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MAIN

The relationship between perfectionism and self-esteem in adults: a systematic review and meta-analysis

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Abstract

Background: Perfectionism dimensions, including perfectionistic strivings and perfectionistic concerns, have a significant positive association with psychopathology. Clinical perfectionism is defined as when an individual's self-esteem is excessively reliant on meeting high standards despite negative consequences. Numerous studies have found that higher perfectionistic concerns correlate with lower self-esteem; however, evidence for the association with perfectionistic strivings has been mixed.
Aims: The focus of this systematic review and meta-analysis was to inform theoretical understanding of the relationships between perfectionism dimensions and self-esteem in adults.
Method: A systematic literature search was conducted in Medline, PsycINFO, PsychARTICLES, ProQuest Central, and Scopus on 31 May 2023.
Results: There were 83 articles included, with 32,304 participants (M_{age} = ~24.66 years). There was a significant negative moderate pooled association between self-esteem and perfectionistic concerns, r = –.42, 95% CI [–0.47 to –0.38]. A significant negligible positive pooled association was found between self-esteem and perfectionistic strivings, r = .06, 95% CI [0.01 to 0.11]. Results indicate higher perfectionistic concerns is associated with lower self-esteem, providing indirect support for the cognitive-behavioural model of clinical perfectionism.
Conclusions: Future research should compare cognitive behaviour therapy for perfectionism to treatments for low self-esteem on outcomes of perfectionistic concerns and psychopathology.

Keywords: meta-analysis; perfectionism; self-esteem; systematic review

Introduction

Perfectionism has been proposed to be a transdiagnostic process across numerous psychological disorders (Egan *et al*., 2011). The Multidimensional Perfectionism Scales (FMPS, Frost *et al*., 1990; HMPS, Hewitt and Flett, 1991) have consistently been found to load on the two perfectionism dimensions of perfectionistic concerns (rumination over mistakes and the belief others expect the individual to be perfect), and perfectionistic strivings (striving towards high standards) (Smith and Saklofske, 2017).

Another definition of perfectionism is clinical perfectionism, defined as self-esteem based on striving to meet high standards despite negative consequences (e.g. anxiety and depression) (Shafran *et al*., 2002). The definition of clinical perfectionism emphasises both perfectionistic

strivings and concerns as relevant to psychopathology if an individual bases their self-worth on their achievement of high standards (Shafran *et al*., 2002). The cognitive-behavioural model of clinical perfectionism (Shafran *et al*., 2002; Shafran *et al*., 2010) includes a range of processes that maintain clinical perfectionism, including for example, performance checking behaviours, re-setting standards higher following both success and failure, and a number of cognitive biases that the individual engages in (i.e. discounting success and focusing on flaws in performance). The Clinical Perfectionism Questionnaire (CPQ; Fairburn *et al*., 2003) has been used to measure clinical perfectionism. Various studies have found different factor solutions, consisting of single, bi-factor and two factor solutions, consistent with an overall clinical perfectionism construct, in addition to factors congruent with both perfectionistic strivings and perfectionistic concerns (Egan *et al*., 2016; Howell *et al*., 2020; Prior *et al*., 2018; Shu *et al*., 2020).

A significant moderate positive association has been found between perfectionistic concerns and symptoms of anxiety, depression, obsessive-compulsive disorder (OCD), and eating disorders in adults ($r = .33$ to $r = .43$; e.g. Callaghan *et al*., 2023; Stackpole *et al*., 2023). Similarly, in adult samples, significant, although smaller correlations have been found between perfectionistic strivings and symptoms of anxiety, depression, OCD and eating disorders ($r = .10$ to $r = .21$; e.g. Callaghan *et al*., 2023; Stackpole *et al*., 2023). Indeed, higher perfectionistic concerns have been found to consistently relate to other correlates of poor mental health, including low self-esteem. Low self-esteem can be defined as a negative view toward oneself and poor self-worth, operationalised as low scores on common measures of self-esteem, such as Rosenberg's (1965) Self-Esteem Scale (RSES). Moderate to large negative associations have been found between self-esteem and perfectionistic concerns in numerous studies, indicating higher perfectionistic concerns is related to lower self-esteem (e.g. Jayakumar *et al*., 2016; Juwono *et al*., 2022; Moroz and Dunkley, 2015; Murray *et al*., 2013; Piotrowski *et al*., 2023; Raedeke *et al*., 2021). Similarly, meta-analytic evidence of longitudinal studies has demonstrated that low-self-esteem is associated with higher symptoms of anxiety, depression (Sowislo and Orth, 2013), and eating disorders (Krauss *et al*., 2023). The meta-analyses have demonstrated reciprocal effects between self-esteem and psychopathology, where self-esteem both leads to and is reduced by psychopathology (Krauss *et al*., 2023; Sowislo and Orth, 2013).

Unlike the association between perfectionism and psychopathology which has been summarised in numerous meta-analyses (e.g. Bills *et al*., 2023; Callaghan *et al*., 2023; Limburg *et al*., 2017; Lunn *et al*., 2023; Smith *et al*., 2021; Stackpole *et al*., 2023), to date there has been no meta-analysis of the relationship between perfectionism and self-esteem.

It is important to understand processes such as perfectionism which relate to low self-esteem, given the consistent relationship between self-esteem and psychopathology to further understand correlates of low self-esteem (Zeigler-Hill, 2011). Furthermore, there are inconsistent associations between perfectionistic strivings and self-esteem, with some studies indicating a non-significant relationship (e.g. Moroz and Dunkley, 2015; Piotrowski *et al*., 2023), some a negative relationship (e.g. Murray *et al*., 2013; Jayakumar *et al*., 2016; Raedeke *et al*., 2021), while others indicate a positive relationship (e.g. Barnes and Caltabianco, 2017; Chen *et al*., 2017; Chou *et al*., 2019; Trumpeter *et al*., 2006).

Given the mixed directions of association and inconsistency in findings, it would be useful to summarise in a meta-analysis the associations between perfectionistic concerns and strivings, and self-esteem to gain clarity on the relationship between perfectionism and self-esteem. Understanding the relationships between perfectionism dimensions and self-esteem has important theoretical implications, particularly for understanding clinical perfectionism, where it is hypothesised that self-esteem is based on striving for high standards (Shafran *et al*., 2002). The cognitive-behavioural approach to self-esteem also suggests that self-esteem and perfectionism are closely related, with the latter being a compensatory strategy to hide low self-esteem (Fennell, 2009). Gaining insight into the associations between the dimensions of perfectionism may provide a direction for future research on how to improve treatments aimed at decreasing perfectionism

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and improving self-esteem as transdiagnostic processes that maintain psychopathology (Egan *et al.*, 2011; Fennell, 2009).

The aim of this systematic review and meta-analysis was to examine the association between perfectionistic strivings, perfectionistic concerns, and self-esteem in adults. We chose to restrict to adult samples rather than include studies across age ranges including children and adolescents given the rationale of developmental differences potentially impacting the results and that associations should be considered separately between youth and adults (Bills *et al.*, 2023; Lunn *et al.*, 2023). Based on previous meta-analyses of the relationship between perfectionism dimensions and psychopathology (Bills *et al.*, 2023; Callaghan *et al.*, 2023; Lunn *et al.*, 2023; Stackpole *et al.*, 2023) we predicted there would be a significant moderate negative pooled association between perfectionistic concerns and self-esteem. Given the mixed evidence to date regarding the association between perfectionistic strivings and self-esteem, with some studies finding a negative association, others finding no association, whilst others demonstrating positive correlations, we did not outline a hypothesis for this aim.

Method

The search terms and research protocol were registered on PROSPERO on 23 May 2023, prior to the search (Registration ID: CRD42023425443). The PRISMA guidelines (Page *et al.*, 2021) were adhered to. The research conformed to the Declaration of Helsinki.

Inclusion and exclusion criteria

Studies were judged against the following inclusion criteria: (1) mean age of sample $\geq$18 years, or a minimum age of 18 in the age range when the mean was not available; (2) included a correlation or convertible effect size between self-esteem and perfectionism; (3) included a standardised measure of perfectionism and self-esteem; (4) reported unadjusted effect sizes; (5) correlational study designs or reported a group comparison; (6) published, quantitative research in peer-reviewed journals reported in English; and (7) from any country, published between 1 January 1990 and 31 May 2023. The rationale for using articles from 1990 onwards was this was the year of publication of the first multi-dimensional measure of perfectionism (FMPS; Frost *et al.*, 1990). Exclusion criteria were grey literature, qualitative studies, dissertations, study protocols, case conferences, and unpublished data.

Search strategy and selection process

A literature search was conducted on 31 May 2023 on PsycINFO, OVID Medline, PsychARTICLES, Scopus, and ProQuest Central. The search terms were decided by S.E. and R.S., and preliminary searches and search strategy were guided by a senior health librarian at Curtin University. The search terms were (perfectionis*) AND (self-esteem OR self-worth OR self-evaluation). Although we were interested in finding studies that were on self-esteem and included a specific measure of measure of self-esteem, the terms self-worth and self-evaluation were added to potentially detect relevant articles where self-esteem may not have been specifically mentioned in an abstract. The senior author (S.E.) trained V.K. (an Honours in psychology student) in how to perform article screening, who screened 100% of articles at title and abstract, and full text levels. A second independent assessor, another Honours student in psychology (S.D.), screened a random 30% of the studies at title and abstract ($n = 518$) and full text ($n = 59$) level. The two assessors (V.K., S.D.) worked independently and were blind to each other's ratings. Cohen's kappa coefficient was used to assess inter-rater reliability between the assessors and was calculated in SPSS (version 28; IBM Corporation, 2021). Kappa coefficients were interpreted as: no agreement ($\kappa < 0$), slight agreement ($\kappa = .01–.20$), fair agreement ($\kappa = .21–.40$), moderate

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agreement κ = .41–.60), substantial agreement (κ = .61–.80), or near perfect agreement (κ = .81–.99) (Landis and Koch, 1977). Inter-rater reliability between the first and second reviewers demonstrated substantial agreement at the title and abstract level (κ = .68) and near-perfect agreement at the full-text level (κ = .94). Discrepancies in study eligibility were discussed with S.E. until consensus was reached.

Data extraction and management

Data extraction was performed by V.K. and included Pearson's correlation coefficients, sample size, study design, population (e.g. clinical or non-clinical), the instrument(s) used to measure self-esteem and perfectionism, the country where the study was conducted, gender, mean age of the sample including standard deviation and age range. In cases where studies did not report a correlation coefficient or the data required to calculate one (i.e. an effect size), V.K. contacted the corresponding author to obtain the data. Five authors were contacted, and two responded. Studies where authors did not respond with the required data were excluded. When extracting data from longitudinal and intervention studies, only the correlations at baseline were obtained to ensure independence of effect sizes. For intervention studies, effect sizes were calculated using the Campbell Collaboration Effect Size Calculator (Wilson, 2001) to transform means and standard deviations into correlation coefficients. The standard error (*SE*) for the *r* coefficient for each effect was calculated using the formula ($SE = (1-r^2)/\sqrt{N-3}$; Gnambs, 2023).

Risk of bias

The risk of bias was assessed independently by V.K. following training from S.E. with the 14 items from the cross-sectional and observational section of the National Institutes of Health quality assessment tool (National Institutes of Health, 2014). The study design, selection bias, confounding variables, information bias and measurement bias, were rated 'no' (criterion not met), 'yes' (criterion met), 'cannot determine', 'not applicable', 'not reported. An overall score was determined by dividing the number of 'yes' responses by the number of appropriate items and multiplying them by 100 to produce a percentage. Scores below 50% indicate 'poor' quality, 51–74.99% denote 'fair' quality, and 75% and above denote good quality (National Institutes of Health, 2014).

Assessment of heterogeneity

Cochran's *Q* and I^2 statistics were calculated to assess the heterogeneity of effect sizes (Higgins *et al.*, 2003). Heterogeneity was assessed using Cochran's *Q*, with the Hunter-Schmidt method (Higgins *et al.*, 2003). I^2 determined the percentage of variation across studies, where heterogeneity of 25–49% is 'low', 50–74% is 'moderate', and >75% is 'high' (Higgins *et al.*, 2003). Generally, it is recommended to explore potential moderators when I^2 is high (≥75%; Higgins *et al.*, 2003). Exploring potential variables can be useful in examining reasons for high heterogeneity (Cuijpers, 2016).

Meta-regressions were used where there was high heterogeneity (>75%; Cuijpers, 2016; Fu *et al.*, 2011). Following Deeks *et al.* (2023) recommendations, meta-regression can be used to investigate differences for categorical variables, as for subgroup analyses using dummy variables (e.g. 1 = non-clinical, 2 = clinical) in the meta-regression model, as it is for standard linear regression modelling. The regression coefficient indicated how the effect for each subgroup differed from the nominated reference subgroup and the *p*-value of each regression co-efficient was examined to indicate whether the differences were statistically significant. Potential sources of heterogeneity, classified as categorical variables, included the mean age of participants (i.e. young adult, 18–24.99 years or adult, 25 years and over), participants' gender (male or female or mixed),

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Table 1. Subscale classification of perfectionism measures into perfectionistic strivings and perfectionistic concerns

Scale	Perfectionistic concerns	Perfectionistic strivings
Frost Multidimensional Perfectionism Scale (Frost *et al.*, 1990)	Concern over mistakes, Doubts about actions, Parental expectations, and Parental criticism	Personal standards, Organisation
Hewitt and Flett Multidimensional Perfectionism Scale (Hewitt and Flett, 1991)	Socially prescribed perfectionism	Self-oriented perfectionism, Other-oriented perfectionism
Almost Perfect Scale-Revised (Slaney *et al.*, 2001)	Discrepancy	High standards, Order
Big Three Perfectionism Scale (Smith *et al.*, 2016)	Self-critical perfectionism	
Children and Adolescent Perfectionism Scale (Flett *et al.*, 1997)	Socially prescribed perfectionism	Self-oriented perfectionism
Dysfunctional Attitudes Scale (Weissman and Beck, 1978)	Self-critical perfectionism	
Clinical Perfectionism Questionnaire (Fairburn *et al.*, 2003)	Perfectionism	
Eating Disorder Inventory – Perfectionism (Garner *et al.*, 1983)	Socially prescribed perfectionism	Self-oriented perfectionism
Positive and Negative Perfectionism Scale (Terry-Short *et al.*, 1995)	Negative perfectionism	
Depressive Experiences Questionnaire (Bagby *et al.*, 1994)	Self-criticism	

Adapted from 'The Relationship Between Perfectionism and Psychopathology: A Meta-Analysis' by K. Limburg, H. J. Watson, M. S. Hagger, and S. J. Egan (2017), *Journal of Clinical Psychology*, *73*, 1303 (https://doi.org/10.1002/jclp.22435).

sample type (university sample, community sample, non-clinical (psychological not physical) other or clinical (psychological), and study quality (poor, fair, or good quality). Following Lunn *et al.* (2023), country of residence was another moderator and was classified as high, low or middle-income (LMIC) based on the Organisation for Economic Co-operation and Development (OECD) country classification system (Guedj, 2022). We did not run perfectionism measure as a moderator as some studies used several different measures which we averaged so that each sample only provided one data point per outcome. Please note that none of the clinical sample studies provided specific effect sizes for perfectionistic concerns or perfectionistic strivings. If a moderator was a significant, we ran subgroup analyses to determine the pooled effects for each category of that moderator.

Data synthesis, sensitivity analysis and assessment of publication bias

The meta-analysis was conducted using JASP (version 0.17.3; JASP Team, 2023). Pooled correlations between perfectionism and self-esteem represent the effect size in this meta-analysis and were estimated using a Hedges random effects model with 95% confidence intervals (Hedges and Olkin, 1985). Cohen's (1992) conventions were used to interpret the pooled correlations as small ($r = .10$), medium ($r = .30$), or large ($r \geq .50$).

Perfectionism outcomes were classified into perfectionistic concerns and perfectionistic strivings following the review of Limburg *et al.* (2017) (Table 1). In cases where correlation coefficients were presented for the subscales or reported for more than one perfectionism measure, the average effect sizes were calculated to determine an overall perfectionistic concerns or strivings correlation with self-esteem. For example, Pearson and Gleaves (2006) reported two measures of perfectionism: the Almost Perfect Scale-Revised (APS-R; Slaney *et al.*, 2001) and the FMPS (Frost *et al.*, 1990). The subscales/measures that fit into perfectionistic strivings were averaged for each study (e.g. for the FMPS, the personal standards and organisation subscales were averaged to

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provide an overall correlation for perfectionistic strivings, the same was done for the high standards and order subscales of the APS-R). Studies were categorised as clinical or non-clinical depending on whether authors stated their sample met the criteria for a diagnosis of a psychological disorder based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) or the International Classification of Diseases and Related Health Problems (ICD-11; World Health Organisation, 2019). Samples were classified as non-clinical if they did not meet the diagnostic criteria for a psychological disorder.

Publication bias was assessed through funnel plot visual inspection and Egger's test for plot asymmetry (Egger *et al.*, 1997). If Egger's test was significant ($p<.05$), plot asymmetry was assumed, indicating potential publication bias concerns. Forest plots were visually inspected for outliers, and case-wise diagnostics were conducted in JASP (JASP Team, 2023) to assess influential studies through Cook's distance. Sensitivity analyses were conducted without the outliers to determine if removing these cases would meaningfully change the pooled effect sizes.

Results

Study characteristics

There were 83 studies found (Fig. 1) with 88 samples from which 58 effect sizes for perfectionistic strivings and 68 effect sizes for concerns were extracted or computed. Note that some studies/samples did not provide specific effect sizes for either perfectionistic strivings or concerns – instead they include only effect sizes for global perfectionism or another type of perfectionism. These studies are summarised in Table 2 but are not included in the meta-analysis.

Studies were conducted between 1991 and 2023 across 20 countries. There were 32,304 participants (approximate mean pooled age = 24.66 years). Sample sizes ranged from $n = 30$ to $n = 4340$, with an average sample size of $n = 367$. Samples were predominantly from high-income countries including the USA ($n = 38$), Europe (Belgium, Italy, Portugal, all $n = 3$; Sweden, Germany, Hungary, all $n = 2$, Croatia, Finland, Poland, all $n = 1$), Australia ($n = 7$), the United Kingdom ($n = 5$) and Canada ($n = 3$). There were a small number from high-income nations in Asia (South Korea, $n = 1$; Taiwan, $n = 2$). Low and middle-income countries represented a small number of studies (China, $n = 5$; Lebanon, $n = 2$; Iran, $n = 3$; India, $n = 2$; Turkiye, $n = 2$). Samples were mainly non-clinical ($n = 82$), with only six clinical samples, of which the diagnoses were eating disorders ($n = 4$), OCD ($n = 1$), and mixed psychological disorder diagnoses ($n = 1$). Perfectionism was most commonly measured using the FMPS ($n = 40$), followed by the HMPS ($n = 18$; Hewitt and Flett, 1991), APS-R ($n = 19$; Slaney *et al.*, 2001), and EDI-P ($n = 10$; Garner *et al.*, 1983) with some studies using more than one measure of perfectionism (see Table 2 for all measures used). The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) was the most common measure of self-esteem ($n = 76$).

Risk of bias

The quality rating scores were 'poor' (5% of studies), fair (70%) and good (25%) (Table 2). On average, studies were rated as fair ($M = 68.12\%$, $SD = 8.98\%$), which may be due to the cross-sectional design of most studies, with the majority not justifying their sample size or reporting details of sampling methods.

Publication bias

Egger's test for plot asymmetry was significant, for perfectionistic concerns ($z = 2.35$, $p = .019$). However, a trim-and-fill analysis did not impute any studies or alter the effect size, suggesting that there is unlikely to be publication bias. Therefore, asymmetry might be due to other factors. For perfectionistic strivings Egger's test was not significant ($z = -1.01$, $p = .311$), indicating publication bias was not of concern. Visual inspection of funnel plots comprising pooled effect

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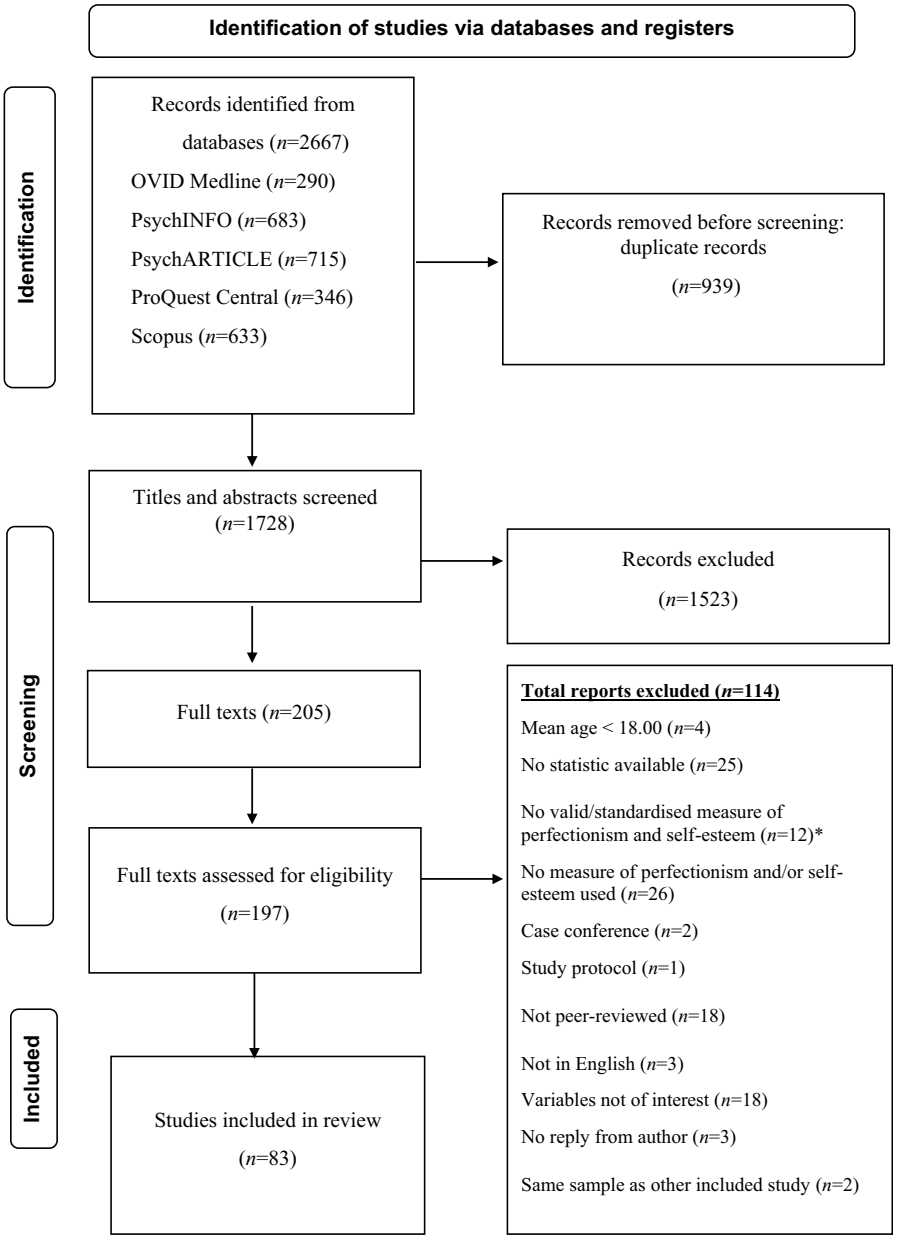

Figure 1. Study selection flow chart in accordance with PRISMA 2020 guidelines. *n*, number of studies. *No valid/standardised measure refers to a questionnaire measure of perfectionism/self-esteem which did not have published evidence of a minimum reliability alpha co-efficient of .70 or above, validity, or other psychometric properties reported in the literature.

sizes confirmed symmetry for perfectionistic strivings, showing no evidence of publication bias (see Supplementary material for funnel plots).

Pooled correlations between perfectionism dimensions and self-esteem

Pooled correlations between perfectionistic concerns, perfectionistic strivings, and self-esteem are shown in Table 3. Consistent with our prediction, there was a significant, moderate negative

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Table 2. Study characteristics

Authors	Country	Design	Sample type	*n*	F (%)	Mean age (years)	Age range (years)	Perfectionism measure(s)	Self-esteem measure	Quality score (%)
Aldea *et al.* (2010)	USA	Intervention	University students	60	78	19.68	16–35	APS-R	RSES	71.42
Barnes and Caltabiano (2017)	Australia	Cross-sectional	University students	220	79	23.81	17–62	HMPS	RSES	50
Bartsch (2007)	Australia	Cross-sectional	University students	619	73	26.14	17–65	HMPS	RSES	63.64
Bean *et al.* (2000)[a]	USA	Cross-sectional	Clinical (eating disorder)	30	77	29.8	16–63	EDI-P	RSES	70
Besharat (2009)	Iran	Cross-sectional	University students	606	58	22.3	18–82	PANPS	CSEI	77.78
Blankstein *et al.* (2008)	USA	Cross-sectional	University students	386	76	20.05	—	HMPS, FMPS, APS-R	Extended Self-Esteem Questionnaire	75
Boysan and Kiral (2017)	Turkiye	Cross-sectional	University students	242	67	20.98	18–32	FMPS	RSES	66.67
Brannan *et al.* (2009)	USA	Cross-sectional	Collegiate athletes	204	100	20.16	—	FMPS	RSES	66.67
Chai *et al.* (2020)	China	Cross-sectional	University students	918	63	19.78	—	APS-R	RSES	66.67
Chen *et al.* (2017)	China	Cross-sectional	University students	1957	50	21.22	—	FMPS	RSES	70
Chou *et al.* (2019)	Taiwan	Cross-sectional	Collegiate dancers	266	92	20.62	18–29	FMPS	RSES	66.67
Cokley *et al.* (2018)	USA	Cross-sectional	University students	468	56	21	17–30	APS-R	RSES	77.78
Colle *et al.* (2020)	Italy	Cross-sectional	University students	119	45	26.2	18–63	FMPS	RSES	63.64
Cusack *et al.* (2013)[a]	USA	Cross-sectional	University students	506	79	21.02	17–44	CAPS	RSES	66.67
Deuling and Burns (2017)	USA	Cross-sectional	Community sample	379	58	41.6	—	APS-R	RSES	50
Doyle and Catling (2022)	UK	Cross-sectional	University students	424	85	19	18–21	APS-R	RSES	60
Duncan-Plummer *et al.* (2023)	Australia	Cross-sectional	University students	514	74	21.15	18–41	CPQ	RSES	66.67
Dunkley *et al.* (2012)	Canada	Cross-sectional	University students	163	61	20.02	—	FMPS, HMPS, DEQ	RSES	60
Elion *et al.* (2012)	USA	Cross-sectional	University students	219	48	21	18–43	APS-R	RSES	66.67
Evangelista *et al.* (2022a)[a]	Portugal	Cross-sectional	Female consumers of antiaging products	260	100	35.7	25–64	FMPS	RSES	77.78
Evangelista *et al.* (2022b)[a]	Portugal	Cross-sectional	Community sample	271	100	35.9	25–70	FMPS	RSES	77.78
Fekih-Romdhane *et al.* (2023)	Lebanon	Cross-sectional	University students	363	62	22.65	—	BTPS	RSES	77.78
Flett *et al.* (1991)	Canada	Cross-sectional	University students	103	100	24.34	—	HMPS	RSES	55.56
Gotwals *et al.* (2003)	USA	Cross-sectional	Collegiate athletes	87	59	19.65	17–25	FMPS	RSES	55.56
Hewitt *et al.* (1995)	Canada	Cross-sectional	University students	81	100	20.92	17–45	HMPS	FIS	66.67
Hill *et al.* (2011)	UK	Cross-sectional	University students	284	30	19.08	18–49	HMPS	CSWS	55.56
Hinterman *et al.* (2012)	USA	Cross-sectional	University students	232	49	19.6	—	PANPS	RSES	66.67
Jayakumar *et al.* (2016)	India	Cross-sectional	University students	192	69	21.22	—	FMPS	RSES	66.67
Jones and Crowther (2013)[a]	USA	Cross-sectional	University students	237	100	19.4	—	EDI-P	RSES	66.67

(*Continued*)

Table 2. (*Continued*)

Authors	Country	Design	Sample type	*n*	F (%)	Mean age (years)	Age range (years)	Perfectionism measure(s)	Self-esteem measure	Quality score (%)
Karatas and Tagay (2012)	Turkey	Cross-sectional	University students	318	63	—	—	HMPS	RSES	60
Kempke *et al.* (2011)	Belgium	Cross-sectional	Chronically ill adults	192	85	40.17	—	FMPS	RSES	70
Klibert *et al.* (2005)	USA	Cross-sectional	University students	475	71	20.9	—	HMPS	RSES	70
Koivula *et al.* (2002)	Sweden	Cross-sectional	Elite athletes	178	39	20.3	—	FMPS	BESES	70
Kothari *et al.* (2019)	UK	Intervention	Community sample	120	82	28.93	—	FMPS, CPQ	RSES	84.62
Kresznerits *et al.* (2022)[a]	Hungary	Cross-sectional	Clinical (mixed diagnoses)	611	71	32.84	18–67	DAS-P	RSES	57.14
Kuennen and Waldron (2007)[a]	USA	Cross-sectional	Gym users	49	0	28.27	20-59	FMPS	RSES	77.78
Kun *et al.* (2020)	Hungary	Cross-sectional	Community sample	4340	51	37.4	18–82	S-HMPS	RSES	60
Lamanna *et al.* (2010)[a]	USA	Cross-sectional	University students	348	71	19.13	17–44	FMPS	RSES	77.78
LaSota and Kearney (2017)	Italy	Cross-sectional	University students	189	66	20	18–51	FMPS	RSES	66.67
Le Marne and Harris (2016)[a]	Australia	Cross-sectional	Community sample	164	80	33.5	18–71	APS-R	RSES	77.78
Methikalam *et al.* (2015)	USA	Cross-sectional	Community sample	174	63	27.49	18–47	APS-R	RSES	70
Miegel *et al.* (2020)	Germany	Cross-sectional	Clinical (OCD)[a] and nonclinical	105	53	41.5	—	FMPS, CPQ	RSES	66.67
Minnich *et al.* (2014)[a]	USA	Cross-sectional	University students	302	0	19.2	18–24	EDI-P	RSES	72.73
Mobley *et al.* (2005)	USA	Cross-sectional	University students	251	69	19.94	—	APS-R	RSES	60
Moghadam *et al.* (2021)	Iran	Cross-sectional	Cosmetic surgery applicants	400	100	30.72	—	HMPS	RSES	90
Moroz and Dunkley (2015)	USA	Cross-sectional	Community sample	210	65	39.83	—	FMPS, HMPS, APS-R	RSES	50
Mousavi Asl *et al.* (2022)	Iran	Cross-sectional	University students	302	44	23.82	19–46	EDI-P	RSES	70
Murray *et al.* (2013)	Australia	Cross-sectional	University students	119	0	21.86	18–25	HMPS	RSES	60
Ortega *et al.* (2014)	USA	Cross-sectional	University students	207	76	21.13	—	APS-R	RSES	77.78
Park and Jeong (2015)	South Korea	Cross-sectional	University students	200	43	20.3	—	FMPS	RSES	63.64
Pearson and Gleaves (2006)	USA	Cross-sectional	University students	286	100	18.75	16–23	FMPS, APS-R	RSES	66.67
Pereira *et al.* (2022)[a]	Portugal	Cross-sectional	Community sample	382	71	37.02	25–73	FMPS	RSES	77.78
Piotrowski *et al.* (2023)	Poland	Cross-sectional	University students	158	74	30.78	—	FMPS	RSES	60
Pokrajac-Bulian *et al.* (2008)[a]	Croatia	Cross-sectional	University students	262	100	21.22	18–25	EDI-P	RSES	70
Procopio *et al.* (2006)[a]	USA	Longitudinal	Health professionals	2383	—	45.19	—	EDI-P	RSES	63.64
Pulford *et al.* (2005)	Lebanon/ UK	Cross-sectional	University students	128	61	21.04	18–47	FMPS	RSES	66.67
Puttevils *et al.* (2019)[a]	Belgium	Cross-sectional	Clinical (eating disorder)	732	100	24.29	14–59	EDI-P	RSES	88.89

(*Continued*)

Table 2. (*Continued*)

Authors	Country	Design	Sample type	*n*	F (%)	Mean age (years)	Age range (years)	Perfectionism measure(s)	Self-esteem measure	Quality score (%)
Raedeke *et al.* (2021)	Sweden	Cross-sectional	Aesthetic performers	254	80	18.7	—	FMPS	BESES	60
Raudasoja *et al.* (2023)	Finland	Cross-sectional	Mothers of infants	479	100	32.45	—	BTPS	RSES	80
Rice *et al.* (1998)	USA	Cross-sectional	University students	464	75	23.66	18–62	APS, FMPS	RSES	66.67
Rice *et al.* (2007)	USA	Cross-sectional	University students	207	74	19.38	—	FMPS, HMPS, APS-R	RSES	55.56
Rice and Dellwo (2001)	USA	Longitudinal	University students	119	74	21.45	18–47	FMPS	RSES	81.82
Rice and Dellwo (2002)	USA	Cross-sectional	University students	312	75	21.02	17–55	FMPS	RSES	60
Rice and Lopez (2004)	USA	Cross-sectional	University students	211	72	21.32	18–55	FMPS	RSES	60
Rosenberger *et al.* (2006)[a]	USA	Cross-sectional	Bariatric surgery candidates	131	100	41.8	—	EDI-P	RSES	66.67
Ruggiero *et al.* (2008)	Italy	Cross-sectional	University students	35	100	22.85	—	FMPS	RSES	75
Sassaroli *et al.* (2008)[a]	Italy	Cross-sectional	Clinical (eating disorder)	55	96	32.71	—	FMPS	RSES	72.72
Shanmugam *et al.* (2011)	UK	Cross-sectional	Athletes	588	59	20.75	—	FMPS, DAS-P	RSES	70
Steele *et al.* (2007)	Australia	Longitudinal	University students	95	100	22.08	—	FMPS	RSES	76.92
Taylor *et al.* (2016)	USA	Cross-sectional	University students	290	100	19.68	18–25	FMPS	RSES	60
Tissot and Crowther (2008)	USA	Cross-sectional	University students	277	100	18.7	18–27	HMPS	RSES	70
Trumpeter *et al.* (2006)	USA	Cross-sectional	University students	531	65	19.3	—	HMPS	RSES	66.67
Vergauwe *et al.* (2015)	Belgium	Cross-sectional	White collar workers	201	58	36.11	20–61	FMPS	CSEI	77.78
Vohs *et al.* (2001)[a]	USA	Longitudinal	University students	70	100	—	18–20	EDI-P	RSES	72.73
Wang (2010)	USA	Cross-sectional	University students	283	79	19.67	18–45	APS-R	RSES	70
Wang *et al.* (2012)	India	Cross-sectional	University students	132	83	21.22	20–27	APS-R	RSES	55.56
Wang *et al.* (2007)	Taiwan	Cross-sectional	University students	273	41	19.75	18–26	APS-R	RSES	66.67
Wang and Wu (2022)	China	Cross-sectional	Medical students	1377	64	19.44	17–24	FMPS	RSES	77.78
Watson *et al.* (2011)[a]	Australia	Longitudinal	Clinical (eating disorder-purging sub-sample)	258	—	26.03	—	EDI-P, FMPS	RSES	91.67
Watson *et al.* (1999)	USA	Cross-sectional	University students	400	62	20.32	—	HMPS	RSES	50
Zeigler-Hill and Terry (2007)	USA	Cross-sectional	University students	563	60	19.37	—	FMPS	RSES	70
Zhang and Cai (2012a)	China	Cross-sectional	University students	412	55	20.16	17–24	FMPS, HMPS, APS-R	RSES	70
Zhang and Cai (2012b)	China	Cross-sectional	University students	292	55	20.04	17–24	FMPS, HMPS, APS-R	RSES	60

OCD, obsessive-compulsive disorder. Dash (—) reflects data not obtained or reported; F (%), percentage of sample that are female; RSES, Rosenberg Self-Esteem Scale; APS-R, Almost Perfect Scale-Revised; BTPS, Big Three Perfectionism Scale; HMPS = Hewitt and Flett Multidimensional Perfectionism Scale; FMPS = Frost Multidimensional Perfectionism Scale; EDI-P, Eating Disorder Inventory-Perfectionism subscale; PANPS, Positive and Negative Perfectionism Scale; CSEI, Coopersmith Self-Esteem Inventory; CPQ, Clinical Perfectionism Questionnaire; DEQ, Depressive Experiences Questionnaire; CSWS, Contingencies of Self-Worth Scale; S-HMPS, Short Multidimensional Perfectionism Scale based on HMPS; DAS-P, Dysfunctional Attitude Scale-Perfectionism subscale; SSES, State Self-Esteem Scale. [a]Studies/samples not included in the meta-analysis as they did not include a specific effect size for perfectionistic strivings or concerns.

Table 3. Summary statistics for pooled correlations between perfectionism dimensions and self-esteem

			Random effects model						
				95% CI			Heterogeneity statistics		
	k	*r*	*SE*	LL	UL	*p*	*Q* (d.f.)	*p*	I^2
Perfectionistic concerns	68	−0.42	0.02	−0.47	−0.38	<.001	1065.11 (67)	<.001	95.35%
Perfectionistic strivings	58	0.06	0.03	0.01	0.11	0.020	1516.81 (57)	<.001	93.22%

k, number of data points included (i.e. independent samples); *r*, pooled association; *SE*, standard error; CI, confidence interval; LL, lower limit; UL, upper limit; *Q*, Cochran's *Q*; I^2, heterogeneity.

pooled correlation ($r = -.42$) between perfectionistic concerns and self-esteem, indicating higher perfectionistic concerns are related to lower self-esteem. There was a negligible significant, positive pooled correlation between perfectionistic strivings and self-esteem ($r = .06$), indicating higher perfectionistic strivings are related to higher self-esteem.

Sensitivity analysis

When assessing perfectionistic strivings, two studies were identified as influential outliers (Besharat, 2009; Moghadam *et al.*, 2021). Removing these outliers made little difference ($r = .06$ [.01, .10], $p = .009$) to the direction or significance of the results; therefore they were retained. Outliers on perfectionistic concerns were identified as Barnes and Caltabiano (2017), Chou *et al.* (2019) and Koivula *et al.* (2002). Removing these outliers would not have a meaningful impact as the effect size was moved by −.03, and the relationship remained significant ($r = -.45$ [−.49, −.42], $p < .001$) hence these studies were also retained.

Heterogeneity

Heterogeneity was high, indicating wide variance in correlations across the studies ($I^2 \geq 75\%$), for perfectionistic concerns and self-esteem, $I^2 = 95.35\%$; and perfectionistic strivings and self-esteem, $I^2 = 93.22\%$. Meta-regressions were conducted (Table 4) on the mean age of participants (18–24.99 years and 25 years and older), participant gender (male or female, or mixed), country of residence (high or low- and middle income), the sample type (university or community or other non-clinical), and study quality (poor, fair, or good).

Regarding perfectionistic concerns, only one moderator was significant – gender (Table 4). Specifically, female-only samples had a stronger pooled effect ($r = -.55$ [−.64, −.45] $p < .001$, $k = 10$) than mixed-gender samples ($r = -.40$ [−.45, −.35], $p < .001$, $k = 56$). However, even after accounting for this moderator the level of heterogeneity was still high (Table 4). There were only two male-only samples that provided an effect size for this association; therefore, we do not provide the pooled effect for male-only samples.

Regarding perfectionistic strivings, again only one moderator was significant – gender. Specifically, inspecting subgroup analyses, mixed gender studies had a negligible positive pooled effect (pooled $r = .09$ [.04, .14], $p < .001$, $k = 48$) but female-only had a non-significant pooled effect (pooled $r = -.07$ [−.23, .09], $p = .388$, $k = 8$). However, even after accounting for this moderator the level of heterogeneity was still high (Table 4). There were only two male-only effect sizes included in this pooled association, therefore we do not provide a pooled effect for male-only samples.

Discussion

The aim of this meta-analysis was to examine the association between perfectionism dimensions and self-esteem in adults. Consistent with previous meta-analyses on the association between

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Table 4. Moderator analyses of heterogeneity

	B	*SE*	95% CI of *B* LL	95% CI of *B* UL	*p*
Perfectionistic concerns					
Age moderator[a]					
Intercept	−.41	.03	−.46	−.36	<.001
Age (25 and over)[b]	−.08	.06	−.20	.03	.141
Heterogeneity		Q (65) = 932.41, p<.001, I^2 = 94.80%			
Country income status					
Intercept	−.43	.03	−.49	−.38	<.001
Income (LMIC)[c]	.05	.06	−.06	.16	.392
Heterogeneity		Q (66) = 1026.90, p<.001, I^2 = 95.27%			
Sample type moderator					
Intercept	−.43	.03	−.48	−.38	<.001
Sample (community)[d]	−.08	.08	−.24	.07	.300
Other non-clinical[d]	.10	.07	−.03	.23	.126
Heterogeneity		Q (65) = 1040.47, p<.001, I^2 = 94.66%			
Gender moderator					
Intercept	−.55	.06	−.66	−.43	<.001
Gender (male)[e]	−.05	.15	−.34	.24	.737
Gender (mixed)[e]	.15	.06	.02	.28	.019
Heterogeneity		Q (65) = 929.34. p<.001, I^2 = 94.93%			
Quality moderator					
Intercept	−.35	.09	−.52	−.18	<.001
Quality (Fair)[f]	−.06	.09	−.24	.12	.502
Quality (Good)[f]	−.16	.10	−.35	.04	.109
Heterogeneity		Q (65) = 1015.87, p<.001, I^2 = 95.09%			
Perfectionistic strivings					
Age moderator[a]					
Intercept	.08	.03	.02	.13	.007
Age (25 and over)[b]	−.09	.07	−.22	.05	.195
Heterogeneity		Q (55) = 1317.95, p<.001, I^2 = 92.68%			
Country income status					
Intercept	.06	.03	.00	.12	.035
Income (LMIC)[c]	−.01	.06	−.13	.12	.898
Heterogeneity		Q (56) = 1315.60, p<.001, I^2 = 93.03%			
Sample type moderator					
Intercept	.07	.03	.01	.13	.020
Sample (community)[d]	.01	.09	−.16	.18	.933
Other non-clinical[d]	−.07	.08	−.22	.08	.336
Heterogeneity		Q (55) = 1341.49, p<.001, I^2 = 92.54%			
Gender moderator					
Intercept	−.07	.07	−.20	.06	.299
Gender (male)[e]	−.02	.16	−.33	.29	.888
Gender (mixed)[e]	.16	.07	.01	.30	.031
Heterogeneity		Q (55) = 1344.04, p<.001, I^2 = 92.85%			
Quality moderator					
Intercept	.11	.09	−.07	.28	.228
Quality (fair)[f]	−.08	.09	−.26	.11	.416
Quality (good)[f]	.05	.11	−.16	.25	.647
Heterogeneity		Q (55) = 1278.13, p<.001, I^2 = 92.74%			

[a]Karatas *et al*. (2012) was excluded as we could not determine which age category it belonged to from the information provided.
[b]Reference group is under 25.
[c]Reference group is high income country.
[d]Reference group is university sample.
[e]Reference group is female samples.
[f]Reference group is poor quality studies. Other non-clinical: non-clinical refers to non-clinical in the sense of psychological disorders rather than physical disorders.

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psychopathology and perfectionism in adults (Callaghan *et al.*, 2023; Limburg *et al.*, 2017; Stackpole *et al.*, 2023), perfectionistic concerns had a medium, negative pooled correlation with self-esteem, indicating higher perfectionistic concerns were related to lower self-esteem. Inconsistent with previous meta-analyses on psychopathology and perfectionism in adult samples (Callaghan *et al.*, 2023; Limburg *et al.*, 2017; Stackpole *et al.*, 2023), perfectionistic strivings had a negligible positive pooled correlation with self-esteem, indicating higher perfectionistic strivings are related to higher self-esteem. However, when considering these results, it should be noted that this positive correlation ($r = .06$) failed to reach Cohen's (1992) convention of a small correlation ($r \geq .10$). Our moderators also explained little variance in the imputed effect sizes.

The finding that higher perfectionistic concerns is related to lower self-esteem fits with the wealth of meta-analyses demonstrating that perfectionistic concerns are associated with a range of negative psychological variables and psychopathology (Bills *et al.*, 2023; Callaghan *et al.*, 2023; Limburg *et al.*, 2017; Lunn *et al.*, 2023; Smith *et al.*, 2021). Clearly, higher perfectionistic concerns are related to many adverse psychological states, including lower self-esteem. The results also support the tenets of the cognitive-behavioural model of clinical perfectionism (Shafran *et al.*, 2002), which proposes that self-esteem is overly dependent on striving to meet demanding standards despite negative effects (e.g. psychopathology). Individuals with lower self-esteem may be more likely to base their self-evaluation on how well they perform when striving to achieve their goals, and a negative interpretation of failure to meet their high standards maintains low self-worth (Shafran *et al.*, 2002). Hence the findings of this meta-analysis provide some indirect support for the cognitive-behavioural model of clinical perfectionism (Shafran *et al.*, 2002).

We found that higher perfectionistic strivings was related to higher self-esteem, however this was a negligible association and in contrast to previous research on psychopathology and perfectionism in adults (Callaghan *et al.*, 2023; Limburg *et al.*, 2017; Stackpole *et al.*, 2023). It should be noted that this very small association ($r = .06$) was unlikely to be clinically meaningful. Furthermore, whether these results would be similar in clinical samples is unclear given the lack of clinical samples measuring this outcome in our meta-analysis. Unfortunately, there were insufficient clinical samples to conduct a robust analysis of the differences between clinical and non-clinical samples. It is possible that different relationships may be observed between perfectionistic strivings and self-esteem in clinical samples, in line with large reviews on the association between strivings and psychopathology in adults which had sufficient studies to analyse clinical samples (Callaghan *et al.*, 2023). Future meta-analyses should aim to classify samples into clinical and non-clinical for moderator analyses, to determine if clinical status makes a difference to the strength or direction of the relationship between perfectionistic strivings and self-esteem. It would also be helpful for more primary studies in clinical samples to be conducted measuring the association between perfectionism and self-esteem. Nonetheless, our findings support other meta-analyses documenting the association between perfectionistic strivings and some positive psychological states such as helpful academic outcomes (Osenk *et al.*, 2020).

Clinical implications

Given the meta-analysis involved cross-sectional data, no direct clinical implications can be drawn from this review. However, there are several directions for future research that may inform future clinical implications. Future research should continue to examine the cognitive-behavioural model of clinical perfectionism (Shafran *et al.*, 2002), where self-esteem is based on striving to meet high standards, which is the basis of cognitive behaviour therapy (CBT) for perfectionism, demonstrated to reduce symptoms of anxiety, depression, and eating disorders (Galloway *et al.*, 2022; Robinson and Wade, 2021). A core aim of CBT for perfectionism is to broaden an individual's self-esteem, so it is less dependent on striving and achievement, whilst simultaneously reducing perfectionistic concerns (e.g. fear of making mistakes and performance-related

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self-doubt; Egan *et al*., 2014a; Shafran *et al*., 2018). CBT for perfectionism has been demonstrated to improve self-esteem. For example, Egan *et al*. (2014b) and Handley *et al*. (2015) found CBT for perfectionism resulted in significant increases in self-esteem, which were maintained at 6-month follow-up, concurrent with significant reductions psychopathology. These findings suggest preliminary evidence that interventions addressing perfectionism may have a transdiagnostic impact on reducing low self-esteem and psychopathology. However, further research is required to examine the efficacy of CBT for perfectionism in improving low self-esteem. It is also possible that interventions aimed at reducing low self-esteem such as Fennell's (2009) CBT for low self-esteem, may also improve perfectionism in addition to self-esteem. Future research could examine a head-to-head comparison of CBT for perfectionism and CBT for low self-esteem in terms of the relative efficacy on outcomes of perfectionism, self-esteem, and psychopathology to understand the most efficacious approach for clients presenting with low self-worth which is overly dependent on meeting their personally demanding standards.

Limitations

There were several limitations. A major limitation was that the data were cross-sectional. We cannot determine whether perfectionistic concerns and self-esteem are causally related. Future research should aim to conduct further experimental studies such as Hummel *et al*. (2022), where an increase in perfectionistic concerns was found to result in an increase in psychological distress, with the assessment of self-esteem as the outcome from the manipulation of perfectionistic concerns. Another limitation was that grey literature was not included and we only included studies published in English, therefore it is possible that some literature was missed. In addition, while we included numerous databases for the search, inclusion of the Web of Science database may have been useful to locate further articles and would be helpful for future reviews to include as a search database. Furthermore, we did not conduct inter-rater reliability on risk of bias ratings.

Conclusion

The results of this meta-analysis indicate that in adults perfectionistic concerns were moderately related to lower self-esteem. Higher perfectionistic strivings were related to higher self-esteem, although this was a negligible, very small association. It should also be considered that perfectionistic strivings have been found to be associated with psychopathology such as eating disorders (e.g. Bills *et al*., 2023; Stackpole *et al*., 2023), even when the effect of perfectionistic concerns was controlled (e.g. Limburg *et al*., 2017). Similar to recent meta-analyses (Callaghan *et al*., 2023), we reiterate that further cross-sectional studies are unlikely to yield significantly new results. The field of perfectionism requires a focus now on experimental and longitudinal studies, and the examination of the causality between dimensions of perfectionism and negative psychological variables, including low self-esteem.

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(supporting); **Sheree Dickinson:** Investigation (supporting); **Sarah Egan:** Conceptualization (equal), Methodology (equal), Project administration (equal), Supervision (lead), Writing – original draft (equal), Writing – review & editing (lead).

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*Denotes that the study was included in the meta-analysis

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