The Impact of Psychological Interventions on Functioning in the Context of Borderline Personality Disorder Features for Adolescents and Young Adults; a Systematic Review and Meta Analysis

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Abstract

Background

Adolescents recruited from clinical samples with borderline personality disorder (BPD) experience high levels of functional impairment in numerous domains. Evidence suggests that the presence of borderline personality features before adulthood predict long term functional impairment and can worsen into adulthood. However, the method of assessment and the impact of intervention on functioning remains unclear.

Methods

This study conducted a systematic review and meta-analysis of randomized controlled trials (RCTs) to assess the impact of psychological intervention on functioning in adolescents and young adults with BPD features. Four databases were reviewed (PsycINFO, Medline, Embase, and CINAHL).

Results

Out of 1859 papers, seven trials (657 participants) met eligibility criteria. Overall, psychological intervention significantly improved functioning at post-treatment and final follow-up. However, when comparing “BPD-specific” interventions with generalist treatment as usual (TAU) at post-treatment, effect sizes were small (overall ES $g = 0.08$, 95% CI = -0.10–0.25), and marginally improved at final follow-up (overall ES $g = 0.16$, 95% CI = -0.13–0.46). However, the trials raised some concerns about the risk of bias, with one showing a high risk.

Conclusions

Based on the synthesis of findings, both interventions showed similar effects on functional impairment. The findings have implications for service design and addressing the needs of an often-underrepresented patient population. This study emphasizes a need for more high-quality trials with larger sample sizes to strengthen the evidence base further.

Introduction

Borderline Personality Disorder (BPD) is a complex mental health condition marked by instability in interpersonal relationships, self-image, affect, and impulsivity (American Psychiatric Association, 2013), and is often associated with elevated suicide rates, severe functional impairment, extensive treatment utilization, and significant societal costs (Leichsenring et al., 2011).

Over the past two decades, an increasing evidence base has established that BPD in adolescence is both a valid and reliable diagnosis, distinguishable from typical adolescent development (Chanen et al., 2022; Hutsebaut et al., 2023). Empirical evidence supports the notion that both adolescent and adult BPD exhibit high comorbidity and a similar aetiological picture, incorporating genetic factors, maladaptive attachment patterns, and experiences of trauma (Winsper et al., 2018; Bozatello et al., 2021).

In adolescents, research suggests that BPD has an estimated prevalence of between 1–3% in the community, increasing to 11–22% in outpatients, and 33–49% in inpatients (Chanen et al., 2017; Guilé et al., 2018). Despite these findings, there has been a reluctance to diagnose BPD in young people. Griffiths (2011) reported that in a sample of psychiatrists in the United Kingdom, the majority felt that adolescent BPD diagnosis was inappropriate, invalid, or harmful. However, reluctance to recognize BPD in adolescence can lead to prolonged distress, iatrogenic complications, and negative encounters with healthcare services (Bateman & Fonagy, 2015; Laurenszen et al., 2013).

Similar to adult populations, adolescents with BPD commonly experience significant functional impairment, (Chanen et al., 2008). Long-term follow-up studies have consistently shown that adolescent BPD is associated with diminished life satisfaction, limited social support, and challenges across multiple functional domains, including relationships, academic performance, and occupational attainment (Winograd et al., 2008). Functional impairment has been observed across a broad range of symptomatic presentations in adolescent BPD, and evidence has shown that even the presence of one BPD feature can impact functional outcomes (Kaess Fischer-Waldschmidt, Resch, & Koenig., 2017; Thompson et al., 2018). Furthermore, evidence indicates that if left untreated, functioning can worsen as young individuals transition into adulthood and beyond (Wertz et al., 2020).

Frias et al. (2017) compared younger and older participants with BPD and found that functional deficits were more severe in the older group. The authors proposed that the increased severity of functional deficits in older age are likely driven by the cumulative impact of challenging life events, resulting in the avoidance of new vocational and relational opportunities. Consequently, maladaptive patterns persist, exerting a detrimental effect on mood and overall functioning. As such, Hutsebaut et al. (2020) propose that when considering outcomes, the recovery of social and vocational domains should be prioritized, as they carry greater significance in treatment success compared to the resolution of BPD features. The prioritization of symptomatic recovery over holistic models has been noted, where service users have expressed concerns about psychotherapies for BPD disproportionately focusing on self-harm symptoms (Katsakou et al., 2012).

Furthermore, extensive epidemiological data highlight that while symptomatic improvement is a component of BPD management, functional impairment often endures over time. This emphasizes the significance of considering a more comprehensive approach to recovery, one that extends beyond symptomatic remission (Gunderson et al., 2011; Zanarini et al., 2012). An increasing number of randomized controlled trials (RCTs) have evaluated the impact of psychological therapies on BPD features (Jørgensen et al., 2021). However, recovery, including functional abilities, is seldom described, and
insufficiently prioritized in assessment, treatment, and research (Ng et al., 2016; Skodol, 2018). While clinical symptom remission is a critical treatment goal, there is now widespread interest in addressing the functional challenges inherent to adolescents and young adults that experience BPD features at subthreshold and threshold levels (Chanen et al., 2020). Adequate support around functioning should be a critical treatment target, particularly in adolescence and young adulthood, as Zanarini et al. (2018) found that ‘excellent recovery’ for BPD later in life was predicted by good vocational engagement, amongst other variables such as number of friends, suggesting key treatment targets for this group. Considering this, adequate support around functioning should be a critical treatment target in adolescence and young adulthood.

Previous reviews by Wong et al. (2020) and Jorgensen et al. (2021) analyzed the impact of psychological therapies on BPD symptoms in children and adolescents. Although both meta-analyses reviewed functioning, further descriptive evaluations of functional outcomes, and an expanded inclusion of young adults would better reveal how targeted interventions effect various functional outcomes within a broader developmental period of early-intervention and prevention. This is particularly important as BPD typically emerges and has its peak incidence between puberty and early adulthood (Chanen et al., 2022), and is associated with long term adverse outcomes on social, health and economic outcomes (Fok et al., 2012; Hastrup et al., 2019). Yet, this is a group of individuals that experience discrimination and exclusion from services which can further perpetuate iatrogenic harm and health inequalities (Ring et al, 2019; Moran et al., 2016). As such, a comprehensive literature review is essential to synthesize current evidence and explore intervention-based studies which target an often-excluded treatment target and population during this critical period.

Consequentially, this systematic review aims to comprehensively analyze the existing studies that investigate functional outcomes resulting from psychological intervention in adolescents and young adults (up until age 25) displaying BPD features. This review aimed to:

1. Systematically review and synthesize existing studies that investigate the impact of psychological interventions on overall functioning in the target population.
2. Identify what psychological interventions are used and examine how functioning is evaluated.
3. Analyse the effect of psychological intervention on functional domains when compared with treatment as usual (TAU) through a meta-analysis.
4. Evaluate the methodological quality of the studies included that examine the impact of psychological intervention on functioning within this population.

**Method**

**Protocol and registration**

This review was prospectively registered (https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42023430703) with the International Prospective Register of Systematic Reviews (PROSPERO) in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement guidelines (Page et al., 2021).

**Search Strategy**

A systematic search of published studies examining the impact of psychological therapies on functioning in adolescents with BPD features was performed 30th June 2023 using the following databases: PsycINFO (Ovid) Medline (Ovid), Embase (Ovid), CINAHL (EBSCO).

Search terms were developed based upon scoping searches and previous reviews which had been of the terms used for PsycINFO (Ovid) is included below:

**Sample Search Terms**
Eligibility criteria

Inclusion Criteria
Eligibility criteria stipulated that the following requirements were satisfied for inclusion. The study should be: (a) A randomised controlled trial design, (b) describing the implementation of a psychological intervention for BPD, (c) for children and/or adolescents (0–18) or young adults (18–25), (d) who were experiencing BPD symptoms, and reported any outcomes of functioning (i.e., including social, occupational, and vocational) as defined by the author(s). Consequently, functional outcomes were not predefined and were instead determined by the authors.

Exclusion Criteria
Due to resource constraints, the review focused solely on English-language papers published between 1980 (the year when BPD was first described in the DSM-III by APA (American Psychiatric Association, 1987) and the search date of 30th June 2023, ensuring a specific time frame for the included studies. Exclusion criteria were applied to studies that did not involve the use of a psychological intervention. For the purposes of this review, a psychological intervention was broadly defined as a structured and targeted therapeutic process that encompasses verbal communication between an individual and a trained practitioner.

Assessment of Quality
To evaluate the methodological strength and clinical applicability of the studies examined, the Cochrane Risk of Bias Tool 2 for Randomised Controlled Studies (Higgins et al., 2016) was used for this review.

The main author rated risk of bias for all papers and a second rater (a final year trainee clinical psychologist, AM) did so independently for all papers. The process of calibration and reliability was established prior to rating. Inter-rater agreement was calculated using Cohen's kappa.

Data Extraction
A data extraction and study-specific proforma was created and piloted (Appendix 1.2). Study authors, year, title, journal, volume (issue), country in which the research was completed, and sample size were extracted. Demographic data (age, gender, ethnicity or race, diagnosis [diagnostic method], and participant setting) were collated. The primary outcome was the impact of psychological intervention on functioning for people with BPD symptoms. Functioning was noted as described by the authors of the studies included in this review, which meant this review was accepting of a broad spectrum of measures assessing functioning. However, it was expected that functional assessment would fall within the realms of social, occupational, leisure, and global functioning. As such, descriptions of interventions and treatment effects of psychological therapies on measures of functioning were collected. Data were tabulated and intervention characteristics and measures of functioning were summarized.

Statistical Analyses
A primary aim was to present a meta-analysis of the overall effect of psychological intervention on functioning in adolescents and young adults with BPD features. We summarise the effect of intervention on functioning by examining the treatment effect at post-treatment and final follow-up. To ensure
comparability of different outcome measures, standardized mean differences (SMD) were computed in the form of Hedge's g using the approach described by Hedges and Olkin (1985).

The meta-analysis was performed using the R software and the Metafor package (Viechtbauer, 2010), with a random-effects model using restricted maximum-likelihood estimation to measure between-study variance and producing a Wald-type confidence interval.

By calculating the difference in SMD between pre-, post-intervention, and final follow-up any initial disparities in measures of functioning between the groups were considered. The primary objective of the meta-analysis was to assess the difference in functioning between the experimental group and the matched TAU at both the post-intervention and end-of-trial follow-up stages. All pooled SMDs effect sizes were assessed as a small effect (0.2), medium effect (0.5) and large effect (0.8) (Hedges and Olkin, 1985).

Results

The search strategy yielded 3580 citations. Citations were screened for duplicates and 1722 were removed. One article was identified through hand searching references in key known references (Jørgensen et al., 2021). Thus leaving 1859 records to be screened at title and abstract level. Upon review of title of abstract, it was apparent that articles screened out were not related to the target population (e.g. did not specifically examine BPD); not a randomised controlled trial (e.g. reviews, qualitative, single cohort case studies or observational studies, or questionnaire/survey studies); and/or not testing a psychological intervention (e.g. pharmacological). Of the remaining studies, 67 full-text studies were reviewed for eligibility. Excluded articles were randomized controlled trials not related to the target population (e.g., analyses did not include children, adolescents, or young adults with BPD symptoms); or without measures of functioning (e.g., Schuppert et al., 2012). The references of the final seven articles were scanned and further possible articles were screened, however, no further studies were identified through reference lists. See Fig. 1. for a PRISMA flow diagram of this process (Page et al, 2021). Table 1 provides details on the seven eligible articles included in this systematic review.
<table>
<thead>
<tr>
<th>Study</th>
<th>Trial Design &amp; Setting</th>
<th>BPD criteria met (diagnostic framework)</th>
<th>Total n (%f/m)</th>
<th>Age, years (range and mean, SD)</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Duration</th>
<th>Functional Outcome (primary or secondary)</th>
<th>Time points</th>
<th>Effect on functioning and between group effect sizes at post treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chanen et al., 2008</td>
<td>Outpatient, Australia, RCT</td>
<td>&gt; 2 and additional risk factor (DSM–IV)</td>
<td>78</td>
<td>15–18 (16.4, 0.9)</td>
<td>CAT</td>
<td>GCC</td>
<td>24 weeks</td>
<td>SOFAS (primary)</td>
<td>0, 6, 12, and 24 months</td>
<td>Both groups improved from baseline in functioning which was sustained at 24 months. No significant difference between groups at follow-up up to 24 months at which point GCC was better. Rate of change was quicker in CAT.</td>
</tr>
<tr>
<td>Gleeson et al., (2012)</td>
<td>Outpatient, Australia, RCT</td>
<td>&gt; 4 (DSM–IV)</td>
<td>16</td>
<td>15–25 (18.4, 2.9)</td>
<td>CAT + SFET</td>
<td>SFET</td>
<td>17 weeks + 2 booster sessions</td>
<td>SOFAS (secondary)</td>
<td>0, EOT and 6 months</td>
<td>Significant improvements in functioning from baseline to EOT and 6 months. Experimenta group had better functioning at 6 months and EOT.</td>
</tr>
<tr>
<td>Pistorello et al., (2012)</td>
<td>Outpatient, USA, RCT</td>
<td>&gt; 3 and least one act of lifetime NSSI and or suicide attempt (DSM–IV)</td>
<td>63</td>
<td>18–25 (20.86, 1.92)</td>
<td>DBT</td>
<td>O-TAU</td>
<td>12 months</td>
<td>SAS-SR (secondary)</td>
<td>0, 3, 6, 9, and 12, and 18 months.</td>
<td>Significant improvements between baseline and all timepoints on both conditions (symptoms and functioning). Better improvement for experimenta condition compared to those in the comparison condition at post-treatment and final follow-up.</td>
</tr>
<tr>
<td>Mehlum et al., (2016)</td>
<td>Outpatient, Norway, RCT</td>
<td>&gt; 2 and history of at least 2 episodes of self-harm, at least 1 episode within the last 16 weeks; (DSM–IV)</td>
<td>77</td>
<td>12–18 (15.6, 1.5)</td>
<td>DBT-A</td>
<td>EUC</td>
<td>19 weeks</td>
<td>C-GAS (secondary)</td>
<td>0, 19 weeks, and 71 weeks</td>
<td>Both groups showed significant improvement in functioning at post-treatment and at 71 weeks. Minimal difference between experimenta and control group in functioning.</td>
</tr>
<tr>
<td>Asarnow et al., (2021)</td>
<td>Outpatient, USA, RCT</td>
<td>&gt; 3 and at least 1 lifetime suicide attempt, elevated past-month</td>
<td>173</td>
<td>12–18 (14.89, 1.47)</td>
<td>DBT</td>
<td>IGST</td>
<td>6 months</td>
<td>SAS-SR (secondary)</td>
<td>0, 3, 6, 9, and 12 months.</td>
<td>Both groups showed significant improvement post-treatment at 12 month. DBT group</td>
</tr>
<tr>
<td>Study</td>
<td>Trial Design &amp; Setting</td>
<td>BPD criteria met (diagnostic framework)</td>
<td>Total n (%f/m)</td>
<td>Age, years (range and mean, SD)</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Duration</td>
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<td>Time points</td>
<td>Effect on functioning and between group effect sizes at post treatment</td>
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<tr>
<td>Jørgensen et al., (2021)</td>
<td>Outpatient, Denmark, RCT</td>
<td>&gt; 4 (DSM-5) + &gt; 67 on BPFS-C</td>
<td>111</td>
<td>14–17 (15.8, 1.1)</td>
<td>MBT-G</td>
<td>TAU</td>
<td>12 months</td>
<td>C-GAS (secondary)</td>
<td>0, 3 times during treatment phase, EOT, 3 and 12 months post-treatment</td>
<td>Both groups showed improved function between baseline and 12 months. No difference found between experimental condition and TAU on functioning. At end of trial both groups were rated as having “variable functioning with sporadic difficulties or symptoms”</td>
</tr>
<tr>
<td>Chanen et al., (2022)</td>
<td>Outpatient, Australia, RCT</td>
<td>&gt; 5 (DSM-IV-TR)</td>
<td>139</td>
<td>15–25 (19.1, 2.8)</td>
<td>HYPE + CAT</td>
<td>HYPE + BEF; YMHS + BEF</td>
<td>16 sessions (16–25 weeks)</td>
<td>IIP; SAS-SR (primary)</td>
<td>0, 3, 6, 12, and 18 months</td>
<td>All groups improved significantly on both measures of functioning and 12 months. These benefits were sustained with the comparison group (YMHS + BEF) outperforming the active therapy conditions on the IIP-C, but not the SAS at the end of trial follow-up</td>
</tr>
</tbody>
</table>

**Abbreviations:** BEF = Befriending; BPFS = Borderline Personality Features Scale for Children; CAT = Cognitive Analytic Therapy; C-GAS = Children’s Global Assessment Scale; DBT = Dialectical Behavior Therapy; DBT-A = Dialectical Behavior Therapy for Adolescents; DSM = Diagnostic and Statistical Manual of Mental Disorders; EOT = End of Treatment; GCC = General Clinical Care; HYPE = Helping Young People Early; IGST = Intensive Group Skills Training; IIP = Inventory of Interpersonal Problems; MBT-G = Mentalization-Based Treatment - Group Format; O-TAU = Optimized Treatment as Usual; SAS-SR = Social Adjustment Scale - Self-Report; SFET = Specialist First Episode Treatment; SOFAS = Social and Occupational Functioning Assessment Scale; TAU = Treatment as Usual; YMHS = Youth Mental Health Service.
Table 2

<table>
<thead>
<tr>
<th>Study</th>
<th>Measure</th>
<th>Administration</th>
<th>Functional Domains Assessed</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chanen et al., 2008</td>
<td>SOFAS</td>
<td>Clinician or observer-rated based on knowledge of patient or interview</td>
<td>Social (interpersonal) and occupational performance</td>
<td>On the SOFAS, the individual is provided with a score out of 100 which considers social, occupational and/or academic functioning. A higher score indicates a higher level of functioning.</td>
</tr>
<tr>
<td>Gleeson et al., (2012)</td>
<td>SAS-SR</td>
<td>Self-reported structured questionnaire with 5-point likert scale</td>
<td>Social (relationships with family and extended family and leisure activities), emotional adjustment, and school or work</td>
<td>SAS-SR contains 54 items that assess role performance over the past two weeks. Six domains reviewed including work/school, social/leisure activities, extended family, primary relationship, parental role, and family unit.</td>
</tr>
<tr>
<td>Pistoroello et al., (2012)</td>
<td>SAS-SR</td>
<td>Self-reported structured questionnaire with 5-point likert scale</td>
<td>Social (relationships with family and extended family and leisure activities), emotional adjustment, and school or work</td>
<td>SAS-SR contains 54 items that assess role performance over the past two weeks. Six domains reviewed including work/school, social/leisure activities, extended family, primary relationship, parental role, and family unit.</td>
</tr>
<tr>
<td>Asarnow et al., (2021)</td>
<td>IIP-C</td>
<td>Self-reported structured questionnaire with 5-point likert scale</td>
<td>Social (interpersonal)</td>
<td>IIP is a 64-item measure designed to assess interpersonal difficulties. Items organized in a circumplex structure. The dimensions include dominance, submission, hostility, warmth, aloofness, nurturance, manipulation, and social avoidance.</td>
</tr>
<tr>
<td>Chanen et al., (2022)</td>
<td>IIP-C</td>
<td>Self-reported structured questionnaire with 5-point likert scale</td>
<td>Social (interpersonal)</td>
<td>IIP is a 64-item measure designed to assess interpersonal difficulties. Items organized in a circumplex structure. The dimensions include dominance, submission, hostility, warmth, aloofness, nurturance, manipulation, and social avoidance.</td>
</tr>
<tr>
<td>Jorgensen et al., (2021)</td>
<td>CGAS</td>
<td>Clinician or observer-rated based on knowledge of patient or interview</td>
<td>Social (interpersonal) and academic performance</td>
<td>The CGAS is scored on a scale ranging from 1 to 100, with higher scores indicating better overall functioning. The CGAS considers numerous domains, including academic performance, interactions with family and peers, emotional well-being.</td>
</tr>
</tbody>
</table>

Abbreviations: SOFAS = Social and Occupational Functioning Assessment Scale; SAS-SR = Social-Adjustment Scale – Self Report; IIP-C = Inventory of Interpersonal Problems - Circumplex version; CGAS = Children's Global Assessment Scale

Table 3

<table>
<thead>
<tr>
<th>Study</th>
<th>Domain 1</th>
<th>Domain 2</th>
<th>Domain 3</th>
<th>Domain 4</th>
<th>Domain 5</th>
<th>Overall Risk of Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Chanen et al., 2008</td>
<td>low</td>
<td>low</td>
<td>some concerns</td>
<td>low</td>
<td>some concerns</td>
<td>some concerns</td>
</tr>
<tr>
<td>2 Gleeson et al., (2012)</td>
<td>low</td>
<td>low</td>
<td>high</td>
<td>some concerns</td>
<td>some concerns</td>
<td>high</td>
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<tr>
<td>3 Pistoroello et al., (2012)</td>
<td>some concerns</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>some concerns</td>
<td>some concerns</td>
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<tr>
<td>4 Mehlum et al., (2016)</td>
<td>some concerns</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
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<tr>
<td>5 Asarnow et al., (2021)</td>
<td>low</td>
<td>low</td>
<td>some concerns</td>
<td>low</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>6 Jorgensen et al., (2021)</td>
<td>low</td>
<td>low</td>
<td>some concerns</td>
<td>low</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>7 Chanen et al., (2022)</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
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</tbody>
</table>

Seven studies were identified from the search. Figure 1 details the search, screening, and selection process.

Figure 1 to be inserted at this point in the manuscript

Study Characteristics

Seven RCTs were identified from the search. Studies were undertaken in: Australia (n = 3), USA (n = 2), Norway (n = 1), Denmark (n = 1). Eligible studies reported data for 657 participants (86.71% female). The mean age ranged from 14.89 to 20.86. All samples were composed of adolescents or young adult outpatients receiving care in the community. Only three studies reported data on ethnicity. Of these, Pistoroello et al. (2012) reported ethnicity for the full sample (69.8% 'White; 6.3% 'Asian American'; 11.1% Hispanic; 31.7% 'African American' and 4.8% 'Native American') as well as Asarnow et al. (2021) (56.39% 'White; 5.85% 'Asian American'; 27.49% Hispanic; 7.02 'African American' and 0.58% 'Native American'). One study, (Mehlum et al., 2016) reported that 84.9% of their sample was of "Norwegian ethnicity". Two studies identified functional outcomes as primary outcomes (Chanen et al., 2021; Gleeson et al., 2012).

Criteria for Assessing BPD Features and Inclusion
All studies in the sample refer to DSM criteria, with the DSM-IV being the most common (American Psychiatric Association, 1994). However, the thresholds at which participants were accepted into the studies varied significantly. Four studies required that participants met at least subthreshold criteria, thus having three symptoms present or more (Chanen et al., 2008; Gleeson et al., 2012; Jørgensen et al., 2021; Pistorello et al., 2012). Three papers required an additional risk factor such as self-harm behaviour, low-socioeconomic status, or history of abuse/neglect (Chanen et al., 2008; Mehlum et al., 2016; Asarnow et al., 2021). Chanen et al. (2008) specified additional risk criteria such as low socio-economic status or experience of previous abuse or neglect. Whereas Mehlum et al. (2016) required at least three BPD features as well as one episode of self-harming behaviour two weeks prior to entry. Similarly, Asarnow et al. (2021) required two BPD features, at least one suicide attempt, three or more episodes of self-harm over the individuals life and ≥ 24 on the Suicidal Ideation Questionnaire-Junior.

**Measures of Functioning and Method of Assessment**

Refer to Table 2 for specific measures of functioning and further details on their administration and scoring. Across the seven included studies, four measures of functioning were identified, with variation in functional measures between studies. Functioning was reported as a primary outcome in two studies (Chanen et al., 2008, 2022), with one of these studies (Chanen et al., 2022) examining multiple domains of utilising two outcome measures of functioning (SAS-SR; IIP-C).

Among the identified measures, two studies utilized the Social and Occupational Functioning Assessment Scale (SOFAS) (Chanen et al., 2008; Gleeson et al., 2014), while two studies employed the Children’s Global Assessment Scale (C-GAS) (Jørgensen et al., 2021; Mehlum et al., 2016). All studies assessed both social functioning and either educational or vocational functioning. However, it is important to note that the approach to assessing these domains varied. Three studies involved use of structured questionnaires in which the participant was prompted to provide feedback regarding their skills and the frequency of their behaviours or activities (Pistorello et al., 2012; Asarnow et al., 2021; Chanen et al., 2022). Four studies (Chanen et al., 2008; Gleeson et al., 2014; Jørgensen et al., 2021; Mehlum et al., 2019) employed functional measures which utilised a single score scaled summary of functioning through semi-structured interviews.

**Intervention**

A diverse range of therapies was observed amongst selected studies. Three studies (Chanen et al., 2008; Gleeson et al., 2012; Chanen et al., 2022) utilized Cognitive Analytic Therapy (CAT) as the primary intervention, which was integrated with the Helping Young People Early (HYPE) model. The HYPE program is a specialized treatment program that adopts a multidisciplinary approach, incorporating relational clinical care, case management, general psychiatric care, and talking therapy (Chanen et al., 2008). Two studies (Mehlum et al., 2016; Asarnow et al., 2021) used DBT-A and employed similar intervention methods, including weekly individual therapy sessions, multifamily skills training, and telephone coaching with therapists outside of therapy sessions. Jørgensen et al. (2021) implemented Mentalization-based Treatment (MBT) in a group format, comprising three introductory sessions, five individual case formulation sessions, 37 weekly group sessions, and six sessions with parents.

There were variations in the duration of the interventions delivered across selected studies. Mehlum et al. (2016) conducted their intervention over 19 weeks, whilst Asarnow et al. (2021) delivered intervention over a 6-month period. Two other studies, Pistorello et al. (2012) and Jørgensen et al. (2021), completed their treatments over one year. Whereas Chanen (2008, 2022) and Gleeson et al., (2012) did not specify explicit time frames for their interventions; instead, they indicated the number of sessions, which were 16, 13, 17 sessions, respectively.

**Comparison Condition**

All papers included an active treatment condition as a control, with variations in the control condition therapy. Studies compared this to different descriptions of TAU or good clinical care (Chanen et al., 2008; Jørgensen et al., 2021; Mehlum et al., 2016). Descriptions of TAU or good clinical care varied between studies. Two studies discussed non-specific conditions integrating either psychodynamically or cognitive-behavioural strategies (Pistorello et al., 2012; Mehlum et al., 2016).

Jørgensen et al. (2021) described TAU as a non-manualized approach that included psychoeducation, counselling, crisis management, and caregiver participation. However, sessions were conducted monthly. Chanen et al. (2022) compared the active treatment condition to two interventions within the Helping Young People Early (HYPE) model, one using befriending and the other integrating HYPE with a Young Persons Mental Health (YPMH). Asarnow et al. (2021) compared the active treatment condition to a general “individual and group supportive therapy” focused on addressing “thwarted belongingness,” emphasizing acceptance, validation, and fostering a sense of connection and belonging, with ad-hoc sessions involving parents.

**Quality Appraisal**

Quality appraisals using the ROB2 of included studies are detailed in Table 3. As such, studies were assessed for randomization process, deviations from intended interventions, missing outcome data, measurement of outcomes, and selection of reported results. Reviewers BB and AM followed the guidelines provided by the Cochrane Collaboration to assign judgments of low, some concerns, or high risk of bias for each domain. Study quality was rated low (n = 2), some concerns (n = 4) and high (n = 1).

Studies were not excluded based on their quality rating; however, quality was considered in the narrative synthesis.

To ensure consistent quality appraisal and establish inter-rater reliability, authors BB and AM independently assessed all seven papers. Initially, there was a weighted κ agreement of 0.818, which indicated substantial agreement. The use of a weighted kappa score was appropriate as the evaluated categories had...
an inherent order or hierarchy. Although there was initially a discrepancy in one paper, following discussion, complete agreement was reached.

Table 3: To be inserted at this point in the manuscript

Meta Analysis of Functional Outcomes

Chanen et al. (2022) included three conditions, where the experimental condition CAT + HYPE was compared with the condition that resembled an active TAU condition, which was HYPE + YPMH. Chanen et al. (2022) utilized two measures of functioning, namely IIP-C (interpersonal functioning) and SAS-SR (social adjustment, leisure, educational, and vocational). For the analysis, we chose the SAS-SR as the primary outcome measure because it offers a broader scope and has been consistently used in three other studies. This was in attempts to ensure comparability and enhance the validity of the findings.

Effect of Psychological Interventions on Functional Outcomes at Post-Treatment

Seven studies (N = 506) were included in a meta-analysis of pre- and post-treatment effect sizes (ES). Overall, specialised psychological interventions did not significantly improve functional outcome scores when compared to control groups (p = 0.3742). The meta-analysis yielded a small effect favouring the intervention group (overall ES g = 0.08, 95% CI = -0.10–0.25). ES for individual studies ranged from −0.18 to 1.23 and substantial significant heterogeneity was observed (T2 = 0.49, Q = 228.60, p < 0.001, I2 = 89.55%). See Fig. 2 for the forest plot.

Figure 2: To be inserted at this point in the manuscript

Effect of Psychological Interventions on Functional Outcomes at Final Follow-up

Seven studies (N = 508) were included in a meta-analysis of pre- to final follow-up effect sizes (ES). Again, specialised psychological interventions did not significantly improve functional outcomes compared to control groups (p = 0.276). The meta-analysis yielded a slightly higher ES when compared to post-treatment. ES were still within the small range and favouring the intervention group (overall ES g = 0.16, 95% CI = -0.13–0.46). ES for individual studies ranged from −0.05 to 1.27 and substantial significant heterogeneity was observed (T2 = 0.29, Q = 14.59, p < 0.024, I2 = 59.79%).

Figure 3 forest plots for effect size at final follow-up

Overall Effect on Functioning

All studies showed that participants improved in functioning from baseline to the end of the trial. Only two studies (Gleeson et al., 2012; Pistorello et al., 2012) found a significant positive effect of the experimental condition on functioning compared to the control condition. However, both studies were noted to have had some concerns or a high risk of bias. Only two studies were identified as low risk of bias.

At post-treatment Chanen et al. (2008) reported that the experimental group had a higher level of functioning albeit with a small effect size (SMD, 0.21). However, at the 24-month follow-up, participants in the GCC condition exhibited higher overall functioning levels (SMD, 0.32). Additionally, three studies (Pistorello et al., 2012; Mehlum et al., 2014, 2016; Asarnow et al., 2021) reported small effect sizes post-treatment between the DBT experimental group and the control group. The effect was maintained until final follow-up, although ES between the two conditions remained small. Jørgensen et al.’s., (2020) results favoured the control TAU condition compared with the MBT experimental condition; ES were small at post-treatment but were maintained at the final follow-up (SMD, -0.05).

Chanen et al., (2022) note changes in functioning across all three conditions at post-treatment and final follow-up. On both the IIP-C and the SAS-SR, the HYPE with befriending was the most effective in improving functioning. Functional gains continued through to final follow-up on both measures of functioning in all conditions, however, the YMHS with befriending outperformed both the CAT with HYPE condition as well as the HYPE with befriending condition on the IIP.

Discussion

This systematic review and meta-analysis are the first comprehensive examination of the effectiveness of psychological interventions in improving functioning among adolescents and young adults with BPD features. We aimed to systematically analyse and synthesize existing literature on targeted psychological interventions and their impact on functioning and assess the quality of the evidence in this population.

Effectiveness of Interventions on Functioning

The main findings suggest that intervention did improve functioning, but targeted intervention did not yield additional improvements beyond TAU (Wong et al., 2020; Jørgensen et al., 2021). Effect sizes between conditions at post-intervention were small, and in two studies (Jørgensen et al., 2021; Chanen et al., 2022) the TAU condition demonstrated better outcomes than the experimental conditions. However, at the final follow-up on Chanen et al., (2022)’s study, the TAU condition was outperformed by the experimental condition. In this meta-analysis, no one intervention type stood out from the others. However, the quality of evidence as measured by the risk of bias was variable. This is with the exception for two studies which were rated as "low". While there was an observed improvement in functioning, it falls outside the scope of this review to ascertain whether functioning reached levels to be expected at the respective developmental phase.

This finding bears significant importance as it suggests that a generalist approach could be just as effective, thus guiding more efficient allocation of resources as BPD-specific interventions have been found to be costly and show inconsistent results (Leichsenring et al., 2011). Indeed, generalist treatments have been found to be effective in adult populations (Bateman and Krawitz, 2013). Arguably, a pragmatic and solution-focused approach to role and social
functioning may impact specific functional domains better than psychotherapy. As of the time of writing, the INVEST Trial is currently in progress, aiming to assess the effects of individualized placement support on functioning in young people with BPD features. This model utilises personalized assistance, accommodations, and continuous educational and vocational support for young individuals exhibiting features of BPD (Chanen, et al., 2020).

Chanen et al. (2022) posited that psychotherapy might not be the most suitable early-stage treatment for BPD, and instead, it might be more appropriate for individuals with nonacute or BPD features, in comparison to later stages of the disorder, or individuals with more developed self-regulatory capacities. This is in line with the clinical staging model (McGorry et al., 2006; Minnis et al., 2022), whereby intervention should match the symptom severity, functional impairment, and duration. Recently, Hutsebaut et al. (2020) considered a staging model for BPD, which highlights the presence of functional difficulties from the early stages and persisting into the late stages.

Contrary to a staged model or linear progression, personalized interventions targeting specific features of BPD may result in enhanced functional outcomes, as certain features have been shown to predict functional impairment. For example, Juurlink et al. (2021) found that identity instability and chronic emptiness predicted vocational difficulties, while perceived social support has been shown to act as a protective factor against functional impairment (Thadani et al., 2022). As such, it is important to be open to all forms of trials and interventions for BPD in adolescents and young adults as the work is still in its nascent stages in clinical and community settings (Gajwani et al., 2022). The awaited ODDESSI trial, an RCT exploring Open Dialogue Therapy’s effects, a social network model of crisis and continuing mental healthcare, could offer valuable insights into the impact on functioning and recovery (Pilling et al., 2022).

Findings indicated a slight increase in ES at the final follow-up for longer-term outcomes in specialist BPD interventions. However, the varying time intervals between post-treatment and follow-up suggest a need for cautious interpretation. If both the standard and targeted interventions lead to similar improvements in functioning, it may suggest that preserving functional gains over time depends more on factors such as support and follow-up care rather than the specific type of intervention used.

Importantly in this review, most studies considered functioning as a secondary outcome, and five studies that met all other criteria were excluded for not assessing functioning. This is an important finding, as it indicates that functioning is still not prioritised as a key outcome despite the literature base demonstrating that functional difficulties are widespread in this population (Videler et al., 2019).

**Outcome Measures of Functioning**

A mixture of self-report and clinician rated outcomes were used across all seven studies. Although all studies used standardized and well validated measures, there were limitations to the methods of assessment.

Firstly, the C-GAS, similar to the Global Assessment of Functioning (GAF), whereby symptom-based outcomes are integrated into the overall score; functional impairment has been reported even in the context of good symptom-based outcomes (Biskin et al., 2011; Gunderson et al., 2011), suggesting the importance of scales which separate both domains. This was a critical driver in the development of the SOFAS from the GAF, as the GAF exclusively focusses upon the individual’s level of social and occupational functioning and is not conflated by symptoms. However, given the breadth of features experienced in BPD, finding a comprehensive assessment of functioning that remains unbiased by these features poses a considerable challenge, as conceptually functioning is conflated by symptomatology. Further, there is also an argument as to whether functioning can reliably be assessed by a clinician, as social inclusion and recovery are more appropriately measured by the individual due to their subjective and experiential nature (Burgess et al., 2017).

Beyond this critique, it is important to recognize that relying on a single score to assess overall functioning can introduce biases and limitations. Functioning is a multifaceted phenomenon that spans diverse domains such as social relationships, academic performance, quality of life, and capabilities. The World Health Organisation’s ICF prioritizes functioning over disability, highlighting ‘activity’ (task performance) and ‘participation’ (engagement in life roles), indicating a comprehensive and holistic approach to capturing the complexity of functioning (World Health Organisation, 2001). Gerber & Price (2018) discuss functional status as the degree to which an individual can perform chosen roles without limitation in three key domains: physical, social, and psychocognitive.

**Strengths and Limitations**

This systematic review has followed current best-practice through registration with PROSPERO and has followed standard reporting procedures as per PRISMA guidelines. Moreover, this review provides a summarisation of an often marginalised and underrepresented group across a broad early intervention-based age range.

However, several factors limited the generalizability of the evidence. Firstly, a key limitation was the lack of reporting on ethnicity among the included studies. Additionally, due to the quantitative nature of the review, it is possible that the subjective experiences of individuals who underwent intervention were not adequately captured. Moreover, the predominant use of female samples in the studies further constrained the generalizability of the findings.

Furthermore, three out of the seven studies primarily focused on self-harming behaviour or suicidality, potentially introducing sampling bias and restricting the applicability of the findings. Although non-suicidal self-injury and suicidal behaviour are common features of BPD, indeed, subthreshold and threshold adolescent BPD occurs in the absence this feature. However, often suicidal expression is the strongest impetus for treatment (Zimmerman & Becker, 2022). Additionally, variations in BPD phenotype have been found to exist between those that have suicidal ideation and behaviour as a feature compared to those that do not (Chabrol et al., 2004; Becker et al., 2006).

The current synthesis focused exclusively on randomized trials papers published in academic journals, which led to a potential bias in the findings by including only significant results. Despite a comprehensive search strategy and broad inclusion criteria, it is possible that ongoing or unpublished studies exist that were not captured in this analysis. Furthermore, there is a whole body of evidence which examines longitudinal outcomes of functioning, which
were not included in this review. This study reviewed randomised controlled trials, which meant naturalistic, nonrandomised studies were not included (see Schmeck et al., 2023). These data are critical to understanding how intervention functions in real world settings. Finally, the reliance on English-language studies may have introduced a bias toward Western countries, potentially limiting the applicability and breadth of this review.

The meta-analysis assessed the impact of a specialized psychological intervention on functional deficit in adolescent BPD. Due to the limited number of studies, conducting a comprehensive subgroup and meta-regression analysis to address observed heterogeneity was not feasible. However, the grouping of studies based on types of psychotherapy (DBT vs. CAT) aligns with the concept of Common Factors Theory (Lambert et al., 1992), suggesting that different therapeutic modalities share common elements contributing to their efficacy.

Furthermore, due to the heterogeneity between studies, the timepoints at which participants were examined both at post testing and final follow up varied considerably between studies, as there was variance in the length and number of follow-ups as well as the study intervention. This is particularly true to long-term follow-up assessments and in consideration of the rapid change normative adolescent development entails.

Conclusions

Creating scalable methods to address the short- and long-term adverse outcomes faced by young people with BPD is a public health priority (Holmes et al., 2020), and functioning has emerged as a key treatment priority amongst this group (Winsper, 2021). In consideration of the present review, both the experimental and control groups exhibited improved functioning, but the interventions did not show significant benefits over TAU. Indeed, it remains unclear what the specific moderators were associated with functional improvements. Overall, results indicated that on the most robust trials TAU was associated with better functional outcomes; however, effect sizes tended to be within the small range. The observed changes may in part be attributable to a treatment effect or natural progression of BPD features. In any case, continued assessment of functional outcomes through high-quality trials with larger sample sizes remains crucial to understanding an underrepresented and marginalised group.

Implications for Theory, Clinical Practice, and Future Research

While existing evidence suggests that individuals with BPD experience impaired functioning, the precise elements required for successful psychological interventions aimed at enhancing functioning remain uncertain. These findings underscore the importance for service providers to consider the distinctive requirements of this population and to tailor interventions to address their functional needs effectively. Moreover, providers should recognise that functional difficulties are present throughout adolescence and adulthood and may benefit from a generalist approach. Further research should integrate the viewpoints of young people to provide insight on crucial factors related to functioning and recovery, as well as the feasibility and acceptability of interventions that integrate functional considerations. This is of particular significance considering the research papers included in this review highlighted notable dropout rates. Finally, research assessing psychological therapies in adolescent BPD should prioritise functional recovery as a primary outcome.

Declarations

Ethics Approval and Consent to participate

Not applicable

Consent for publication

Not applicable.

Availability of data and Materials

Not applicable

Competing interests

The authors declare that they have no known competing financial or personal interests.

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Author’s Contributions

BB led the study’s conceptualization, design, data collection, analysis, and interpretation. RG provided oversight as a supervisor, contributing to the study’s conceptualization, design, and interpretation. Both authors critically reviewed the manuscript and consented to its final version

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References


**Figures**
Figure 1

Legend not included with this version
Figure 2

Forest plots for post-treatment effect sizes.

Figure 3

Forest plots for effect size at final follow-up.