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Title: Positive and meaningful lives: Systematic review and meta-analysis of eudaimonic well-being in first-episode psychosis.

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Abstract

Background: First-episode psychosis typically has its onset during adolescence. Prolonged deficits in social functioning are common in FEP and yet often variance in functioning remains unexplained. Developmental psychology frameworks may be useful for understanding these deficits. Eudaimonic well-being (EWB), or positive self-development, is

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a developmental psychology construct that has been shown to predict mental health outcomes across multiple populations but has not been systematically reviewed in FEP.

Aim: Our aim was to systematically review the evidence for: the predictors of EWB, the effectiveness of EWB interventions, and to examine the quality of this research in FEP.

Methods: Selected studies measured either composite or components of EWB. A systematic search produced 2,876 abstracts and 122 articles were identified for full screening which produced 17 final papers with 2,459 participants.

Results: Studies comprised six RCTs, eight prospective follow-up studies, and three case-controlled studies. Self-esteem and self-efficacy were the most commonly measured components. A meta-analysis of RCTs revealed no statistically significant effect of interventions on self-esteem. The extant research indicates that character strengths may be associated with higher EWB. Self-esteem may be lower in FEP compared with age matched controls but not different from ultra-high risk patients. Self-esteem appears to be associated with poorer insight and improved therapeutic alliance. Significant problems with both external and internal validity of reviewed studieswere apparent.

Conclusions: The hypotheses that lowered EWB is a risk factor for both onset of FEP and for poorer functional outcomes warrant further investigation. There is currently no evidence for effective interventions for EWB in FEP.

Key words: early psychosis, eudaimonia, psychological well-being, self-determination, self-esteem

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Running title: Eudaimonic well-being in FEP

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1. Introduction

The onset of first-episode psychosis (FEP) most commonly occurs in late adolescence coinciding with a critical developmental stage. Although positive psychotic symptoms are fortunately responsive to acute phase treatments in approximately 75% of cases(Emsley et al., 2006), for the majority of FEP patients the ensuing course of illness is associated with impaired social functioning and low rates of educational/vocational participation(Penn et al., 2005). These functional impairments imposemajor burdens on FEP sufferers, their families, and the community(Santesteban-Echarri et al., 2017). The evolution of specialist FEP services – perhaps the most significant global reform in mental health service delivery of the last 20 years(McGorry et al., 2008) – has not fully realised its aspiration of addressing long-term deficits in psychosocial functioning (Iyer et al., 2011).

Successful interventions that result in a sustained change in social participation will most likely be derived from empirically validated models of social functioning in FEP.However, despiteincreased understanding of the role of social and general cognitive abilities in social functioning in FEP (Fett et al., 2011; Green et al., 2019; Halverson et al., 2019), the majority of the variance in psychosocial functioning remains unexplained (Halverson et al., 2019; Stouten et al., 2017).Higher-order psychological processes, such as self-constructs and motivation, may add to the understanding and prediction of social functioningin FEP. One such construct is psychological or *eudaimonic* well-being (EWB). Given that EWB isa highlyvaluedoutcomefor consumers recovering from serious mental disorders,it also warrants research attention in its own right. Although there have been debates regarding the underlying

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models, the project of incorporating existential needs and personally meaningful outcomes for consumers within the scope of mental health interventions is consistent with other recent reviews and commentaries(Fava & Guidi, 2020; Slade, Blackie, & Longden, 2019).

1.1 Eudaimonic well-being

In the mid-twentieth century, Erickson postulated that the key developmental tasks of adolescence were to resolve questions of personal identity and direction in life (Erikson, 1968). Delays or failure to resolve these challenges could result in identity confusion, social isolation, and prolonged stagnation in motivation, which translates into poorer functioning (Erikson, 1968). Building upon Erikson's theory, contemporary developmental psychologists converged upon the notion of eudaimonic well-being (EWB) as a theory of positive self-development spanning adolescence to late adulthood(Ryff, 2018). Eudaimonic well-being is a distinct construct from *hedonic* well-being, which has its origins in *happiness* or *pleasure*(Ryan & Deci, 2001).Inspired by Aristotle's notion of Eudaimonia, translated as the "good life" or "virtuous life", this construct has given rise to a large body of empirical investigations into psychological well-being and health(Vittersø, 2016).

Two major contributions to theory development and measurement of EWB have been made by Carol Ryff(Ryff, 1989), and Richard Ryan with Edward Deci(Ryan and Deci, 2000). Ryff identified six constituent components of EWB that indicate healthy personal development across the lifespan, namely, *self-acceptance*, *personal growth*, *purpose in life*, *environmental mastery*, *autonomy*, and *positive relations with others*(Ryff and Keyes, 1995). Ryff's

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Psychological Well Being Scales (PWBS)(Ryff and Keyes, 1995) have been applied to multiple clinical populations (Brandel et al., 2017). Ryan and Deci developed the self-determination theory (SDT), often described as a theory of motivation and wellness, intending to further specify how EWB can be attained through the fulfillment of basic psychological needs for *competence*, *relatedness*, and *autonomy*(Ryan and Deci, 2017, 2001). The fulfillment of these needswas considered by Ryan and Deci asa necessary condition for fostering personal growth, which is indicated by intrinsic motivation for goal attainment and mastery. Evidence has accrued for the cross-cultural validity of SDT (Yu et al., 2018).

1.2Links between eudaimonicwell-beingand mental health disorders

EWB and SDT have been investigated in a range of mental health disorders. In major depressive disorder, a large effect has been observed for the prediction of recovery over a 10-year periodfrom EWB at baseline (Iasiello et al., 2019) and 10% of sufferers of major depression have been shown at 10 years follow-up to fall into the top 25% of US adults interms of levels of EWB (Rottenberg et al., 2019). EWB has also provided the basis for a promising model of treatment in major depressive disorder (Fava et al., 2017). Research interest in SDT in clinical populations has arisen in psychosis, posttraumatic stress disorder, social anxiety, and anorexia nervosa. SDT has also been shown to specifically predict social functioning in clinical populations (Breitborde et al., 2012; Jochems et al., 2017; Ryan et al., 2016). In one study, persons with FEP reported significantly less satisfaction of basic psychological needs compared to same-aged comparisons, and among those with FEP, basic need satisfaction was positively associated with well-being(Breitborde et al., 2012). The

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construct of EWB also overlaps withconsumer-lednotions of personal recovery,which include personal growth and search for empowerment and meaning in the specific context of living with psychosis (Slade et al., 2019).EWB affords the additional advantage of a broader and normative developmental framework for adolescents and young adults in the early stage of recovery from psychosis. However, little is known about the relationship between EWB and FEP or the prospects for the recovery of EWB after the first episode.

1.3Aims of the review

Given the evidence for an association between EWB and mental healthdisorders and its importance for patientsit is timely (i) to review the state of the evidence in FEP concerning the known predictors of EWB and its components and (ii) to examine the state of the evidence concerning interventions to improve EWB in FEP. We argue that EWBprovides an important framework for measuring higher-order appraisals of functioning (e.g. self-efficacy), and the extent to which environmental and existential needs have been met(Uzenoff et al., 2010).

The purposes of this review, therefore, are: first, to survey what is known about EWB in the FEP population, as well as areas that have not been studied; second, to identify the predictors of EWB, third, to synthesize the effectiveness of interventions for EWB in FEP; and fourth, to identify methodological limitations and gaps in this literature and directions for further research to progress the understanding of recovery from FEP. Given that EWB entails a range of component constructs, the scope of our review included investigations of both individual

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components of EWB (e.g., self-esteem and autonomy) and composite EWB constructs (e.g., psychological well-being and self-determination).

2. Method

2.1 Data sources

Embase, Medline, PsycINFO, Web of Science, and Scopus were utilized for the literature search, which was undertaken in April 2018. Tables of contents of key journals in the field from January 2017 to April 2018 were also checked. The search terms and search strategy are outlined in the Supplementary Material.

2.2 Study selection

Randomized controlled trials (RCTs), non-randomized clinical trials including single-group pilot studies, follow-up observational studies, and case-controlled studies were considered for inclusion to determine the predictors of EWB. We excluded non-controlled cross-sectional studies because they could not support conclusions about either effects over time, or whether any cross sectional associations were specific to FEP.Randomized controlled trials (RCTs), non-randomized clinical trials including single-group pilot studies were included in order to assess the efficacy of interventions, including any psychosocial and pharmacological treatments that specified EWB or a component of EWB as a primary or secondary outcome. Studies were included that reported specifically on samples of patients diagnosed with a first-episode of a psychotic disorder or patients identified as being early in the course of a

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psychotic disorder (i.e., maximum of two years since the initial diagnosis or initiation of treatment).

Based upon both Ryff's and Ryan and Deci's models of EWB(Ryff, 1989; Ryan and Deci, 2000), outcomes were included for either composite measures of EWB or measures of its individual components, including: 1) Psychological well-being; 2) Self-determination; 3) Purpose in life; 4) Meaning in life; 5) Autonomy or locus of control; 8) Mastery, competency,or general self-efficacy; 9) Social connectedness; 9) Personal growth; and 10) Self-acceptance or self-esteem.

We set no restrictions on the duration of treatment and follow-up of treatment effects. Observational follow-up studies required a minimum follow-up duration of three months with at least two measurement time points, including baseline. The date of publication was not limited and study settings were not restricted, however, only publications in English were included. A detailed list of the exclusion and inclusion criteria is included in the Supplementary Material.

2.3 Data extraction process

Records were imported by an independent librarian into an Endnote library and imported into Covidence(Babineau, 2014)for initial screening of abstracts by JG and DE and for the screening of full text articles, including the resolution of conflicts.

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Data extraction forms were piloted prior to the completion of data extraction from full text articles by JG and DE and completed data extraction forms were filed independently by the two reviewers prior to consensus checks. Corresponding authors were contacted via email (a maximum of two emails to each corresponding author) if clarification was necessary.

JG and DE independently reviewed the titles and abstracts with reference to the inclusion and exclusion criteria and independently screened full text articles. DE checked the Tables of contents of key journals in the field from January 2017 to April 2018.

To assess risk of bias, we used The Cochrane Collaboration Tool (Higgins et al., 2011) and The Downs and Black Checklist for assessment of the methodological quality of health care interventions (Downs and Black, 1998), which is appropriate for both randomised and non-randomised studies.

2.4 Meta-analysis

We specified a priori that if there were four or more studies utilising homogenous designs we would undertake a meta-analysis. We employed random-effects models for meta-analyses, which account for within-study error and variation in the true effects across studies because the studies included were not methodologically identical(Borenstein et al., 2009). Studies differed in treatment modality, sample, assessment measures, and follow-up time-points (Hedges and Vevea, 1998). Sensitivity analyses were undertaken to explore the results and assumptions for different follow-up time-points. If a prediction interval lies entirely above

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zero, then it can be concluded that the intervention is beneficial in at least 95% of the individual study settings(Riley et al., 2011).

The *Q* statistic was calculated to assess heterogeneity(Borenstein et al., 2009). A significant *Q* statistic confirms heterogeneity. We also calculated the I^2statistic, which reflects the percentage of variance in the observed effects due to variance in the true effects. Heterogeneity can be considered low, moderate, substantial, or considerable with I^2 values of 0-40%, 30-60%, 30-90%, and 75-100%, respectively(Higgins and Green, 2008).

Funnel plots were examined to identify possible outliers and investigate publication bias(Borenstein et al., 2009). If publication bias exists, it was expected that smaller studies would report larger effect sizes. If publication bias was detected, a non-parametric trim and fill method was used to impute missing studies and re-estimate the pooled effect size (Duval and Tweedie, 2000). All analyses were conducted using the software program Comprehensive Meta-Analysis Software (CMA) version 2.3(Borenstein et al., 2009).An alpha level of 0.05 was used for tests of the estimated average treatment effect and publication bias.

2.5 Narrative synthesis

We planned separate narrative syntheses of findings from RCTs and other treatment study designs. An additional synthesis was planned for longitudinal observational studies categorised by type of independent predictor variables.

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3. Results

Figure 1 displays the outcome of the study search, screening, and selection processes. A total of 2,876 abstracts were initially identified via the database searches and 1,748 remained after an initial removal of duplicates. From the 1,748 records, 122 articles were identified for full-text screening which produced a final set of 17 studies.

3.1 Characteristics of studies

Across the 17 studies, there were 2,459 participants meeting criteria for FEP with an additional 535 participants across the three case-controlled studies. The key study and sample characteristics and findings from the 17 studies are displayed in Table 1.

3.2 Range of ages/ gender

The mean age of participants in most studies was in the early to mid-twenties with the exception of the case-controlled study by Ciufolini et al., in which 53% of participants were aged between 16-29 years and 47% of participants were aged 30-65 years(Ciufolini et al., 2015).

3.3 Diagnoses

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In nearly all studies the range of FEP diagnoses were specified, usually in relation to DSM (5th ed.; *DSM-5*)or ICD (11th ed.;ICD-11). However, in one study (Taylor et al., 2014), FEP was defined in terms of scores above the threshold for At-Risk State as assessed on the Comprehensive Assessment for At-Risk Mental State (CAARMS;Yung et al., 2005).

3.4 Study types

The 17 studies comprised a total of 11 observational studies and six treatment studies). The observational studies included eight prospective follow-up studies (Browne et al., 2018; Drake et al., 2015; Drake et al., 2004; Harder, 2006; Lecomte et al., 2012; Lecomte et al., 2018; Lecomte et al., 2015; Singer et al., 2014), and three case-controlled studies (Ciufolini et al., 2015; Macdonald et al., 1998; Taylor et al., 2014).

The treatment studies were all RCTs(Browne et al., 2017b; Ostergaard Christensen et al., 2014; Drake et al., 2014; Jackson et al., 2009; McCay et al., 2007; Thorup et al., 2010The RCTs entailed evaluations of two cognitively orientated individual psychological interventions(Browne et al., 2017b; Jackson et al., 2009), one group-based intervention(McCay et al., 2006), two studies of cognitive remediation(Ostergaard Christensen et al., 2014; Drake et al., 2014), and one evaluation of early intervention services(Thorup et al., 2010).

3.5 Follow-up ranges

For the prospective follow-up studies, the duration ranged from three months (Lecomte et al., 2012) to two years (Browne et al., 2018). The case-controlled studies were all cross-sectional

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investigations (Ciufolini et al., 2015; MacDonald et al., 1998; Taylor et al., 2014). The follow-up durations ranged from 12 weeks (McCay et al., 2007) to two years (Thorup et al., 2010) for the RCTs.

3.6 Eudamonic well-being outcomes variables

In terms of investigations of individual components of EWB, self-esteem and self-efficacy were investigated in 15 of the 17 studies. A composite measure of EWB, in both cases the Ryff scales, was used across two studies (Browne et al., 2018; Browne et al., 2017b). Other outcomes measured across single studies were autonomy (Singer et al., 2014), locus of control(Ciufolini et al., 2015), and interpersonal relations(Browne et al., 2018). Basic needs satisfaction in line with self-determination theory was not measured in any of the eligible studies.

3.7 Predictor variables in observational studies

Across the prospective follow-up studies, two studies included therapeutic alliance as a predictor of EWB(Lecomte et al., 2012; Lecomte et al., 2015), two included insight(Drake et al., 2015; Drake et al., 2004), three symptoms(Drake et al., 2004; Harder, 2006; Lecomte et al., 2018), one attitude to medication(Drake et al., 2015), one character strengths (Browne et al., 2018), and one dysfunctional beliefs(Singer et al., 2014).Within the three case controlled studies(Ciufolini et al., 2015; Macdonald et al., 1998; Taylor et al., 2014), all included a non-clinical comparison group and one study included an at-risk group for psychosis(Taylor et al.,

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2014). Although designed as an RCT, one study also included an investigation of duration of untreated psychosis (DUP) as a predictor of EWB (Browne et al., 2017b).

3.8 Methodological quality

In relation to minimum reporting standards, as displayed in Table 2, aims and primary outcomes were consistently specified. In three studies(Macdonald et al., 1998; Singer et al., 2014; Taylor et al., 2014), there was lack of clarity regarding informed consent, and in fivestudies ethics approval was not explicitly reported. Ethnicity and race were not reported in five studies (Ostergaard Christensen et al., 2014; Harder, 2006; Macdonald et al., 1998; McCay et al., 2007; Thorup et al., 2010), and we noted that in one study self-esteem and locus of control findings varied across racial groups, specifically black minority patients and controls had higher self-esteem than white British patients and controls (Ciufolini et al., 2015).

The study setting varied - eight studies recruited from specialist FEP programs, while the remainder recruited from adult mental health services, including inpatient and community-based services and one study also recruited from multiple sources. Although the severity of positive symptoms (10 studies) and negative symptoms (10 studies) was reported in the majority of studies, depressive symptoms were reported in a minority (seven studies), and physical health and related co-morbidity were not reported in any of the eligible studies.

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The reporting of participant numbers varied markedly across the 17 studies, with only a single study meeting all relevant criteria(Drake et al., 2014). In eight studies, the overall number of eligible participants was not reported(Harder, 2006; Lecomte et al., 2012; Lecomte et al., 2018; Lecomte et al., 2015; Macdonald et al., 1998; Singer et al., 2014; Taylor et al., 2014; Thorup et al., 2010).

The results from Downs and Black Checklist(Downs and Black, 1998), summarized in Table 3, highlight that patients who were lost to follow-up were only reported in four out of 17 studies (Drake et al., 2004; Jackson et al., 2009; Lecomte et al., 2015; McCay et al., 2007)and important adverse events were not detailed in any of the 17 studies.

Significant threats to external validity across the 17 studies were evident, with only three studies (Browne et al., 2017b; Drake et al., 2014; Singer et al., 2014) clearly reporting on whether participants were representative of the entire FEP population, and no study reported data to confirm that the participants who were prepared to participate were representative of the entire FEP population. The representativeness of facilities pertaining to recruitment was clearly reported in only four studies (Drake et al., 2014; Lecomte et al., 2015; Taylor et al., 2014; Thorup et al., 2010).

In relation to internal validity, it was not possible to attempt to blind participants to treatment allocation. However, it was notable that only six studies (Browne et al., 2018; Browne et al.,

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2017b; Ostergaard Christensen et al., 2014; Drake et al., 2014; Lecomte et al., 2015; Singer et al., 2014)provided clear evidence that an attempt was made to blind those assessing the outcomes. Few studies reported compliance with treatment (where applicable), with only four studies out of 12meeting this criterion(Ostergaard Christensen et al., 2014; Lecomte et al., 2012; Singer et al., 2014; Thorup et al., 2010). The majority (11 studies) appropriately managed the time period of assessments, used appropriate statistical tests (14 studies) and utilized valid and reliable outcome measures (nine studies). In terms of power analysis, less than half (seven studies) provided clear evidence for sufficient statistical power.

In relation to the six RCTs, figure 3 illustrates that over 80% of the studies(OstergaardChristensen et al., 2014; Drake et al., 2014; Jackson et al., 2009; McCay et al., 2007; Thorup et al., 2010) attained a low risk rating in relation to random sequence generation and half of the studies attained a low risk rating for blinding of outcome assessments. In the five other domains, the majority of studies attained either a high risk or unclear rating.

3.9 Effectiveness of interventions

As can be seen in Table 1, five of the six RCTs showed no significant treatment effects in relation to composite EWB (one study;Browne et al., 2017b) or self-esteem (four studies;Drake et al., 2014; Jackson et al., 2009; McCay et al., 2007; Thorup et al., 2010). In only one RCT, a significant effect for cognitive remediation (CR) combined with early

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interventions services compared with early intervention services alone in relation to self-esteem was reported at fourmonths follow-up with a moderate effect size(Ostergaard Christensen et al., 2014).

3.10 Meta-Analytic Results

Out of the six RCTs included in the review, five reported treatment effects on self-esteem as an outcome(Ostergaard Christensen et al., 2014; Drake et al., 2014; Jackson et al., 2009; McCay et al., 2007; Thorup et al., 2010).However, as data could not be retrieved for one study(Drake et al., 2014) our meta-analysis is based on four RCTs. A summary of effect sizes is shown in Figure 2. Themeta-analytic effect of treatment on self-esteem was not statistically significant (n=352, g=0.100, 95% CI −0.307to −0.508, p=.629). Significant heterogeneity was noted (Q=9.946; df=3; p=0.019;I^2=69.837; T^2=0.118; T=0.343). We performed sensitivity analyses to examine whether the treatment effect differed acrossstudies with longer follow-up (i.e., 6 and 12 months) (Ostergaard Christensen et al., 2014; Jackson et al., 2009). Similar to the main meta-analysis, the effect of the treatment conditions on self-esteem was not significant in the two studies with longer follow-up (n=352, g=0.015, 95% CI −0.273 to −0.304, p=.918), with no evidence of heterogeneity remaining (Q=5.113; df=3; p=0.164; I^2=41.330; T^2=0.035; T=0.188).

3.11 Publication bias

No publication bias was found for self-esteem (See Supplementary Material).

3.12 Case-controlled studies and prospective follow-up studies.

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Self-esteem was shown to be significantly lower in FEP participants compared with aged-matched healthy controls (Ciufolini et al., 2015) and compared with aged-matched controls with psychotic-like experiences (Taylor et al., 2014), but not significantly different from patients with at-risk mental state (Taylor et al., 2014). Singer and colleagues found evidence that both self-esteem and autonomy improved over time in FEP patients in the context of a small (*n*=10) pilot interventionof CBT for depression in early psychosis(Singer et al., 2014).

In relation to predictors of EWB from prospective follow-up studies, Browne and colleagues found that character strengths were significantly associated with overall psychological well-being with a small to moderate effect size (Browne et al., 2018).

The remaining effects were all in relation to self-esteem. Insight was significantly negatively associated with self-esteem in two studies (Browne et al., 2018; Drake et al., 2004). Therapeutic alliance in a group therapy context emerged as a correlate of self-esteem (i.e., improved therapeutic alliance was associated with higher self-esteem) from two studies (Lecomte et al., 2012; Lecomte et al., 2015). Other significant correlates of self-esteem included: positive and negative symptoms (negative) (Harder, 2006), overall symptoms (negative)(Lecomte et al., 2018), attitudes to medication(positive) (Drake et al., 2015)and social functioning (positive) (Harder, 2006).

4. Discussion

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The results of this first systematic review and meta-analysis of EWB in FEP highlight that few researchers have focused on the variables associated with thriving and growth in FEP that have been so widely studied in general populations. Further, those investigations that have occurred have been heavily weighted towards self-esteem rather than other elements of EWB. This line of enquiry hasresulted from strong interest in the role of self-esteem in the development of persecutory delusions in schizophrenia(Kesting & Lincoln, 2013).

Results from two studies indicated that self-esteem is poorer in FEP patients compared with healthy controls, and this reduction may precede the initial onset of psychosis, consistent with what is known about the presence of psychosocial functioning in patients at ultra-high risk for psychosis (Addington et al., 2008). There was also evidence from one study that positive self-image was related to better social functioning (Harder, 2006).Encouragingly, self-esteem among people with FEP may improve over time, along with autonomy(Singer et al., 2014).However, apart from one promising finding in relation to CRT combined with early intervention (Ostergaard Christensen, 2014), findings from the current meta-analysis indicate a lack of evidence for the effectiveness of interventions in FEP for increasing self-esteem. The CRT finding could be accounted for the effect of supported practice,which improved perceived competency and reduced defeatist beliefs.

Self-esteem, in turn, may be predicted by the severity of mental health symptoms, consistent with its improvement early in the course of illness.Importantly, our review identified insight

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as a potential predictor of self-esteemover time (i.e. greater insight was associated with higher self-esteem across time) (Drake et al., 2015), highlighting the value ofpsychoeducation in FEP (McGorry, 1995). Interestingly, therapeutic alliance also emerged as a potential predictor of higher self-esteem consistent with the SDT proposition that practitioner autonomy and relatedness, which are robust predictor of therapeutic alliance, are associated with enhancement of self-concept (e.g., Zuroff et al., 2007, 2012).However, thesepreliminary conclusions are limited by the inability to perform meta-analyses on these specific relationships.

We were surprised to find how few evaluations of interventions for composite EWB have been undertaken and that purpose in life, meaning, social connectedness, and autonomy have largely been ignored as targets of intervention. The RAISE study was an important recent exception (Browne et al., 2017a). Overall, there is no evidence of effective interventions for EWB.

In relation to composite EWB, character strengths emerged as a potential predictor of EWB, suggesting that identification of personal strengths could be a meaningful target for interventions(Browne et al., 2018). Our recent pilot study, which showed significant improvements at 3 months follow-up on the SPWB in young psychosis patients after engagement in a pilot digital intervention that targeted loneliness using personal strengths, further highlights the potential of this line of research (Lim et al., 2019). It was also notable

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that there were no eligible studies that assessed EWB based on the SDT framework. Onlyone FEP study has assessed satisfaction of the three fundamental needs theorized in SDT, however thisstudy did not meet our specific criteria for FEP (Breitborde et al., 2012), as well as treatment studies focused on psychosocial adjustment (e.g., Jochems et al., 2017). We note with interest that there has been some recent attention to the targeting of motivation in schizophrenia (Favrod et al., 2019). We also note recent additional evidence showing that intrinsic motivation may be higher in FEP compared with more chronic psychosis and that intrinsic motivation predicted social functioning (Luther et al., 2015).

4.1 Implications

At this stage, we conclude that it is premature to propose a definitive theoretical model based upon these findings.In fact, the review suggests that many of the variables associated with EWB have been neglected in FEP research. However, given the evidence that EWB is impaired in FEP and that it may be impaired prior to onset, the hypothesis that lowered EWB is a risk factor for onset of FEP warrants further investigation. The potential for direct and indirect pathways between EWB and deficits in social participation should be investigated alongside the established predictors of social functioning. In addition, EWB is an important therapeutic target requiring further research attention.

4.2 Strengths and limitations

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Our review was comprehensive in entailing multiple study designs. Given this was the first review of EWB in FEP, our scope was deliberately wide, and we included studies that incorporated measures of individual components of EWB.We found statistically significant heterogeneity in our results, a common limitation in meta-analyses (Concato& Horwitz, 2019).However, to mitigate heterogeneity, we performed sensitivity analyses, which removed heterogeneity, supporting the statement that heterogeneity may be accounted for by varied timepoints. Given the growing research interest in subjective psychological phenomena (Gardner et al., 2019) and the recent call for greater consideration of existential needs of patients (van Os et al., 2019) we expect that EWB research will increase significantly.

4.3 Further directions

Our review highlights threats to both the external and internal validity of research on EWB in FEP. This is perhaps not surprising given that several of the eligible studies involved secondary analyses of data which implies that studies purposefully designed to examine predictors of EWB and its associations to psychosocial functioning are needed.

Results from the current review suggest that deficits in psychological well-being are present prior to the onset of FEP and may therefore be implicated in the aetiology, however, changes in the earlier stages of illness including in the population at ultra-high risk for psychosis need to be investigated prospectively (Yung et al., 2005).

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In terms of predictors, it was surprising that no studies included an examination of the association between physical health and EWB in FEP despite the significant known problems in physical health in FEP (Hetrick et al., 2010). Furthermore, there is a need for additional studies that directly examine the link between cognition and EWB, and the links between EWB and social participation.

Finally, we note with great interest that others have recently called for a major re-orientation of mental health services such that patient existential needs, including purpose, meaning and connectedness, are placed at the center of their mission (van Os et al., 2019). Similarly, there are continued calls for psychological well-being to gain more attention as a key transdiagnostic outcome (Fava & Guidi, 2020). Whilst EWB offers a scientific framework for such an important project, more research is required to understand the course of psychological well-being in FEP and to identify effective interventions to facilitate its attainment for young people on the cusp of adulthood.

Contributors

JG, MA-J and DE conceived the study. JG drafted the protocol and DE, PK, BB, DP, ML, RR and MA-J reviewed the draft and contributed to the final protocol. JG and DE conducted the literature searches and data extraction. OS-E conducted the meta-analysis. JG wrote the first draft of the manuscript and DE, OS-E, PK, BB, DP, ML, RR, and MA-J reviewed and contributed to the final version of the manuscript.

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Conflict of interest statement

Olga Santesteban-Echarri has received advisory board honoraria from the Alicia Koplowitz Foundation. John Gleeson, Dina Eleftheriadis, Peter Koval, David L. Penn, Richard Ryan and Mario Alvarez-Jimenez do not have competing interests.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Table 1. Sample Characteristics and Study Outcomes for RCTs, Prospective Follow-up Studies and Case Controlled Studies

Author (year)/ Location/ Design & Duration	Study Aims	Sample N/ Inclusion and Exclusion Criteria	Demographics Age/ Gender/DUP	Eudaimonic Well-Being Measures & Predictors	Outcome & Effect Sizes
		RCTs			
Browne et al., 2017/ USA/ Cluster RCT 35 sites/ Randomized to Community Care (CC) or NAVIGATE/ 2 years outcome.	Examine impact of treatment on PWB; examine impact of DUP, and to examine the relationships among PWB, mental health recovery, and quality of life.	N = 404; CC= 181; NAVIGATE = 223/ Inclusion: age 15–40 years; schizophrenia, schizoaffective disorder, schizophreniform disorder, psychotic disorder NOS, brief psychotic disorder (DSM-IV). Exclusion: >1 psychotic episode; bipolar disorder, psychotic depression, substance-induced psychotic disorder, or psychotic disorder due to general medical condition; neurologic disorders. ≤ 6 months of antipsychotics.	Age mean: CC = 23.1(4.9); NAVIGATE = 23.2(5.2)/ Gender: CC = 120 male (66%); Navigate = 173 male (78%); DUP: CC = 211.4 (277.5) weeks; NAVIGATE = 178.9 (248.7) weeks.	EWB: PWB Predictor: DUP	No significant treatment effect in relation to SPWB (-β = 0.0165 group by time); Environmental mastery (β = -0.0002; $p < 0.05$) and Positive relationships (β = -0.0012, $p < 0.01$) predicted by DUP. All other subscales non-significant.
Drake et al., 2014/ UK/ RCT from SOCRATES study/ Baseline, 12 and 42 weeks follow-up.	Hypothesis: that Preceding CBTp with CR would allow CBTp to reduce delusions and hallucinations further and earlier.	N = 61/ (30 controls co for CR)/ Inclusion: age 18–35 years; first episode DSM-IV schizophreniform schizophrenia, schizoaffective disorder or delusional disorder, Exclusion: ICD-10 organic brain disease; DSM-IV substance abuse or dependence; primary diagnosis substance-induced psychosis;and insufficient fluency in English.	Age 24.7(5.2) CR; 23.4(4.4) controls/ Gender: 21 (68%) male CR; 16(53%) male controls/ DUP not reported	EWB: self-esteem (Rosenberg self-esteem scale)	No significant effect of CR on self-esteem.

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Jackson et al., 2009/ UK/ RCT - Cognitive therapy based recovery intervention (CRI) plus TAU or TAU alone/ 6 months.	The primary aim of the intervention was the reduction of trauma symptoms and depression; secondly, improvements in self-esteem in the CRI group were also predicted.	N = 76 (36 CRI, 30 controls)/ Inclusion: first episode of psychosis within the previous 6–18 months; aged between 16-35 years. Patients exclude if they could not speak English or were unable to give informed consent	Age: TAU mean = 22.3 (4.4); CRI mean = 24.1 (4.7)/ TAU male = 18, female = 12 Cognitive therapy male = 31, female = 5/ DUP: CRI mean = 17.4 (25.9) weeks; TAU mean 23.7(58.4)	EWB: self-esteem (Robson SEQ)	No significant group effects. There was a significant effect for time with an average 7-point increase on Robson SEQ (p = 0.002).
McCay et al., 2007/ Canada/ RCT/ 12 weeks.	To test the efficacy of a group intervention for young adults recovering from first-episode schizophrenia. Reports on end of treatment.	N = 67/ Inclusion: DSM IV Schizophrenia, schizophreniform, Schizoaffective Disorder; no previous admissions, ≤ 8 weeks antipsychotic meds; ≤ 2 years of initial treatment; aged 18-35; years, competence in English;. Exclusion: drug-related psychosis; significant medical illness and or organic brain syndrome.	Age: Treatment group 25.07 years (4.86); Control Group 26.17 (7.03)/ Treatment Group: male 69%; Control: 77.8%/ DUP not reported.	EWB: self-esteem (Tennessee self-concept scale Rosenberg Self-esteem scale) Self-efficacy (Self-efficacy scale).	No significant differences between groups. Effect sizes not reported.
Ostergaard Christensen, 2014/ Denmark/ RCT/ Post-treatment and 12 months follow-up	Assess effects of 16-week Cognitive Remediation programme combined with early intervention services compared with early intervention alone	N = 60 (neurocom); N = 57 (control group)/ FE schizophrenia ICD10 F2 spectrum, a stable post-acute phase of illness for at least 1 month, sufficient comprehension of Danish and written informed consent. Exclusion criteria: rejection of participation, organic disorder or substance dependence.	Age: Neurocomm mean 25 (3.3); Control mean 24.9 (3.7)/ Gender: Neurocomm 35 male (58.3%); control 28 male (49.1%)/ DUP not reported.	EWB – self-esteem (Rosenberg self-esteem scale)	Self-esteem: At 4 months intervention group higher, p< 0.05 Cohen's d = 0.54; 12 months, Cohen's d = 0.08 NS.

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Thorup et al., 2010/ Denmark/ RCT from OPUS study compared standard treatment to intensive psychosocial treatment in first-episode psychosis/ 2-year outcomes.	Aims to evaluate the effects of integrated treatment for patients with a first episode of psychotic illness.	N = 280/ Inclusion: aged 18-45; ICD-10 diagnoses of schizophrenia, acute psychoses, schizotypal disorder, schizoaffective disorder, delusional disorder; competent in Danish, ≤ 12 weeks of antipsychotic meds, psychiatric symptoms not due to organic condition.	TAU group median = 45.4 weeks (mean 144.1)/ TAU proportion male = 67.9% OPUS intervention proportion male = 60.0%/ DUP = OPUS group median = 34.9 weeks (mean 107.0).	EWB: self-esteem (Rosenberg self-esteem scale).	No significant group effects.
Prospective Follow-Up Studies					
Browne et al. 2018/ USA/ Prospective follow-up observational study/ Baseline 3, 6, 12, 18 and 24 months assessments	Examine exploratory associations between character strengths and changes in symptomatic and recovery outcomes after 6 months of treatment.	N = 104/ single episode non-affective psychosis	Age mean: 23.6years (5.4)/ Gender: 81/105 male (77%) / DUP = 161.5 (239.3)weeks.	EWB: 1. SPWB (18 items) (RYFF); and 2. Heinrich QLS interpersonal relations subscale Predictors: 24 item Brief Strengths Test.	SPWB: Overall model including 6 virtues $R^2 = .290$, $p < .001$ QLS Interpersonal relations: Overall mode including 6 virtues $R^2 = .367$, $p < .001$
Drake et al., 2015/UK/ Prospective longitudinal design/ 6 weeks, 3 months and 18 months. Data from SOCRATES trial.	Examines how far and how quickly key processes related to nonadherence interact and change in an acutely presenting first episode cohort followed over the medium term.	N = 101 CBTp, 106 supportive counselling, 102 TaU/ Inclusion: ≤2 years since 1st admission; DSM-IV schizophrenia, schizophreniform, schizoaffective, delusional disorder, psychosis NOS; neither substance misuse nor organic disorder.	Age 26.9 at follow-up and 25.5 for those who dropped out./ Gender: 127 (68%) male and follow up; 56 (71%) male for drop outs/ DUP: Not reported.	EWB: self-esteem (Rosenberg self-esteem scale) Predictors: Insight (Birchwood Insight Scale); Attitudes to medication (Drug Attitudes Inventory).	Insight predicted higher self-esteem over time. Need for treatment predicted self-esteem over time. Effect sizes and *p* values not reported.

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Drake et al., 2004/ UK/ Prospective follow-up study/ Baseline, 6 week, 12 weeks and 18-month assessments. Data from SOCRATES trial.	Tested the hypotheses that the relationship between increased insight and increased depression is entirely mediated by reduced self-esteem.	N = 257/ Inclusion: (i) 1st admission; (ii) DSM-IV schizophreniform, schizophrenia, schizoaffective, delusional disorder or psychosis NOS; (iii) ≥ 4 weeks of positive symptoms; and (iv) substance abuse not major cause of the psychosis. No exclusion criteria.	Mean Age: 26.9 at follow-up and 25.5 for those who dropped out/ Gender: 127 (68%) male and follow up; 56 (71%) male for drop outs./ DUP: Not reported.	EWB: self-esteem (Rosenberg self-esteem scale). Predictors: Insight (Birchwood Insight Scale); Depression (derived from four items on the PANNS: anxiety, depression, guilt and avolition).	Insight predicted self-esteem over time (β = 0.37). Depression positively correlated with self-esteem (ES not reported). Paranoia negatively correlated with self-esteem (ES not reported).
Harder, 2006/ Denmark/ Prospective comparative longitudinal treatment study /1 year follow-up.	Aimed at contributing to the empirical exploration of possible defensive processes behind a positive self-image in psychosis.	N = 97/ Inclusion: 16-35 years, ICD 10 first episode schizophrenia spectrum disorder. Exclusion: mental retardation, organic brain damage, or not sufficient Danish speakers.	Mean age 25 (4.4)/ Gender:60 men, 37 women/ DUP: not reported.	EWB = self-image (Self-image best state; Self-image worst state). Predictors: negative and positive symptoms; social functioning.	Change in positive symptoms (β = -0.0021), change in negative symptoms (β = -0.0029), and change in social functioning (β = 0.0015) significantly predicted self-image at best. Change in positive symptoms (β = 0.0011) significantly predicted self-image at worst.

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Lecomte et al., 2012/ Canada/ Data from RCT: group CBT for psychosis versus group skills training (SM) for symptom management versus wait-list control/ 3-month follow-up.	To determine the predictive value of clients' and therapists' alliance on attendance and participation in groups, and on symptoms, insight, and self-esteem.	N = 74 SM; 65 CBT; 83 for controls/ Inclusion: <2 years since initial consultation for psychotic episode, 18-35 years, fluent in English or French. Exclusion: organic disorder or mental retardation.	Age mean 25 (4.8);/ 22/36 (61%) male/ DUP Not reported.	EWB = self-esteem (Self-esteem rating scale (SERS)); Predictors = Therapeutic alliance (WAI) measured monthly.	Therapeutic alliance significantly predicted self-esteem ($R^2 = 0.16$, $p < 0.005$)
Lecomte et al., 2015/ Canada/ Uncontrolled longitudinal study/ 6 months follow-up.	To investigate variables in clinical improvements in GCBTp for early psychosis.	N = 66/ Inclusion: persistent or sporadic psychotic symptoms, receiving first-episode outpatient programme, fluent in French. Exclusion: not specified.	Age on average 26 (6.0)/ mostly male (70%)/ DUP not reported.	EWB = self-esteem (Self-esteem rating scale (SERS)); Predictors = Working alliance (The brief version of the WAI; and the Cohesion Questionnaire).	SD on cohesion – more stability in cohesion predicted more improvements in positive self-esteem. $b = 59.5$, $t(9) = 3.15$, $p < .05$.
Lecomte, 2018/ Canada/ Uncontrolled longitudinal study recruiting from a convenience sample/ 24 sessions over 3 months.	To determine temporal links between self-esteem, overall symptoms, and group cohesion in people with psychosis receiving 24 sessions of GCBTp.	N = 66/ Inclusion: persistent or sporadic psychotic symptoms, receiving FEP outpatient programme, fluent in French or English.	Age: mean 26 years (6), mostly male (70%)/ DUP= Not reported	EWB = self-esteem (Items on Quick LL – self report questionnaire) Predictors = symptoms from previous sessions; group cohesion from previous sessions (Items on Quick LL).	Symptoms predicted self-esteem ($\beta = 0.413$, $p = .0002$); Group cohesion from previous session ($\beta = 0.195$, $p < .0001$) and 2 sessions prior ($\beta = 0.146$, $p = .0007$) predicted self-esteem.
Singer et al., 2014/ Canada/ Pre-post single group pilot study/	Aimed to: develop a guide for CBT in early psychosis patients with depression; to evaluate the major clinical	N = 10/ Inclusion: aged ≥18; completed ≥ 3 months and < 2 years of treatment; DSM-IV psychotic	Age: Range 19-57 years (mean not reported)/ Gender: 7 males, 3 females/ DUP: Not reported	EWB = self-esteem (Coopersmith Self-Esteem Inventory); Autonomy	Self-esteem: significant improvement over time $p < 0.05$;

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Duration of follow-up not reported.	outcomes in the treatment of depression; and examine the feasibility of CBT.	disorder; > 6 on Calgary Depression Scale; antipsychotic meds for ≥ 3 months. Exclusion: inability to communicate; DSM-IV-TR substance abuse, dependence.		(Dysfunctional Attitudes Scale (DAS)).	Autonomy significantly improvement over time (p<0.05).
Case Controlled Studies					
Ciufolini et al., 2015/ UK/ Data from the AESOP study –Cross sectional case control study comparing FEP patients and controls matched by location.	Impact of self-esteem and sense of being in control of one's own behaviours on early clinical presentation and pathways to care in a large epidemiological sample with FEP and in a population based comparison group with focus on variations by ethnic group.	N= 598; Cases N = 241, controls N = 341/ Inclusion: 16-65 years; 1st episode of psychosis (F10-F29 and F30- F33 in ICD-10); no previous contact with health services for psychosis. Exclusion: organic psychosis; transient psychotic symptoms and c) IQ < 50.	Age: Cases 16-29 years; 135 (53%) 30-65 121 (47%); Controls: 16-29 years 103 (30%); 30-65 year 238 (70%) / Gender: Cases: 122 (48%) female; controls 137 (60%) female.	EWB = self-esteem (Rosenberg self-esteem scale LoC (Rotter Interval versus External Control of reinforcement scale) Predictor = clinical v control).	Self-esteem lower in FEP group p< .001 Higher external LOC in FEP group p< .01
MacDonald et al., 1998/ Australia/ Cross sectional case controlled study. Early psychosis matched on age and gender with a non-clinical group.	Identify how people with early psychosis cope with stressful situations and identify what factors influence use of coping strategies.	N = 57 (34 clinical, 23 non-clinical)/ Inclusion: outpatients with first episode or multi-episode psychosis. Exclusion: not reported. Controls: excluded if treated for psychosis.	Age Clinical group: Mean 22.9 (3.6); Controls group: Mean 23.3 (4.5)/ Clinical group 39 men and 11 women; Control group 18 mean and 5 women/ DUP: Not reported	EWB: self-efficacy (stress and coping rating (CISCR))	No significant differences between groups
Taylor et al., 2014/ UK/ Cross sectional Observational case-controlled study across four group. Data from	Examine and compare core schemas and psychotic symptoms in individuals in four groups: FEP, ARMS, help-seeking clinical group	N = 20 FEP; 113 ARMS; 28 HSC; 30 NH. Inclusion: FEP > ARMS threshold on CAARMS, no prior history of psychosis.	Age: FEP group 22.4 (5.4); ARMS 20.4 (4.3); HSC 21.3 (3.4); NH 22.8 (3.7)/ % female FEP group 26.3; ARMS 40.7; HSC 17.9; NH	EWB = negative self-belief; positive self-belief (Brief Core Schema).	FEP significantly higher than NH on negative self, p = .005, r =.495. No other comparisons

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the EDIE-2 trial.	non- ARMS (HSC) and a non-help-seeking (NH) group who endorse some psychotic-like experiences.	73.3/ DUP: Not reported.	significant.

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Table 2. Reporting Against Minimum Standards, Characteristics and Study Numbers

Study	Browne et al., 2017	Drake et al., 2014	Jackson et al., 2009	McCay et al., 2007	Ostergaard Christensen, 2014	Thorup et al., 2010	Browne et al. 2018	Drake et al., 2015	Drake et al., 2004	Harder, 2006	Lecomte et al., 2012	Lecomte et al., 2015	Lecomte , 2018	Singer et al., 2014	Ciufolini et al., 2015	MacDonald et al., 1998	Taylor et al., 2014
	Randomized Controlled Trials							**Prospective Follow-Up Studies**								**Case Controlled Studies**	
Minimum Standards																	
1. Aims specified	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Primary outcomes specified	✓	✓	✓	M✓	✓	M✓	M✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Study design	RCT	RCT	RCT	RCT	RCT	RCT	UPFU	UPFU	UPFU	UPFU	UPFU	UPFU	UPFU	PPPS	CCC	CCC	CCC
4. Number of arms/groups	2	2	2	2	2	2	1	1	1	1	2	1	1	1	2	2	4
5. Funding source specified	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓
6. Informed consent obtained	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	?	?
7. Ethical approval	✓	✓	✓	✓	?	✓	✓	?	?	✓	✓	✓	✓	?	✓	?	✓
Additional Study Characteristics Reported																	
8. Setting	CC	FEPP	CMH	FEPP	FEPP	IPUOP	CC	IPUOP	IPUOP	IPUCMH	FEPP	FEPP	FEPP	FEPP	MHS	FEPP	M
9. Methods of recruitment	IPUOP	SFEPP	RAs	×	SFEPP	M	SA	SA	SA	SA	SFEPP	SFEPP	SFEPP	SFEPP	RAs	×	M
Additional Participant Characteristics Reported																	
10. Ethnicity and race described	✓	✓	✓	×	×	×	✓	✓	✓	×	✓	✓	✓	✓	✓	×	✓
11. Rate of remission	×	×	×	×	✓	×	×	NA	NA	×	×	NA	NA	×	NA	×	×
12. Rate of treatment response	×	×	×	×	✓	×	×	NA	NA	×	×	NA	NA	×	NA	×	×
13. Severity of positive symptoms	✓	×	✓	×	✓	✓	✓	✓	P	×	✓	✓	×	✓	×	×	✓
14. Severity of negative symptoms	✓	×	✓	×	✓	✓	✓	✓	✓	×	✓	✓	×	✓	×	×	×
15. Severity of depressive symptoms	✓	✓	✓	×	×	✓	✓	×	×	×	×	✓	×	✓	×	×	×
16. Physical health/comorbidity	×	×	×	×	×	P	×	×	×	×	×	✓	×	×	×	×	×
Reporting of Study Numbers																	

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17.	Numbers eligible for inclusion	✓	✓	✓	✓	✓	×	✓	✓	✓	×	×	×	×	×	✓	×	×
18.	Numbers excluded	✓	✓	✓	×	✓	×	✓	✓	×	×	×	×	×	×	×	×	×
19.	Refused to take part	✓	✓	✓	✓	×	×	NA	✓	✓	×	×	×	×	×	✓	×	×
20.	Numbers withdrawn	×	✓	×	×	×	×	NA	×	×	×	×	×	×	×	NA	NA	NA
21.	Numbers lost to follow-up	✓	✓	✓	✓	✓	✓	×	✓	✓	×	✓	×	✓	✓	NA	NA	NA

Notes.✓ = Reported; × = Not reported; ? = unclear CC = Community Clinics; CCC = Cross Sectional Case Controlled Study;CMH = Community Mental Health;FEPP = First Episode Psychosis Program;IPU = Inpatient Psychiatric Unit;M = multiple;MHS = Mental Health Service;NA = Not Applicable;OP = outpatient services; P = Partially;PPPS = Pre-Post Pilot Study;RAs = Research Assistants; RCT = Randomized Control Study; SA = Secondary Analysis;SFEPP = via staff from First Episode Psychosis Program;UPFU = Uncontrolled Prospective Follow-Up Study.

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Table 3. Down and Black Checklist

Study	Browne et al., 2017	Drake et al., 2014	Jackson et al., 2009	McCay et al., 2007	Ostergaard Christensen, 2014	Thorup et al., 2010	Browne et al. 2018	Drake et al., 2015	Drake et al., 2004	Harder, 2006	Lecomte et al., 2012	Lecomte et al., 2015	Lecomte, 2018	Singer et al., 2014	Ciufolini et al., 2015	MacDonald et al., 1998	Taylor et al., 2014
Down & Black Items	**Randomized Controlled Trials**								**Prospective Follow-Up Studies**							**Case Controlled Studies**	
Reporting																	
1. Hypotheses clearly described	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓
2. Main outcomes clearly described	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Characteristics of the patients included clearly described?	✓	×	✓	×	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓
4. Interventions of interest clearly described?	✓	✓	✓	×	✓	✓	NA	✓	NA	✓	✓	✓	✓	✓	NA	NA	×
5. Distributions of principal confounders in each group of subjects to be compared clearly described	P	P	✓	P	×	✓	P	NA	P	P	×	NA	P	×	✓	✓	✓
6. Main findings of each study clearly described	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓
7. Study provides estimates of the random variability in the data for the main outcomes	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓
8. Important adverse events that may be a consequence of the intervention been reported	×	×	×	×	×	×	NA	NA	NA	×	×	×	NA	×	NA	NA	NA
9. Characteristics of patients lost to follow up been described	×	×	✓	✓	×	×	×	×	✓	×	×	✓	×	×	×	NA	NA

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10. Actual probability values been reported for the main outcomes	×	×	✓	✓	×	✓	×	✓	×	✓	×	×	✓	✓	×	×	✓
External validity																		
11. Subjects asked to participate in the study representative of the entire population from which they were recruited	✓	✓	?	?	?	?	×	?	?	?	?	×	?	✓	?	?	×
12. Subjects representative of the entire population from which they were recruited	×	?	×	?	?	?	×	?	?	×	?	×	?	?	?	?	?
13. Staff, places and facilities representative of the treatment the majority of patients receive	×	✓	?	?	?	✓	×	?	?	?	?	✓	?	×	?	×	✓
Internal validity - bias																		
14. Attempt made to blind study subjects to the intervention	×	NA	×	×	×	×	×	NA	NA	×	×	NA	NA	×	NA	NA	NA
15. Attempt made to blind those measuring the main outcomes of the intervention	✓	✓	×	?	✓	×	✓	NA	NA	×	?	✓	NA	✓	NA	NA	×
16. If any of the results of the study were based on “data dredging”, was this made clear	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	?	×	✓	?	?
17. Do the analyses adjust for different lengths of follow-up of patients, or in case-control studies, is the time period between the intervention and outcome the same for cases and controls	✓	✓	✓	✓	✓	✓	✓	?	?	×	×	✓	✓	×	NA	✓	✓
18. Statistical tests used to assess the main outcomes appropriate	✓	✓	✓	×	✓	✓	✓	✓	✓	×	×	✓	✓	✓	X	✓	✓
19. Compliance with the intervention/s reliable	?	?	×	?	✓	✓	?	NA	NA	?	✓	?	×	✓	NA	NA	NA
20. Main outcome measures used accurate (valid and reliable)	×	?	✓	✓	?	✓	?	✓	✓	?	✓	?	✓	✓	?	?	✓
Internal validity - confounding																		

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21.	Patients in different intervention groups (trials and cohort studies) or the cases and controls (case-control studies) recruited from the same population	✓	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	✓	✓	✓	✓	×	×
22.	Patients in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited over the same period of time	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	?	×
23.	Subjects randomised to intervention groups	×	✓	✓	✓	✓	✓	×	✓	✓	×	✓	NA	NA	×	×	NA	NA
24.	Randomised intervention assignment concealed from both patients and health care staff	×	×	✓	×	×	✓	NA	✓	×	×	×	NA	NA	NA	NA	NA	NA
25.	Adequate adjustment for confounding in the analyses from which the main findings were drawn	×	✓	✓	✓	?	✓	✓	×	×	×	×	✓	×	×	?	×	×
26.	Losses of patients to follow-up taken into account	?	✓	✓	×	✓	✓	×	✓	✓	✓	?	✓	✓	✓	?	NA	NA
Power																		
27.	Sufficient power to detect a clinically important effect	?	✓	✓	?	✓	×	?	✓	×	?	?	✓	✓	×	✓	?	?

Notes.✓ = Reported; × = Not reported; NA = Not applicable; P = Partially

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Figure Legends

Figure 1. *PRISMA Flow Diagram.*

Figure 2. *Meta-analysis outcomes for treatment studies in relation to self-esteem.*

Figure 3. *Results of Risk of Bias Assessment for RCTs*

Please see separate files for Figure 1, Figure 2, and Figure 3.

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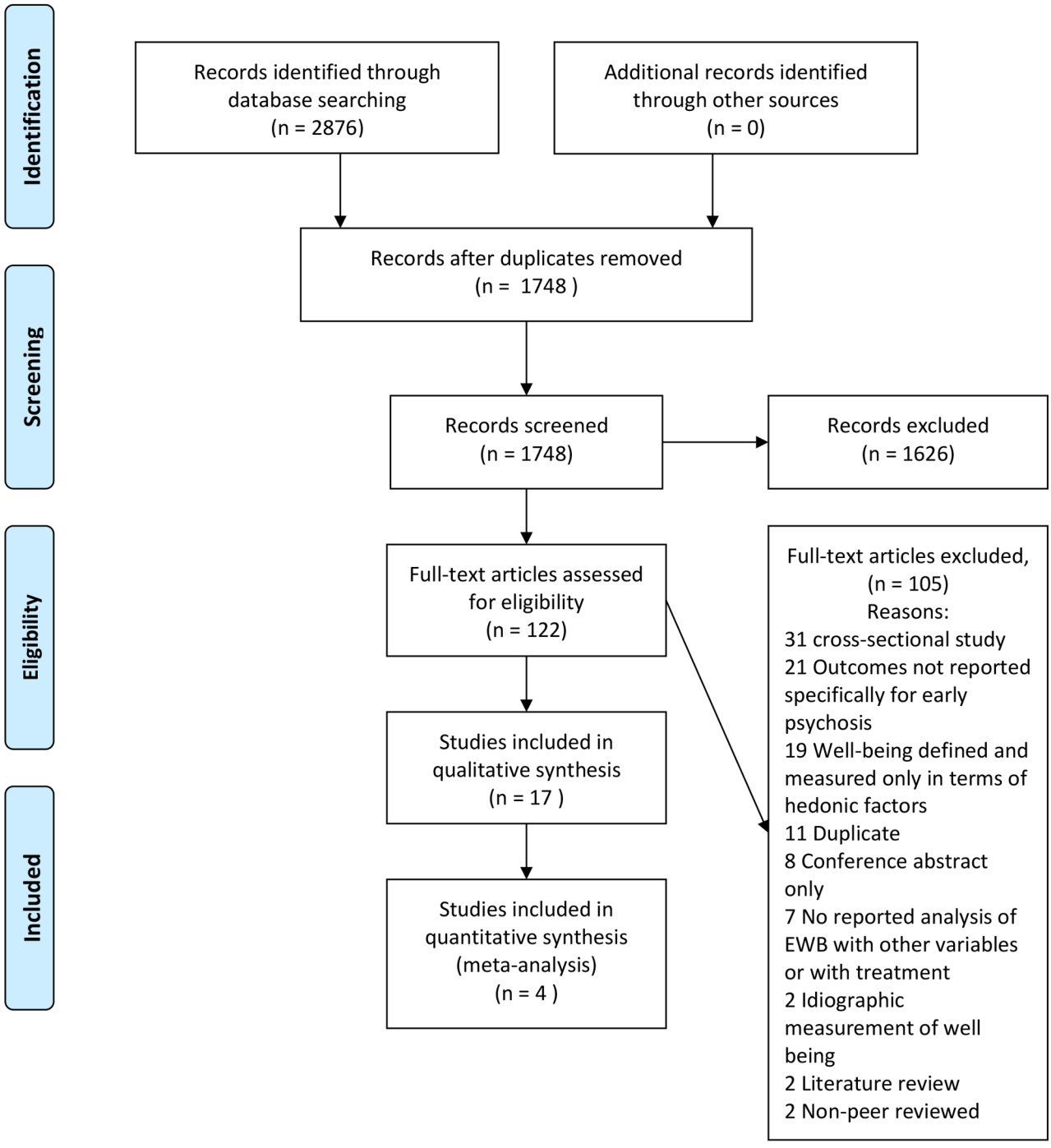

Figure 1. *PRIMSA Flow Diagram.*

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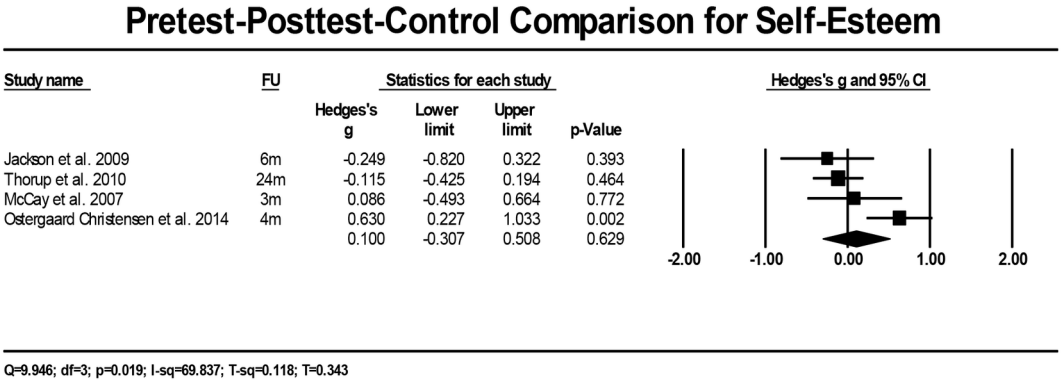
Figure 2. Meta-analysis outcomes for treatment studies in relation self-esteem



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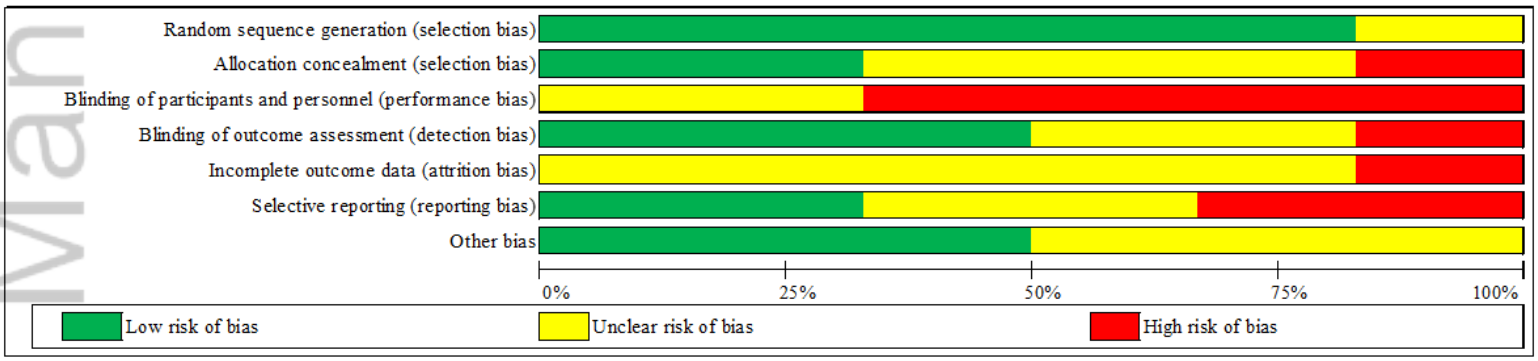

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