170: 240-250. DOI: 10.1001/archinternmed.2009.536.

13. de Bruin M, Viechtbauer W, Eisma MC, et al. Identifying effective behavioural components of Intervention and Comparison group support provided in SMOKing cEssation (IC-SMOKE) interventions: a systematic review protocol. *Syst Rev* 2016; 5: 77. DOI: 10.1186/s13643-016-0253-1.
14. Resurreccion DM, Motrico E, Rubio-Valera M, et al. Reasons for dropout from cardiac rehabilitation programs in women: A qualitative study. *PLoS One* 2018; 13: e0200636. 2018/07/17. DOI: 10.1371/journal.pone.0200636.
15. Pogosova N, Saner H, Pedersen SS, et al. Psychosocial aspects in cardiac rehabilitation: From theory to practice. A position paper from the Cardiac Rehabilitation Section of the European Association of Cardiovascular Prevention and Rehabilitation of the European Society of Cardiology. *Eur J Prev Cardiol* 2015; 22: 1290-1306. DOI: 10.1177/2047487314543075.
16. Habibovic M, Cuijpers P, Alings M, et al. Attrition and adherence in a WEB-Based Distress Management Program for Implantable Cardioverter defibrillator Patients (WEBCARE): randomized controlled trial. *J Med Internet Res* 2014; 16: e52. Research Support, Non-U.S. Gov't 2014/03/04. DOI: 10.2196/jmir.2809.
17. Hedman E, Ljotsson B, Kaldø V, et al. Effectiveness of Internet-based cognitive behaviour therapy for depression in routine psychiatric care. *J Affect Disord* 2014; 155: 49-58. 2013/11/19. DOI: 10.1016/j.jad.2013.10.023.
18. Andrews G, Cuijpers P, Craske MG, et al. Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis. *PLoS One* 2010; 5: e13196. 2010/10/23. DOI: 10.1371/journal.pone.0013196.
19. Hedman E, Ljotsson B and Lindefors N. Cognitive behavior therapy via the Internet: a systematic review of applications, clinical efficacy and cost-effectiveness. *Expert Rev Pharmacoecon Outcomes Res* 2012; 12: 745-764. 2012/12/21. DOI: 10.1586/erp.12.67.
20. Andersson G, Cuijpers P, Carlbring P, et al. Guided Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: a systematic review and meta-analysis. *World Psychiatry* 2014; 13: 288-295. 2014/10/03. DOI: 10.1002/wps.20151.

21. Versluis A, Verkuil B, Spinhoven P, et al. Changing Mental Health and Positive Psychological Well-Being Using Ecological Momentary Interventions: A Systematic Review and Meta-analysis. *J Med Internet Res* 2016; 18: e152. 2016/06/29. DOI: 10.2196/jmir.5642.