

**Royal Australian and New Zealand College of Psychiatrists – RANZCP  
2012 Fellowship Program: Scholarly Project**

Impaired functioning in young people with borderline personality  
disorder features: a systematic review

**Submission date:** 12<sup>th</sup> July 2019

**Word count:** 4744

## **Abstract**

**Background:** Borderline personality disorder (BPD) is associated with moderate to severe functional impairment in adults, but less is known about functional impairment in young people, when the disorder first presents clinically. This systematic review aims to describe the nature, extent and severity of functional impairment among young people (12 to 25 year-olds) with BPD features.

**Method:** MEDLINE, Embase, PsycINFO and PubMed were systematically searched for primary empirical studies that reported on functional impairment in youth diagnosed with BPD features, published between 1980 to 31 March 2018. A qualitative synthesis of data was conducted.

**Results:** A total of 9,978 abstracts were screened. Of 999 full-text articles retrieved, 43 met the inclusion criteria for age group, BPD features, and a reported outcome related to functioning. These studies indicate that young people with BPD features have significant impairments in functioning in the domains of education, employment, interpersonal relationships, substance use, sexual behaviour, and mental health service utilisation.

**Conclusions:** Functional impairment in young people with BPD features is pervasive and severe. There is a need for a clearer definition of what constitutes impaired functioning in BPD, along with a more comprehensive and developmentally appropriate measure of this construct.

Borderline personality disorder (BPD) is a common and severe mental disorder that is characterised by extreme sensitivity to perceived interpersonal slights, an unstable sense of self, intense and volatile emotions and impulsive behaviours (Gunderson et al. 2018). BPD is associated with various adverse long-term outcomes (Álvarez-Tomás et al. 2019). Longitudinal studies of adolescents and adults consistently demonstrate that BPD features naturally attenuate over time, whereas impairments in functioning persist (Gunderson et al. 2011; Zanarini et al. 2018; Alvarez-Tomás et al. 2017; Soloff & Chiappetta 2018; Winograd et al. 2008; Álvarez-Tomás et al. 2019).

The clinical ‘onset’ of BPD is typically in the period between puberty and emerging adulthood (young people; aged 12 to 25 years) (Chanen & Thompson 2019). This is also the key period for the development of adult identity, attitudes, behaviours and social roles (Hill et al. 2013; Kerpelman et al. 2012; Erikson 1994; Arnett et al. 2014), along with key skills needed for education and future vocations, interpersonal relationships, and independence from one’s family of origin (Hill et al. 2013; Kerpelman et al. 2012; Cohen et al. 2005). By its very nature, personality disorder during this developmental period can disrupt the acquisition of the functional skills required for adult role functioning. This is largely due to the maladaptive cognitions, emotions and behaviours that foster vicious circles, leading to further vocational or relational dysfunction (Cohen et al. 2005; Chen et al. 2006; Levy et al. 1999; Johnson et al. 2000; Kasen et al. 1999; Millon 2016).

In community samples, young people with BPD features have been shown to have the broadest range of psychological distress and functional impairment of all the personality disorders (Bernstein et al. 1993; Winograd et al. 2008) and BPD features uniquely predict poor functional outcomes for up to two decades into the future, including increased risk of mental disorders, interpersonal problems, school and work difficulties, reduced quality of life and poor physical health (Bernstein et al. 1993; Crawford et al. 2008; Winograd et al. 2008;

Chen et al. 2009). In clinical samples, both full-syndrome ( $\geq 5$  DSM-5 BPD criteria) and sub-threshold presentations of BPD (1-4 DSM-5 BPD criteria) in youth are also independently associated with greater impairments in social and occupational functioning, compared with patients having no BPD features (Chanen et al. 2007; Thompson et al. 2019). Despite this knowledge, a comprehensive understanding of the nature, extent and severity of the impairments experienced during this critical developmental period remains unclear.

This limited understanding is heightened by the lack of a consensus definition of the functioning construct (Ro & Clark 2009; Ustün & Kennedy 2009) and the lack of developmentally appropriate measures of functioning. The Diagnostic and Statistical Manual of Mental Disorders (5th ed; DSM-5; American Psychiatric Association [APA], 2013) requires an evaluation of the clinical significance of distress or functional impairment as a criterion for the diagnosis of a mental disorder, including personality disorder. Yet, DSM-5 does not provide clear guidance about the level of impairment required to meet the diagnostic threshold. Furthermore, little is understood about the clinical extremes of functional impairment, where personality and mental state pathology routinely co-occur.

This is the first systematic review to investigate functional impairment experienced by youth with BPD features. The aim is to provide a comprehensive description of the nature, extent and severity of this functional impairment.

## **Method**

A literature search was conducted to ensure a systematic review had not recently been published on the current topic. Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) recommendations (Moher et al. 2009) were used as a framework for this review.

### *Search*

A search was conducted to identify relevant studies in MEDLINE, Embase, PsycINFO and PubMed from 1980 to 31 March 2018. The earlier date was set at 1980 to reflect the first appearance of BPD in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association 1980). The search strategy was devised using relevant subject headings from each database and a list of free word terms identified by the authors to capture the relevant age range, BPD features, and areas of functioning. Supplementary tables 1 to 4 provide a detailed list of search terms used and the results obtained.

#### *Inclusion and exclusion criteria*

Studies were included if: (i) they were an original quantitative research article published in a peer reviewed journal, in English, from 1980 onwards; (ii) the age range of participants at one time point (either a baseline or follow-up assessment) was between 12 and 25 years; (iii) participants had a formal diagnosis of BPD or assessment for BPD criteria or features; (iv) an area of functioning was reported, either when describing the participants, or included as an outcome of the study. Baseline data was used when the study was a treatment trial, in order to exclude any short-term gains that might be observed from interventions.

Studies were excluded if: (i) they employed qualitative methodologies; (ii) participants with BPD could not be clearly identified (i.e., BPD diagnosis/features was reported as an outcome, participants were grouped by personality disorder cluster, or only some participants in the sample had BPD).

#### *Screening Procedure*

Rayyan, a web-based screening tool for systematic reviews, was used to screen titles and abstracts (Ouzzani et al. 2016). Titles and abstracts were reviewed to identify relevant articles for full-text retrieval. Ten percent of articles were reviewed independently by two authors, the remaining 90% by either one of the authors. Full-text review was conducted

independently by both authors. Discrepancies between reviewers were resolved by discussion.

#### *Data collection and qualitative assessment*

A table was created, prior to review, for the extraction of relevant data, including author details, country of the study, characteristics of the sample, study design, comparison group(s) (if any), BPD assessment tool used and the area(s) of functioning reported. Quality assessment was performed using the 9-item Joanna Briggs Institute checklist for the critical appraisal of quasi-experimental studies (Tufanaru et al. 2017). The checklist was used to appraise the cross-sectional data, with a specific focus on selection bias and reliability of BPD assessment. These domains were rated low, medium, or high and then a consensus was reached by two authors to estimate an overall risk of bias for each study (Rojas et al. 2018).

#### *Data synthesis*

Inconsistent use of measures and reporting of functional impairment meant that the data collected in this review was not suitable for quantitative synthesis. Data was synthesised qualitatively.

## **Results**

#### *Study Selection*

Of the 9,978 titles and abstracts scanned, 999 (10%) were identified for full text retrieval. There was a high level of agreement between raters on articles to be included for full text retrieval (>87%). Of the 999 articles retrieved, 637 (64%) were excluded because they were outside the inclusion criterion for age range. Of the remaining 362 articles, 43 were identified as relevant to the current review (refer Figure 1). The most frequent reasons for exclusion were: having no BPD group detailed ( $n = 111$ ) or no area of functioning reported ( $n = 152$ ). Six studies were excluded due to multiple published reports from the same cohort.

### *Study Characteristics*

Thirty-seven studies were of clinical samples, 3 were community samples from a university, 2 were samples from youth residential homes, and 1 was from a residential school. Thirty studies included participants with a diagnosis of BPD, 8 studies comprised individuals with a diagnosis of less than five DSM-5 BPD criteria, and 5 studies provided an assessment of BPD features (not referencing specific diagnostic criteria) (see Table 1). Study methodologies included 30 cross-sectional studies, 6 prospective cohort studies, and 7 clinical trials (including randomised controlled trials (RCTs)). Twenty-eight studies (including all clinical trials) reported on functioning at baseline in the form of global measures of functioning and/or demographic data, and 15 studies reported on functioning as a research outcome.

### *Quality Assessment*

Low risk studies ( $n = 25$ ): Recruitment was based on representative samples (i.e., all youth entering a specialist mental health service (e.g., Brunner et al. (2010)), diagnostic assessments were conducted using structured interviews (e.g., Andrewes et al. (2017)), often reporting inter-rater reliability (e.g., Cailhol et al. (2013)).

Medium risk ( $n = 16$ ): Less rigorous methods were used in diagnostic assessments (i.e., no interrater reliability, no structured assessment tools, e.g. Amminger et al. (2013)), a limited description of the assessment processes was provided (e.g. Fleischhaker et al., (2011)), or samples were less clear about their recruitment procedure (e.g. Schuppert et al. (2009)).

High risk ( $n = 2$ ): One did not report how BPD was defined or assessed (Segal-Trivitz et al. 2006), the other did not report who conducted the diagnostic assessment (Kutcher et al. 1995).

### *Global functioning*

This was the most frequently reported type of functioning. Nineteen studies used a single item measure, rated between 0 and 100, encompassing several domains (occupational, social, psychological, or emotional). Four variants of such measures were used: (1) the Children's Global Assessment of Scale (C-GAS; Shaffer et al. 1983), a measure of emotional and behavioural functioning for 4 to 16 year olds; (2) the Global Assessment Scale (GAS; Endicott et al. 1976) and (3) the Global Assessment of Functioning scale (GAF; American Psychiatric Association 1994; 2000), which are measures of psychiatric symptoms as well as occupational and social functioning (Endicott et al. 1976); and, (4) the Social and Occupational Functioning Assessment Scale (SOFAS; Goldman et al. 1992) a measure of social and occupational functioning. A rating on any of these scales greater than 70 indicates normal or healthy functioning. A rating of 69 and below indicates moderate to severe functional impairment (American Psychiatric Association 2000; Shaffer et al. 1983).

Global functioning for inpatients ranged between  $M=35.2$  ( $SD=4.8$ ) (Zanarini et al. 2017) and  $M=42.75$  ( $SD=7.46$ ) (Selby & Yen 2014) on admission, and up to  $M=49.7$  ( $SD=6.4$ ) at discharge (Chang et al. 2011) (see Table 2). Global functioning of inpatients with BPD was similar or worse than age-matched inpatients with other mental health disorders, and worse than older inpatients with BPD or age-matched healthy controls.

Global functioning for outpatients ranged between  $M=48.12$  ( $SD=9.24$ ) using the GAF (Morgan et al. 2013) and  $M=66.78$  ( $SD=15.4$ ) using the SOFAS (Chanen et al. 2009). Outpatient groups were more impaired than healthy controls and on *par* with age-matched clinical controls (see Table 2). Participants from studies of inpatients and outpatients were found to be more impaired compared with age-matched clinical or healthy controls.

One study with non-clinical participants found those with greater BPD features had lower global functioning (Trull 2001).



### *Employment and educational functioning*

Of studies with school age participants (up to 18 years) 62.7% and 72.7% of those with BPD were currently studying (Chanen et al. 2009; Laurensen et al. 2014). Two studies (from the same research group) that compared females with BPD with healthy clinical controls (with no significant difference in IQ level) showed that a greater proportion of BPD participants attended schools that lead to vocational pathways rather than university (Kaess, Resch, et al. 2013; Richter et al. 2014). Four studies, from the same research team, with participants up to the age of 25, found lower levels of educational attainment among their participants with BPD and BPD features. From that group, only 38.8% of participants over the age of 18 had completed high school (Andrewes et al. 2017). They also had lower levels of high school education and fewer progressed to tertiary studies compared with age-matched clinical, healthy and/or community controls (Jovev et al. 2011; Tay et al. 2017; Thompson et al. 2017). Chanen and colleagues (2009) found 11.8% of participants had dropped out of school in the month prior to participating in research. In contrast, Morgan et al. (2013) found among young adults (18 to 25 years) with BPD, 81.4% had graduated high school, 10.3% had graduated from college or higher, and only 8.2% had not completed high school.

Youth with BPD were more likely to have been suspended, expelled or to have repeated a year compared with healthy controls (Kramer et al. 2017). They also had more days out of role (i.e., education, seeking employment, employment) due to truancy, compared with adolescents with other personality disorders (Chanen et al. 2007). At 5-year follow-up, 70% of adolescents with a history of childhood borderline pathology and current BPD had changed schools due to behavioural problems (Zelkowitz et al. 2007).

In community-based samples, adolescents with BPD were three times more likely to drop out of school or repeat a year (Bernstein et al. 1993). College students with BPD features had a lower cumulative grade point average (GPA) compared with those without.

During the 2-year follow-up period, a greater proportion of those with BPD features were ineligible to enrol in classes compared with those without (Trull et al. 1997).

Five studies, using clinical samples, reported unemployment rates between 10.0-17.3% for young people with BPD (Andrewes et al. 2017; Frías et al. 2017; Tay et al. 2017) and BPD features (Chanen et al. 2009; Jovev et al. 2011). Others showed higher rates of unemployment: 33.3% for youth with BPD features (Sio et al. 2011), 48% for youth with BPD (Sio et al. 2011; Gersh et al. 2017), 55% for young adults with a history of BPD in adolescence and 64% for young adults with persistent BPD (Biskin et al. 2011). Youth with BPD features were more likely to be unemployed or have a lower employment status than age-matched community controls (Thompson et al. 2017). Five percent of young people with BPD were reported to be “retired due to disability” in one study (Frías et al. 2017), while 47% were on leave from work or school commitments (Andrewes et al. 2017). Compared with age-matched healthy controls, adolescents with BPD were less likely to have a good work or school history (Kramer et al. 2017) and were 4.9 times more likely to experience problems at work (Bernstein et al. 1993).

### *Social functioning*

Young people with BPD experienced more difficulties in their peer relationships and family relationships than clinical and healthy control participants (Chanen et al. 2007; Kramer et al. 2017; Taylor et al. 2008; Zerkowicz et al. 2007). Adolescents with BPD spent more than half of their free time alone and participated less in community organisations (Kramer et al. 2017). With regard to involvement in romantic relationships, two studies reported a rate of 41% and 50% (no comparison group) (Frías et al. 2017; Gersh et al. 2017), while two others reported rates of 57% and 64%, which was higher than among clinical or healthy comparison groups (Chanen et al. 2007; Kramer et al. 2017).

### *Substance use*

A study of 18 adolescents (12 to 17 years) with BPD reported the rate of regular substance use over the previous 12 months to be 50% for alcohol, 44% for cannabis, 50% for amphetamines, and 22% had not used drugs or alcohol (Huynh et al. 2010). A study with 43 14- to 19-year-olds with BPD features showed that 12% consumed greater than 10 units of alcohol per week, 21% had more than one marijuana cigarette per week and 4.6% engaged in regular use of “hard drugs” (Schuppert et al. 2009). In a larger sample of 109 youth with BPD features (14 to 19 years), 34% had abstained from alcohol, 33% had consumed alcohol socially, and 33% had consumed alcohol excessively (Schuppert et al. 2012). Female youth with BPD features consumed alcohol less frequently compared with a nationally representative community group, but when they did drink it was in much higher quantities ( $M = 5.85$ ,  $SD = 4.21$  number of drinks) (Thompson et al. 2017). Youth with BPD were also found to have higher alcohol related problems and risk than a nationally representative community group (Scalzo et al. 2017). Kutcher and colleagues (1995) reported that 38% of youth with BPD had a “significant” history of drug and alcohol use. In a study of 117 youth with BPD, the youth with BPD were found to have a greater rate of monthly or more frequent use of cannabis, amphetamines and two or more illicit substances, compared with a nationally representative community group (Scalzo et al. 2017). Greenfield and colleagues (2015) found that of the 12- to 17-year olds who presented to an emergency department for suicidal behaviours, 57% of those with a BPD diagnosis used drugs compared with 24% of those without a BPD diagnosis.

Daily tobacco use (62.9%) was significantly higher for youth with BPD compared with nationally representative community controls (12.3%) (Scalzo et al. 2017), began at a younger age ( $M = 12.03$ ,  $SD = 2.78$  years) for youth with BPD compared with individuals with other personality disorders ( $M = 13.32$ ,  $SD = 1.81$  years) (Chanen et al. 2007), and the number of cigarettes smoked per day ( $M = 10.90$ ,  $SD = 8.79$  cigarettes) by females with BPD

features was significantly higher than nationally representative community controls ( $M = 1.81$ ,  $SD = 0.74$  cigarettes) (Thompson et al. 2017).

### *Sexual and reproductive health*

Two independent studies (from the same research group) reported on sexual and reproductive health of youth with BPD features ( $<5$  DSM-5 criteria) (Thompson et al. 2017) or full-syndrome BPD ( $\geq 5$  criteria) (Chanen et al. 2007). In a study of youth with BPD Chanen and colleagues (2007) found youth with BPD had a significant higher rate of currently being sexual active (70.5%) and higher frequency of sexually transmitted infections (13.6%) compared with youth with other or no personality disorder. The research conducted by Thompson and colleagues (2017) focussed on female sexual health compared with a nationally representative community sample. Females with BPD features were found to be sexually active at a younger age ( $M = 15.6$ ,  $SD = 2.3$  years), have had more sexual partners in the last 12 months, and more were in casual relationships (41.0%) than the nationally representative community controls. This study also found that more young females with BPD features had been coerced into unwanted sexual experiences (55.1%), and they were also more likely to practice unsafe sex in their first sexual encounter (31.6%) than the nationally representative community controls (Thompson et al. 2017).

### *Other areas of functioning*

Other areas of functioning that have been studied include service utilisation, financial dependence on others, and forensic issues. In a study of 85 adolescents with BPD taken from an inpatient and outpatient sample, 74 (63%) were having regular weekly meetings with a healthcare professional (Cailhol et al. 2013). From the same study, 84 (98%) had a history of outpatient treatment, 67 (79%) had a history of inpatient treatment, and participants had consulted with an average of 5.6 mental health professionals in their lifetime. This was a significantly higher rate of service utilisation than the controls. In a study of 31 females that

were diagnosed with BPD in adolescence, of the 11 that had retained a diagnosis at 4-year follow up, 8 (73%) were receiving psychological treatment compared with 5/20 (25%) participants that had remitted, and 3/16 (19%) controls that had no BPD diagnosis (Biskin et al. 2011). In a study of 13 adolescents with BPD living in a residential group home, 12 (92%) had received previous psychotherapy treatment (Kutcher et al. 1995). In a study comparing 35 female adolescent inpatients with BPD to 46 female adolescents without, (similar age, socioeconomic status, IQ, illness severity) the adolescents with BPD exhibited behaviours that led to a greater amount of restraints, time-outs, acts of aggression and more drug/alcohol screens (Faulkner et al. 1999). Greenfield et al. (2015) looked at 12 to 17 year olds with and without BPD and found the BPD group had a higher rate of previous hospital admissions ( $M = 2.31, SD = 0.95$ ) vs ( $M = 1.83, SD = 0.92$ ) and emergency department presentations ( $M = 1.48, SD = 1.03$ ) vs ( $M = 1.24, SD = 0.69$ )).

In a study comparing 46 outpatient youth with BPD to 88 with another personality disorder (OPD) and 43 with no personality disorder (NPD), youth with BPD (21 (46%)) were less likely to be financially supported by their parents (OPD: 74 (84%), NPD: 38 (88%)). They were more reliant on government benefits (BPD: 14 (30%), OPD: 12 (14%), NPD: 5 (12%)), more likely to be living out of home with other non-relatives (BPD: 12 (26%), OPD 7 (8%) NPD 5 (12%)). There was also significantly poorer self-care than the other groups (Chanen et al. 2007). Two studies have reported on forensic involvement. One found that 23% of youth with BPD had had contact with the law within a 12 month period (Schuppert et al. 2009), and 37% had contact with the juvenile justice system (Chanen et al. 2007).

#### *Measures of functioning used across studies*

Unitary measures of global functioning were the most commonly used measures to determine functional status of participants (19 studies). Five other studies utilised a detailed measure of functioning (Social Adjustment Scale - Self Report (SAS-SR; Weissman &

Bothwell 1976), Columbia Impairment Scale (CIS; Bird et al. 2008), Health of the Nation Outcome Scores for Children and Adolescents (HONOSCA; Gowers et al. 1999)) to collect broader data over several domains of functioning (Biskin et al. 2011; Gersh et al. 2017; Trull 2001; Zelkowitz et al. 2007; Chanen et al. 2007). Of these five studies, four did not report ratings obtained by the measure and only provided statistical analyses of group comparisons or associations with other study variables (Biskin et al. 2011; Gersh et al. 2017; Trull 2001; Zelkowitz et al. 2007). The fifth study (Chanen et al. 2007) collected and reported on functioning using four items selected from the HONOSCA (peer relationships, self-care and independence, family life and relationships, and school attendance).

## **Discussion**

This is the first systematic review to investigate impaired functioning in youth with BPD features. Importantly, both global functioning and specific domains of functioning were assessed. Functional impairment in youth with BPD pathology was both severe and pervasive. Moreover, global functioning was found to be lower than that of age-matched healthy or clinical comparison groups. Impairments were identified in education (Andrewes et al. 2017; Kramer et al. 2017), employment (Frías et al. 2017; Kramer et al. 2017), interpersonal relationships (Zelkowitz et al. 2007), self-care (Chanen et al. 2007), substance use (Kutcher et al. 1995), sexual health and behaviours (Chanen et al. 2007), and health service utilisation (Cailhol et al. 2013). Evidence from prospective, longitudinal studies suggests that these impairments have the capacity to continue into adulthood, long after the features of BPD attenuate (Winograd et al. 2008; Wright et al. 2016).

In the studies reviewed, four methods of measuring functioning were identified. First, global measures of functioning (e.g., SOFAS) were the most frequently used. However, they lacked detail regarding the actual domains of functioning and the extent of impairment (e.g., Amminger et al., (2013)). Second, multidimensional measures were collected in some

studies, but only selected variables were reported (e.g., Gersh et al., (2017)). Third, demographic descriptors were reported but these were limited to current employment status, highest education achieved, or current relationship status (e.g., Frias et al., (2017)). Fourth, a minority of studies used bespoke questions about functioning that were relevant to their research. These studies provided the richest information about functional impairment in youth with BPD (e.g., Chanen et al., (2007)).

The lack of consistent or comprehensive assessment tools appears to be a consequence of the absence of conceptual or operational clarity regarding the functioning construct. There is no consensus definition of functioning or of functional impairment (Ro & Clark 2009; Ustün & Kennedy 2009). Existing measures vary in the detail and range of impairments captured and comparisons between studies are limited. Further research is needed to develop a unified model and an operationalised definition of functioning in mental ill-health. This would then support the development of a valid and reliable measure of functional impairment that might be suitable for use with young people who have a personality disorder.

### *Clinical Implications*

The findings from this systematic review have important implications for clinical practice by suggesting the need for a specific focus on functional outcomes, over and above symptoms, in the early treatment of BPD (Chanen 2015; Wright et al. 2016; Chanen et al. 2015). Historically, BPD treatment has largely focused on reducing suicide and self harm risk, along with extensive service utilisation. Although service utilisation is costly, there is evidence that the majority of the high costs attributable to BPD are due to indirect costs, chiefly work-related disability (van Asselt et al. 2007; Salvador-Carulla et al. 2014). Greater clarity with regard to defining functioning might assist in the development of new forms of early intervention that address functional impairment, thereby improving long-term clinical

outcomes. Early intervention strategies targeting improved functioning in the domains of education and/or employment (i.e., vocation) might lead to reductions in social and economic costs of BPD. Such strategies might complement existing treatments and might include vocational engagement, interpersonal skills, or health literacy. Such an approach is also consistent with the World Health Organisation's perspective that an individual's level of functioning might be a better indicator of healthcare service need and treatment outcome than symptoms or diagnosis alone (Reed et al. 2005).

### *Strengths and limitations*

This is the first systematic review to examine functional impairment in young people with BPD. Despite variation in the methods and quality of the data available, this review highlights the consistency of findings regarding the extent of functional impairment in youth with BPD, as well as the need for further descriptive and intervention research in this area. Limitations include that many studies used global ratings or demographic descriptors as their key outcomes and consequently, few studies provided adequate detail about the functioning of young people with BPD. Five studies used a comprehensive measure of functional impairment, (Biskin et al. 2011; Gersh et al. 2017; Trull 2001; Zelkowitz et al. 2007; Chanen et al. 2007) however reporting of these measures was selective and inconsistent. Consequently, there was insufficient data available to allow for a quantitative synthesis of findings.

The assessment of quality found that 58% of the studies had a low risk of bias for selection of participants or for assessment of BPD and the remaining 42% of studies were rated as medium or high risk. Among the most common issues that resulted in a higher risk of bias was the way in which BPD was assessed. Less rigorous diagnostic methods raises concerns about potential under-reporting of BPD. Consequently, the extent of functional impairment among individuals with BPD might not be fully captured.



Finally, the lack of a standardised definition of functioning or functional impairment, along with the lack of reliable and valid methods for measuring function among young people with severe mental disorders, including BPD suggests an urgent need for further research.

## **Conclusion**

This systematic review demonstrates the severity and extent of functional impairment among young people with BPD and BPD features. They have poorer global functioning scores, less educational attainment and greater amounts of unemployment compared with healthy controls or other personality disorder groups. There are greater difficulties in relationships, higher amounts of substance abuse, engagement in more risky sexual behaviours and more frequent use the health system and government welfare payments. This review has also served to highlight the challenges associated with adequately assessing function and functional impairment given the inconsistencies in definitions and the limitations of existing measures. A consistent definition of functioning, along with a standardised, reliable and valid measuring tool, would help to clarify the extent of functional impairment in young people with BPD. This could ensure that interventions were better tailored to meet the needs of this vulnerable group.

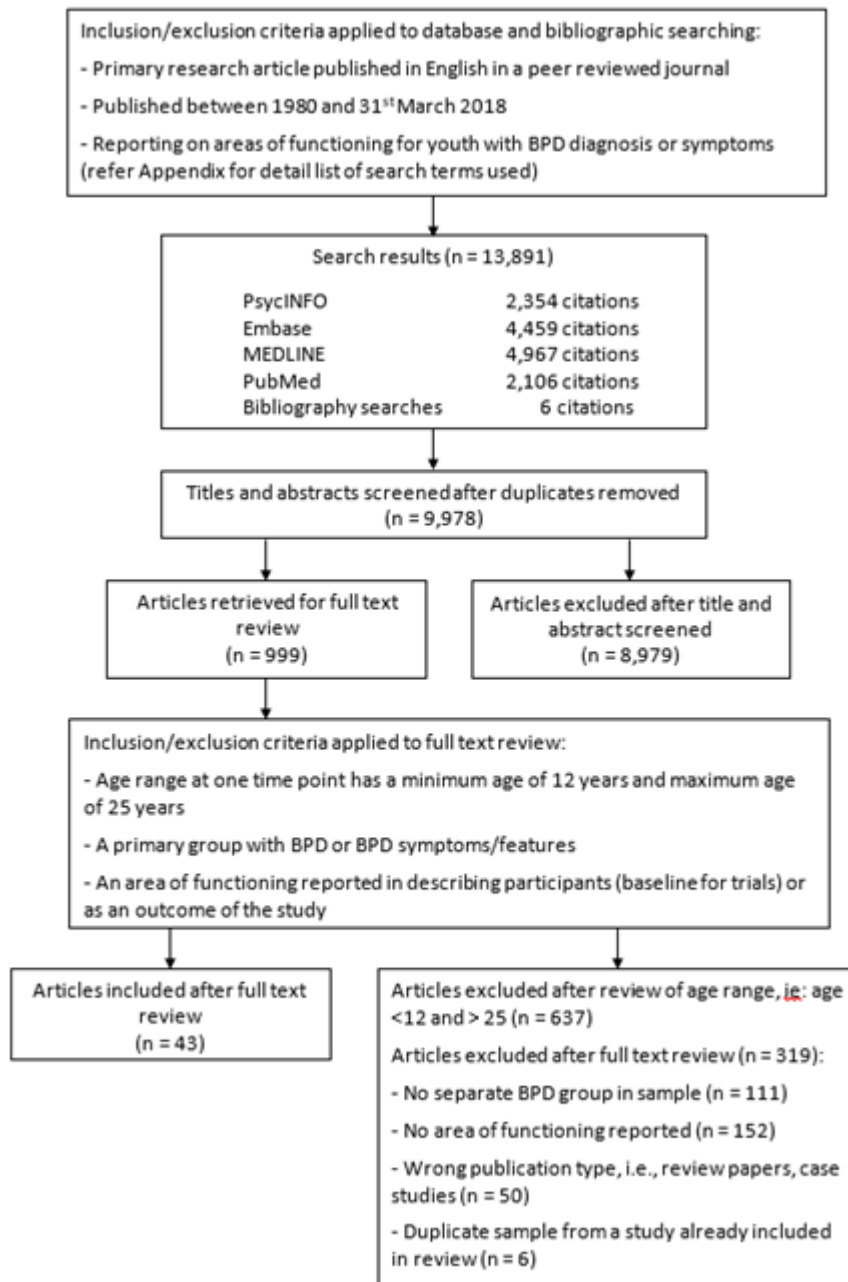


Figure 1. Flowchart outlining the search and selection strategy.

Table 1.

*Details of studies reporting on areas of functioning for youth with BPD*

<b>Author, Year, Country</b>	<b>Participants: n; age range; sex (% female)</b>	<b>Sampled from</b>	<b>BPD diagnostic tool</b>	<b>Comparison group</b>	<b>Study design</b>	<b>Areas of functioning</b>	<b>Risk of Bias</b>
Amminger, 2013, Austria	81 (15 with BPD); 13 to 25 year olds; M and F (33.3%)	Clinical setting (outpatient)	Consensus chart review for DSM-IV BPD	Clinical controls	Trial (RCT)	Baseline demographics: global functioning	Medium
Andrewes, 2017, Australia	107 with BPD; 15 to 25 year olds; M and F (83.2%)	Clinical setting (outpatient)	SCID-II for DSM-IV	N.A.	Cross-sectional	Demographics: education and/or employment	Low
Bernstein, 1993, USA	733 (79 with BPD); 11 to 21 year olds; M and F (49.8%)	Community (residential)	PDQ and SCID-II for DSM-III-R	N.A.	Prospective, 10 year follow-up	Outcome: education and/or employment, social	Medium
Biskin, 2011, Canada	47 (11 with BPD); mean age range 18.4 to 20.4 years; F (100%)	Clinical setting	Chart review: R-DIB	Clinical controls	Prospective, 4-year follow-up	Outcome: education and/or employment, service utilisation	Medium
Brunner, 2010, Germany	60 (20 with BPD); 14 to 18 year olds; F (100%)	Clinical setting (inpatient)	SCID-II for DSM-IV	Clinical controls and healthy controls	Cross-sectional	Demographics: global functioning	Low
Cailhol, 2013, France, Belgium and Switzerland	190 (85 with BPD); 15 to 19 year olds; M and F (87%)	Clinical setting (inpatient and outpatient)	SIDP-IV	Healthy controls	Cross-sectional	Outcome: global functioning, service utilisation	Low
Chanen, 2007,	177 (46 with BPD);	Clinical	SCID-II for DSM-IV	Clinical	Cross-sectional	Outcome: global	Medium

Australia	15 to 18 year olds; M and F (68.4%)	setting (outpatient)		controls		functioning, education and/or employment, social, health	
Chanen, 2009, Australia	110 with BPD*; 15 to 18 year olds; M and F (74.5%)	Clinical setting (outpatient)	SCID-II for DSM-IV ≥ 2 BPD symptoms	N.A.	Cross-sectional	Baseline demographics: global functioning, education and/or employment	Medium
Chang, 2011, USA	51 (20 with BPD); 12 to 18 year olds; M and F (54.7%)	Clinical setting (inpatient)	BPFS-C	Clinical controls	Cross-sectional	Demographics: global functioning	Medium
Edell, 1990, USA	54 (31 with BPD); mean age 18.0 years; M and F (48.1%)	Clinical setting (inpatient)	PDE	Clinical controls	Cross-sectional	Demographics: global functioning	Low
Faulkner, 1999, USA	81 (unreported n with BPD); 13 to 17 year olds; F (100%)	Clinical setting (inpatient)	DIB-R for DSM-III	Clinical controls	Cross-sectional	Outcome: service utilisation	Low
Fleischhaker, 2011, Germany	12 with BPD*; 13 to 19 year olds; F (100%)	Clinical setting (outpatient)	SCID-II for DSM-IV ≥ 3 BPD symptoms	N.A.	Trial (treatment)	Baseline demographics: global functioning	Medium
Frias, 2017, Spain	168 with BPD; 4 age groups: 16 to 25, 26 to 35, 36 to 45, 46 and older; M and F (92.8%)	Clinical setting (outpatient)	SCID-II for DSM-IV	Clinical controls (adults)	Cross-sectional	Demographics: education and/or employment	Low
Gersh, 2016, Australia	44 with BPD; 15 to 25 year olds;	Clinical setting	SCID-II for DSM-IV	N.A.	Cross-sectional	Demographics: education and/or	Low

	M and F (81.8%)	(outpatient)				employment	
Greenfield, 2014, Canada	235 with BPD; 12 to 17 year olds; M and F (69.4%)	Emergency room	Abbreviated Diagnostic Interview for Borderlines	Clinical controls	Cross-sectional	Demographics: service utilisation, substance use	Low
Ha, 2014, USA	335 (110 with BPD); 12 to 17 year olds; M and F (61.8%)	Clinical setting (inpatient)	CI-BPD	Clinical controls	Cross-sectional	Demographics: global functioning	Low
Huynh, 2010, Canada	18 with BPD; 12 to 17 year olds; M and F (88.9%)	Clinical setting (outpatient)	DIB	N.A.	Cross-sectional	Demographics: substance use	Medium
Jovev, 2011, Australia	41 (21 with BPD*); 15 to 25 year olds; M and F (75.6%)	Clinical setting (outpatient)	SCID-II for DSM-IV $\geq 3$ BPD symptoms	Healthy controls	Cross-sectional	Demographics: education and/or employment	Medium
Kaess, 2012, Germany	87 (31 with BPD); 13 to 18 year olds; F (100%)	Clinical setting (inpatient and outpatient)	SCID-II for DSM-IV	Clinical controls	Cross-sectional	Demographics: global functioning	Low
Kaess, 2013, Germany	99 (33 with BPD); 13 to 19 year olds; F (100%)	Clinical setting (inpatient and outpatient)	SCID-II for DSM-IV	Clinical controls and healthy controls	Cross-sectional	Demographics: global functioning, education and/or employment	Low
Kramer, 2017, USA	164 (104 with BPD); 13 to 17 year olds; M and F (90.2%)	Clinical setting (inpatient)	CI-BPD for DSM-IV	Healthy controls	Cross-sectional	Outcome: education and/or employment, social	Low
Kutcher, 1995, Canada	13 with BPD; 14 to 22 year olds; M and F (84.6%)	Residential home for youth	DIB $\geq 7$ and DSM-III-R criteria	N.A.	Trial (drug trial)	Baseline demographics: global functioning,	High

Laurenssen, 2014, Netherlands	11 with BPD*; 14 to 18 year old; F (100%)	Clinical setting (inpatients)	SCID-II for DSM-IV $\geq 2$ BPD symptoms	N.A.	Trial (treatment)	Baseline demographics: education and/or employment	Medium
Mehlum, 2014, Norway	77 with BPD*; 12 to 18 year olds; M and F (88.3%)	Clinical setting (outpatient)	SCID-II for DSM-IV $\geq 2$ BPD symptoms	N.A.	Trial (treatment RCT)	Baseline demographics: global functioning	Medium
Morgan, 2013, USA	143 with BPD; 18 to 25 year olds and 45 to 68 year olds; M and F (76.2%)	Clinical setting (outpatient)	SIDP-IV	Clinical controls (adults)	Cross-sectional	Outcome: global functioning, education and/or employment	Low
Richter, 2014, Germany	60 (20 with BPD), 14 to 18 year olds; F (100%)	Clinical setting (outpatient)	SCID-II for DSM-IV	Clinical controls and healthy controls	Cross-sectional	Demographics: global functioning	Low
Scalzo, 2017, Australia	117 with BPD; 15 to 25 year olds; M and F (79.5%)	Clinical setting (outpatient)	SCID-II for DSM-IV	Community group	Cross-sectional	Outcome: substance use	Low
Schuppert, 2009, Netherlands	43 with BPD*; 14 to 19 year olds; M and F (88.4%)	Clinical setting (outpatient)	BPDSI-IV $\geq 2$ symptoms	N.A.	Trial (treatment RCT)	Baseline demographics: substance use and crime	Medium
Schuppert, 2012, Netherlands	109 with BPD*; 14 to 19 year olds; M and F (96%)	Clinical setting (outpatient)	SCID-II BPD section $\geq 2$ symptoms	N.A.	Trial (treatment RCT)	Baseline demographics: substance use	Medium
Selby, 2014, USA	119 (48 with BPD); 12 to 18 year olds,	Clinical setting (inpatient)	CI-BPD	Clinical controls	Prospective, 6-month follow-up	Baseline demographics: global functioning	Low

	M and F (68%)						
Segal-Trivitz, 2006, Israel	40 with BPD; mean age of 15.8 and 33.2 years; M and F (75%)	Clinical setting (inpatient)	not reported	Clinical controls (adults)	Cross-sectional	Demographics: education and/or employment, service utilisation	High
Sio, 2011, Australia	60 with BPD; 15 to 25 year olds; M and F (80%)	Clinical setting (outpatient)	SCID-II for DSM-IV	N.A.	Cross-sectional	Outcome: education and/or employment	Medium
Speranza, 2011, Europe (France, Belgium and Switzerland)	85 with BPD; 15 to 19 year olds; M and F (87%)	Clinical setting (inpatient and outpatient)	SIDP-IV	N.A.	Cross-sectional	Demographics: global functioning	Low
Tay, 2017, Australia	78 (41 BPD); 15 to 25 year olds; F (100%)	Clinical setting (outpatient)	SCID-II for DSM-IV	N.A.	Cross-sectional	Demographics: education and/or employment	Medium
Taylor, 2009, USA	1436 (239 with BPD*); 12 to 20 year olds; M (F 0%)	Residential school for delinquent boys	Borderline Tendency scale of MACI	N.A.	Cross-sectional	Outcome: social	Medium
Thompson, 2017, Australia	254 (50 with BPD); 15 to 24 year olds; F (100%)	Clinical setting (outpatient)	SCID-II for DSM-IV	Community group	Cross-sectional	Outcome: education and/or employment, health	Low
Trull, 1995, USA	103 (54 with BPD*); 19 year olds; M and F (51.5%)	Community (university)	PAI-BOR $\geq$ 38	Low BPD features	Cross-sectional	Outcome: social	Low
Trull, 1997, USA	65 (35 with BPD*); 21 year olds; M and F (52%)	Community (university)	PAI-BOR $\geq$ 38	Low BPD features	Prospective, 2-year follow-up	Outcome: education and/or employment, social	Low

Trull, 2001, USA	65 (21 with BPD*); 19 year olds; M and F (52.3%)	Community (university)	PAI-BOR $\geq$ 38 and SIDP-IV	Low BPD features	Cross-sectional	Outcome: global functioning, social	Low
von Ceumern- Lindenstjerna, 2009, Germany	89 (30 with BPD); 13 to 19 year olds; F (100%)	Clinical setting (inpatient and outpatient)	SCID-II for DSM-IV	Clinical controls and healthy controls	Cross-sectional	Demographics: global functioning	Low
Yen, 2013, USA	119 (47 with BPD*); 12 to 18 year olds; M and F (68%)	Clinical setting (inpatient)	CI-BPD	Clinical controls	Prospective, 6- month follow- up	Baseline demographics: global functioning	Low
Zanarini, 2017, USA	454 (394 with BPD); 13 to 17 year olds and 18 to 35 year olds; M and F (83.9%)	Clinical setting (inpatient)	DIB-R and CI-BPD	Clinical controls (adults) and healthy controls	Cross-sectional	Demographics: global functioning	Low
Zelkowitz, 2007, Canada	59 (27 with BPD*); 7 to 12 year olds, followed-up at 12 to 20 years; M and F (18.6%)	Clinical setting (outpatient)	Baseline: CDIB-R $\geq$ 7 follow-up: DIB-R $\geq$ 8	Clinical controls	Prospective, 5- year follow-up	Outcome: education and/or employment, social	Medium

---

Note: BPD: borderline personality disorder; \*: BPD symptoms; ‡: BPD features. BPFS-C : Borderline Personality Features Scale for Children ; CDIB-R: Retrospective Diagnostic Interview for Borderlines; CI-BPD: Childhood Interview for Borderline Personality Disorder; DIB: Diagnostic Interview for Borderlines; DIB-R: Revised Diagnostic Interview for Borderlines; DSM-III-R: Diagnostic and Statistical Manual of Mental Disorders, 3<sup>rd</sup> Edition, Revised. DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> Edition; MACI: Millon Adolescent Clinical Inventory; PAI-BOR: Personality Assessment Inventory- Borderline Features Scale; PDE: Personality Disorder Examination; PDQ: Personality Diagnostic Questionnaire; R-DIB: Retrospective diagnostic interview for Borderline; SCID-II: Structured Clinical Interview for DSM-IV Axis II Personality Disorders; SIDP-IV: Structured Interview for DSM-IV Personality;



Table 2. Studies of clinical populations with global functioning ratings and comparisons to control groups

Author, year	Measure of global functioning	BPD group m (sd)	Comparison group, m (sd)	Comparison results
<b>Clinical setting (inpatients)</b>				
Chang, 2011	GAF	49.7 (6.4)	CC <sup>a</sup> : 49.4 (5.8)	n.s.
Edell, 1990	GAS	38.2 (5.3)	CC <sup>a</sup> : 40.4 (5.6)	n.s.
Ha, 2014	GAF	35.19 (7.83)	CC <sup>a</sup> : 38.84 (7.35)	p < .001
Selby, 2014	GAF	42.75(7.46)	CC <sup>a</sup> : 42.75 (7.70)	n.s.
Yen, 2013	GAF	40.8(6.8)	CC <sup>a</sup> : 44.3 (7.7)	p < .013
Zanarini, 2017	GAF	35.2(4.8)	CC <sup>b</sup> : 38.9 (7.5) HC: 73.7 (6.8)	p < .001 p < .001
<b>Clinical setting (outpatients)</b>				
Amminger, 2013	GAF	56.7(9.2)	CC <sup>a</sup> : 61.4 (13.0)	n.s.
Chanen, 2007	SOFAS	60.4 (10.8)	CC <sup>a</sup> : 59.50 (22.06) HC: 75.81 (13.01)	n.s. p < .01
Chanen, 2009	SOFAS	60.27 (8.4) to 66.78 (15.4)	n.a.	n.a.
Fleischhaker, 2011	GAF	57.8 (12.0)	n.a.	n.a.
Mehlum, 2014	C-GAS	56.1 (8.3)	n.a.	n.a.
Morgan, 2013	GAF	48.12 (9.24)	CC <sup>b</sup> : 48.02 (7.63)	n.s.
<b>Clinical setting (mixed inpatient and outpatient or not specified)</b>				
Brunner, 2010	C-GAS	47.5 (8.2)	CC <sup>a</sup> : 61.9 (9.3)	p < .001
Cailhol, 2013	GAF	Not reported	HC <sup>a</sup> : not reported	p < .0001
Kaess, 2012	C-GAS	38.71 (6.05)	CC <sup>a</sup> : 48.39 (13.28)	p < .001
Kaess, 2013	C-GAS	50.5 (10.4)	CC <sup>a</sup> : 60.5 (13.4)	p < .0013
Richter, 2014	C-GAS	47.5 (8.2)	CC <sup>a</sup> : 60.9 (9.3)	p < .001
Speranza, 2011	GAF	47.2 (14)	n.a.	n.a.
von Ceumern-Lindenstjerna, 2010	C-GAS	50.5 (10.61)	CC <sup>a</sup> : 60.90 (13.75) HC: 100.00 (0.00)	p < .001 p < .001

Note: BPD: borderline personality disorder; GAF: Global Assessment of Functioning; GAS: Global Assessment Scale; C-GAS: Children's Global Assessment Scale, SOFAS: Social and Occupational Functioning Assessment Scale; GAS: Global Assessment Scale; CC<sup>a</sup>: age-matched clinical controls; CC<sup>b</sup>: adults with BPD; HC: age-matched healthy controls; n.s.: not significant; n.a.: not applicable

Supplementary Table 1

*Search terms used and articles identified from PsycINFO database as at 24 March 2018*

#	Searches	Results
1	Youth*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	92980
2	young*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	243530
3	teen*.mp.	21464
4	adolescen*.mp.	246266
5	student*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	598647
6	child*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	697867
7	school age*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	22564
8	juven*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	34658
9	young men.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	5115
10	young women.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	6939
11	young people.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	24997
12	undergrad*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	107106
13	college.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	234442
14	high school.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	85253
15	young adults.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	31116
16	BORDERLINE PERSONALITY DISORDER/	5790
17	(Borderline adj3 Personality Disorder).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	9613
18	Personality Disorders/	11289

19	(borderline adj4 BPD).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	3986
20	(borderline personality adj3 BPD).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	3917
21	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	1479483
22	limit 21 to (peer reviewed journal and english language and yr="1980 - Current")	820714
23	16 or 17 or 18 or 19 or 20	19836
24	limit 23 to (peer reviewed journal and english language and yr="1980 - Current")	12554
25	22 and 24	3202
26	global assessment of functioning / or global assessment of functioning.mp.	6234
27	global function*.mp.	1781
28	function*.mp.	622660
29	impair*.mp.	195822
30	psychosocial*.mp. or PSYCHOSOCIAL FACTORS/	105150
31	Adaptive Behavior/ or adaptive function*.mp.	5358
32	26 or 27 or 28 or 29 or 30 or 31	823751
33	limit 32 to (peer reviewed journal and english language and yr="1980 - Current")	546274
34	Employment Status/ or employ*.mp.	244319
35	part time employ*.mp.	572
36	full time employ*.mp.	1427
37	casual employ*.mp.	28
38	unemploy*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	13927
39	Employee Absenteeism/ or attendance*.mp.	19838
40	sick day*.mp.	16
41	sick leave.mp.	1300
42	vocation*.mp.	39781
43	job.mp. or Occupations/	101877
44	Work*.mp.	452268
45	educat*.mp.	577402
46	high school.mp. or High Schools/	86179

47	COMMUNITY COLLEGES/ or COLLEGES/ or college.mp.	239446
48	university.mp.	133832
49	Higher Education/ or higher education*.mp.	27172
50	academ*.mp.	181035
51	academic achievement.mp. or Academic Achievement/	70914
52	academic performance.mp.	12754
53	school attendance.mp. or School Attendance/	3361
54	truancy.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	1597
55	bullying.mp. or BULLYING/	9922
56	School Dropouts/ or Dropouts/ or drop-out.mp.	5988
57	school.mp. or SCHOOLS/	380690
58	34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57	1540045
59	limit 58 to (peer reviewed journal and english language and yr="1980 - Current")	852368
60	Social Interaction/ or social function*.mp.	42249
61	MALE FEMALE RELATIONS/ or PEER RELATIONS/ or MARITAL RELATIONS/ or SIBLING RELATIONS/ or MOTHER CHILD RELATIONS/ or FATHER CHILD RELATIONS/ or FAMILY RELATIONS/ or PARENT CHILD RELATIONS/ or relation*.mp.	957922
62	marri*.mp.	52176
63	Divorced Persons/ or Couples/ or DIVORCE/ or Marital Separation/ or Conflict/ or Marriage/ or divorce*.mp.	55136
64	Significant Others/ or Interpersonal Relationships/ or Romance/ or Sexual Partners/ or Couples/ or Intimate Partner Violence/ or Psychosexual Behavior/	64089
65	boyfriend.mp.	567
66	girlfriend.mp.	465
67	Peers/ or Peer Relations/ or Social Support/ or Friendship/ or friend*.mp. or Social Networks/	119712
68	mother.mp. or UNWED MOTHERS/ or ADOLESCENT MOTHERS/ or SINGLE MOTHERS/ or MOTHERS/	88505
69	father.mp. or ADOLESCENT FATHERS/ or SINGLE FATHERS/ or FATHERS/	30743
70	single.mp. or SINGLE PERSONS/	170230

71	roman*.mp.	22101
72	romance.mp. or ROMANCE/	5967
73	Intimacy/ or Romance/ or Couples/ or Conflict/ or romantic.mp.	48178
74	Friendship/ or friend*.mp.	63522
75	SOCIAL DATING/ or dating.mp.	8903
76	parent*.mp. or PARENT CHILD RELATIONS/	267963
77	Social Networks/ or Social Support/ or social network*.mp.	57946
78	Social Integration/ or Social Acceptance/ or Social Isolation/ or social inclusion.mp.	17391
79	peers.mp.	50264
80	60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79	1443275
81	limit 80 to (peer reviewed journal and english language and yr="1980 - Current")	856346
82	activities of daily living.mp. or "Activities of Daily Living"/	14298
83	ADL*.mp.	8572
84	Coping Behavior/ or Self-Care Skills/ or self care.mp.	54877
85	Help Seeking Behavior/ or Health Care Utilization/ or Health Care Seeking Behavior/ or treatment seek*.mp. or Mental Health Services/	54137
86	service utili*.mp.	3880
87	sexual function*.mp.	8829
88	HIV/ or Sexually Transmitted Diseases/ or Sexual Risk Taking/ or Psychosexual Behavior/ or sexual health.mp. or Reproductive Health/	62600
89	physical health.mp. or Physical Health/	18721
90	recreation.mp. or participation restriction RECREATION/	10160
91	Sports/ or Physical Activity/ or LEISURE TIME/ or Health Behavior/ or Lifestyle/ or leisure.mp. or Exercise/	88512
92	exercise.mp.	51388
93	sport*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	34632
94	social media.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	8413
95	Social Media/ or social media.mp.	8413
96	facebook.mp.	3999
97	hygiene.mp. or HYGIENE/	9240

98	government support.mp.	326
99	pension.mp.	1517
100	"WELFARE SERVICES (GOVERNMENT)"/ or welfare.mp.	32660
101	housing.mp. or HOUSING/	16442
102	Group Homes/ or Residential Care Institutions/ or Foster Care/ or residential care.mp.	17022
103	HOMELESS/ or homeless*.mp.	10275
104	Participation/ or participation restriction.mp.	7526
105	activity limitation*.mp.	951
106	hobbies.mp. or HOBBIES/	979
107	illness.mp.	134424
108	82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103 or 104 or 105 or 106 or 107	529716
109	limit 108 to (peer reviewed journal and english language and yr="1980 - Current")	361387
110	33 or 59 or 81 or 109	1797398
111	25 and 110	2354

---

*Supplementary Table 2*

*Search terms used and articles identified from EMBASE database as at 24 March 2018*

#	Searches	Results
1	Youth*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	73982
2	teen*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	36415
3	adolescen*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	1558848
4	student*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	424352
5	child*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	2513132
6	school age*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	24483
7	juven*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	129651
8	young men.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	15485
9	young women.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	26943
10	young people.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	31071
11	undergrad*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	41189
12	college.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	279516

13	high school.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	38821
14	young adult.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	248238
15	(borderline adj3 personality disorder).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	7069
16	(borderline adj3 PD).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	253
17	(borderline adj3 BPD).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	3231
18	(personality disorder adj3 BPD).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	3171
19	borderline state/	11709
20	(borderline adj personality adj disorder).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	6941
21	personality disorder/	27024
22	(personality adj disorder).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	44074
23	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14	4006343
24	limit 23 to (english language and embase and yr="1980 -Current" and journal)	1835816
25	15 or 16 or 17 or 18 or 20 or 21 or 22	44117
26	limit 25 to (english language and embase and yr="1980 -Current" and journal)	25774
27	24 and 26	6706
28	global assessment of functioning.mp. or "Global Assessment of Functioning"/	3164
29	global functioning.mp.	1844
30	function* impair*.mp.	29931
31	psychosocial development/ or psychosocial disorder/ or psychosocial.mp.	125125



32	adaptive behavior/ or adaptive function*.mp.	55412
33	28 or 29 or 30 or 31 or 32	209825
34	limit 33 to (english language and embase and yr="1980 -Current" and journal)	95045
35	employment/ or employ*.mp.	636121
36	employment status.mp. or employment status/	15687
37	part time employ*.mp.	549
38	full time employ*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	1578
39	casual employ*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	29
40	unemployment/ or unemploy*.mp.	24954
41	attendance.mp.	30650
42	absenteeism.mp. or absenteeism/	18053
43	sick leave.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	5659
44	sick day*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	665
45	vocation/ or vocation*.mp. or occupation/	65089
46	work.mp. or work/	1086443
47	education/ or educat*.mp. or educational status/	1180841
48	high school.mp. or student/ or high school/ or school/	171483
49	college.mp. or college/ or community college/ or college student/	279516
50	university.mp. or university/ or university student/	592196
51	higher education.mp.	13024
52	academic achievement.mp. or academic achievement/	33926
53	academ*.mp.	319821
54	academic performance.mp.	5420
55	school attendance.mp. or school attendance/	1944
56	truam*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word]	586

57	bullying.mp. or bullying/	6434
58	school dropout/ or dropout.mp.	9721
59	35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58	3684544
60	limit 59 to (english language and embase and yr="1980 -Current" and journal)	1813609
61	relation*.mp. or human relation/ or child parent relation/ or family relation/ or sibling relation/ or mother child relation/	2371830
62	marri*.mp. or married person/ or marriage/	85633
63	divorce/ or divorce*.mp.	12934
64	boyfriend.mp.	515
65	girlfriend.mp.	395
66	sexuality/ or partner violence/ or sexual behavior/ or partner*.mp.	289902
67	couple.mp.	34722
68	romance.mp.	546
69	friend/ or friend*.mp.	87399
70	peer*.mp. or peer group/	109988
71	mother/ or adolescent mother/ or mother.mp. or mother child relation/	183197
72	adolescent father/ or father/ or father child relation/ or father.mp.	39689
73	intimacy.mp. or intimacy/	6868
74	single-parent family/ or single parent/ or parent/ or parent*.mp.	523004
75	social interaction/ or social network.mp. or social support/ or social network/	132001
76	social support/ or social inclusion.mp. or social isolation/	97208
77	61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76	3411462
78	limit 77 to (english language and embase and yr="1980 -Current" and journal)	1800639
79	activities of daily living.mp. or daily life activity/	83704
80	ADL*.mp.	21255
81	self care.mp. or self care/	52644
82	help seeking behavior/ or help seeking.mp. or health care utilization/	69772
83	treatment seek*.mp.	5517
84	mental health service/ or service utili*.mp.	58067

85	sexual function/ or sexual function*.mp. or sexual behavior/	116352
86	sex/ or sexual health.mp. or sexual behavior/ or sexual health/ or sexuality/ or sexually transmitted disease/	191502
87	physical health.mp. or health/	231507
88	recreation.mp. or recreation/	21974
89	leisure.mp. or leisure/	35701
90	exercise/ or exercise.mp.	432952
91	sport.mp. or sport/	88028
92	hobbies.mp.	1298
93	social media.mp. or social media/	12230
94	Facebook.mp.	3427
95	personal hygiene/ or hygiene.mp. or hygiene/	109574
96	pension.mp. or pension/	7795
97	government support.mp.	584
98	welfare.mp. or welfare/	86438
99	housing/ or housing.mp.	43990
100	homeless woman/ or homeless*.mp. or homeless person/ or homeless youth/	13061
101	participation restriction.mp.	371
102	activity limitation.mp.	1915
103	illness.mp.	323400
104	79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103	1707152
105	limit 104 to (english language and embase and yr="1980 -Current" and journal)	784467
106	34 or 60 or 78 or 105	3762929
107	27 and 106	4459

---

Supplementary Table 3

*Search terms used and articles identified from MEDLINE database as at 24 March 2018*

#	Search terms	Results
1	youth*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	55838
2	young*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1094389
3	teen*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	24269
4	adolesc*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1877289
5	student*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	233030
6	child*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	2092102
7	school age*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	16909
8	juven*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	75530
9	young men.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	11686

10	young women.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	18121
11	young people.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	19402
12	undergrad*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	43954
13	college.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	77201
14	high school.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	20728
15	young adult*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	692624
16	borderline personality disorder.mp. or Borderline Personality Disorder/	6772
17	BPD*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	8805
18	(borderline adj3 personality disorder).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	6824
19	Personality Disorders/	19184
20	(borderline adj3 PD).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	172
21	(borderline adj3 BPD).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word,	2235

unique identifier, synonyms]

22	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	3829351
23	limit 22 to (english language and yr="1980 -Current" and journal article)	2653448
24	16 or 17 or 18 or 19 or 20 or 21	30963
25	limit 24 to (english language and yr="1980 -Current" and journal article)	20321
26	23 and 25	7586
27	global assessment of functioning.mp.	1333
28	global functioning.mp.	1026
29	function* impair*.mp.	18220
30	PSYCHOSOCIAL SUPPORT SYSTEMS/ or PSYCHOSOCIAL DEPRIVATION/ or psychosocial*.mp.	72448
31	adaptive function*.mp.	1810
32	27 or 28 or 29 or 30 or 31	93680
33	limit 32 to (english language and yr="1980 -Current" and journal article)	82302
34	employ*.mp.	448057
35	employment.mp. or EMPLOYMENT, SUPPORTED/ or EMPLOYMENT/	73057
36	part time employ*.mp.	377
37	full time employ*.mp.	943
38	casual employ*.mp.	18
39	Unemployment/ or unemploy*.mp.	15784
40	attendance*.mp.	20012
41	absenteeism.mp. or ABSENTEEISM/	10435
42	sick leave.mp. or Sick Leave/	7095
43	sick day*.mp.	397
44	vocation*.mp.	18724
45	job*.mp.	73589
46	WORK/ or WORK ENGAGEMENT/ or WORK PERFORMANCE/ or work*.mp.	1100561
47	Educational Status/ or educat*.mp.	741069
48	high school.mp.	20728
49	high school*.mp. or Schools/	52010

50	college.mp. or Students/	114438
51	university.mp. or Universities/	284438
52	higher education.mp.	8166
53	academic achievement.mp. or Academic Success/	3403
54	academ*.mp.	136592
55	truan*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	414
56	bullying.mp. or BULLYING/	4202
57	STUDENT DROPOUTS/ or dropout.mp.	7306
58	school.mp.	182165
59	34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58	2564449
60	limit 59 to (english language and yr="1980 -Current" and journal article)	1993175
61	social function*.mp.	10702
62	relation*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	2178322
63	INTERPERSONAL RELATIONS/ or interpersonal.mp.	83654
64	boyfriend.mp.	364
65	girlfriend.mp.	262
66	mother.mp. or Mothers/	120331
67	father.mp. or Fathers/	26500
68	SINGLE PARENT/ or PARENT-CHILD RELATIONS/ or parent*.mp.	385042
69	sibling*.mp. or SIBLING RELATIONS/	45879
70	Family/ or famil*.mp.	1047928
71	Marriage/ or Divorce/ or marri*.mp. or Spouses/	56561
72	divorce.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	6261

73	conflict.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	54969
74	Sexual Partners/ or intimate partner.mp.	18200
75	peer*.mp. or PEER GROUP/	73158
76	FRIENDS/ or friend*.mp.	56934
77	social network.mp. or Social Support/	65572
78	roman*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	20178
79	dating.mp.	9022
80	social inclusion.mp. or Social Behavior/ or Social Isolation/	57994
81	61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80	3600290
82	limit 81 to (english language and yr="1980 -Current" and journal article)	2915554
83	activities of daily living.mp. or "Activities of Daily Living"/	65988
84	ADL*.mp.	10699
85	self care.mp. or Self Care/	36266
86	treatment seek*.mp.	3612
87	service utili*.mp. or Help-Seeking Behavior/	4610
88	Sexual Behavior/ or sexual function*.mp.	58381
89	sexual health.mp. or Sexual Behavior/ or HIV Infections/ or Sexual Health/ or Reproductive Health/ or Sexually Transmitted Diseases/	229735
90	physical health.mp.	13644
91	illness.mp.	417589
92	RECREATION/ or recreation*.mp.	22310
93	leisure.mp. or Leisure Activities/	15379
94	EXERCISE/ or exercise.mp.	273274
95	sport.mp. or Sports/	42503
96	social media.mp. or Social Media/	5774
97	facebook.mp.	1538
98	HYGIENE/ or hygiene.mp.	63498
99	government support.mp.	453



100 pension.mp. or Pensions/	5613
101 welfare.mp. or SOCIAL WELFARE/	66095
102 housing*.mp. or HOUSING/	42156
103 residential care.mp.	2468
104 HOMELESS PERSONS/ or homeless*.mp.	9899
105 participation restriction.mp.	207
106 activity limitation*.mp.	2344
107 hobbies.mp. or HOBBIES/	1471
108 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103 or 104 or 105 or 106 or 107	1236489
109 limit 108 to (english language and yr="1980 -Current" and journal article)	964765
110 33 or 60 or 82 or 109	4929541
111 26 and 110	4967

---

Supplementary Table 4

*Search terms used and articles identified from PUBMED database as at 24 March 2018*

#	Search terms	Results
#11	Search (((((((("borderline personality disorder") AND (((((((borderline personality disorder[MeSH Terms]) OR borderline personality disorders[MeSH Terms]) OR disorder, borderline personality[MeSH Terms]) OR disorders, borderline personality[MeSH Terms]))) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) AND (((((((((((((((youth*) OR young*) OR teen*) OR adolescen*) OR child*) OR student*) OR "school age") OR juven*) OR "young men") OR "young women") OR "young people") OR undergrad*) OR college) OR "high school") OR "young adult*") AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) AND (((((((((((((((((((((((("activities of daily living") OR activities of daily living[MeSH Terms]) OR ADL*) OR self care[MeSH Terms]) OR "service utili*") OR "self care") OR "treatment seek*") OR "sexual function*") OR "sexual health") OR sexual health[MeSH Terms]) OR physical health) OR physical health[MeSH Terms]) OR leisure) OR leisure[MeSH Terms]) OR leisure activit*[MeSH Terms]) OR exercise) OR sport) OR hobbies) OR welfare) OR "government support") OR pension) OR housing) OR homeless*) OR homeless[MeSH Terms]) OR "activity limitation") OR "participation restriction") OR hygien*) OR "social media") OR Facebook) OR social media[MeSH Terms]) OR illness*) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) OR (((((((((((((((((((((((parent child relationship[MeSH Terms]) OR family relationship[MeSH Terms]) OR father child relationship[MeSH Terms]) OR mother child relationship[MeSH Terms]) OR friendship[MeSH Terms]) OR "social function*") OR social interaction[MeSH Terms]) OR peer group[MeSH Terms]) OR relation*) AND peer*) AND boyfriend) OR girlfriend) OR parent*) OR mother*) OR father*) OR sibling*) OR single*) OR marri*) OR divorce*[MeSH Terms]) OR divorce*) OR married[MeSH Terms]) OR roman*) OR couple*) OR dating*) OR "social inclusion") OR "scoial accetance") OR "social isolation") AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) OR (((((((((((((((((((((((employment status[MeSH Terms]) OR employ*) OR unemploy*) OR attendance) OR absenteeism[MeSH Terms]) OR absenteeisn) OR "sick day*") OR "sick leave") OR vocation[MeSH Terms]) OR vocation) OR job) OR work) OR occupation) OR achievements, educational[MeSH Terms]) OR education[MeSH Terms]) OR dropouts, school[MeSH Terms]) OR dropout) OR college) OR	2106

university) OR "high school") OR academ\*) OR "academic performance")  
OR educat\*) OR truan\*) OR bullying[MeSH Terms]) OR bullying) AND  
Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] )  
AND English[lang])) OR ((((((("global assessment of functioning") OR  
"global function\*") OR "function\* impair\*") OR psychosocial) OR  
"adaptive function\*") OR psychosocial factor\*[MeSH Terms]) AND  
Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] )  
AND English[lang])) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang]) Filters:  
Journal Article; Publication date from 1980/01/01 to 2018/12/31; English

#10 Search (((((((((((((((((((((((((((((((((((("activities of daily living") OR activities of daily living[MeSH Terms]) OR ADL\*) OR self care[MeSH Terms]) OR "service utili\*") OR "self care") OR "treatment seek\*") OR "sexual function\*") OR "sexual health") OR sexual health[MeSH Terms]) OR physical health) OR physical health[MeSH Terms]) OR leisure) OR leisure[MeSH Terms]) OR leisure activit\*[MeSH Terms]) OR exercise) OR sport) OR hobbies) OR welfare) OR "government support") OR pension) OR housing) OR homeless\*) OR homeless[MeSH Terms]) OR "activity limitation") OR "participation restriction") OR hygien\*) OR "social media") OR Facebook) OR social media[MeSH Terms]) OR illness\*) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) OR (((((((((((((((((((((((((((((((((((parent child relationship[MeSH Terms]) OR family relationship[MeSH Terms]) OR father child relationship[MeSH Terms]) OR mother child relationship[MeSH Terms]) OR friendship[MeSH Terms]) OR "social function\*") OR social interaction[MeSH Terms]) OR peer group[MeSH Terms]) OR relation\*) AND peer\*) AND boyfriend) OR girlfriend) OR parent\*) OR mother\*) OR father\*) OR sibling\*) OR single\*) OR marri\*) OR divorce\*[MeSH Terms]) OR divorce\*) OR married[MeSH Terms]) OR roman\*) OR couple\*) OR dating\*) OR "social inclusion") OR "socioal accetance") OR "social isolation") AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) OR (((((((((((((((((((((((((((((((((((employment status[MeSH Terms]) OR employ\*) OR unemploy\*) OR attendance) OR absenteeism[MeSH Terms]) OR absenteeisn) OR "sick day\*") OR "sick leave") OR vocation[MeSH Terms]) OR vocation) OR job) OR work) OR occupation) OR achievements, educational[MeSH Terms]) OR education[MeSH Terms]) OR dropouts, school[MeSH Terms]) OR dropout) OR college) OR university) OR "high school") OR academ\*) OR "academic performance") OR educat\*) OR truan\*) OR bullying[MeSH Terms]) OR bullying) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) OR (((((((("global assessment of functioning") OR "global function\*") OR "function\* impair\*") OR psychosocial) OR "adaptive function\*") OR psychosocial factor\*[MeSH Terms]) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) Filters: Journal Article; Publication date from 1980/01/01 to 2018/12/31; English

12615071

- #9 Search (((((((((((((((((((((((((((((((("activities of daily living") OR activities of daily living[MeSH Terms]) OR ADL\*) OR self care[MeSH Terms]) OR "service utili\*") OR "self care") OR "treatment seek\*") OR "sexual function\*") OR "sexual health") OR sexual health[MeSH Terms]) OR physical health) OR physical health[MeSH Terms]) OR leisure) OR leisure[MeSH Terms]) OR leisure activit\*[MeSH Terms]) OR exercise) OR sport) OR hobbies) OR welfare) OR "government support") OR pension) OR housing) OR homeless\*) OR homeless[MeSH Terms]) OR "activity limitation") OR "participation restriction") OR hygien\*) OR "social media") OR Facebook) OR social media[MeSH Terms]) OR illness\*) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang]) Filters: Journal Article; Publication date from 1980/01/01 to 2018/12/31; English 1485932
- #8 Search (((((((((((((((((((((((((((((((parent child relationship[MeSH Terms]) OR family relationship[MeSH Terms]) OR father child relationship[MeSH Terms]) OR mother child relationship[MeSH Terms]) OR friendship[MeSH Terms]) OR "social function\*") OR social interaction[MeSH Terms]) OR peer group[MeSH Terms]) OR relation\*) AND peer\*) AND boyfriend) OR girlfriend) OR parent\*) OR mother\*) OR father\*) OR sibling\*) OR single\*) OR marri\*) OR divorce\*[MeSH Terms]) OR divorce\*) OR married[MeSH Terms]) OR roman\*) OR couple\*) OR dating\*) OR "social inclusion") OR "scoial acetance") OR "social isolation" Filters: Journal Article; Publication date from 1980/01/01 to 2018/12/31; English 2256657
- #7 Search (((((((((((((((((((((((((((((((employment status[MeSH Terms]) OR employ\*) OR unemploy\*) OR attendance) OR absenteeism[MeSH Terms]) OR absenteeisn) OR "sick day\*") OR "sick leave") OR vocation[MeSH Terms]) OR vocation) OR job) OR work) OR occupation) OR achievements, educational[MeSH Terms]) OR education[MeSH Terms]) OR dropouts, school[MeSH Terms]) OR dropout) OR college) OR university) OR "high school") OR academ\*) OR "academic performance") OR educat\*) OR truan\*) OR bullying[MeSH Terms]) OR bullying Filters: Journal Article; Publication date from 1980/01/01 to 2018/12/31; English 11368987
- #6 Search (((("global assessment of functioning") OR "global function\*") OR "function\* impair\*") OR psychosocial) OR "adaptive function\*") OR psychosocial factor\*[MeSH Terms] Filters: Journal Article; Publication date from 1980/01/01 to 2018/12/31; English 489051
- #5 Search (((("borderline personality disorder") AND (((((((borderline personality disorder[MeSH Terms]) OR borderline personality disorders[MeSH Terms]) OR disorder, borderline personality[MeSH Terms]) OR disorders, borderline personality[MeSH Terms]))) AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) AND English[lang])) AND (((((((((((((((((((((((((((((((youth\*) OR young\*) OR teen\*) OR adolescen\*) OR child\*) OR student\*) OR "school age") OR juven\*) OR "young men") OR "young women") OR "young people") OR undergrad\*) OR college) OR "high school") OR "young adult\*") AND Journal Article[ptyp] AND ( "1980/01/01"[PDat] : "2018/12/31"[PDat] ) 2600

AND English[lang]) Filters: Journal Article; Publication date from 1980/01/01 to 2018/12/31; English

#4	Search ("borderline personality disorder") AND ((((((borderline personality disorder[MeSH Terms]) OR borderline personality disorders[MeSH Terms]) OR disorder, borderline personality[MeSH Terms]) OR disorders, borderline personality[MeSH Terms]))) Filters: Journal Article; Publication date from 1980/01/01 to 2018/12/31; English	4946
#3	Search "borderline personality disorder"	7580
#2	Search ((((((borderline personality disorder[MeSH Terms]) OR borderline personality disorders[MeSH Terms]) OR disorder, borderline personality[MeSH Terms]) OR disorders, borderline personality[MeSH Terms])))	6039
#1	Search (((((((((((((youth*) OR young*) OR teen*) OR adolescen*) OR child*) OR student*) OR "school age") OR juven*) OR "young men") OR "young women") OR "young people") OR undergrad*) OR college) OR "high school") OR "young adult*" Filters: Journal Article; Publication date from 1980/01/01 to 2018/12/31; English	4330864

---

## References

- Álvarez-Tomás, I. et al., 2019. Long-term clinical and functional course of borderline personality disorder: A meta-analysis of prospective studies. *European psychiatry: the journal of the Association of European Psychiatrists*, 56, pp.75–83.
- Alvarez-Tomás, I. et al., 2017. Long-Term Course of Borderline Personality Disorder: A Prospective 10-Year Follow-Up Study. *Journal of personality disorders*, 31(5), pp.590–605.
- American Psychiatric Association, 2000. *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR)*, American Psychiatric Association.
- American Psychiatric Association, 2013. *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*, American Psychiatric Pub.
- American Psychiatric Association, 1980. *Diagnostic and Statistical Manual of Mental Disorders (DSM-III)*,
- American Psychiatric Association, 1994. *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*, Washington DC: American Psychiatric Association.
- Amminger, G.P. et al., 2013. Omega-3 fatty acid supplementation in adolescents with borderline personality disorder and ultra-high risk criteria for psychosis: a post hoc subgroup analysis of a double-blind, randomized controlled trial. *Canadian journal of psychiatry. Revue canadienne de psychiatrie*, 58(7), pp.402–408.
- Andrewes, H.E. et al., 2017. An ecological momentary assessment investigation of complex and conflicting emotions in youth with borderline personality disorder. *Psychiatry research*, 252, pp.102–110.
- Arnett, J.J., Žukauskienė, R. & Sugimura, K., 2014. The new life stage of emerging adulthood at ages 18–29 years: implications for mental health. *The Lancet Psychiatry*, 1(7), pp.569–576.
- van Asselt, A.D.I. et al., 2007. The cost of borderline personality disorder: societal cost of illness in BPD-patients. *European psychiatry: the journal of the Association of European Psychiatrists*, 22(6), pp.354–361.
- Bernstein, D.P. et al., 1993. Prevalence and stability of the DSM-III-R personality disorders in a community-based survey of adolescents. *The American journal of psychiatry*, 150(8), pp.1237–1243.
- Bird, H. et al., 2008. Columbia Impairment Scale. In *Handbook of Psychiatric Measures*. pp. 352–354.
- Biskin, R.S. et al., 2011. Outcomes in women diagnosed with borderline personality disorder in adolescence. *Journal of the Canadian Academy of Child and Adolescent Psychiatry = Journal de l'Académie canadienne de psychiatrie de l'enfant et de l'adolescent*, 20(3), pp.168–174.
- Brunner, R. et al., 2010. Reduced prefrontal and orbitofrontal gray matter in female adolescents with borderline personality disorder: is it disorder specific? *NeuroImage*, 49(1), pp.114–120.
- Cailhol, L. et al., 2013. Borderline personality disorder and mental healthcare service use among adolescents. *Journal of personality disorders*, 27(2), pp.252–259.
- von Ceumern-Lindenstjerna, I.-A. et al., 2010. Attentional Bias in Later Stages of Emotional Information Processing in Female Adolescents with Borderline Personality Disorder. *Psychopathology*, 43(1), pp.25–32.

- Chanen, A. et al., 2015. Comparing three forms of early intervention for youth with borderline personality disorder (the MOBY study): study protocol for a randomised controlled trial. *Trials*, 16(1), pp.1–10.
- Chanen, A.M., 2015. Borderline Personality Disorder in Young People: Are We There Yet? *Journal of clinical psychology*, 71(8), pp.778–791.
- Chanen, A.M. et al., 2009. Early Intervention for Adolescents with Borderline Personality Disorder: Quasi-Experimental Comparison with Treatment as Usual. *The Australian and New Zealand journal of psychiatry*, 43(5), pp.397–408.
- Chanen, A.M., Jovev, M. & Jackson, H.J., 2007. Adaptive functioning and psychiatric symptoms in adolescents with borderline personality disorder. *The Journal of clinical psychiatry*, 68(2), pp.297–306.
- Chanen, A.M. & Thompson, K.N., 2019. The Age of Onset of Personality Disorders. In G. de Girolamo, P. D. McGorry, & N. Sartorius, eds. *Age of Onset of Mental Disorders: Etiopathogenetic and Treatment Implications*. Cham: Springer International Publishing, pp. 183–201.
- Chang, B., Sharp, C. & Ha, C., 2011. The criterion validity of the Borderline Personality Features Scale for Children in an adolescent inpatient setting. *Journal of personality disorders*, 25(4), pp.492–503.
- Chen, H. et al., 2009. Impact of early adolescent psychiatric and personality disorder on long-term physical health: a 20-year longitudinal follow-up study. *Psychological medicine*, 39(5), pp.865–874.
- Chen, H. et al., 2006. Relative impact of young adult personality disorders on subsequent quality of life: findings of a community-based longitudinal study. *Journal of personality disorders*, 20(5), pp.510–523.
- Cohen, P. et al., 2005. Adolescent Cluster A personality disorder symptoms, role assumption in the transition to adulthood, and resolution or persistence of symptoms. *Development and psychopathology*, 17(02). Available at: <http://dx.doi.org/10.1017/s0954579405050261>.
- Crawford, T.N. et al., 2008. Comorbid Axis I and Axis II disorders in early adolescence: outcomes 20 years later. *Archives of general psychiatry*, 65(6), pp.641–648.
- Edell, W.S., Joy, S.P. & Yehuda, R., 1990. Discordance Between Self-Report and Observer-Rated Psychopathology in Borderline Patients. *Journal of personality disorders*, 4(4), pp.381–390.
- Endicott, J. et al., 1976. The global assessment scale. A procedure for measuring overall severity of psychiatric disturbance. *Archives of general psychiatry*, 33(6), pp.766–771.
- Erikson, E.H., 1994. *Identity and the Life Cycle*, W. W. Norton & Company.
- Faulkner, C.J., Grapentine, W.L. & Francis, G., 1999. A behavioral comparison of female adolescent inpatients with and without borderline personality disorder. *Comprehensive psychiatry*, 40(6), pp.429–433.
- Fleischhaker, C. et al., 2011. Dialectical Behavioral Therapy for Adolescents (DBT-A): a clinical Trial for Patients with suicidal and self-injurious Behavior and Borderline Symptoms with a one-year Follow-up. *Child and adolescent psychiatry and mental health*, 5(1), p.3.
- Frías, Á. et al., 2017. Differential symptomatology and functioning in borderline personality disorder across age groups. *Psychiatry research*, 258, pp.44–50.



- Gersh, E. et al., 2017. Alliance rupture and repair processes and therapeutic change in youth with borderline personality disorder. *Psychology and psychotherapy*, 90(1), pp.84–104.
- Goldman, H.H., Skodol, A.E. & Lave, T.R., 1992. Revising axis V for DSM-IV: a review of measures of social functioning. *The American journal of psychiatry*, 149(9), pp.1148–1156.
- Gowers, S.G. et al., 1999. Brief scale for measuring the outcomes of emotional and behavioural disorders in children. Health of the Nation Outcome Scales for children and Adolescents (HoNOSCA). *The British journal of psychiatry: the journal of mental science*, 174, pp.413–416.
- Greenfield, B. et al., 2015. Correlates, stability and predictors of borderline personality disorder among previously suicidal youth. *European child & adolescent psychiatry*, 24(4), pp.397–406.
- Gunderson, J.G. et al., 2018. Borderline personality disorder. *Nature reviews. Disease primers*, 4, p.18029.
- Gunderson, J.G. et al., 2011. Ten-year course of borderline personality disorder: psychopathology and function from the Collaborative Longitudinal Personality Disorders study. *Archives of general psychiatry*, 68(8), pp.827–837.
- Ha, C. et al., 2014. Psychiatric Comorbidity in Hospitalized Adolescents With Borderline Personality Disorder. *The Journal of clinical psychiatry*, 75(05), pp.e457–e464.
- Hill, P.L. et al., 2013. Longitudinal relations between personality traits and aspects of identity formation during adolescence. *Journal of adolescence*, 36(2), pp.413–421.
- Huynh, C. et al., 2010. Is it possible to study sleep patterns in adolescent borderline personality disorder? An actigraphic feasibility study. *International journal of adolescent medicine and health*, 22(4). Available at: <http://dx.doi.org/10.1515/ijamh.2010.22.4.547>.
- Johnson, J.G. et al., 2000. Age-related change in personality disorder trait levels between early adolescence and adulthood: a community-based longitudinal investigation. *Acta psychiatrica Scandinavica*, 102(4), pp.265–275.
- Jovev, M. et al., 2011. Emotional sensitivity in youth with borderline personality pathology. *Psychiatry research*, 187(1-2), pp.234–240.
- Kaess, M., von Ceumern-Lindenstjerna, I.-A., et al., 2013. Axis I and II comorbidity and psychosocial functioning in female adolescents with borderline personality disorder. *Psychopathology*, 46(1), pp.55–62.
- Kaess, M., Resch, F., et al., 2013. Temperamental patterns in female adolescents with borderline personality disorder. *The Journal of nervous and mental disease*, 201(2), pp.109–115.
- Kasen, S. et al., 1999. Influence of Child and Adolescent Psychiatric Disorders on Young Adult Personality Disorder. *The American journal of psychiatry*, 156(10), pp.1529–1535.
- Kerpelman, J.L. et al., 2012. Identity and intimacy during adolescence: connections among identity styles, romantic attachment and identity commitment. *Journal of adolescence*, 35(6), pp.1427–1439.
- Kramer, U. et al., 2017. Psychosocial functioning in adolescents with and without borderline personality disorder. *Personality and mental health*, 11(3), pp.164–170.
- Kutcher, S. et al., 1995. The successful pharmacological treatment of adolescents and young adults with borderline personality disorder: a preliminary open trial of flupenthixol. *Journal of psychiatry & neuroscience: JPN*, 20(2), pp.113–118.

- Laurensen, E.M.P. et al., 2014. Feasibility of mentalization-based treatment for adolescents with borderline symptoms: a pilot study. *Psychotherapy*, 51(1), pp.159–166.
- Levy, K.N. et al., 1999. Concurrent and Predictive Validity of the Personality Disorder Diagnosis in Adolescent Inpatients. *The American journal of psychiatry*, 156(10), pp.1522–1528.
- Mehlum, L. et al., 2014. Dialectical behavior therapy for adolescents with repeated suicidal and self-harming behavior: a randomized trial. *Journal of the American Academy of Child and Adolescent Psychiatry*, 53(10), pp.1082–1091.
- Millon, T., 2016. What Is a Personality Disorder? *Journal of Personality Disorders*, 30(3), pp.289–306. Available at: <http://dx.doi.org/10.1521/pedi.2016.30.3.289>.
- Moher, D. et al., 2009. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ*, 339(jul21 1), pp.b2535–b2535.
- Morgan, T.A. et al., 2013. Differences between older and younger adults with borderline personality disorder on clinical presentation and impairment. *Journal of psychiatric research*, 47(10), pp.1507–1513.
- Ouzzani, M. et al., 2016. Rayyan-a web and mobile app for systematic reviews. *Systematic reviews*, 5(1), p.210.
- Reed, G.M. et al., 2005. Operationalizing the International Classification of Functioning, Disability and Health in Clinical Settings. *Rehabilitation psychology*, 50(2), pp.122–131.
- Richter, J. et al., 2014. Reduced cortical and subcortical volumes in female adolescents with borderline personality disorder. *Psychiatry research*, 221(3), pp.179–186.
- Ro, E. & Clark, L.A., 2009. Psychosocial functioning in the context of diagnosis: assessment and theoretical issues. *Psychological assessment*, 21(3), pp.313–324.
- Rojas, J.I. et al., 2018. A systematic review about the epidemiology of primary progressive multiple sclerosis in Latin America and the Caribbean. *Multiple sclerosis and related disorders*, 22, pp.1–7.
- Salvador-Carulla, L. et al., 2014. Cost of borderline personality disorder in Catalonia (Spain). *European psychiatry: the journal of the Association of European Psychiatrists*, 29(8), pp.490–497.
- Scalzo, F. et al., 2017. Substance Use in Youth With Borderline Personality Disorder. *Journal of personality disorders*, pp.1–16.
- Schuppert, H.M. et al., 2009. Effectiveness of an emotion regulation group training for adolescents--a randomized controlled pilot study. *Clinical psychology & psychotherapy*, 16(6), pp.467–478.
- Schuppert, H.M. et al., 2012. Emotion Regulation Training for Adolescents With Borderline Personality Disorder Traits: A Randomized Controlled Trial. *Journal of the American Academy of Child and Adolescent Psychiatry*, 51(12), pp.1314–1323.e2.
- Segal-Trivitz, Y. et al., 2006. Comparison of symptoms and treatments of adults and adolescents with borderline personality disorder. *International journal of adolescent medicine and health*, 18(2). Available at: <http://dx.doi.org/10.1515/ijamh.2006.18.2.215>.
- Selby, E.A. & Yen, S., 2014. Six-month trajectory of suicidal ideation in adolescents with borderline personality disorder. *Suicide & life-threatening behavior*, 44(1), pp.89–100.
- Shaffer, D. et al., 1983. Children's Global Assessment Scale. *PsycTESTS Dataset*. Available at:

<http://dx.doi.org/10.1037/t05648-000>.

- Sio, I.T. et al., 2011. The relationship between impulsivity and vocational outcome in outpatient youth with borderline personality features. *Early intervention in psychiatry*, 5(3), pp.249–253.
- Soloff, P.H. & Chiappetta, L., 2018. 10-Year Outcome of Suicidal Behavior in Borderline Personality Disorder. *Journal of personality disorders*, pp.1–19.
- Speranza, M. et al., 2011. ADHD in adolescents with borderline personality disorder. *BMC psychiatry*, 11, p.158.
- Taylor, J. et al., 2008. Borderline Personality Traits are Associated with Poor Clinical and Psychosocial Functioning in Delinquent Boys. *Journal of psychopathology and behavioral assessment*, 31(2), pp.94–103.
- Tay, S.-A. et al., 2017. Affective and cognitive theory of mind abilities in youth with borderline personality disorder or major depressive disorder. *Psychiatry research*, 255, pp.405–411.
- Thompson, K.N. et al., 2017. Sexuality and sexual health among female youth with borderline personality disorder pathology. *Early intervention in psychiatry*. Available at: <http://dx.doi.org/10.1111/eip.12510>.
- Thompson, K.N. et al., 2019. The Clinical Significance of Subthreshold Borderline Personality Disorder Features in Outpatient Youth. *Journal of personality disorders*, 33(1), pp.71–81.
- Trull, T.J. et al., 1997. Borderline personality disorder features in nonclinical young adults: 2. Two-year outcome. *Journal of abnormal psychology*, 106(2), pp.307–314.
- Trull, T.J., 1995. Borderline personality disorder features in nonclinical young adults: I. Identification and validation. *Psychological assessment*, 7(1), pp.33–41.
- Trull, T.J., 2001. Relationships of borderline features to parental mental illness, childhood abuse, Axis I disorder, and current functioning. *Journal of personality disorders*, 15(1), pp.19–32.
- Tufanaru, C. et al., 2017. Systematic reviews of effectiveness. In M. Z. Aromataris E, ed. *Joanna Briggs Institute Reviewer's Manual*. The Joanna Briggs Institute.
- Ustün, B. & Kennedy, C., 2009. What is “functional impairment”? Disentangling disability from clinical significance. *World psychiatry: official journal of the World Psychiatric Association*, 8(2), pp.82–85.
- Weissman, M.M. & Bothwell, S., 1976. Assessment of social adjustment by patient self-report. *Archives of general psychiatry*, 33(9), pp.1111–1115.
- Winograd, G., Cohen, P. & Chen, H., 2008. Adolescent borderline symptoms in the community: prognosis for functioning over 20 years. *Journal of child psychology and psychiatry, and allied disciplines*, 49(9), pp.933–941.
- Wright, A.G.C. et al., 2016. Developmental Trajectories of Borderline Personality Disorder Symptoms and Psychosocial Functioning in Adolescence. *Journal of personality disorders*, 30(3), pp.351–372.
- Yen, S., Gagnon, K. & Spirito, A., 2013. Borderline personality disorder in suicidal adolescents. *Personality and mental health*, 7(2), pp.89–101.
- Zanarini, M.C. et al., 2018. Description and prediction of time-to-attainment of excellent recovery for borderline patients followed prospectively for 20 years. *Psychiatry research*, 262, pp.40–45.

Zanarini, M.C. et al., 2017. Prevalence rates of borderline symptoms reported by adolescent inpatients with BPD, psychiatrically healthy adolescents and adult inpatients with BPD. *Personality and mental health*, 11(3), pp.150–156.

Zelkowitz, P. et al., 2007. A five-year follow-up of patients with borderline pathology of childhood. *Journal of personality disorders*, 21(6), pp.664–674.