

Search strategy employed in the systematic review and quality assessment tool

Table A1. Search strategy, databases and number of records found

Pubmed	
#1	surgery OR postoperative OR post-operative OR postsurgical OR post-surgical OR arthroplasty OR TKA OR THA OR ((knee OR hip OR joint) AND (arthroplasty OR replacement)) OR discectomy OR amputation OR Cholecystectomy OR thoracotomy OR Herniotomy OR orthopaedic
#2	pain
#3	association* OR predict* OR "risk factor*" OR determinant* OR prognos*
#4	psychological OR anxiety OR fear OR depression OR depress* OR mood OR catastrophizing OR self-efficacy OR work-related OR executive function* OR kinesiophobia OR emotional OR coping OR avoidance
Note	Search restricted to humans
Results	3961
SCOPUS	
#1	(TITLE-ABS-KEY(surgery OR postoperative OR post-operative OR postsurgical OR post-surgical OR arthroplasty OR tka OR tha OR ((knee OR hip OR joint) AND (arthroplasty OR replacement)) OR discectomy OR amputation OR cholecystectomy OR thoracotomy OR orthopaedic)) AND (TITLE-ABS-KEY(pain)) AND (TITLE-ABS-KEY (association OR associations OR predict OR predicts OR predictor OR predictors OR "risk factor" OR "risk factors" OR determinants OR prognosis OR prognostic)) AND (TITLE-ABS-KEY (psychological OR anxiety OR fear OR depression OR depress* OR mood OR catastrophizing OR self-efficacy OR work-related OR executive AND function* OR kinesiophobia OR emotional OR coping OR avoidance)) AND(LIMIT-TO(DOCTYPE , "ar") OR LIMIT-TO(DOCTYPE,"ip"))
Results	1503
Embase	
#1	'surgery':ti,ab,kw OR 'postoperative':ti,ab,kw OR 'postsurgical':ti,ab,kw OR 'post-operative':ti,ab,kw OR 'post-surgical':ti,ab,kw OR 'knee arthroplasty':ti,ab,kw OR 'hip arthroplasty':ti,ab,kw OR 'discectomy':ti,ab,kw OR 'amputation':ti,ab,kw OR 'lumbar fusion':ti,ab,kw OR 'orthopedic surgery':ti,ab,kw
#2	pain
#3	risk factor' OR 'predictor variable' OR determinant
#4	'mental disease' OR depression OR anxiety OR catastrophizing OR fear OR work OR social OR 'executive function' OR sensitization
Results	1687
PsycInfo	
#1	((surgery or postoperative or postsurgical) and pain and (predictor* or "risk factor*" or determinant* or prognos*)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
Results	567
Total	7718 (6329 after duplicate removal)

Note. Results for each database refer to the combination of the above partial searches.

Table A2. Domains of the Quality in Prognostic Studies (QUIPS) tool

Item	Explanation	Issues considered
Study participation	The study sample adequately represents the population of interest	The source population, recruitment frame and sample baseline characteristics are adequately described
Study attrition	The study data available adequately represent the study sample	Adequate participation in the study by eligible individuals The response rate (i.e. proportion of study sample completing the study) is adequate Reasons for loss to follow-up are reported There are no important differences between completers and non-completers
Prognostic factor measurement	The PF is measured in a similar way for all participants	A clear description of the measurement instrument and its psychometric properties is provided The method and setting of the measurement of the prognostic factor are the same for all study participants
Outcome measurement	The outcome is measured in a similar way for all participants	A clear description of the outcome, of the measurement instrument and of its psychometric properties is provided The method and setting of the measurement of the outcome are the same for all study participants
Study confounding	Important potential confounding factors are appropriately accounted for	All the important confounders are defined and measured
Statistical analysis and reporting	The statistical analysis is appropriate, and all primary outcomes are reported	There is sufficient presentation of data to assess the adequacy of the analysis and there is no selective report of results The selected statistical model is adequate for the design of the study The strategy for model building is appropriate and is based on a conceptual framework or model

Note. Adapted from Hayden et al., 2013

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Formulae used in the meta-analyses

Conversion of standardized beta in Pearson's coefficient (Peterson & Brown, 2005):

$$r = 0.98\beta + 0.05\lambda \quad (1)$$

where λ equals 1 when β is nonnegative and 0 when β is negative.

Conversion of Odds Ratio to d (Borenstein et al., 2009):

$$d = \ln(OR) * \frac{\sqrt{3}}{\pi} \quad (2)$$

with variance:

$$V_d = V_{\ln(OR)} * \frac{3}{\pi^2} \quad (3)$$

Conversion of d to Pearson's r:

$$r = \frac{d}{\sqrt{d^2 + a}} \quad (4)$$

where a is:

$$a = \frac{(n_1 + n_2)^2}{n_1 n_2} \quad (5)$$

and the variance is computed as:

$$V_r = \frac{a^2 V_d}{(d^2 + a)^3} \quad (6)$$

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Meta-analysis details and supplementary graphs

Depression

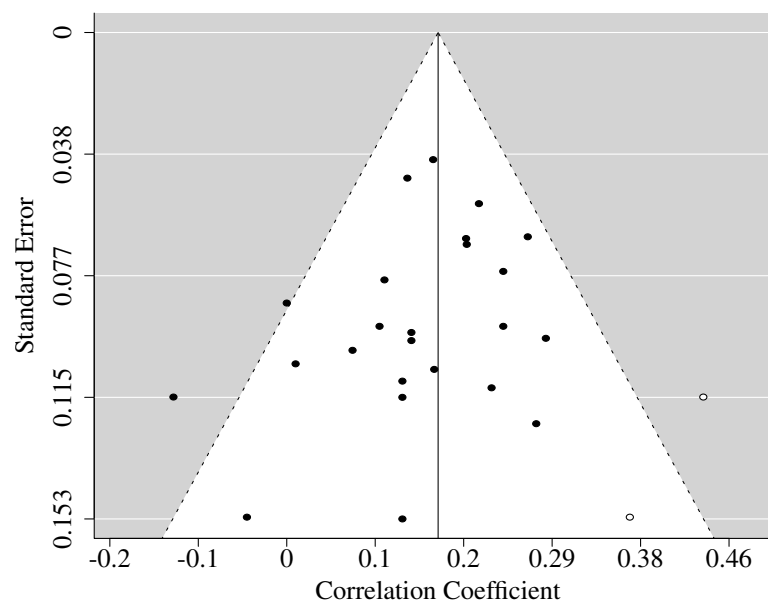
The study by Attal et al., 2014 reported data of patients undergoing breast surgery and total knee arthroplasty at 6 and 12 months. Only data of patients undergoing total knee arthroplasty was employed. The overall effect size was calculated by aggregating the effects at 6 and 12 months in this group.

The study by Brander et al., 2003 reported correlations between depression and pain at 3, 6 and 12 months. The overall effect size was calculated aggregating these effects.

The study by Rice et al., 2018 reported coefficients of a multivariable regression investigating the association between depression and pain at 6 and 12 months. The overall effect size was calculated aggregating these effects. Singh et al. 2013 reported data about primary and revision total knee arthroplasty at 24 and 60 months. Separate estimates for the two time points were calculated. Effect size of primary and revision total knee arthroplasty were aggregated.

Results reported in the articles Sinikallio et al., 2007; Sinikallio et al., 2009 and Sinikallio et al., 2011 were based on the same study. The overall effect size of this study was calculated by aggregating their effect sizes, which represent the effects of depression on pain at 3, 12 and 24 months, respectively.

Figure A.1: Meta analysis on depression - Funnel plot with trim-and-fill method



Note. White dots represent studies imputed by the trim-and-fill procedure.

Trait anxiety

The study by Attal et al., 2014 reported data of patients undergoing breast surgery and total knee arthroplasty at 6 and 12 months. Only data of patients undergoing total knee arthroplasty was employed. The overall effect size was calculated by aggregating the effects at 6 and 12 months in this group.

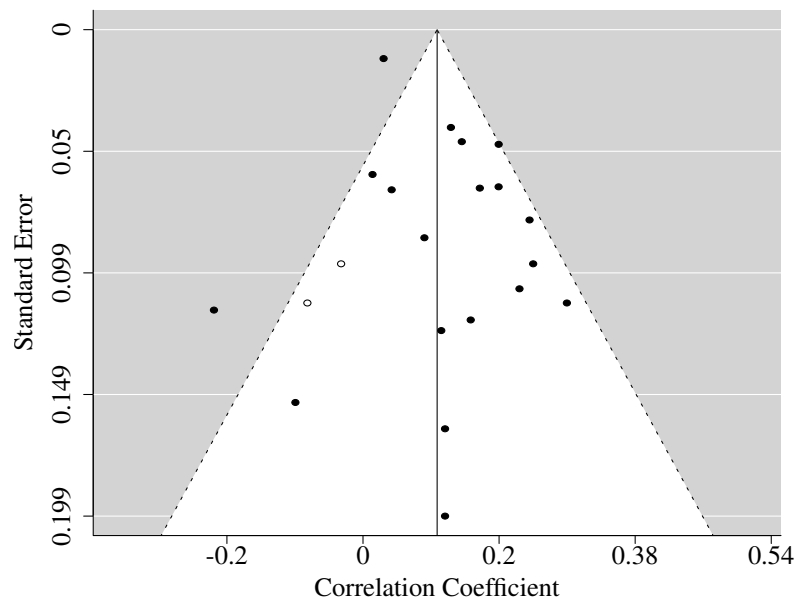
The study by Bierke and Petersen, 2017 reported correlations between trait anxiety and pain at 6 and 12 months. The overall effect size was calculated aggregating these effects.

The study by Brander et al., 2003 reported correlations between trait anxiety and pain at 3, 6 and 12 months. The overall effect size was calculated aggregating these effects.

The study by Rice et al., 2018 reported coefficients of a multivariable regression investigating the association between trait anxiety and pain at 6 and 12 months. The overall effect size was calculated aggregating these effects.

Singh et al. 2013 reported data about primary and revision total knee arthroplasty at 24 and 60 months. Separate estimates for the two time points were calculated. Effect size of primary and revision total knee arthroplasty were aggregated.

Figure A.2: Meta-analysis on trait anxiety - Funnel plot with trim-and-fill method



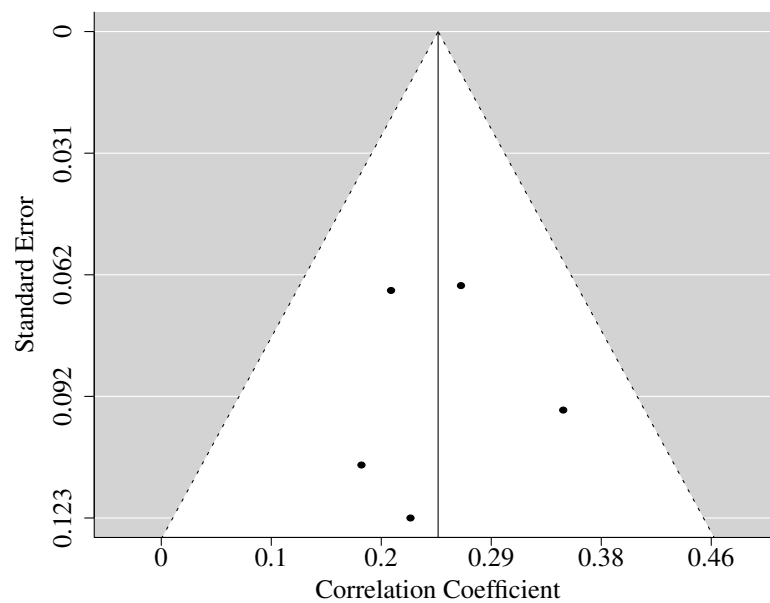
Note. White dots represent studies imputed by the trim-and-fill procedure.

State anxiety

The study by Attal et al., 2014 reported data of patients undergoing breast surgery and total knee arthroplasty at 6 and 12 months. Only data of patients undergoing total knee arthroplasty was employed. The overall effect size was calculated by aggregating the effects at 6 and 12 months in this group.

The study by Rice et al., 2018 reported coefficients of a multivariable regression investigating the association between state anxiety and pain at 6 and 12 months. The overall effect size was calculated aggregating these effects.

Figure A.3: Meta-analysis on state anxiety - Funnel plot with trim-and-fill method



Note. White dots represent studies imputed by the trim-and-fill procedure.

Catastrophizing

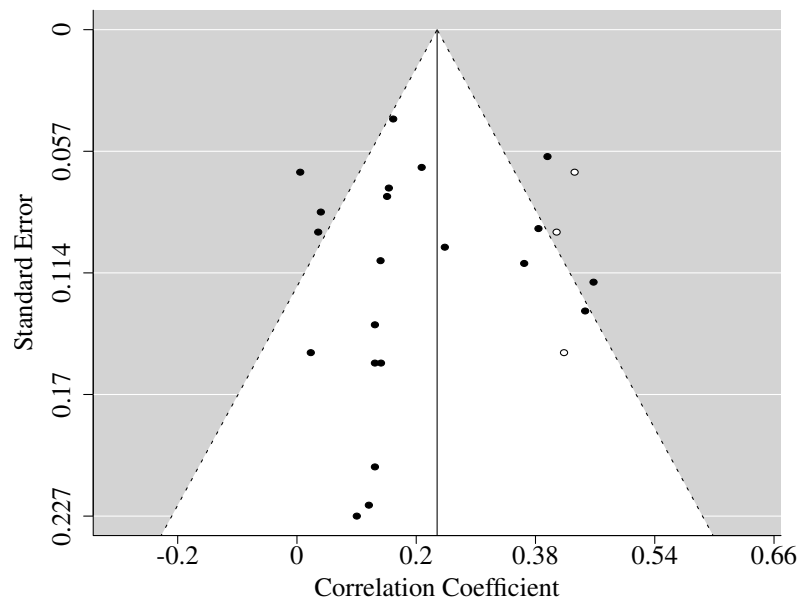
The study by Birch et al., 2019 assessed the impact of catastrophizing on pain at 12 months in patients undergoing total knee arthroplasty and unicompartmental knee arthroplasty. The effect sizes of the two groups were aggregated before inclusion in the meta-analysis.

The study by Bierke and Petersen, 2017 reported correlations between trait anxiety and pain at 6 and 12 months. The overall effect size was calculated aggregating these effects.

The study by Masselin-Dubois et al., 2014 (which was also reported in the article by Attal et al., 2014), reported data of patients undergoing breast surgery and total knee arthroplasty at 6 and 12 months. Only data of patients undergoing total knee arthroplasty was employed. The overall effect size was calculated by aggregating the effects at 6 and 12 months in this group.

The study by Rice et al., 2018 reported coefficients of a multivariable regression investigating the association between catastrophizing and pain at 6 and 12 months. The overall effect size was calculated aggregating these effects.

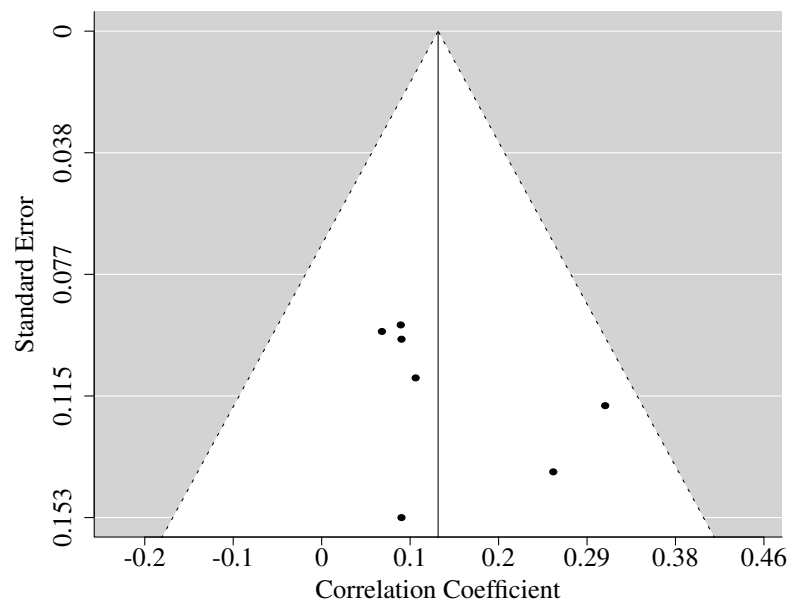
Figure A.4: Meta-analysis on catastrophizing - Funnel plot with trim-and-fill method



Note. White dots represent studies imputed by the trim-and-fill procedure.

Kinesiophobia

Figure A.5: Meta-analysis on kinesiophobia - Funnel plot with trim-and-fill method

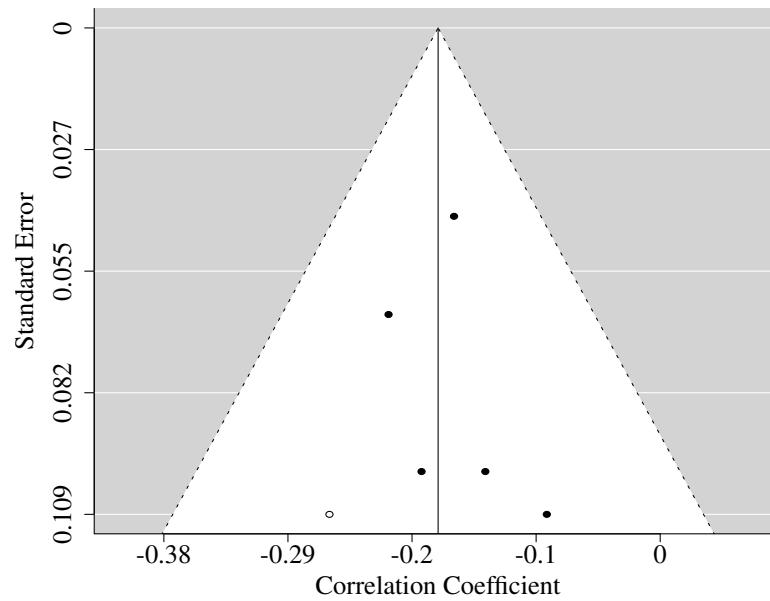


Note. White dots represent studies imputed by the trim-and-fill procedure.

Mental health

The study by Goh et al., 2019 evaluated the association between mental health and arm and neck pain at six months and two years. Separate estimates for the two time points were calculated. The effect sizes relative to arm and neck pain were aggregated before being included in the meta-analysis.

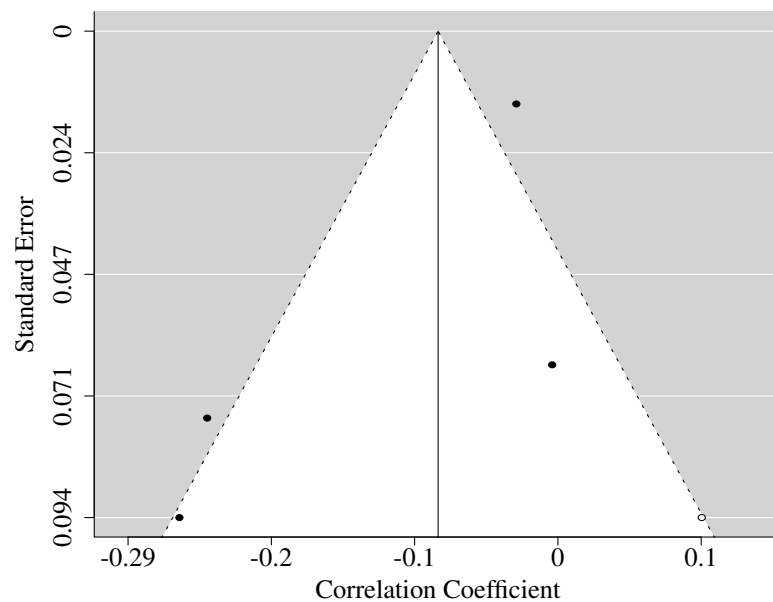
Figure A.6: Meta-analysis on mental health - Funnel plot with trim-and-fill method



Note. White dots represent studies imputed by the trim-and-fill procedure.

Optimism

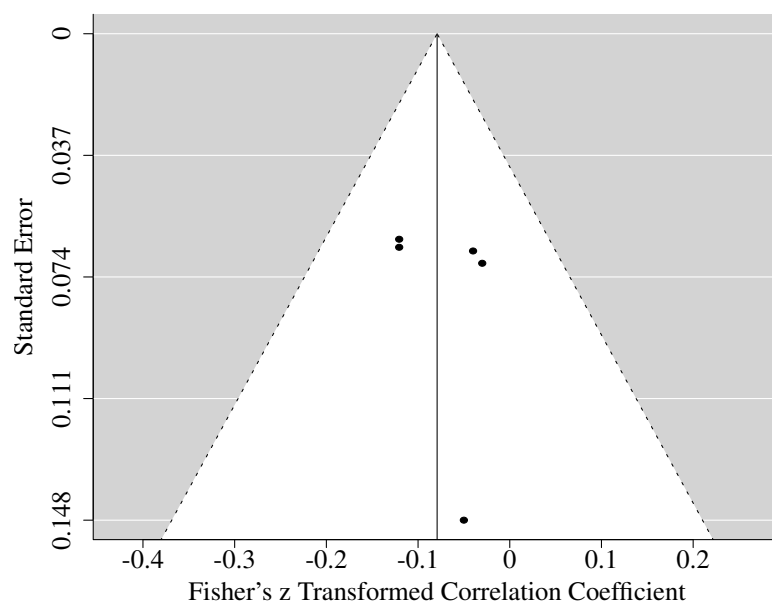
Figure A.7: Meta-analysis on optimism - Funnel plot with trim-and-fill method



Note. White dots represent studies imputed by the trim-and-fill procedure.

Self-efficacy

Figure A.8: Meta analysis on self-efficacy - Funnel plot with trim-and-fill method



Note. White dots represent studies imputed by the trim-and-fill procedure.