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Psychological Medicine

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Mental health and service use of parents with and without borderline intellectual functioning

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Original Article

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Abstract

Background. People with borderline intellectual functioning (BIF) encounter greater social adversities than the general population and have an increased prevalence of mental illness. However, little is known about the socio-demographic characteristics and mental health of parents with BIF.

Methods. A secondary data analysis of the Adult Psychiatric Morbidity Survey 2014 was conducted. Logistic regression models were fitted to compare differences in socio-demographic, mental health and service-use characteristics between parents and non-parents with and without BIF, and to investigate if the relationship between parent status and mental health outcomes was modified by BIF status, sex, and employment.

Results. Data from 6872 participants was analyzed; 69.1% were parents. BIF parents had higher odds of common mental disorder, severe mental illness, post-traumatic stress disorder, self-harm/suicide and were more likely to see their General Practitioner (GP) and to receive mental health treatment than non-BIF parents. BIF parents did not have a higher prevalence of mental health problems than BIF non-parents. Being a parent, after adjusting for BIF status and other confounders, was associated with increased odds of having a common mental disorder, visits to see a GP and treatment for mental health. Female parents had higher odds of treatment for mental health problems.

Conclusions. Being a parent is associated with elevated rates of common mental disorders. There is a higher burden of mental health problems and service use in people with BIF. A greater provision of specialist support services including ascertainment is indicated for this group.

Background

Borderline intellectual functioning (BIF) is a term used to describe people with an intelligent quotient (IQ) between 70 and 85 (i.e. 1–2 standard deviations below the general population mean), who may have some difficulties with day-to-day functioning (Wieland & Zitman, 2016). In high income countries, BIF affects 11–13% of the population (Martínez-Leal, Folch, Munir, Novell, & Salvador-Carulla, 2020). BIF is not a separate diagnositic entity, rather a contextualizing descriptor indicating individuals with additional needs who may require support and interventions similar to those of people with an Intellectual Disability (ID) (Kataria & Philip, 2022).

People with BIF face greater adversity than the general population, with fewer opportunities for paid employment, lower incomes, and home ownership (Hassiotis et al., 2008) and are more likely to live in poverty, poor housing, and deprived neighborhoods (McManus et al., 2018). These difficulties may impair mental health (Emerson et al., 2015; McManus et al., 2018) and indeed, studies show higher rates of mental health disorders in people with BIF than the general population including anxiety and depression (Lim, Totsika, & Ali, 2022; McManus et al., 2018), psychosis (Hassiotis et al., 2017; Lim et al., 2022; Peña-Salazar, Arrufat, Santos, Novell, & Valdés-Stauber, 2018); and alcohol and substance misuse (Lim et al., 2022; van Duijvenbode et al., 2015). Adverse childhood experiences (ACEs) have also been shown to partially mediate the psychiatric morbidity in people with BIF (Hassiotis et al., 2019). People with BIF may be particularly vulnerable to social stressors; they are less likely to be married, have smaller social networks (Hassiotis et al., 2008) and are more likely to be lonely than the general population (Papagavriel, Jones, Sheehan, Hassiotis, & Ali, 2020).

Being a parent is also associated with mental health problems and this was most apparent during the COVID-19 pandemic when the psychological distress associated with being a parent came to the fore (Adams, Smith, Caccavale, & Bean, 2021; Pierce et al., 2020). The age of mothers is also a risk factor; mothers who have children before age 30, have increased risk of mental health disorders, compared to fathers of a similar age and women without children (Pearson et al., 2019). Parents who are middle aged or older, across both sexes and levels of deprivation, have an increased risk of depression, particularly in individuals not living with

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a partner (Giannelis et al., 2021). Being an unmarried or lone parent has a negative impact on mental health (Campbell, Thomson, Fenton, & Gibson, 2016; Cooper et al., 2008; Meadows, McLanahan, & Brooks-Gunn, 2008; Wade, Veldhuizen, & Cairney, 2011). Employment, however, may be protective, with employed single mothers found to be happier and less stressed than unemployed mothers (Meier, Musick, Flood, & Dunifon, 2016).

A comparison of disabled and non-disabled parents found that disabled parents were more likely to be female, older, unmarried, and have lower levels of post-secondary education and incomes, and were more likely to have chronic physical health conditions. (Li, Parish, Mitra, & Nicholson, 2017). Mothers with ID (who may be similar to those with BIF) have more mental health difficulties than mothers without ID (Brown, Cobigo, Lunsky, & Vigod, 2017a; Emerson et al., 2015; Mitra, Parish, Clements, Zhang, & Simas, 2018) including depression and anxiety (McConnell, Mayes, & Llewellyn, 2008). During pregnancy and after childbirth, they have more visits to emergency departments for psychiatric reasons (Mitra et al., 2018) such as postpartum depression, anxiety, and other mood disorders (Brown et al., 2017a). In many countries, with the exception of the Netherlands (where there are dedicated mental health services for people with BIF (Neijmeijer, Korzilius, Kroon, Nijman, & Didden, 2019), people with BIF are unable to access specialist services and rely on mainstream services, where healthcare professionals may not have the skills to accommodate their needs.

There is a lack of research on the mental health of fathers (Devost, 2015) and even less on fathers with BIF. In both the general population and in samples with cognitive impairment, female gender is associated with higher levels of anxiety and depression (Chen, Lawlor, Duggan, Hardy, & Eaton, 2006; McManus et al., 2018). Psychiatric morbidity might therefore be expected to be higher in mothers with BIF than fathers with BIF.

Deinstitutionalization and changing attitudes, coupled with policy and legislative changes recognizing the rights to be a parent (Equality Act, 2010) and to have a family life (Human Rights Act, 1998, 2020) have resulted in more people with cognitive impairments becoming parents. There is little clarity over figures, with reasons including inconsistencies in assessment, lack of access to services and fear of judgement. However, an estimated 0.9 per 1000 births are to women with ID (Goldacre, Gray, & Goldacre, 2015). Therefore, public health strategies and professionals delivering services need to be aware of the issues affecting parents with cognitive impairments in order to deliver high-quality tailored care.

The aim of this study was to investigate whether being a parent is associated with differences in the prevalence of mental health conditions and service use compared to non-parents in people with BIF and non-BIF, and whether there are differences amongst parents with and without BIF.

Our objectives were to:

(1) Examine whether the prevalence of being a parent differs between people with and without BIF.
(2) Compare the demographic and health characteristics of a. parents and non-parents with BIF, b. parents and non-parents without BIF, and c. parents with BIF and parents without BIF.
(3) Examine the associations between mental health conditions (common mental disorders, severe mental illness, possible drug and alcohol dependence, self-harm, and suicidality) and service use (contact with a General Practitioner [GP], psychiatrist, and treatment [use of medication and psychotherapy]) in parents and non-parents with and without BIF and in parents with BIF compared to parents without BIF.
(4) Investigate whether the association between parent status, mental health and service use is moderated by BIF status (BIF/non BIF), sex or employment status.

We hypothesized that rates of mental health conditions and service use would be higher in parents than non-parents, including among those with BIF, and that there will be an interaction with BIF status, sex, and employment status. We hypothesize that the stresses of parenting may be greatest on those who are BIF and unemployed and on female parents.

Method

This study is a secondary data analysis of the Adult Psychiatric Morbidity Survey 2014 (APMS; McManus et al., 2019). This is a population-based cross-sectional survey that is representative of private households in England, which were identified by stratified sampling of different areas in England followed by sampling of addresses within the selected areas. A letter was sent to each sampled address which introduced the survey. The interviewer then attended the address and if the household consented to being involved, one person aged 16 or over in the household was randomly selected for an interview which consisted of both computer assisted self-completion and face-to-face questions, lasting on average 90 min. A subset of participants was invited to complete a second-phase interview.

There were 14 417 addresses in the original sample, of which 13 313 were found to be eligible and contact was made. Of these, 4172 refused to take part; 782 were not contactable and 813 did not take part for other reasons. In total 7546 (57%) responded and completed the interview but 18 were partially completed interviews. Participants with missing NART scores and children-status were excluded, providing data from 6872 participants for analysis. Further details are available at McManus, Bebbington, Jenkins, & Brugha (2016). We have included participants aged 16 or over in our analysis to ensure that younger parents were represented as they may potentially be at risk of poorer mental health outcomes.

Ethical approval for the primary study was obtained from the West London National Research Ethics Committee (Reference number: 14/LO/0411). All data collected by the APMS survey is held by the National Centre for Social Research and National Health Service (NHS) Digital. A data sharing agreement to access the data files from NHS Digital was issued on 26/05/21. Informed consent for participant data to be analyzed in future ethical research was obtained at the time of the primary study. Ethical approval of this secondary analysis was obtained from University College London (ID 21553/001).

Measures

Sociodemographic characteristics

Identification of BIF and non BIF group

IQ was calculated from participants' scores on the National Adult Reading Test (NART) administered by an interviewer (Nelson, 1982). The NART is a measure of premorbid IQ and is validated in English speakers. It provides estimates of verbal, performance,

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and full scale IQ. The NART comprises 50 words with atypical phonemic pronunciation that are presented in ascending order of difficulty. The estimated IQ score is calculated by recording the number of reading errors made by the participant (error score is 50 minus the number of words read correctly) and entering this information into an equation. The NART provides IQ scores between 70 to 127. It is not sensitive enough to detect IQ scores below 70 or above 127. Participants with a Verbal IQ score between 70 and 79 were identified for this analysis as those with BIF. Those with an IQ of 80 and above were categorized into the non-BIF group.

Parent status

Participants who were parents were identified from the binary question (asked by an interviewer): *Do you have any children, including any that do not live with you as part of your household?* If necessary, the interviewer clarified: *Include step or adopted children and any grown-up children who have moved away. Exclude miscarriages, abortions, stillbirths or any deceased children.*

Sociodemographic details

Age (in years) was recorded as a continuous variable. Sex was recorded as male or female. Participants identified their ethnicity from 18 groups presented on a show card. Ethnic groups were merged into four categories: White; Black/ Black British; Asian/ Asian British and Mixed/ Multiple/Other. Marital status was categorized into three groups: Single, Married and Separated/ widowed/divorced. Employment status was categorized into two groups: Employed and Unemployed. The unemployed group also included participants who were economically inactive (e.g. students, those who were retired or unable to work due to illness). Participants were asked about their highest educational qualification. These were categorized into three groups: higher education (e.g. degree, teaching qualification, nursing or other qualification); secondary school (e.g. A levels and GCSEs) and no qualifications. Participants were asked whether they owned their own home and this was categorized as 'Yes' or 'No'.

Index of multiple deprivation (IMD)

This is a measure of multiple deprivations at the small area level, which is based on nationally published data and was recorded for each postal address. The measure uses 38 indicators across seven domains: Income Deprivation; Employment Deprivation; Health Deprivation and Disability; Education Skills and Training Deprivation; Barriers to Housing and Services; Living Environment Deprivation; and Crime (Smith et al., 2015). IMD scores calculated from these indicators were broken down by quintile, with higher scores indicating more deprivation. IMD scores were assigned to each participant based on the IMD score for their local area. A score of 0.53 to 8.49 indicated very low to low deprivation; 8.49 to 13.79 indicated low to mild levels of deprivation; 13.79 to 21.35 indicated mild to moderate levels of deprivation; 21.35 to 34.17 indicated moderate to severe levels of deprivation and a score of 34.17 to 87.80 indicated severe levels of deprivation.

Stressful life events

Life events were assessed using the interviewer-administered List of Threatening Experiences (Brugha, Bebbington, Tennant, & Hurry, 1985). Trauma variables were combined into three categories based on whether they were related to abuse (in line with literature on ACEs (Lacey & Minnis, 2020)), previous household dysfunction or adult adversities:

Abuse. Consisting of binary responses to: *Experienced serious assault to yourself at any time in your life; Experienced bullying at any time in your life; Experienced violence in the home at any time in your life; Experienced sexual abuse at any time in your life.*

Previous household dysfunction. consisting of binary responses to: *Spent time in any institution before age 16 (excluding private education boarding school); Ever taken into Local Authority Care up to age of 16; Experienced serious illness or injury to a close relative at any time in your life; Experienced serious assault of a close relative at any time in your life.*

Adult adversities. consisting of binary responses to: *Experienced separation due to marital difficulties, divorce or steady relationship breakdown at any time in your life; Experienced major financial crisis, equivalent to loss of 3 months income at any time in your life; Experienced trouble with police involving court appearance at any time in your life; Experienced being homeless at any time in your life.*

A 'yes'/'No' response to any of the sub-components of the trauma variables was used to indicate that variable (abuse, previous household dysfunction or adult adversities) was 'present'/ 'absent'

Health-related characteristics

General health

An interviewer asked the participant to rate their general health on a five point scale, from excellent to poor.

Chronic physical disorder

The presence of chronic disease ('Yes' or 'No') was indicated by reporting to the interviewer the presence in the past year of any one of the following conditions: asthma, cancer, epilepsy, diabetes, and/or hypertension.

Mental wellbeing

Mental wellbeing was assessed using the interviewer-administered Warwick Edinburgh Mental Wellbeing Scale (Tennant et al., 2007), a 14-item scale with five response categories, summed to provide a single continuous score ranging from 14–70, where a higher score indicates greater psychological wellbeing.

Neurodevelopmental disorder (NDD)

The presence of a neurodevelopmental disorder was indicated by the presence of either autism or Attention Deficit Hyperactivity Disorder (ADHD) or both. Autism was screened for using the Autism Quotient (AQ-20; Brugha et al., 2012). Participants with a self-completed AQ-20 test score of 4 or more were given diagnostic assessments by clinically trained interviewers using the Autism Diagnostic Observation Schedule (ADOS, module 4; Lord et al., 2002) where a score of 10 or more was used to indicate a positive autism screen. The survey also included an interview of the six-item Adult ADHD Self Report Scale (ASRS; World Health Organisation, 2003) for screening for ADHD, where a score of 4 or more indicated a positive screen for possible ADHD. Above-threshold scores for either of these screens were used in the analyses to indicate a 'positive' screen for NDD.

Mental disorders and service use

Common mental disorders

This included depression, generalized anxiety disorder, panic disorder, phobias, Obsessive Compulsive Disorder, and Common

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Mental Disorders not otherwise specified, as determined by a score of 12 or more on the Clinical Interview Schedule-Revised (CIS-R), a structured interview schedule assessing the presence of symptoms in the past week (Lewis, Pelosi, Araya, & Dunn, 1992). In line with APMS 2014, we used an overall score as many people meet the criteria for more than one common mental disorder. This shows the burden of symptoms in the population. Participants who did/did not have at least one of the above conditions were categorized as having a common mental disorder 'present' or 'absent'.

Post-traumatic stress disorder

Post-traumatic stress disorder (PTSD) was screened using a 17-item PTSD Checklist – Civilian (PCL-C). This is a self-completion checklist in which those with a score of 50 or more and those meeting Diagnostic Statistical Manual (DSM) criteria for PTSD are identified as positive screens for PTSD. A positive screen did not mean that a disorder was necessarily present, only that there were sufficient symptoms to warrant further investigation (Weathers, Litz, Herman, Huska, & Keane, 1993).

Participants who met or did not meet the criteria for the PTSD screen were categorized as having PTSD 'present' or 'absent'.

Severe mental illness

This included psychosis, bipolar disorder or severe depression, which were determined from different screening questions. Meeting/ not meeting the threshold scores in any of the screening measures below was used to indicate severe mental illness as 'present' or 'absent'.

A probable psychotic disorder in the past year was indicated by the SCAN (Schedule for Clinical Assessment in Neuropsychiatry; World Health Organisation, 1999) interview, or, if participants met two psychoses testing criteria in initial screening, such as currently taking antipsychotic medication or hearing voices. As not all participants who screened positive had their diagnosis confirmed by SCAN, this measure is a screen rather than confirmation of diagnosis.

The self-completed 15-item Mood Disorder Questionnaire indicated the likely presence of bipolar disorder with at least seven lifetime manic/hypomanic symptoms, as well as several co-occurring symptoms, together with moderate or serious functional impairment (Hirschfeld et al., 2000). A positive screen indicated the likely presence of bipolar disorder and that fuller assessment would be warranted.

The presence of severe depression in the past week was assessed using the CIS-R, a score of 18 or more being considered severe.

Signs of possible drug dependence and hazardous alcohol use/ dependence

This was combined into a single variable for this analysis. They were all tested using self-completion. Participants meeting/ not meeting any of these criteria were marked as having signs indicating possible drug dependence or hazardous alcohol use/ dependence.

Alcohol use in the past year was assessed using the Alcohol Use Disorders Identification Test (AUDIT) (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). An AUDIT score of 8 or more out of 40 was used to indicate hazardous alcohol use. Alcohol dependence was assessed using the Severity of Alcohol Dependence Questionnaire (SADQ) (Stockwell, Hodgson, Edwards, Taylor, & Rankin, 1979) where scores between 15 and 60 were used to indicate dependence.

Participants who reported having taken particular illicit drugs in the past year were also asked about signs of dependence on that drug. For each of the eight drug types (cannabis, amphetamines, crack, cocaine, ecstasy, tranquillizers, opiates, and volatile substances), reported use in the past year was followed by five questions based on the Diagnostic Interview Schedule and designed to assess symptoms of drug dependence (Malgady, Rogler, & Tryon, 1992). These questions covered: daily use for 2 weeks or more; sense of need or dependence; inability to abstain; increased tolerance, and withdrawal symptoms. A positive response to any of the items was used to indicate the presence of signs of possible drug dependence.

Suicidal attempts and self-harm

This was assessed as binary questions in the CIS-R in both the face-to-face interview and self-completion sections of the survey. Participant responses which indicated that they had or had not self-harmed or made suicidal attempts in the past year were taken to indicate that this variable was 'present' or 'absent'.

Service use and treatment

This was assessed by interviewers asking all participants binary questions regarding, if they had: '*spoken with a GP about being anxious, depressed, or about a mental, nervous or emotional problem in the past year*' or '*seen a psychiatrist in the past year*'. Data was also collected on whether they were receiving any medication (*antipsychotic, antidepressant, ADHD, hypnotic, anxiolytic, bipolar medication*), or therapy (*psychotherapy, psychoanalysis, Cognitive Behavioral Therapy, counseling* (*including bereavement*), *alcohol or drug counseling, art/music/drama therapy, social skills training, couple or family therapy, sex therapy, Mindfulness Therapy and any other types of therapy*). The number of 'yes' responses to any one of these questions were summed for the analysis.

Statistical analysis

The association between parent status (and having at least one child at home under the age of five) and BIF status was assessed using logistic regression with BIF status as the independent variable and parent status as the dependent variable, adjusting for age.

We conducted sub-group analyses comparing parents and non-parents in the people BIF and non-BIF groups and in parents with and without BIF. Descriptive statistics (e.g. percentages, means) were used to compare demographic, health and service-use characteristics. All the outcome/ dependent variables were binary. To investigate if being a parent according to BIF status was associated with differences in socio-demographic and clinical characteristics, mental health conditions and service use, compared to non-parents, separate logistic regression models were fitted for each demographic, mental health and service use indicator as the outcome/dependent variable, with parent status as the exposure/ independent variable. In addition, we examined the relationship between parent status and the above outcomes in the whole sample by fitting separate logistic regression models with parent status as the independent variable and mental health health/service use outcomes as the dependent variable, adjusting for BIF status (unadjusted model). We then added key demographic covariates that were found to be associated with parenting status (age, sex, marital status, employment) and also adjusted for

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whether there was at least one child under five living at home. We limited the number of covariates in the model due to small cell sizes for some variables.

The potential moderating effect of BIF status, sex and employment status on the relationship between parent status and mental health and social outcomes was explored using logistic regression, with mental health and service use outcomes as the dependent variable. The potential moderator, parent status, and the interaction between them were specified as explanatory (independent) variables.

Missing data were handled by doing a complete case analysis; therefore, we only included participants with observed data. The data were weighted to take into account selection probabilities and non-response. The results are presented as unweighted frequencies and weighted odds ratios with 95% confidence intervals and p values (<0.05 were considered significant). We did not adjust for multiple statistical testing by using the Bonferroni method as this can lead to type II errors; our aim was to understand the multi-dimensional profile of parents rather than testing for multiple differences; the risk of a type I error is reduced if there is an a priori /pre-planned hypothesis (Armstrong, 2014). Statistical analysis was conducted using Stata version 17.0.

Results

Parent status in people with and without BIF

Socio-demographic and health characteristics comparing parents and non-parents within each group (BIF and non BIF) and between parents with and without BIF are shown in Table 1. The proportion of parents in the sample was 69.1%. The BIF group comprised 666 (9.7%) participants. Of those with BIF, 465 (69.8%) had children and of those without BIF 4284 (69.0%) had children (odds ratio (OR) 1.05; 95% CI 0.86–1.29; $p = 0.604$). A higher proportion of participants in the BIF group reported that they had at least one child under five living at home (98; 14.7%), compared to the non-BIF group (641; 7.5%; OR 0.66; 95 CI 0.51–0.85; $p = 0.001$). The relationship remained significant after adjusting for age (OR 0.75; 95% CI 0.57–0.99; $p = 0.041$).

Within group comparisons of demographic and health characteristics

Parents and non-parents in the BIF group

Parents with BIF were older compared to non-parents with BIF (57.2 years old; [Standard deviation (S.D.) 19.0] *v.* 41.6 years old [S.D. 21.3]). There was a higher proportion of females (55.7% *v.* 39.8%) and fewer males in the parent group compared to non-parents (44.3% *v.* 60.2%; OR 0.63 (male); 95% CI 0.43–0.94; $p = 0.02$). Parents were more likely to be married (37.6 *v.* 16.3; OR 0.84; 95 CI 4.58–15.57; $p < 0.001$); separated, widowed, and divorced (40.2% *v.* 13.4; OR 13.66; 95% CI 7.58–24.62; $p = <0.001$); own their own home (47.2% *v.* 36.5%; OR 2.06 1.26–3.36 $p = 0.004$) and were less likely to be employed (31.4% *v.* 48.3%; OR 0.55; 95% CI 0.36–0.82; $p = 0.004$); Parents were more likely to report previous household dysfunction (28.2% *v.* 24.5%; OR 2.66; 95% CI 1.51–4.68; $p = 0.001$); adult adversity (40.2% *v.* 31.8%; OR 1.65; 95% CI 1.04–2.62; $p = 0.022$) but less likely to report a history of abuse (28.9% *v.* 40.5%: OR 0.58; 95% CI 0.36–0.92; $p = 0.022$).

Parents with BIF were more likely to report their health as poor (16.8% *v.* 9.5%; OR 3.98; 95% CI 1.50–10.57; $p = 0.006$) and to have at least chronic physical health condition (43.1% *v.* 26.9%; OR 2.66; 95% CI 1.51–4.68; $p = 0.001$) compared to non-parents.

Parents and non-parents in the non-BIF group

Non BIF parents were older compared to non-parents (58.1 years old (S.D. 16.4) *v.* 42.7 years old (S.D. 18.4); They were less likely to be males (37.6% *v.* 45.4%; OR 0.72; 95% CI 0.64–0.81; $p = 0.001$) and be employed (49.4% *v.* 65.6%; OR 0.56; 95% CI 0.49–0.63; $p < 0.001$) and more likely to be married (54.7% *v.* 25.3%; OR 14.92; 95% CI 12.62–17.65; $p < 0.001$). Parents were more likely to own their homes (73.4% *v.* 63.4%; OR 1.97; 95% CI 1.72–2.26; $p < 0.001$); and less likely to live in areas with the highest levels of deprivation (14.9% *v.* 18.1%; OR 0.63; 95% CI 0.52–0.77; $p < 0.001$). Parents were more likely to report household dysfunction (40.4% *v.* 37.8%; OR 1.25; 95% CI 1.09–1.43; $p = 0.001$) and adult adversity (46.3% *v.* 35.5%; OR 1.86; 95% CI 1.63–2.1; $p < 0.001$) but were less likely to report a history of abuse (31.8% *v.* 37.7%; OR 0.75; 95% CI 0.66–0.86; $p < 0.001$).

Non-BIF parents, compared to non-parents were more likely to report their health as being poor (7.0% *v.* 4.3%); OR 2.76; 95% CI 1.96–3.89; $p < 0.001$) and having at least one chronic health condition (36.4% *v.* 24.2%; OR 2.20; 95% CI 1.89–2.54; $p < 0.001$) but were less likely to have a neurodevelopmental disorder (8.2% *v.* 11.1%; OR 0.68; 95% CI 0.55–0.84; $p < 0001$).

Comparisons between parents in BIF and non-BIF groups

There were no differences in age in parents from BIF and non-BIF groups. There was a lower proportion of males in the non-BIF parent group (37.6% *v.* 44.3%; OR 0.71; 95% CI 0.58–0.87; $p = 0.001$). Non-BIF parents were more likely to be married (54.7% *v.* 37.6%; OR 2.75; 95% CI 2.05–3.69; $p < 0.001$), be employed (49.4% *v.* 31.4%; OR 1.89; 95% CI 1.49–2.39; $p = 0.003$) and own their homes (73.4% *v.* 47.2%; OR 3.11; 95% CI 2.47–3.91; $p < 0.001$). They were less likely to live in areas with the highest level of deprivation (14.9% *v.* 35.7%; OR 0.19; 95% CI 0.13–0.28; $p < 0.001$). However, they were more likely to experience household dysfunction (40.4% *v.* 28.2%; OR 1.56; 95% CI 1.21–2.01; $p = 0.001$ and adult adversity (46.3% *v.* 40.2%; OR 1.28; 95% CI 1.01–1.61; $p = 0.001$) compared to BIF parents.

Non-BIF parents were less likely to report their health as being poor (7.0% *v.* 16.8%; OR 0.29; 95% CI 0.19–0.44; $p < 0.001$) and to having a chronic illness (36.4% *v.* 43.1%; OR 0.77; 95% CI 0.61–0.97; $p = 0.024$) and they were less likely to have a neurodevelopmental disorder (8.2% *v.* 14.7%; OR 0.50; 95% CI 0.35–0.72; $p < 0.001$).

Mental health and service use in parents and non-parents with and without BIF

Univariate comparisons showing the presence and absence of mental health conditions, treatment and use of services amongst parents and non-parents according to BIF status, are shown in Table 2. In people with BIF, there were no differences in the presence of mental health conditions, treatment and service use between parents and non-parents. In the non-BIF group, parents were less likely to have post-traumatic stress disorder (6.1% *v.* 9.8%; OR 0.6; 95% CI 0.47–0.77; $p < 0.001$) and were less likely to have self-harmed or attempted suicide in the past year

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Table 1. Demographic and health related characteristics comparing parents and non-parents within BIF and non-BIF groups, and parents with and without BIF

	Borderline intellectual functioning group (BIF)				Non-borderline intellectual functioning group (non-BIF)				Parents (BIF and non-BIF)	
	Parents: Numbers (N) Percentage (%)	Non-parents: Numbers (N) Percentage (%)	Odds ratio (95% confidence interval) (Reference group: non-parents)	*p* value	Parents: Numbers (N), Percentage (%)	Non-parents: Numbers (N), Percentage (%)	Odds ratio (95% confidence interval) (Reference group: non-parents)	*p* value	Odds ratio (95% confidence interval) (Reference group: BIF)	*p* value
Age in years: Mean (standard deviation)	57.2 (19.0)	41.6 (21.3)	1.06 (1.04–1.07)	<0.001	58.1 (16.4)	42.7 (18.4)	1.07 (1.07–1.08)	<0.001	1.01 (1.00–1.02)	0.036
Sex:										
Females	259 (55.7)	80 (39.8)	1	0.02	2672 (62.4)	1049 (54.6)	1	<0.001	1	0.001
Males	206 (44.3)	121 (60.2)	0.63 (0.43–0.94)		1612 (37.6)	873 (45.4)	0.72 (0.64–0.81)		0.71 (0.58–0.87)	
Ethnicity:										
White	428 (92.2)	179 (89.1)	1		3852 (90.3)	1749 (90.3)	1		1	
Black/ Black British	10 (2.2)	7 (3.5)	0.78(0.29–2.15)	0.635	121 (2.8)	39 (2.04)	1.34 (0.91–1.97)	0.137	1.15 (0.56–2.39)	0.700
Asian/ Asian British	20 (4.3)	11 (5.5)	0.67(0.23–1.94)	0.464	206 (4.8)	84 (4.4)	1.21 (0.89–1.64)	0.220	1.24 (0.73–2.09)	0.422
Mixed/ Multiple/Other	6 (1.3)	4 (2.0)	0.83 (0.15–4.44)	8.820	88 (2.1)	43 (2.3)	0.88 (0.60–1.30)	0.522	1.42 (0.57–3.52)	0.448
Marital status:										
Single	103 (22.2)	141 (70.2)	1		502 (11.7)	1196 (62.3)	1		1	
Married	175 (37.6)	33 (16.3)	8.45 (4.58–15.57)	<0.001	2342 (54.7)	486 (25.3)	14.92 (12.62–17.65)	<0.001	2.75 (2.05 to3.68)	<0.001
Separated/ Divorced/ Widowed.	187 (40.2)	27 (13.4)	13.66 (7.58–24.62)	<0.001	1440 (33.6)	239 (12.4)	19.69 (16.17–23.97)	<0.001	1.49 (1.12 to1.99)	0.007
Employment status:										
Unemployed	319 (68.6)	104 (51.7)	1		2169 (50.6)	662 (34.4)	1		1	
Employed	146 (31.4)	97 (48.3)	0.55 (0.36–0.82)	0.004	2115 (49.4)	1260 (65.6)	0.56 (0.49–0.63)	<0.001	1.89 (1.49–2.39)	0.003
Housing: owns own home										
No	244 (52.8)	127 (63.5)	1		1135 (26.6)	710 (36.6)	1		1	
Yes	218 (47.2)	73 (36.5)	2.06 (1.26–3.36)	0.004	3138 (73.4)	1213 (63.4)	1.97 (1.72–2.26)	<0.001	3.11 (2.47–3.91)	<0.001
Highest qualifications:										
Higher education	160 (34.7)	67 (34.0)	1		1376 (32.4)	603 (31.8)	1		1	
Secondary school	187 (40.6)	75 (38.0)	1.09 (0.66–1.79)	0.74	1838 (43.3)	828 (43.6)	1.04 (0.89–1.21)	0.448	1.09 (0.58–1.40)	0.48

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No qualifications	114 (24.7)	55 (27.9)	1.01 (0.59–1.74)	0.960	1030 (24.3)	467 (24.6)	0.94 (0.80–1.11)		0.96 (0.74–1.26)	0.80
Index of Multiple Deprivation (IMD):										
Very low to low	54 (11.6)	23 (11.4)	1		1013 (23.7)	377 (19.6)	1		1	
Low to mild	74 (15.9)	27 (13.4)	1.31 (0.54–3.21)	0.545	913 (21.3)	432 (22.5)	0.74 (0.60–0.91)	0.005	0.70 (0.47–1.06)	0.096
Mild to moderate	76 (16.3)	40 (19.9)	0.85 (0.37–1.93)	0.696	952 (22.2)	375 (19.5)	0.88 (0.72–1.07)	0.191	0.64 (0.42–0.96)	0.03
Moderate to severe	95 (20.4)	49 (24.4)	0.94 (0.41–2.16)	0.885	766 (17.9)	390 (20.3)	0.68 (0.56–0.83)	<0.001	0.39 (0.26–0.60)	<0.001
Severe	166 (35.7)	62 (30.9)	1.19 (0.57–2.49)	0.65	640 (14.9)	348 (18.1)	0.63 (0.52–0.77)	<0.001	0.19 (0.13–0.28)	<0.001
Previous household dysfunction										
No	333(71.8)	151 (75.5)	1		2552 (59.6)	1194 (62.3)	1		1	
Yes	131 (28.2)	49 (24.5)	2.66 (1.51–4.68)	0.001	1732 (40.4)	724 (37.8)	1.25 (1.09–1.43)	0.001	1.56 (1.21–2.01)	0.001
Adult adversity										
No	277 (59.8)	137 (68.2)	1		2299 (53.7)	1237 (64.4)	1		1	
Yes	186 (40.2)	64 (31.8)	1.65 (1.04–2.62)	0.022	1984 (46.3)	684 (35.6)	1.86 (1.63–2.15)	<0.001	1.28 (1.01–1.61)	0.001
History of abuse										
No	329 (71.1)	119 (59.2)	1		2922 (68.2)	1197 (62.3)	1		1	
Yes	134 (28.9)	82 (40.8)	0.58 (0.36–0.92)	0.022	1361 (31.8)	724 (37.7)	0.75 (0.66–0.86)	<0.001	1.16 (0.90–1.49)	0.243
Neurodevelopmental disorder present (ASD/ADHD)										
No	395 (85.3)	167 (83.1)	1		3931 (91.8)	1708 (88.9)	1		1	
Yes	68 (14.7)	34 (16.9)	0.83 (0.42–1.64)	0.58	353 (8.2)	214 (11.1)	0.68 (0.55–0.84)	<0.001	0.50 (0.35–0.72)	<0.001
Chronic disease present										
No	264 (56.9)	147 (73.1)	1		2722 (63.6)	1456 (75.8)	1		1	
Yes	200 (43.1)	54 (26.9)	2.66 (1.51–4.68)	0.001	1557 (36.4)	465 (24.2)	2.20 (1.89–2.54)	<0.001	0.77(0.61–0.97)	0.024
General Health										
Excellent	46 (9.9)	34 (16.9)	1		732 (17.1)	445 (23.2)	1		1	
Very good	101 (21.7)	55 (27.4)	1.43 (0.73–2.78)	0.293	1390 (32.5)	710 (36.9)	1.30 (1.08–1.56)	0.005	0.99 (0.67–1.48)	0.971
Good	138 (29.7)	50 (24.9)	2.04 (1.02–4.11)	0.045	1177 (27.5)	468 (24.4)	1.64 (1.37–1.98)	<0.001	0.58 (0.40–0.84)	0.004
Fair	102 (21.9)	43 (21.4)	2.01 (1.02–4.00)	0.045	685 (16.0)	216 (11.2)	2.17 (1.71–2.76)	<0.001	0.49 (0.34–0.72)	<0.001
Poor	78 (16.8)	19 (9.5)	3.98 (1.50–10.57)	0.006	300 (7.0)	83 (4.3)	2.76 (1.96–3.89)	<0.001	0.29 (0.19–0.44)	<0.001
Wellbeing: Mean (standard deviation)	48.1 (13.9)	48.8 (12.3)	0.99 (0.98–1.01)	0.492	51.8 (10.9)	51.3 (10.8)	1.00 (0.99–1.01)	0.960	1.02 (1.01–1.03)	<0.001

ADHD, Attention deficit hyperactivity disorder; ASD, Autism spectrum disorder.
All statistics are *N* (%) unless otherwise specified.
Frequencies, percentages and means are unweighted; odds ratios and 95% confidence intervals are weighted.

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Table 2. Mental health conditions and service use in parents and non-parents within BIF and non-BIF groups and between parents with and without BIF

	Borderline Intellectual functioning group (BIF)				Non-borderline intellectual functioning group (non-BIF)				Parents only (BIF and non-BIF)	
Categorical variables	Parents: Numbers (n), Percentage (%)	Non-parents: Numbers (n), Percentage (%)	Odds ratio (95% confidence interval) (Reference group: non-parents)	*p* value	Parents: Numbers (n), Percentage (%)	Non-parents: Numbers (n), Percentage (%)	Odds ratio (95% confidence interval) (Reference group: non-parents)	*p* value	Odds ratio (95% confidence interval) (Reference group: BIF)	*p* value
Common mental disorders										
Present	119 (24.1)	51 (24.1)	1.0 (0.56–1.79)	0.999	707 (15.7)	333(16.9)	0.92 (0.78–1.08)	0.29	0.58(0.45–0.76)	<0.001
Absent	346 (75.9)	150 (75.9)	1		3577 (84.4)	1589 (83.2)	1		1	
Post-traumatic stress disorder										
Present	49 (11.3)	31 (17.1)	0.62 (0.29–1.32)	0.210	255 (6.1)	165 (9.8)	0.60 (0.47–0.77)	<0.001	0.51(0.35–0.74)	<0.001
Absent	353 (88.7)	140 (82.9)	1		3813 (93.9)	1678 (90.3)	1		1	
Severe mental illness										
Present	31 (6.4)	12 (4.6)	1.41 (0.61–3.29)	0.416	147 (3.3)	76 (3.6)	0.93 (0.68–1.28)	0.65	0.50(0.31–0.82)	0.006
Absent	434 (93.6)	189 (95.4)	1		4137 (96.7)	1846 (96.4)	1		1	
Signs of possible drug or alcohol dependence										
Present	78 (16.5)	42 (24.2)	0.62 (0.35–1.09)	0.096	734 (16.7)	360 (18.3)	0.91 (0.77–1.07)	0.255	1.04(0.78–1.38)	0.803
Absent	384 (83.6)	158 (75.8)	1		3539 (83.0)	1561 (81.7)	1		1	
Self-harm or suicide attempt in the past year										
Present	12 (2.7)	9 (4.3)	0.62 (0.21–1.79)	0.371	54 (1.1)	52 (2.9)	0.38 (0.24–0.58)	<0.001	0.40(0.18–0.93)	0.033
Absent	453 (97.3)	192 (95.7)	1		4230 (98.9)	1870 (97.1)			1	
GP contact about mental health in past year										
Yes	91 (17.6)	35 (16.4)	1.09 (0.54–2.19)	0.811	573 (12.5)	260 (12.6)	0.99 (0.81–1.20)	0.885	0.67(0.51–0.88)	0.005
No	373 (82.4)	166 (83.6)	1		3711 (87.5)	1661 (87.4)	1		1	
Psychiatrist contact about mental health in past year										
Yes	7 (1.9)	5 (2.0)	0.94 (0.20–4.38)	0.940	42 (1.0)	31 (1.5)	0.67 (0.37–1.20)	0.175	0.55(0.21–1.41)	0.210
No	458 (98.2)	196 (98.0)	1		4242 (99.0)	1890 (94.5)			1	
Received any treatment for mental health										
Yes	100(21.6)	33 (16.5)	1.64 (0.89–3.03)	0.115	42 (1.0)	31 (1.6)	1.27 (1.06–1.51)	0.009	0.69 (0.52–0.91)	0.009
No	363 (78.4)	167 (83.5)	1		4242 (99.0)	1890 (98.4)				

All statistics are *N* (%) unless otherwise specified.
Frequencies and percentages are unweighted; odds ratios and 95% confidence intervals are weighted.

Table 3. Mental health and service use in parents compared to non-parents in the whole sample, adjusted for BIF status and other confounders

Mental health condition/service use	Unadjusted odds ratio[a]	95% Confidence interval	*p* Value	Adjusted odds ratio[b]	95% Confidence interval	*p* Value
Common mental disorders	0.93	0.80–1.08	0.317	1.47	1.20–1.80	<0.001
Post-traumatic stress disorder	0.60	0.49–0.76	<0.001	1.27	0.95–1.71	0.106
Severe mental illness	0.99	0.74–1.32	0.947	1.42	0.91–2.22	0.124
Signs of possible drug and alcohol dependence	0.87	0.75–1.02	0.08	0.97	0.80–1.17	0.740
Self-harm or suicide attempt in the past year	0.41	0.27–0.61	<0.001	0.96	0.53–1.75	0.905
Saw GP about mental health in the past year	0.98	0.82–1.18	0.861	1.47	1.16–1.87	0.037
Saw psychiatrist about mental health in the past year	0.70	0.41–1.19	0.985	1.22	0.63–2.37	0.547
Received any mental health treatment (therapy and/or medication)	1.31	1.11–1.54	0.001	1.32	1.07–1.63	0.011

[a]In parents compared to non-parents, adjusted for BIF status (BIF = reference group).
[b]In parents compared to non-parents, adjusted for BIF status (BIF = reference group), age, sex, marital status, employment, children under 5 living at home.

compared to non-parents (1.1% *v.* 2.9%); OR 0.38; 95% CI 0.24–0.58; $p < 0.001$). However, they were more likely to have received treatment for a mental health disorder (OR 1.27; 95% CI 1.06–1.51; $p = 0.009$).

Non BIF parents compared to BIF parents were less likely to have a common mental disorder (15.7% *v.* 24.1%; OR 0.58; 95% CI 0.45–0.76; $p < 0.001$), PTSD (6.1% *v.* 11.3%; OR 0.51; 95% CI 0.35–0.74; $p < 0.001$) and severe mental illness (3.3% *v.* 6.4%; OR 0.50; 95% CI 0.31–0.82; $p = 0.006$) and they were less likely to have self-harmed or attempted suicide (1.1% *v.* 2.7%; OR 0.40; 95% CI 0.18–0.93; $p = 0.033$). Non-BIF parents were also less likely to have seen a GP in the last year for mental health problems and less likely to have received treatment for a mental health disorder (OR 0.69; 95% CI 0.52–0.91; $p = 0.009$).

The results of the multivariate analysis are shown in Table 3, which shows the relationship between being a parent and mental illness/service use, adjusted for BIF status and other confounders. After adjusting for BIF status, being a parent was associated with a lower incidence of PTSD (OR 0.60; 95% CI 0.49–0.76; $p < 0.001$) and self-harm/suicide (OR 0.41; 95% CI 0.27–0.61; $p < 0.001$) compared to non-parents, but parents were more likely to receive treatment for their mental health condition (OR 1.31, 95% CI 1.11–1.54; $p = 0.001$). After also adjusting for age, sex, marital status, employment status, and children under five living at home, parents were more likely to have common mental disorders (OR 1.47; 95% CI 1.20–1.80; $p < 0.001$), and were more likely to have seen their GP in the past year (OR 1.47; 95% CI 1.16–1.87; $p = 0.037$) and to be receiving treatment for their mental health (OR 1.32; 95% CI 1.07–1.63; $p = 0.011$) compared to non-parents.

Moderating effect of BIF status, sex, and employment on the association between parent status and mental health and service use

Table 4 shows the results of the regression analysis of the interaction effects of BIF status, sex, and employment on the relationship between parent status and mental health conditions and service use. BIF status and employment status were not found to moderate any of the relationships. Sex was only found to moderate the relationship between parent status and current treatment for mental health problems, with female parents being more likely to receive treatment compared to non-parents and male parents (OR 1.41; 95% CI 1.01–1.95; $p = 0.042$).

Discussion

Being a parent, after adjusting for BIF status and other confounders, was associated with an increased prevalence of common mental disorders, and higher odds of seeing a GP and receiving treatment for mental health problems. This finding supports our hypothesis that being a parent is associated with more mental health problems, although only an association with common mental disorders was found. Non-BIF parents, compared to BIF parents had a lower prevalence of common mental disorder, severe mental disorder, post-traumatic stress disorder, self-harm/suicide and were less likely to see their GP for a mental health problem in the past year. However, when BIF parents were compared to BIF nonparents, there were no differences in the prevalence of mental health disorders or service use, suggesting that being a parent with BIF did not confer additional mental health issues in addition to having BIF.

Being a female parent was associated with higher odds of having treatment for mental health problems. Our results are consistent with other studies that have shown that male parents are less likely to experience mental health problems such as depression and anxiety (Giannelis et al., 2021; Pearson et al., 2019) compared to female parents. There was a higher prevalence of chronic disorders in parents with BIF compared to non BIF parents, which has also been demonstrated in one study comparing parents with and without disability (Li et al., 2017).

Parents with BIF compared to non BIF parents had significantly lower odds of previous household dysfunction. Hassiotis et al. (2008) when comparing those with and without BIF, found that people with BIF were significantly less likely to be assaulted, or have a relative who had been assaulted, but they were more likely to have run away from home and have been expelled from school.. This suggests that the association with life events is less clear-cut, as also described by Hassiotis et al. (2019).

There were no significant differences in signs of possible drug and alcohol dependence in parents and non-parents with and without BIF . Other studies have shown that alcohol misuse is more prevalent amongst non-parents and that becoming a parent

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Table 4. Interaction effects of BIF status, sex, and employment on the relationship between parent status and mental health conditions and service use

Mental health and service use outcomes	Non-parents: Numbers with/ without outcome (percentage with outcome)	Parents: Numbers with/ without outcome of interest (percentage with outcome)	Odds ratio and 95% Confidence interval for the interaction between the moderator and parent status[a]	*p* value for interaction term
1.Common mental disorder				
BIF	51/150 (25.4)	119/346 (25.6)	1.09 (0.65–1.83)	
Non BIF	333/1589 (17.3)	707/3577 (16.4)	0.92 (0.55–1.53)	0.736
Totals	384/1739	826/3923		
Sex				
Female	238/891 (22.1)	598/2333 (20.4)	0.54 (0.21–1.37)	
Male	148/848 (14.9)	228/1590 (12.5)	1.02 (0.75–1.40)	0.890
Totals	384/1739	826/3923		
Employment				
Unemployed	167/599 (21.8)	485/2003 (19.5)	0.67 (0.30 to1.49)	0.683
Employed	217/1140 (16.0)	341/1920 (15.1)	0.94 (0.70–1.26)	
Totals	384/1739	(826/3923)		
2. Severe mental illness				
BIF	12/189 (6.0)	31/423 (6.8)	1.52 (0.66–3.50)	
Non-BIF	76/1846 (4.0)	147/4137 (3.4)	0.66 (0.29–1.50)	0.320
Totals	88/2035	178/4571		
Sex				
Female	48/1084 (4.2)	120/2811 (3.5)	1.43 (0.75–2.73)	
Male	43/951 (4.3)	58/1760 (3.2)	0.70 (0.37–1.32)	0.270
Totals	88/2035	178/4571		
Employment status				
Unemployed	49/717 (6.4)	102/2386 (4.1)	1.45 (0.77–2.71)	
Employed	39/1318 (2.9)	76/2185 (3.4)	0.69 (0.37–1.30)	0.249
Total	88/2035	88/2035		
3. Post-traumatic stress disorder				
BIF	31/140 (18.1)	49/353 (12.2)	1.02 (0.52–2.00)	
Non BIF	165/1678 (9.0)	255/3813 (6.3)	0.98 (0.50–1.91)	0.947
Totals	196/1818	304/4166		
Sex				
Female	106/969 (9.9)	206/2541 (7.5)	1.12 (0.74–1.69)	
Male	90/849 (9.6)	98/1625 (5.7)	0.89 (0.59–1.34)	0.580
Totals	196/1818	304/4166		
Employment status				
Unemployed	96/594 (13.9)	200/2073 (8.8)	1.05 (0.67–1.65)	
Employed	100/1224 (7.6)	104/2093 (4.7)	0.95 (0.61–1.49)	0.249
Totals	196/1818	304/4166		
4. Signs of possible drug dependence or hazardous use of alcohol				
BIF	42/158 (21.0)	78/384 (16.9)	0.68 (0.40–1.14)	
Non BIF	360/1561 (18.7)	734/3539 (17.2)	1.47 (0.88–2.48)	0.143
Totals	402/1719	812/3923		
Sex				

(*Continued*)

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Table 4. (*Continued.*)

Mental health and service use outcomes	Non-parents: Numbers with/ without outcome (percentage with outcome)	Parents: Numbers with/ without outcome of interest (percentage with outcome)	Odds ratio and 95% Confidence interval for the interaction between the moderator and parent status[a]	*p* value for interaction term
Female	222/906 (19.7)	502/2420 (17.2)	0.93 (0.68–1.28)	0.659
Male	180/813 (18.1)	310/1503 (17.1)	1.07 (0.78–1.47)	
	402/1719	812/3923		
Employment status				
Unemployed	144/620 (18.8)	411/2071 (16.6)	0.89 (0.62–1.26)	
Employed	258/1099 (19.0)	410/1852 (18.1)	1.13 (0.79–1.61)	0.501
Totals	402/1719			
5. Self-harm or suicide attempt in the past year				
BIF	9/192 (4.5)	12/453 (2.6)	1.64 (0.55–4.91)	
Non BIF	52/1870 (2.7)	54/4230 (1.3)	0.61 (0.20–1.82)	0.373
Totals	61/2062	66/4683		
Sex				
Female	47/1082 (4.2)	46/2885 (1.6)	0.54 (0.21–1.37)	
Male	14/980 (1.4)	20/1798 (1.1)	1.86 (0.73–4.77)	0.193
Totals	61/2062	66/4683		
Employment status				
Unemployed	31/735 (2.2)	37/2451 (1.5)	0.67 (0.30–1.50)	0.485
Employed	30/1327 (2.2)	29/2232 (1.3)	1.49 (0.67–3.33)	
Total	61/2062	66/4683		
6. Saw general practitioner about mental health in the past year				
BIF	35/166 (17.4)	91/373 (19.6)	1.09 (0.64–1.86)	0.754
Non BIF	260/1661 (13.5)	573/3711 (13.4)	0.72 (0.46–1.16)	0.177
Totals	295/1827	664/4084		
Sex				
Female	187/942 (16.6)	485/2446 (16.5)	1.03 (0.73–1.46)	
Male	108/885 (10.9)	179/1638 (9.9)	0.97 (0.69–1.37)	0.866
Totals	295/1827	666/408		
Employment status				
Unemployed	124/642 (16.1)	383/2104 (15.4)	1.15 (0.81–1.64)	
Employed	171/1185 (12.6)	281/1980 (12.4)	0.87 (0.61–1.23)	0.437
Totals	295/1827			
7. Saw psychiatrist about mental health in the past year				
BIF	5/196 (2.5)	7/458 (1.5)	1.41 (0.034–5.87)	
Non BIF	31/1890 (1.6)	42/4242 (1.0)	0.71 (0.17–2.94)	0.633
Totals	36/2086	49/4700		
Sex				
Female	18/1111 (1.6)	27/2904 (1.0)	0.64(0.23–1.76)	
Male	18/975 (1.8)	22/1796 (1.2)	1.57 (0.57–4.35)	0.382
Totals	36/2086	49/4700		
Employment status				
Unemployed	22/744 (2.9)	33/2455 (1.3)	0.80 (0.34–1.92)	

(*Continued*)

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Table 4. (*Continued.*)

Mental health and service use outcomes	Non-parents: Numbers with/ without outcome (percentage with outcome)	Parents: Numbers with/ without outcome of interest (percentage with outcome)	Odds ratio and 95% Confidence interval for the interaction between the moderator and parent status[a]	*p* value for interaction term
Employed	14/1342 (1.0)	16/2245 (0.71)	1.25 (0.52–2.98)	0.620
Totals	36/2086	49/4700		
8. Receiving current treatment for mental health				
BIF	33/167 (16.5)	100/363 (21.6)	1.29 (0.74–2.25)	
Non BIF	270/1652 (14.0)	682/3600 (15.9)	0.77 (0.44–1.34)	0.36
Totals	303/1819	782/3963		
Sex				
Female	178/951 (15.8)	581/2347 (19.8)	1.41 (1.01–1.95)	
Male	125/868 (12.6)	201/1616 (11.1)	0.71 (0.51–0.99)	0.042
Total	303/1819	782/3963		
Employment status				
Unemployed	159/606 (20.8)	522/1962 (21.0)	1.13 (0.80–1.59)	
Employed	144/1213 (10.6)	260/2001 (11.5)	0.88 (0.63–1.25)	0.485
Total	303/1819	782/3963		

[a]Reference group: non-parents.

is associated with lower levels of drinking in general (Patrick, Evans-Polce, Wagner, & Mehus, 2020). In contrast, female parents with intellectual impairment or disability are more likely to have substance use disorders (Brown, Lunsky, Wilton, Cobigo, & Vigod, 2016). The lack of a difference might be because only a small proportion of parents in the sample had children under the age of five living at home, and this group of parents has been shown to have the lowest level of harmful drinking compared to parents with older children or non-parents (Patrick et al., 2020).

There was no association between being a parent with BIF and seeing a psychiatrist in the past year, despite the higher odds of mental illness and GP contact. This indicates that while there is a higher burden of psychiatric morbidity in parents with BIF than in parents without BIF, in primary care this may be under-recognized leading to a greater unmet need among those with BIF. However, this model was limited by its small sample size and therefore should be interpreted with caution.

The strengths of the study are that this is the first study to use a large nationally representative sample in order to highlight the mental health issues for parents with BIF. Using self-reported screening questionnaires from a community-based sample allowed for identification of illness that may be unrecognized by professionals and thereby not in contact with services. Our data included both fathers and mothers, extending an evidence base predominantly focused on mothers.

However, the study has several limitations. Firstly, the sample of parents was identified from the question: *Do you have any children, including any that do not live with you as part of your household?* This may represent a heterogenous group with different stressors, for example one parent may have had one child who lives outside the home whilst another may have been the sole carer for several children living in the home. This needs to be considered in the interpretation of the results. However, in our regression analysis comparing parent status with mental health and service, we adjusted for the presence of at least one child under the age of five living at home.

Secondly, the study is vulnerable to selection bias. The sampling strategy used may have excluded some groups of people entirely, for example those who are homeless, living in residential settings, or in prison could not have been selected to take part. Also, the time and cognitive demand of the study meant that some participants are less likely to take part such as those with severe mental distress, more time-consuming caring duties or higher levels of intellectual impairment. The sample size of the BIF group was relatively small and therefore the study may have been under-powered to have detected differences in the sub-group analysis between parents and non-parents in the BIF group.

Further, the analysis did not include those who did not have English as a first language as the NART is not valid in this group. The NART also tends to over-estimate IQ in those with very low scores and underestimates IQ in those with higher scores (Bright, Hale, Gooch, Myhill, & van der Linde, 2018). The NART does not assess the full range of intellectual functioning. As the BIF-categorization is solely based on this measure, and does not include any formal evaluation of adaptive functioning, this may have limited the validity of the BIF-categorization.

Finally, information bias may arise from both self-reported data and face-to-face interview, if participants do not answer fully or honestly. The measurement tools used have been validated in general population samples and therefore may not be valid in those with BIF. Also, the study is cross-sectional and therefore we are unable to establish the direction of causality. For example, the associations of mental health outcomes with employment may reflect reverse causality, with those with worse health being less able to work, rather than not working leading to worse health. Conclusions from these findings should therefore be interpreted with caution.

There is a lack of literature on the impact of parental co-morbid mental illness and ID on the mental health of a

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child. However, women with ID are a vulnerable population who experience poverty, violence or abuse, chronic medical disease and mental illness disproportionately, all of which are risk factors for poor reproductive outcomes (Akobirshoev, Parish, Mitra, & Rosenthal, 2017; Brown, Cobigo, Lunsky, & Vigod, 2017b; Fairthorne et al., 2020; Mueller, Crane, Doody, Stuart, & Schiff, 2019; Parish et al., 2015; Shin et al., 2020) and neonatal morbidities (Brown et al., 2017b). A greater understanding is therefore also required about characteristics including disabilities, mental health, behavioral and support needs of children of parents with BIF.

In the future, collecting and analyzing longitudinal data will assist in understanding the timing of mental health problems in parents with BIF and how this might impact their children. This will provide information to allow us to determine the process by which parenting in people with BIF can lead to mental health problems and its consequences. Understanding this process more thoroughly will aid the development of specialist, evidence based interventions for this group.

In practice people with BIF may be overlooked due to this not being classified as a mental disorder in diagnostic manuals (Wieland & Zitman, 2016). However, people with BIF are more vulnerable to the development of mental health problems than people of average or above average intelligence. When they do develop psychiatric disorders, the presence of BIF can have specific impacts on the presentation, diagnostics, and treatment of the psychiatric disorder. Despite this, people with BIF are almost invisible in research, and when they develop comorbid psychiatric disorders, are rarely identified as having BIF in mental healthcare (Wieland & Zitman, 2016).

Mental healthcare professionals require training in recognizing BIF and developing the extra skills needed for effectively treating psychiatric disorders in such patients. Patients deserve access to specialized support services. There should be increased focus on public health interventions that aim to increase awareness of BIF and to tailor healthcare services to mitigate the increased risk of mental health problems. In order to achieve this, a renewed regard is required towards the conceptualization of BIF. A well-defined classification of BIF would improve the recognition and acknowledgement of these patients and give attention to their specific mental healthcare needs. Conversely, unifying mild ID and BIF into a single category could allow early recognition and access to necessary interventions (Kataria & Philip, 2022). Further, advancing to a more dimensional approach towards intellectual impairment in clinical practice may increase recognition of the needs of this group.

Data availability statement. The deidentified APMS dataset, data dictionary, protocol, participant materials, and full documentation are lodged with the UK Data Service archive. Permission to use the dataset for this analysis was obtained from NHS Digital. Requests for further use should be made to the Data Access Request Service at NHS Digital.

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Ethical standards. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

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