Functioning in the context of Borderline Personality Disorder Features for Adolescents and Young Adults

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Chapter 1

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

Benjamin Brandrett

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Abstract

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. 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). Out of 1859 papers, seven trials (657 participants) met the eligibility criteria. Overall, psychological intervention significantly improved functioning at post-treatment and final follow-up. However, the trials raised some concerns about the risk of bias, with one showing a high risk. 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). 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). Considering the multifaceted phenotype and the diverse causal factors linked to BPD, there are ongoing debates regarding its classification, with efforts aimed at potential redefinition. In the UK, the term Emotionally Unstable Personality Disorder (EUPD) is currently used, as defined in the International Classification of Diseases, Tenth Revision (ICD-10). While sharing similar characteristics with BPD, EUPD places a greater focus on interpersonal challenges and self-control issues.

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 UK psychiatrists, 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; Laurenssen 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 (Thompson et al., 2019). Furthermore, evidence indicates that if left untreated, functioning can worsen as young individuals transition into adulthood and beyond (Wertz et al., 2020).

Frías 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. Symptomatic recovery is often prioritized over holistic models of recovery. This has further been identified in qualitative research, whereby service users felt psychotherapies for BPD were disproportionately focused upon 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 randomised 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 his 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 Jørgensen 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 population during this critical period.

Aims

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. As such, 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 completed in the field (Storebø et al., 2020; Wong et al., 2020; Jørgenen et al., 2021). In the development of this thesis, we considered both the DSM-5 and ICD-10 classification systems. For instance, we incorporated "EUPD" as a search term in the systematic review and meta-analysis. The pre-determined search strategy was tested with a librarian with expertise in health and social care research and refined over several meetings to review sensitivity, relevance, and its ability to detect known key papers identified in previous systematic reviews. All searches were limited to English language, human subjects, and articles published after 1980 until 30th June 2023. Boolean operators (OR and AND) were used to combine search strings, an example of the terms used for PsycINFO (Ovid) is included below:

Sample Search Terms

	Ovid PsycINFO 1980 to 2023. Limited to English
1.	(Borderline personality or borderline state or borderline personality disorder or bpd or emotionally unstable personality or eupd or Cluster B or personality disorder*).ti,ab.
2.	borderline personality disorder/ or borderline state/ or personality disorder/
3.	((Psycholog* adj2 (treat* or interven* or therap*)) or psychotherap*).ti,ab.
4.	(((schema or dialectical or cognitive or brief relational or client centered or narrative or emotion-focused or psychoanalytic or family or gestalt or narrative or rational-emotive or mentalization-based) adj2 therap*) or DBT or mindfulness or early intervention or CBT or eye movement desensitization or guided imagery or psychosocial intervention or crisis intervention or psychoanalysis or mentalization based treatment or telepsychotherapy or relaxation training or ((individual or interpersonal or psychodynamic or adolescent or experiential or short term or brief or expressive or multiple or person-centered) adj2 psychotherap*)).ti,ab.
5.	Psychotherapy/ or Adolescent Psychotherapy/ or Brief Psychotherapy/ or Brief Relational Therapy/ or Client Centered Therapy/ or Experiential Psychotherapy/ or Expressive Psychotherapy/ or Individual Psychotherapy/ or Integrative Psychotherapy/ or Interpersonal Psychotherapy/ or Narrative Therapy/ or Psychoanalysis/ or Psychodynamic Psychotherapy/ or Cognitive Therapy/ or Schema Therapy/ or early intervention/
6.	(adoles* or ((Emerg* or young*) adj2 (adult* or person* or people)) or teen* or youth or juvenile or child*).ti,ab.
7.	("160" or "180" or "200").ag.
8.	1 or 2
9.	3 or 4 or 5
10.	6 or 7
11.	8 and 9 and 10
12.	limit 11 to (all journals and english language)

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).

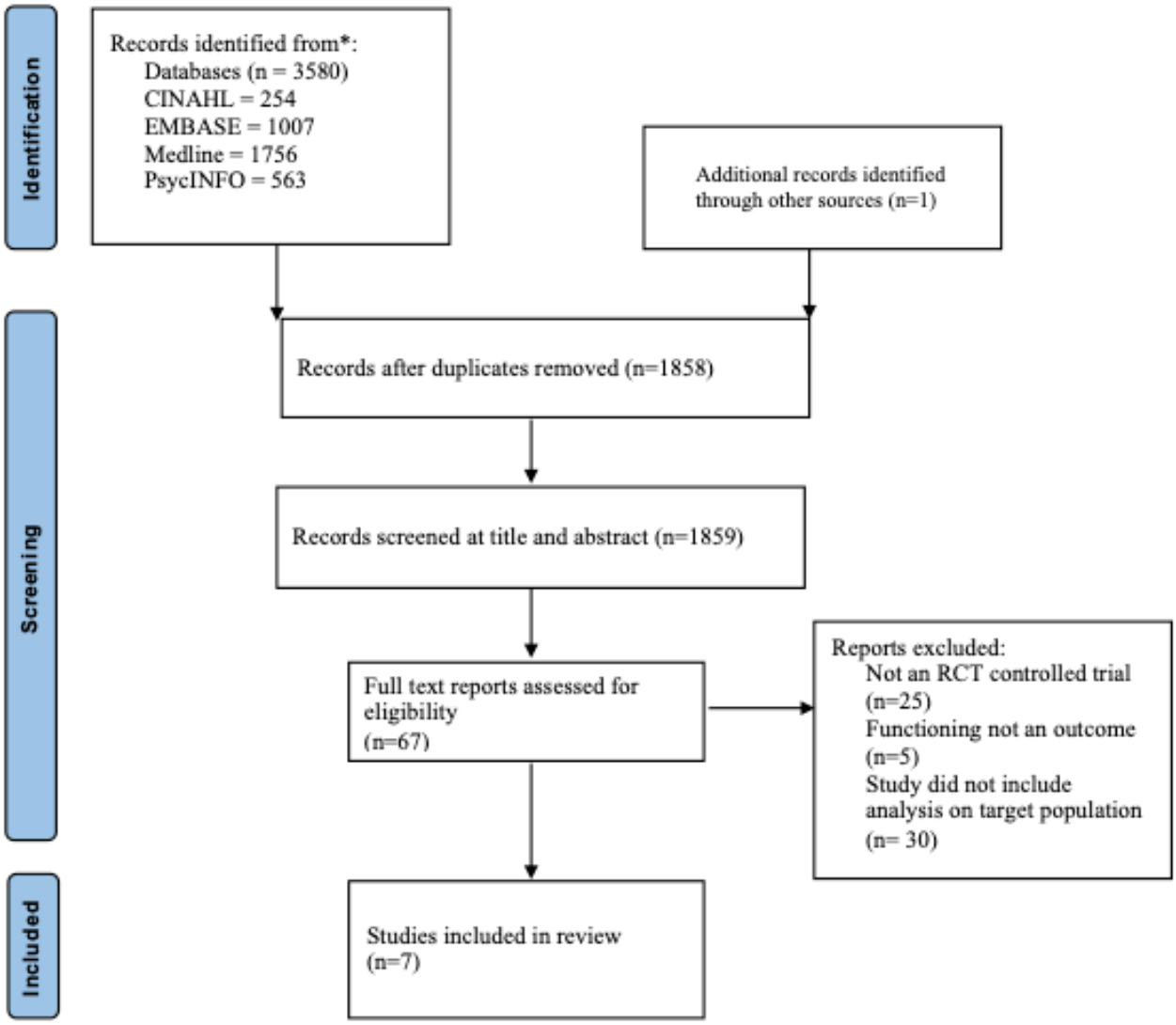
Results

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 Figure 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.

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

Figure 1

PRISMA Study Identification Flowchart



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, Pistorello 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., 2022; 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 of 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 in 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 it 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.

Table 1

Study Characteristics

Study	Trial Design & Setting	BPD criteria met (diagnostic framework)	Total n (%f/m)	Age, years (range and mean, SD)	Intervention	Comparison	Duration	Functional Outcome (primary or secondary)	Time points	Effect on functioning and between group effect sizes at post-treatment
Chanen et al., 2008	Outpatient, Australia, RCT	>2 and additional risk factor (DSM–IV)	78 76/24 %	15-18 (16.4, 0.9)	CAT	GCC	24 weeks	SOFAS (primary)	0, 6, 12, and 24 months	Both groups improved from baseline in functioning, which was sustained at 24 months. No significant difference between groups at follow-up until 24 months at which point GCC was better. Rate of change was quicker in CAT.
Gleeson et al., (2012)	Outpatient, Australia, RCT	>4 (DSM–IV)	16 81.25/ 18.75 %	15-25 (18.4, 2.9)	CAT+SFET	SFET	17 weeks + 2 booster sessions	SOFAS (secondary)	0, EOT and 6 months	Significant improvement in functioning from baseline to EOT and 6 months. Experimental group had better functioning at 6 months and EOT.
Pistorello et al., (2012)	Outpatient, USA, RCT	>3 and least one act of lifetime NSSI and or suicide attempt (DSM–IV)	63 70.95/ 19.05 %	18-25 (20.86, 1.92)	DBT	O-TAU	12 months	SAS-SR (secondary)	0, 3, 6, 9, and 12, and 18 months.	Significant improvement between baseline and all timepoints on both conditions (symptoms and functioning). Better improvement for experimental condition compared to those in the comparison condition at post-treatment and final follow-up
Mehlum et al., (2016)	Outpatient, Norway, RCT	>2 and history of at least 2 episodes of self-harm, at least 1 episode within the last 16 weeks; (DSM–IV)	77 88.31/ 11.69 %	12 – 18 (15.6, 1.5)	DBT-A	EUC	19 weeks	C-GAS (secondary)	0, 19 weeks, and 71 weeks	Both groups showed significant improvement in functioning at post-treatment and at 71 weeks. Minimal difference between experimental and control group in functioning.
Asarnow et al., (2021)	Outpatient, USA, RCT	>3 and at least 1 lifetime suicide attempt, elevated past-month suicidal ideation	173 94.22/ 5.78%	12-18 (14.89, 1.47)	DBT	IGST	6 months	SAS-SR (secondary)	0, 3, 6, 9, and 12 months.	Both groups showed significant improvement post-treatment and at 12 months. DBT group showed better functioning but were less severe at baseline.

		(DSM–IV)								
Jørgensen et al., (2021)	Outpatient, Denmark, RCT	>4 (DSM–5) + >67 on BPFS-C	111 99.1/0.9%	14-17 (15.8, 1.1)	MBT-G	TAU	12 months	C-GAS (secondary)	0, 3 times during treatment phase, EOT, 3 and 12 months post-treatment	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"
Chanen et al., (2022)	Outpatient, Australia, RCT	>5 (DSM-IV-TR)	139 80.58/19.42 %	15-25 (19.1, 2.8)	HYPE+CAT	HYPE+BEF; YMHS+BEF	16 sessions (16-25 weeks)	IIP; SAS-SR (primary)	0, 3, 6, 12, and 18 months	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 the trial follow-up.

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

Overview of measures of functioning

Study	Measure	Administration	Functional Domains Assessed	Scoring
Chanen et al., 2008 Gleeson et al., (2012)	SOFAS	Clinician or observer-rated based on knowledge of patient or interview	Social (interpersonal) and occupational performance	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.
Pistorello et al., (2012) Asarnow et al., (2021) Chanen et al., (2022)	SAS-SR	Self-reported structured questionnaire with 5-point likert scale	Social (relationships with family and extended family and leisure activities) emotional adjustment, and school or work	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.
Chanen et al., (2022)	IIP-C	Self-reported structured questionnaire with 5-point likert scale	Social (interpersonal)	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.
Mehlum et al., (2016) Jorgensen et al., (2021)	CGAS	Clinician or observer-rated based on knowledge of patient or interview	Social (interpersonal) and academic performance	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.

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

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 *Risk of Bias Tool 2 (ROB2)*							
		Domain 1	**Domain 2**	**Domain 3**	**Domain 4**	**Domain 5**	**Overall Risk of Bias**
	Study	**Randomization process**	**Deviations from intended interventions**	**Missing outcome data**	**Measurement of the outcome**	**Selection of the reported result**	
1	Chanen et al., 2008	low	low	some concerns	low	some concerns	some concerns
2	Gleeson et al., (2012)	low	some concerns	high	some concerns	some concerns	high
3	Pistorello et al., (2012)	some concerns	low	low	low	some concerns	some concerns
4	Mehlum et al., (2016)	some concerns	low	low	low	some concerns	some concerns
5	Asarnow et al., (2021)	low	low	low	low	low	low
6	Jorgensen et al., (2021)	low	low	some concerns	low	low	some concerns
7	Chanen et al., (2022)	low	low	low	low	low	low

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.

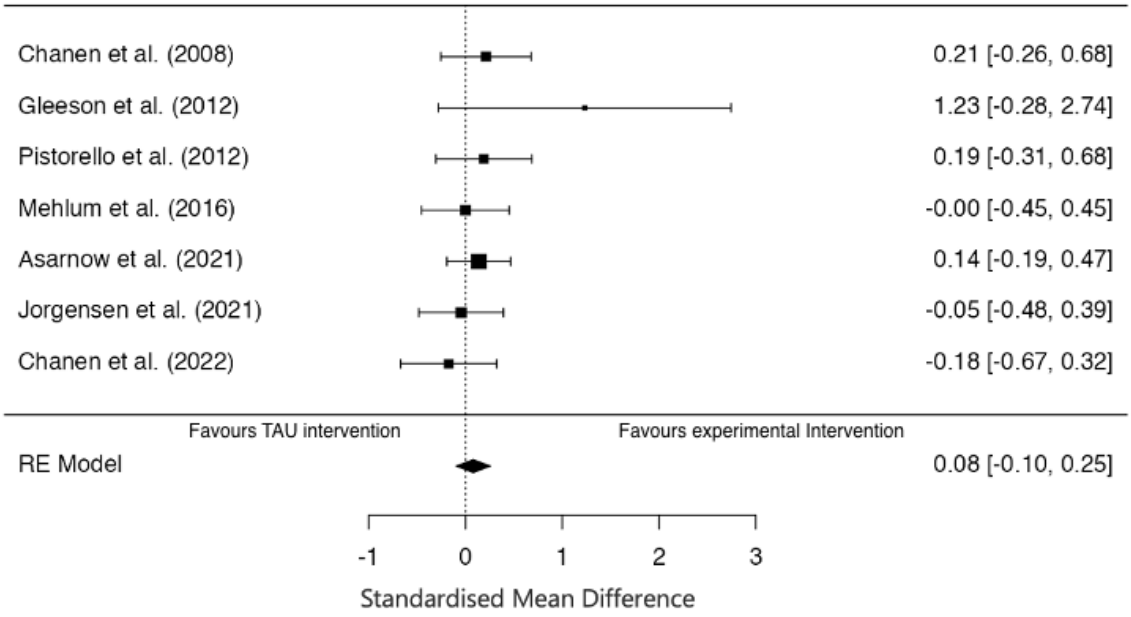


Figure 2 forest Plots for post-treatment effect sizes

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, $p < 0.024$, $I2 = 59.79\%$).

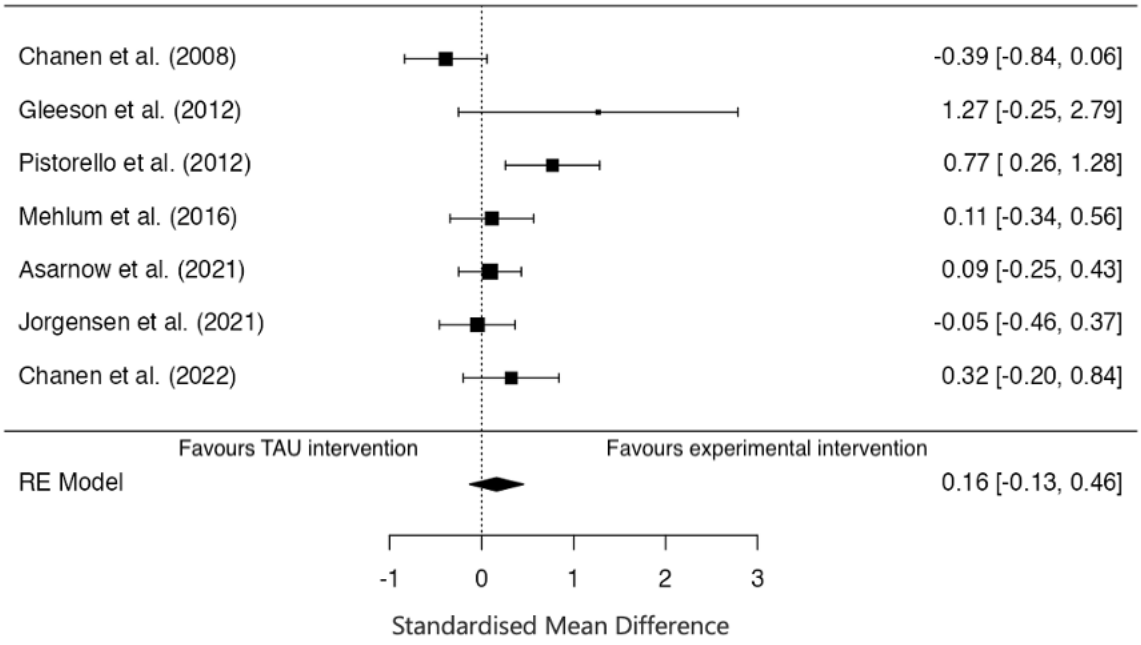


Figure 3 forest plots for effect size at final follow-up

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 comparison 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-focussed 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, natural progression of BPD features, or regression towards the average. 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

The existing evidence base indicates that functioning is indeed affected in individuals with BPD, but the specific components necessary for effective psychological intervention to improve functioning remain inconclusive. 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 recognize that these functional difficulties are present throughout adolescence and adulthood and may benefit from a generalist TAU 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.

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Chapter 2

Functional Impairment in Young People with Features of Borderline Personality Disorder

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Prepared in accordance with the author requirements for Journal of Personality Disorders (https://www.guilford.com/periodicals/jnpdinst.pdf?t=1)

Plain English Summary

Title

Functional Impairment in Young People with Features of Borderline Personality Disorder

Background

Borderline personality disorder (BPD) is a mental health disorder which usually begins in adolescence. People diagnosed with BPD often experience difficulties managing their emotions, self-image, and relationships. As a result, people with BPD will often struggle with keeping stable employment and relationships. These are referred to as "functional impairments" and they have been found to continue even when other BPD "features" such as self-harm, impulsivity, or ability to control emotion improve.

Young adults with BPD are more likely to experience higher levels of functional impairment later in life (Bozatello et al., 2019). However, little is known about the levels of functional impairment experienced by young adults with BPD features in the general community, and whether things like delays in seeking help cause greater functional impairment. Our project had two important aims:

Aims

1. To see what the level of functioning is in a group of young adults with features of BPD.
2. To see if delays in getting help for BPD features influences functional outcomes in young adults with features of BPD.

Methods

We invited young people with BPD features from schools, universities, and mental health teams to participate in interviews and assessments. We looked at the relationship between how

long they had symptoms and the impact this had on their level of functioning. We also explored whether the number of BPD features they had effected their functioning.

Main Findings and Conclusions

We interviewed 35 young adults and found that they struggled with functioning at school, work, and in relationships with their family and others. They also reported lower health related quality of life. We found that those with one or two BPD features had better health related quality of life compared to those with five or more features. However, there was no difference in health-related quality of life or difficulties at school, work, or relationships in those with three or four features of BPD and those with five or more. We did not find that the length of time someone has lived with their symptoms, without receiving help for them, had a negative effect on their functioning. The study is important because it helps us understand the daily problems faced by young people with BPD features and may help us understand ways to support them better.

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Abstract

The primary objective of this study was to gain a comprehensive understanding of functional impairment amongst adolescents presenting with Borderline Personality Disorder (BPD) features (one or two symptoms, subthreshold, or threshold) in the community. Additionally, we investigated whether the number of symptoms and the duration of untreated BPD features had an association with functional outcomes. In this cross-sectional study, a sample of 35 young people were assessed using broad measures of functioning, including Health-Related Quality of Life (HRQoL), general capability, and social/occupational functioning. Results showed that there was functional impairment across all domains when compared with normed data from non-clinical samples. On a measure of general functioning and HRQoL, individuals with threshold BPD features had significantly lower HRQoL when compared with those with just one or two BPD features. However, no significant differences were found in functional impairment between subthreshold and threshold participants. There was no relationship identified between duration of untreated BPD features and functional impairment. These findings underscore the vital significance of incorporating broad functional assessments into the evaluation and intervention strategies for young people presenting BPD features.

Introduction

Borderline Personality Disorder (BPD) is characterized by a persistent pattern of difficulties in several domains, such as interpersonal relations, self-identity, and episodes of severe affective dysregulation and impulsivity (American Psychiatric Association, 2013). The prevalence of BPD symptoms ranges from 1% to 5.9% in the general population (Gunderson et al., 2018), and is associated with harmful long-term outcomes, including premature mortality, severe impairment in social and occupational functioning, and consequently, reduced satisfaction with life (Biskin, 2015).

BPD features have been shown to first manifest in early adolescence (Chanen et al., 2017; Kaess et al., 2014) and reach their peak during young adulthood. Research has also indicated that the number of BPD features (e.g. meeting subthreshold BPD, three or more features of BPD or threshold, five or more features of BPD) identified in this population predicts higher mental health service use and poorer functioning, which aligns with findings observed in adults (Thompson et al., 2019, 2020; Wertz et al., 2020). Consequently, individuals with BPD exhibit complex needs and a high suicide risk, leading to increased rates of psychiatric care and social service utilization (Comtois & Carmel, 2014). Additionally, BPD is associated with psychosocial morbidity, such as major depression and substance misuse, potentially compounding reduced life expectancy and severe long-term functional impairment (Tate et al., 2022).

Psychosocial functioning is defined as an individual's ability to perform roles and activities in daily life, including social or interpersonal, school or work, recreational or leisure, and those of basic daily functioning (i.e., self-care, communication, mobility; World Health Organization, 2001). Functioning is vital in our lives, and its assessment should account for diverse individual and contextual factors. Whilst difficulties in functioning are associated with

different health outcomes (McKnight & Kashdan, 2009), people with BPD often experience impairment in multiple domains of functioning, such as employment, social relationships, and recreation (Skodol et al., 2002). Moreover, functional impairment is often present even when good symptom-based outcomes are observed (Gunderson et al., 2011), a pattern which has been found to be enduring, even at 20-year long-term follow-up (Zanarini et al., 2018). Furthermore, observational studies have indicated that across the age span, even those with one BPD feature were found to have higher levels of functional impairment and unemployment (Ten Have et al., 2016; Thompson et al., 2020; Zimmerman et al., 2012). Alvarez-Tomás et al., (2017) found that after completion of Dialectical Behaviour Therapy, clinical remission of features was not consistently associated with a similar improvement in psychosocial functioning, noting enduring difficulties in occupational and vocational functioning at ten-year follow-up. The current evidence signals the intractable nature of functional impairment within BPD, and even in the presence of good symptom-based outcomes, functional impairment is often present and unabated by specialized therapies.

The existing literature heavily emphasises clinical remission and symptom reduction in clinical trials (Whitley & Drake, 2010). However, crucial indicators such as occupational and vocational functioning are often insufficiently reported (Ng et al., 2016). The Capability Approach, introduced by Amartya Sen (1999), emphasizes individuals' capability as crucial in achieving functioning. In this model, functioning encompasses a wide range of valued activities and conditions, including physical well-being, academic pursuits, meaningful work opportunities, active societal engagement, and equitable access to essential provisions (see Figure 1). As such, Sen's work presents a comprehensive approach to functioning, with

capability serving as the primary driver. The ICECAP-A measure has emerged as an assessment tool aiming to capture individuals' capability and well-being across diverse life domains.

Figure 1

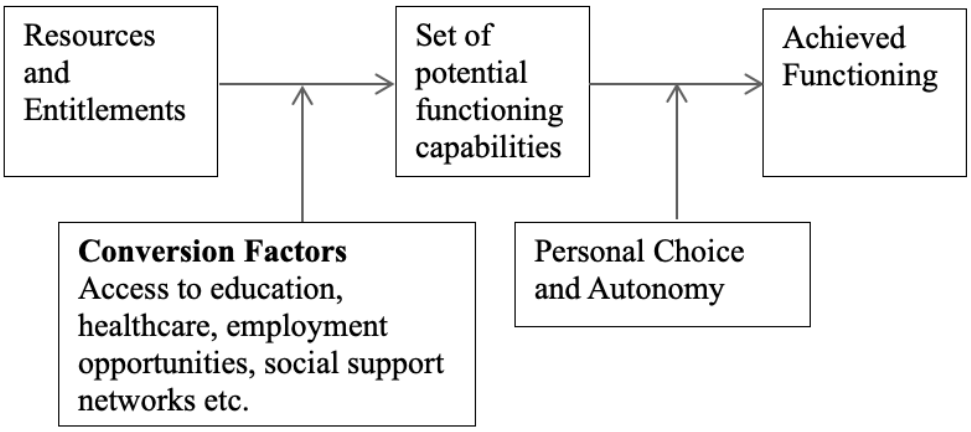


Figure 1 Fundamental Principles of Capability Approach (Comim et al., 2008)

The current evidence indicates that functional deficits are present even in those with subthreshold BPD, and that difficulties can worsen if intervention is not provided (Chanen et al., 2017). This is conceptually similar to the duration of untreated psychosis, where if the emergence of psychotic symptoms is not met with intervention, individuals are more likely to experience long-term psychosocial difficulties (Hill et al., 2012). Due to the poor identification of BPD in adolescence and a relatively recent focus on functioning in early intervention (Minnis et al., 2022) a comprehensive description of functional impairment remains underdeveloped in this group.

Aims

The purpose of this study was twofold: (1) to understand various domains of functional impairment amongst participants with full-threshold and subthreshold BPD features recruited from the community. 2) to examine the nature and severity of untreated BPD features on functioning. As such, three aims for this study were devised:

1. To describe various domains of functioning amongst adolescents and young adults with BPD features, recruited from the community.
2. To examine the relationship between the severity of untreated BPD features and functioning in adolescents and young adults recruited from the community.
3. To explore the relationship between the length of untreated BPD features on functioning in adolescents, and young adults recruited from the community.

Method

Design

This study analysed data from the BRIDGE trial (ClinicalTrials.gov Identifier: NCT05023447). The BRIDGE trial is a feasibility-randomised controlled trial that assesses the feasibility of a brief intervention programme for young people (age 14-24) with early BPD (subthreshold or threshold features) in a community sample recruited from Glasgow, Scotland. For this study, data was collected from October 2021 to June 2023. This study used a cross-sectional design to assess functioning in adolescents with features of BPD, pre-randomisation to the two arms of the clinical trial. Data was collected from screening and baseline assessments completed for the BRIDGE project. Assessment was completed through a three-phased procedure (Screening Phase 1, Diagnostic Phase 2, and Baseline).

Participants

At the time of submission of this thesis, the BRIDGE project is still actively recruiting. As the BRIDGE project is a feasibility randomised controlled trial and did not have a primary outcome, a power calculation was not undertaken (Arain et al., 2010). The current study was a cross-sectional nested study within the context of the BRIDGE project.

A total of 71 participants were screened for the BRIDGE project. As participants progressed through to randomisation in the main trial, three subgroups of data emerged for analysis. See Figure 2 for the CONSORT diagram detailing recruitment. Participants that completed Diagnostic Screening Phase 2, were divided into three subgroups.

1. **Subgroup 1**: Participants that had one or two features of BPD.
2. **Subgroup 2**: Participants that had three or four features of BPD (subthreshold presentation)
3. **Subgroup 3**: Participants that had five or more features of BPD (threshold presentation)

Inclusion/exclusion

Participants were required to 1) be aged between 14-24; 2) have achieved a score ≥ 11 out of 15 on the self-reported Structured Clinical Interview for Diagnostic Services Manual Disorders II (SCID-II) BPD questionnaire; 3) and meet at least subthreshold (score ≥ 3 out of 9 domains) criteria on the SCID-II Diagnostic and Statistical Manual of Mental Disorders (BPD Module; 5th ed.; DSM-5; American Psychiatric Association, 2013). Participants were excluded if 1) they had received a psychological/counselling/psychotherapeutic intervention for BPD; 2) were diagnosed with a severe or profound intellectual disability that would preclude full engagement in talking therapy; 3) had a primary condition/diagnosis that necessitates intensive psychiatric treatment, such as acute psychosis or eating disorder.

Research Procedures

Recruitment and data collection was carried out by the BRIDGE study team, following the protocol (Gajwani et al., under review). Assessments were conducted based on participants' preferences, either in-person by the first author or a member of the BRIDGE study team, or

remotely using a commonly employed NHS video consultation platform. Following informed consent, one-to-one interviews were conducted over one-to-two sessions. At Screening Phase 1, participants self-completed the SCID-II PQ-BPD questionnaire, as well as demographic data. Those meeting the cut off (>11) were invited for diagnostic assessment. At diagnostic assessment, all potentially eligible participants were invited for a short interview (30-40 minutes) conducted by two clinically trained researchers, using the Structured Clinical Interview for DSM-5 Axis II Personality Disorders (SCID-II) BPD module. Consent to continue was gathered at both screening and diagnostic assessment. For the BRIDGE trial, the SCID-II BPD module was used to determine whether an individual meets criterion for subthreshold BPD (at least 3 out of 9 domains) or full-syndrome BPD (5 and above out of 9 domains). Participants either self-referred or were referred by professionals in a range of settings in Glasgow; including referrals from professionals within the NHS Greater Glasgow & Clyde (specialist children's services, Adult mental health services, GP, Accident & Emergency). Or alternatively referral from professionals within social work, forensic services, youth support services or third sector organisations.

Ethics

Managerial approval for the BRIDGE project was granted on the 16th of September 2021 (R&D Reference: GN21MH147P) (Appendix 2.3) and favourable ethical opinion received from the Northwest Haydock Research Ethics Committee (Reference: 21/NW/0209) on the 30th of July 2021 (Appendix 2.4)

Materials and measures

BPD features (subthreshold or threshold)

For the BRIDGE Trial, during Screening Phase 1 participants were assessed for BPD features using the Diagnostic Services Manual-5 (DSM-5) Axis II Personality Disorders (SCID-II) PQ-BPD module. SCID-II PQ-BPD is a 15-item questionnaire and has excellent psychometric properties for BPD in youth (Ryder et al., 2007). For participants to be invited for diagnostic assessment a score of >11 had the be attained. Participants then completed the Structured Clinical Interview for DSM-V Axis II Personality Disorders (SCID-II) BPD module. The SCID-II BPD module assessed whether participants met criteria for BPD (subthreshold or threshold).

Functioning

For assessment of functioning the following measures were used; At Screening Phase 1 demographics, At Diagnostic Screening (Phase 2), the KIDSCREEN-10 (Ravens-Sieberer et al., 2010) was completed. At Baseline (Phase 3), the Sheehans Disability Scale (Sheehan et al., 1996), the ICECAP-A (Al-Janabi et al., 2012) and the EQ-5-DL (EuroQol Research Foundation, 1990) were used.

The KIDSCREEN-10 (Ravens-Siberer et al., 2006) is a generic tool which measures overall Health Related Quality of Life (HRQoL); however, previous studies have used this tool as a measure of psychosocial functioning (Al-Janabi et al., 2012). The KIDSCREEN-10 can be used to assess various aspects of functioning, including emotional well-being, social relationships, school or work performance, physical health, and self-care. To obtain a composite score, the 10 items forming the KIDSCREEN-10 measure were used with a maximum of one missing value allowed and imputed. A Rasch-scaled (Erhart et al., 2009) single sum score was then transformed into T-values with a mean of 50 and a standard deviation of approximately 10,

according to a reference sample of 22,000 European Children and Adolescents that allow for comparison with reference population norms.

The Sheehans Disability Scale (SDS) (Sheehan et al., 1996) is a brief, five-item measure that assesses functional impairment in three major life domains: work, social life/leisure activities, and family life/home responsibilities. Qualitative descriptors for the SDS indicate that a total score between 1-7 indicates mild impairment, 8-15 moderate impairment, and 16-30 indicates severe impairment.

ICEpop Capability Measure for Adults (ICECAP-A) (Al-Janabi et al., 2012) is a six item self-report questionnaire designed to assess the capability and well-being of adults across five key dimensions of capability, stability, attachment, autonomy, achievement, and enjoyment, ranging from no capability to full-capability. Norm-based tariff values can be provided for each response. ICECAP-A scores were then transformed into "capability values" using tariffs for UK general population, ranging from 1 (full capability) to 0 (no capability).

EQ-5-DL (EuroQol Research Foundation, 1990) evaluates general health-related quality of life. More specifically, it examines health status across five domains, including mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each of these five dimensions is divided into five response levels of perceived problems, ranging from no problem to extreme problems. From responses, a unique health state can be defined by combining one level from each of the five dimensions. The EQ-5-DL scores were then transformed into quality-of-life scores using norms collected in England, ranging from one to zero (Devlin et al., 2018).

Duration of Untreated Borderline Personality Disorder Features

Duration of Untreated Borderline Personality Disorder Features (DUBPDF) was calculated using the Structured Clinical Interview for DSM-5 Personality Disorders (SCID-II)

(First & Gibbon, 2004), as well as a pathway to care "life chart" to accurately ascertain the onset, duration, frequency, and severity of the BPD features. This chart allows the young person to recount their "service journey" and the onset of symptoms through anchor points (e.g. transition to a new school, birthdays etc.).

The DUBPDF was calculated by taking the age of onset for each of the nine SCID-II BPD symptom criteria. For a symptom to be scored as threshold the DSM-5 recommends that it should have been persistent for at least one year (DSM-5; APA 2013). The ICD-11 (World Health Organization, 2018), however, recommends a persistent pattern of symptoms over a period of two years from onset. For the BRIDGE project, the DUBPDF was calculated based on a conservative estimate of two years following the initial meeting of subthreshold BPD criteria by the young adult (i.e., three symptoms on the SCID at full threshold). The duration is the length from meeting criteria for BPD features (i.e. two-years of persistent symptom presentation) up to baseline data collection, pre-randomisation. None of the participants recruited for BRIDGE had ever received any BPD treatment.

Regarding data collection and review, two trainee clinical psychologists (BB & KD) reviewed all data independently, with each case supervised by the Principal Investigator (RG) of the project. Age of onset for all BPD features were reviewed and collected. This process was iterative, with biweekly meetings between the first author and trainee clinical psychologist to ensure the accuracy of the age of onset used to determine the DUBPDF. For any ages that were not identified during the review of the SCID data, Egton Medical Information Systems (EMIS), a centralized medical notation system was reviewed by the first author. For any participants that remained unclear, both the RA that interviewed the individual and the Principal Investigator were consulted.

Data Analyses

Analyses for this study were performed using IBM SPSS Statistics v. 25 (SPSS Inc., Chicago, IL, USA). A series of statistical analyses were conducted, including *t*-tests, ANOVAs, and linear regressions. With regards to missing data, specific guidance of respective measures will be checked as strategies such as imputation may be allowable. Based upon the three aims of this study, the following analyses will be completed:

Aim 1: Demographics and Description of Functioning

Analysis for Aim 1 analysed Subgroup 1, 2, and 3 from Diagnostic Screening Phase 1. For this group, descriptive statistics were used to provide an overview of the data and summarise key clinical characteristics and demographics including education and vocational status.

Aim 2: Symptom Severity and Functioning

A one-way ANOVA was conducted on KIDSCREEN-10 using participants from Subgroup 1, 2, and 3, creating three levels of participants based on symptom severity.

Independent *t*-tests were completed using Subgroup 2 and Subgroup 3 Baseline Assessment (Phase 3) measures of functioning. Independent *t*-tests examined the difference between subthreshold and threshold participants.

Aim 3: DUBPDF and Functioning

Analysis for Aim 3 a set of linear regressions were completed to examine the relationship between DUBPDF (first symptom) and measures of functioning. The use of the first symptom was based on Thompson et al.'s (2020) findings, which demonstrated the presence of functional impairment in a sample of outpatient young adults.

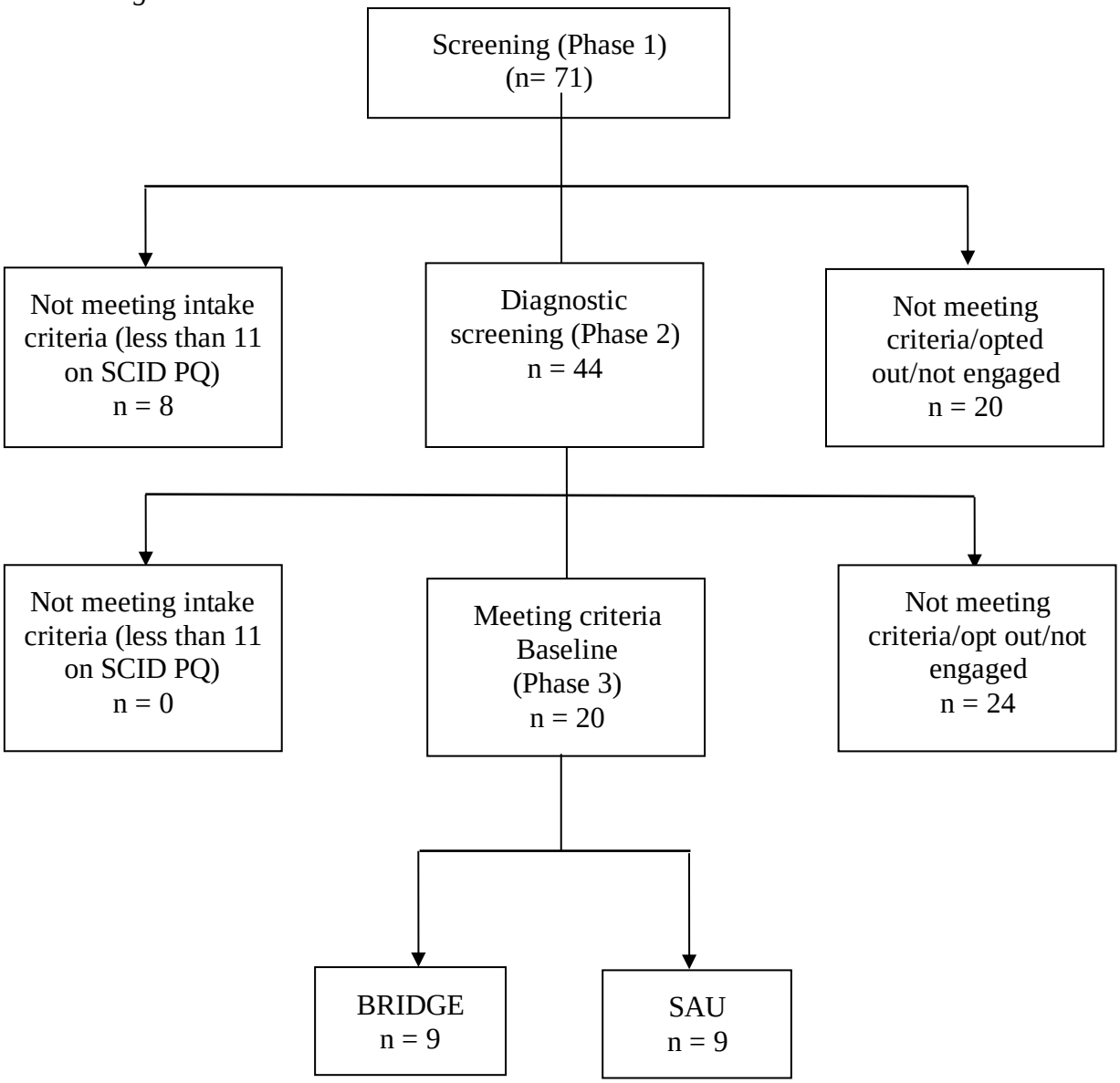
Using Subgroup 1, 2, and 3 a linear regression was conducted which examined the relationship between the DUBPDF first symptom and the KIDSCREEN-10 *t*-score.

Using Baseline Assessment (Phase 3) measures of functioning in Subgroup 2 and 3, a further set of linear regressions were used to examine the association between the onset of the DUBPDF first symptom and scores on the EQ-5-DL, SDS, and ICECAP-A.

Results

Recruitment from BRIDGE began in October 2021 and at the time of writing this thesis is still ongoing. Recruitment at this point is depicted in Consort flowchart below. Data were entered in a data base set and evaluated by means of SPSS-25 statistical package. Descriptive statistics including means, standard deviations, percentages, and ranges were calculated for all demographic variables and were included in Table 1.

Figure 2
CONSORT Diagram



Aim 1: Demographics and Description of Functioning

Of the 71 participants that completed Screening (Phase 1), 44 of these participants completed Diagnostic Screening (Phase 2). Thirty-five of these participants had at least one feature of BPD and were used for the analysis of Research Question 1. Demographics of these participants are detailed in Table 1.

Table 1

Basic Demographic Characteristics

Demographics	Mean (SD)	Frequency (%)
Age	19.09(2.99)	
Gender		
Male		8(20%)
Female		21(62.9%)
Non-binary		3(8.6%)
Transgender		2(5.7%)
Non-conforming		1(2.9%)
Ethnicity		
White British		30(85.2%)
Asian		2(5.7%)
Mixed Heritage		2(5.7%)
Black: African		1(2.9%)
Accommodation		
Rented		10(29.4%)
Private Accommodation		21(55.9%)
Homeless		1(2.9%)
Supported Accommodation		3(8.8%)
Other		1(2.9%)
Education		
Secondary or equivalent		21(60%)
University level		2(5.71%)
Vocational Qualification		10(28.57%)
Other		1(2.86%)
No Qualifications		1(2.86%)
Employment Status		
Full or part time		6(17.14%)
Student		19(54.2%)
Unemployed		10(28.5%)

Note. Data are mean (SD) or n (%), unless otherwise specified.

Clinical Characteristics

Clinical characteristics for 35 participants are reported in Table 2. Of these, twenty-seven reported suicidal behaviours in the past two weeks. Twenty-five participants had experienced at least some form of counselling or psychological therapy over their lifetime for difficulties other than BPD features. Nine participants had experienced at least one admission to a psychiatric ward during their life. Twenty-five participants endorsed that a member of their family had mental or physical health difficulties.

Table 2

Basic Information on Mental Health History and Current Difficulties

Mental Health History	Frequency (%)
Thoughts of suicide and or self-harm over the past two weeks	
None	2(5.9)
Self-harm thought	10(29.4)
Self-harm behaviour	1(2.9)
Suicidal thoughts	13(35.3)
Suicide plan	4(11.8)
Missing	5(14.7)
Lifetime history of psychological intervention	
Yes	27(73.5)
No	7(23.5)
Missing	1(2.9)
Reported mental health diagnosis over the past 12 months	
Yes	20(79.4)
No	13(8.8)
Missing	2(11.8)
Lifetime history of psychiatric admission	
Yes	10(26.5)
No	24(70.6)
Missing	1(2.9)
Currently on medication (anti-depressant, antipsychotic or mood-stabiliser)	
Yes	20(55.9)
No	13(38.2)
Missing	2(5.9)
Member of family with physical or mental health difficulties	
Yes	25(55.9)
No	6(38.2)
Missing	4(5.9)

Note. **Data are mean (SD) or n (%),** unless otherwise specified.

Functioning

Basic occupational and vocational functioning data for Subgroup 1, 2, and 3 (n = 35) participants are detailed in Table 1, 6 participants were currently employed, 19 participants were currently in school, and ten participants were currently unemployed and not in school.

KIDSCREEN-10 means for a total of 31 participants were included in Table 3. Four participants were excluded from the analysis due to missing values and thus could not have a KIDSCREEN T-Score calculated.

Table 3

Means and Standard Deviations for KIDSCREEN-10

Functioning	One or two features (n = 8) Mean and SD	Subthreshold, (n=10) Mean and SD	Threshold, (n=13) Mean and SD	Combined sample (n=31) Mean and SD
KIDSCREEN-10 Score	37.22(5.15)	33.14(3.24)	32.12(3.03)	33.76(4.18)
Number of BPD Features	1(0.00)	3.50(.52)	6.64(1.21)	4.25(2.48)

The mean of the adjusted T-scores obtained from the KIDSCREEN-10 measure was 33.76 (SD = 4.18), which was derived from the Rasch-scaled single sum score. *T*-scores were transformed into a standardized metric with a population mean of 50. Notably, the sample mean was lower than the population mean, indicating that the participants in our study tended to have lower levels of HRQoL when compared to the general population norm.

Baseline 3 (Phase 3) data from Subgroup 2 and 3 (n = 20) were analysed. Means and standard deviations for the SDS, EQ-5-DL, and the ICECAP can be found in Table 4.

The distribution of scores for the KIDSCREEN-10, SDS, EQ-5-DL, and ICECAP were normally distributed, as indicated by skewness and kurtosis values between -1 and 1. Descriptive data split by subthreshold and threshold features for these measures are presented in Table 4.

The mean ICECAP-A tariff score was 0.580 (SD = 0.13), and the mean EQ-5-DL Health Index Score was 0.548 (SD = 0.19). Both scores range from 0 to 1, with higher values indicating better functioning. It is worth noting that the UK general adult population, as reported by Mitchell et al. (2022) before COVID-19, had a higher mean Tariff Score of 0.810 (SD = 0.19).

The overall mean score on the SDS was 19.65 (SD = 5.12), indicating that the overall mean fell within the "severely impaired" range. When examining specific domains, the highest level of impairment was found in the 'family and home' domain (mean = 7.05, SD = 2.08), followed by the occupational domain (mean = 6.85, SD = 1.89), and finally the social and leisure domain (mean = 6.20, SD = 2.96). Scores between symptom thresholds are detailed in Table 4.

Table 4

Subthreshold and Threshold Functioning Measures

Functional Measure	Subgroup 2, (n=10) Mean and SD	Subgroup 3, (n=10) Mean and SD	Subthreshold and threshold combined Mean and SD
SDS (total)	20.10(4.93)	19.20(5.53)	19.65(5.12)
Occupational	6.80(1.6)	6.90(2.18)	6.85(1.89)
Home	7.00(2.10)	7.10(2.18)	7.05(2.08)
Leisure	6.30(2.8)	6.10(3.24)	6.20(2.96)
EQ-5D Health Index	0.549(0.21)	0.548(0.18)	0.548(0.19)
ICE-CAP Tariff Score	0.616(0.14)	0.543(.10)	0.580(0.13)

Note. Data were taken from Baseline (Phase 3)

Aim 2: Symptom Severity and Functioning

Symptom Load and KIDSCREEN-10

A one-way ANOVA was conducted to compare scores on the KIDSCREEN-10 between subgroup 1 (n = 8), subgroup 2 (n = 10), and subgroup 3 (n = 13). The means and standard deviations are presented in Table 1. The analysis revealed a significant effect of group on the KIDSCREEN-10 score ($F(2, 28) = 4.80$, $\mathbf{p = 0.016}$).

Post hoc analyses were conducted using Tukey's Honestly Significant Difference test to further examine the significant effects observed in the ANOVA. The results indicated significant differences between the One and Two Symptom Group and the Threshold Group ($\mathbf{p = 0.014}$), with participants meeting threshold criteria reporting poorer functioning on the KIDSCREEN-10. However, no significant differences were found between the Subthreshold group (three or four symptoms) and the other two groups.

Symptom Load and SDS

A paired t-test using Subgroup 2 and 3 3 data was conducted to compare those with subthreshold loads and threshold symptoms on the SDS. The results did not indicate a significant difference between the two groups, $t(18) = 0.674$, p = .706, with no statistically significant difference in SDS total between those with subthreshold and threshold symptom loads, indicating similarly high levels of functioning impairment in those that are subthreshold and those that meet threshold criteria.

Symptom Load and EQ-5-DL Health Index

A paired t-test using Subgroup 2 and 3 data was performed to compare the EQ-5-DL Health Index scores between individuals with subthreshold loads and those with threshold symptoms. The analysis revealed no significant difference between the two groups, $t(18) =$

0.434, p = .989, suggesting that there was no statistically significant variation in HRQoL total scores between individuals with subthreshold and threshold symptom load.

Symptom Load and ICECAP-A

A paired *t*-test using subgroup 2 and 3 was performed to compare the ICECAP-A scores between individuals with subthreshold loads and those with threshold symptoms. The analysis revealed no significant difference between the two groups, $t(18) = 1.26$, p = .222, suggesting that there was no statistically significant variation in ICECAP-A total scores between individuals with subthreshold and threshold symptom load.

Aim 3: DUBPDF and Functioning

Duration of Untreated BPD Features were calculated for all participants that completed Diagnostic Screening (Phase 2) and had at least one feature of BPD. See Table 5 for DUBPDF between symptom groups. Table 5 shows the DUBPDF between symptom groups, grouped by onset of the first feature, 3rd (subthreshold) feature and 5th (threshold) feature.

Table 5

Duration of Untreated BPD Features

Duration of Untreated BPD Features	Subgroup 1 (one or two features) (n = 9) Mean and SD	Subgroup 2 (sub-threshold) (n=11) Mean and SD	Subgroup 3 (threshold) (n=15) Mean and SD
1st feature onset	5.00(2.69)	5.72(3.5)	7.93(4.40)
3rd feature onset		3.00(2.96)	5.40(3.11)
5th feature onset			4.42(3.22)

DUBPDF and KIDSCREEN-10

Using subgroup 1, 2, and 3 a linear regression analysis was conducted to examine the relationship between the KIDSCREEN-10 and DUBPDF 1 feature. Four participants were excluded from the analysis due to incomplete data resulting in thirty-one participants for

analysis. The linear regression model did not reach statistical significance, indicating that there was no significant relationship between the KIDSCREEN-10 variable and DUBPDF 1 symptom R2 = .310, F(29, 1) = 1.37, β = -.338 , p = .090, 95% CI [-0.73, 0.56]. The model accounted for 31% of the variance in the KIDSCREEN-10, suggesting a limited explanatory power.

DUBPDF and EQ-5-DL

Using subgroup 2 and 3 (*N* = 20), a linear regression analysis was performed to explore the relationship between the EQ-5-DL health index score and the presence of DUBPDF 1 feature. The results of the regression analysis did not reveal a statistically significant relationship between the EQ-5-DL health index score and DUBPDF 1 symptom R2 = .00, F(1, 18) = 1.37, β = -.001 , p = .950, 95% CI [-0.02, 0.23]. The regression model accounted for 0% of the variance in the EQ-5-DL health index score, indicating a limited explanatory power of the model.

DUBPDF and SDS

Using subgroup 2 and 3 (*N* = 20), A linear regression analysis was performed to explore the relationship between the SDS index score and the presence of DUBPDF 1 feature. The results of the regression analysis did not reveal a statistically significant relationship between the SDS total score and DUBPDF 1 symptom R2 = .012, F(1, 18) = .212, β = -.132 , p = .651, 95% CI [-.73, .47]. The regression model accounted for 1.2% of the variance in the SDS total score, indicating a limited explanatory power of the model.

DUBPDF and ICECAP-A.

Using subgroup 2 and 3 (*N* = 20), A linear regression analysis was performed to examine the relationship between the ICECAP-A Tariff score and the DUBPDF 1 symptom category. The regression model did not yield statistically significant results R2 = .09, F(1, 18) = 1.85, β = -.008 , p = .190, 95% CI [0.33, 0.071], indicating that there was no significant association between the

ICECAP-A Tariff score and the presence of DUBPDF 1 symptom. The model accounted for 9.3% of the variance in the ICECAP-A Tariff score, suggesting a limited explanatory power in predicting this outcome.

Discussion

To the best of our knowledge, this is the first study to capture a broad profile of functioning in adolescents and young adults with a wide range of BPD features recruited from the community.

Functional Impairment

Firstly, this study utilised a comprehensive approach to functioning, drawing upon the assessment of numerous domains, based on the capability approach (Sen et al., 1999) and the WHO ICF model (World Health Organisation, 2001). Functional impairment was reported by participants across multiple domains, including HRQoL, general capability, occupational, social, and family functioning among adolescents and young adults. These findings build upon prior evidence from clinical samples of adolescents and young adults with BPD features that report high levels of educational and vocational impairment, poor quality of life, difficulties in physical well-being, and peer relationships (Chanen et al., 2022; Kaess et al., 2017; Winograd et al., 2008), and that even those with one feature of BPD experienced lower HRQoL (Thompson et al., 2020).

Juurlink et al., (2021) found that vocational functioning was predicted by not achieving the expected age-appropriate educational milestones, greater identity instability, and chronic emptiness. At baseline those that were not in education, employment, or training (NEET) was 39.3%. The authors detail that NEET status was predicted by not achieving educational milestones and greater instability in identity and emptiness. Comparatively, our sample of those

meeting NEET status was 28.5%. Differences may have been accounted for by this being a community-based sample containing those with less features of BPD.

Our results also suggest that vocational and education attendance may not be a valid marker of functioning. Although participants may be attending work or school, there was subjective functional impairment as measures by the SDS. This suggests that although attendance may be evidenced, there is a disengagement from the activity.

Symptom Severity and Functional Impairment

There was a significant difference in HRQoL between individuals with one feature of BPD and those with threshold level features of BPD. Despite all groups showing below normed means compared to a non-clinical representative sample of adolescents, those with subthreshold and full-syndrome BPD features displayed lower HRQoL compared to those with one or two BPD features on the KIDSCREEN-10. However, there were no significant differences in HRQoL and other domains of functioning (SDS, EQ-5-DL, and ICECAP-A) between adolescents with subthreshold and full-syndrome BPD features. This finding is important, as it replicates the results of Thompson et al., (2020), that severe functional impairment was just as present in participants with subthreshold as well as threshold presentations of BPD, and this was evident across all measures of functioning. In addition, this study shows that functional impairment along with BPD features are reported by young people in the community, some of whom are receiving no service at all.

Our finding may be considered through the clinical staging model. The clinical staging model categorizes mental health conditions based on symptom severity, functional impairment, and duration, guiding tailored interventions through at-risk to chronic stages (McGorry et al., 2006). In essence, individuals with fewer symptoms may necessitate a different level of

intervention compared to those with threshold features. However, our results reveal comparable levels of impairment between those with subthreshold and threshold BPD, raising questions about the significance of an arbitrary cut-off. This has implications, as subthreshold criteria may be used to exclude individuals from research studies and may impact the provision of care. As functioning starts to become recognised as a key treatment target and primary outcome (see Chanen et al., 2021; Schmeck et al., 2023), strategies to address functional impairment should carefully consider how it manifests across the spectrum of features.

DUBPDF and Functional Impairment

In a small sample, the results suggested that a longer duration of symptoms were not associated with greater functional challenges on the KIDSCREEN-10, SDS, ICECAP or EQ-5-DL; functional challenges were present across a broad spectrum of illness duration. Similarly, a recent study by Esposito et al., (2023) found that clinical aspects of BPD were not associated with duration of illness (DUI). However, those under 18 were excluded from this study, and the authors examined factors "associated with BPD". Additionally, the authors did not review specific BPD features, but rather clinical features such as medical and psychiatric comorbidity.

Fundamentally, our results highlight the functional needs of an overlooked population within a critical period of BPD feature development (Bornovalova et al., 2009; Cavelti et al., 2021). Among those exhibiting subthreshold and threshold features of BPD, none had received targeted BPD-specific intervention as indicated by NICE or the Scottish Matrix Guidelines for their symptoms (NICE, 2009; NHS Education for Scotland, 2011). Given that participants were recruited from the community, the results suggest the importance of screening for possible personality difficulties when providing mental health services for adolescents and young adults in community-based settings. This is of critical importance as any borderline features as early as

age twelve predicts poorer outcomes in the transition to adulthood, over and above other behavioural and emotional problems (Wertz et al., 2020).

Limitations

The present study has some limitations. Firstly, the small sample size hampers the generalizability of findings to a wider population. Using inferential statistics with small sample sizes can be problematic due to reduced statistical power, increased variability, unreliable p-values, limited generalizability, potential bias, and difficulty detecting small effects. In small sample sizes, use of exploratory data analysis can provide more reliable insights into observed effects. However, the adverse personal, social and economic consequences of BPD during adolescence and early adulthood have been summarised in many publications (Leichsenring et al., 2011). Although the small sample size, it is indicative of the most severe and excluded young people in the community with BPD features. Secondly, the retrospective collection of data may introduce recall bias. However, to address this potential bias, assessments were conducted through thorough clinical interviews and case-history reviews were completed when this was available. Meaning biases related to subjective or retrospective reporting were effectively minimized in this study.

It is important to consider the representativeness of the recruited sample in relation to the broader clinical populations. Demographic information was not collected from the entire clinical population. Therefore, there is a possibility that the obtained sample may contain bias and only represents a specific subgroup of the general population. Moreover, the sample were predominantly white, limiting the generalizability of the findings to other racial and ethnic groups. Further work is needed to assess the functional outcomes in adolescents with BPD features across diverse racial and ethnic groups. In addition to this, a control group was not used

in the current study, thus limiting the ability to draw definitive conclusions from the current sample. However, to an extent, this was mitigated by using measures that are well-established and provided normed data.

Furthermore, it is worth noting that the measures utilized in this study were primarily validated for either children or adults. Due to the broad inclusion criteria and early-intervention based age range focus, it was challenging to find measures that precisely matched this transition period.

Conclusions

This study aimed to explore the functioning of adolescents and young adults with BPD features recruited from the community. Despite the small sample size, the participants exhibited significant unmet needs, as indicated by various functional difficulties reported within this group. These findings emphasize the critical importance of integrating comprehensive functional assessments into the evaluation and intervention approaches for young individuals with BPD features.

Both full-syndrome and subthreshold BPD in adolescents are associated with severe impairments in HRQoL and psychopathological distress, including high levels of pre-mature mortality. Our findings provide evidence for high levels of unmet needs in a group of young people with high clinical multi-morbidity, some of whom are receiving no services at all. This study provided support for ongoing clinical trials to focus on functional outcomes alongside symptom profiles in improving early intervention outcomes for young people with BPD features. Future research, using larger and more diverse samples alongside longitudinal designs, would enhance reliability and widen the scope of generalizability to a broader clinical population.

Implications for Theory, Clinical Practice, and Future Research

This study emphasizes the need for early identification and intervention among adolescents displaying BPD features to address potential disruptions in the complex developmental pathway related to achieving adult role functioning. It highlights the importance in moving beyond symptomatology by advocating for comprehensive assessments that encompass various domains of functioning, including HRQoL, general capability, and social/occupational functioning. While the study did not establish a clear link between the duration of untreated BPD features and functional impairment, it is notable that functional challenges were present early on. Healthcare professionals should recognize the necessity of holistic assessment and intervention strategies targeting functional outcomes to improve the overall well-being of adolescents with BPD features at subthreshold or threshold levels, whether newly identified or having lived with these features for an extended period. Future research should examine how the functional difficulties identified in the present study may be integrated and tested in targeted intervention.

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Appendices

Systematic Review

Appendix 1.1: Reporting Checklist (PRISMA)

Appendix 1.2: Data Extraction Template

Major Research Project:

Appendix 2.1: Final Approved Major Research Project Proposal

Appendix 2.2: STROBE Equator Guidelines

Appendix 2.3: Ethics NHS Greater Glasgow and Clyde Managerial Board Approval

Appendix 2.4: Ethics Committee Approval for BRIDGE

Appendix 2.5: Approval of Ethics Amendment for first Author

Appendix 2.6: Approval for Researcher to Start

Appendix 1.1: Reporting Checklist (PRISMA)

TITLE			Location
Title	1	Identify the report as a systematic review.	9
ABSTRACT			9
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	10 - 12
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	15
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	13
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	14
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	13 – 14
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	16
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	15 - 16
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	15
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	15 - 16
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	16
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	16
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	15
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	16
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	16
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	16
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	16
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	15
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	15

RESULTS			Location
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	17
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	18
Study characteristics	17	Cite each included study and present its characteristics.	19
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	27
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	23 -24
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	27
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	28
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	28-29
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	28 - 30
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	30
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	30
DISCUSSION			30
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	31
	23b	Discuss any limitations of the evidence included in the review.	34
	23c	Discuss any limitations of the review processes used.	34
	23d	Discuss implications of the results for practice, policy, and future research.	35
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	12
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	12
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	NA
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	NA
Competing interests	26	Declare any competing interests of review authors.	NA
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	NA

Appendix 1.2: Data Extraction Template

	Data Extraction Proforma		
	Authors		
	Year		
	Title		
	Country		
P	Total sample		
	Age	Mean	
		SD	
		Median	
		Range	
	Gender		
	Race/Ethnicity		
	Diagnostic tool used to assess BPD symptoms		
I	If DSM, number of symptoms for inclusion criteria		
	If ICD-11		
	Study duration		
	Number of participants		
	Intervention	Experimental Modality	
C		Comparison Intervention or TAU	
		Duration of intervention	
		Schedule of assessment	
O	Functioning	Measure used	
		Primary or secondary	
		Analysis	
		Reported p-value	
		Hedges' g	
	Attrition		

Appendix 2.1 Final Approved Major Research Project Proposal

https://osf.io/ys452

Appendix 2.2: STROBE Equator Guidelines

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Pager Number
Page Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	49
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	49
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	50
Objectives	3	State specific objectives, including any prespecified hypotheses	52
Methods			
Study design	4	Present key elements of study design early in the paper	53
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	55
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	55
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	56-58
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	56-58
Bias	9	Describe any efforts to address potential sources of bias	58
Study size	10	Explain how the study size was arrived at	54, 61, 66 and 67
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	58, 59
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	59-60
		(*b*) Describe any methods used to examine subgroups and interactions	59-60
		(*c*) Explain how missing data were addressed	59
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases	

1

	and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	
	(*e*) Describe any sensitivity analyses	59

Continued on next page

Results			**Page Number**
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	65-69
		(b) Give reasons for non-participation at each stage	61
		(c) Consider use of a flow diagram	61
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	63
		(b) Indicate number of participants with missing data for each variable of interest	63
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	67
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	68, 69, 70
		(*b*) Report category boundaries when continuous variables were categorized	68, 69
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	71
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	74
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	72, 73
Generalisability	21	Discuss the generalisability (external validity) of the study results	75
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Appendix 2.3: Managerial Board Approval

Appendix 2.4: Ethics Committee Approval for BRIDGE

Appendix 2.5: Approval of Ethics Amendment for first Author

Appendix 2.6: Approval for Researcher to Start