REVIEW ARTICLE
https://doi.org/10.30773/pi.2025.0209

eISSN 1976-3026
OPEN ACCESS

The Mental Health Profile of Borderline Intellectual Functioning: A Systematic Review

Myeongju Cho[1], Eunseol Ko[1], Haemi Choi[1], Dong-Gyun Han[2], Hyun Jung Kim[3,4], Bora Kim[5], and Min-Hyeon Park[1] ✉

[1]Department of Psychiatry, Eunpyeong St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Republic of Korea
[2]Yonsei University, College of Nursing, Seoul, Republic of Korea
[3]Department of Psychiatry, Harvard Medical School, Boston, MA, United States
[4]Division of Psychotic Disorders, McLean Hospital, Belmont, MA, United States
[5]Department of Literature and Art Therapy, Konkuk University, Seoul, Republic of Korea

Objective Psychiatric morbidity patterns and associated outcomes among individuals with borderline intellectual functioning (BIF) remain poorly characterized. This systematic review aims to examine mental health outcomes in BIF populations compared to individuals with normal intellectual functioning and those with intellectual disability (ID).

Methods A systematic literature search was conducted across the PubMed, Web of Science, PsycInfo, and ERIC databases from inception to January 2025 using comprehensive search terms for BIF. Studies were included in this analysis if they examined individuals with intelligence quotient (IQ) 71–84 and reported mental health outcomes. Data extraction focused on subjective well-being, psychopathology prevalence, and comparative analyses. Quality assessment utilized the Mixed Methods Appraisal Tool.

Results Forty-five studies encompassing 93,396 individuals with BIF were included. Individuals with BIF demonstrated significantly elevated psychiatric morbidity compared with average IQ populations across multiple domains including anxiety, mood, personality, and neurodevelopmental disorders. Mental health outcomes of BIF individuals typically fell intermediate to those observed in normal IQ and mild ID populations.

Conclusion Individuals with BIF represent a vulnerable population with substantially elevated mental health risks, yet remain inadequately differentiated from adjacent cognitive groups. The field requires specialized clinical attention, educational support, and targeted interventions to address their unique mental health challenges and improve outcomes. **Psychiatry Investig 2025;22(11):1230-1242**

Keywords Intellectual disabilities; Mental health; Psychopathology; Quality of life; Systematic review.

INTRODUCTION

Individuals with borderline intellectual functioning (BIF) are typically identified by scoring one to two standard deviations (SDs) below average on standardized intelligence tests (representing intelligence quotient [IQ] levels ranging from approximately 71–84), along with demonstrating adaptive challenges.[1] Actual surveys demonstrate rates ranging from 11% to 16%, with fluctuations being attributable to the utilized assessment tools, sex differences, and geographical variations among study participants.[2-4]

Academic underperformance relative to age-matched peers typically constitutes the initial presentation of BIF, becoming apparent during the school-age period.[5] This scenario has led to various terms to describe the BIF population, focusing on either cognitive ability or educational performance.[1] During their school years, these individuals encounter significant challenges in both academic learning and peer relationships, which subsequently exacerbate feelings of frustration and compromise their self-esteem.[6,7] As adults, they typically experience reduced employment opportunities and encounter barriers to workplace integration, which are circumstances that frequently contribute to financial instability and necessitate reliance on disability pensions.[8]

The Diagnostic and Statistical Manual of Mental Disorders

Received: June 18, 2025 **Revised:** August 22, 2025
Accepted: August 29, 2025

✉ **Correspondence:** Min-Hyeon Park, MD, PhD
Department of Psychiatry, Eunpyeong St. Mary's Hospital, College of Medicine, The Catholic University of Korea, 1021 Tongil-ro, Eunpyeong-gu, Seoul 03312, Republic of Korea
Tel: +82-2-2030-2722, **Fax:** +82-2-2030-2720
E-mail: neominnie00@hanmail.net

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has reclassified BIF and removed it from the classification of intellectual developmental disorders; currently, it is now listed under the V codes as "Other conditions that may be a focus of clinical attention."[9] Despite its ambiguous status as a psychiatric illness, BIF is associated with diverse mental health issues. For example, children with lower-than-average IQ often report of lower levels of happiness[10] and exhibit poor impulse control.[11] Compared with peers with typical intelligence, individuals with BIF demonstrate higher prevalence rates of psychiatric illnesses such as attention-deficit/hyperactivity disorder (ADHD)[12] and mood disorders.[13] Despite scarcity of studies examining the BIF population in isolation, the increased proportion of mild intellectual disability (ID) or BIF among psychiatric patients suggests poor mental health outcomes in this population.[14]

Although the diagnostic criteria for BIF remain unclear, a comprehensive mental health assessment of this population is essential to determine appropriate support levels and inform clinical treatment approaches. However, existing reviews of the BIF population are subject to several limitations. These reviews have only addressed clinical-level psychiatric conditions[15] or have exclusively focused on specific populations, such as children.[16] Although Peltopuro et al.[17] conducted a comprehensive review in 2014 regarding BIF difficulties and risk factors across the lifespan, the scarcity of eligible studies limited their findings.

Given these limitations, we conducted an updated review on the mental health of the individuals with BIF. The present study examined 1) subjective well-being, 2) emotional or behavioral characteristics, and 3) prevalence of psychiatric illness in BIF. We also aimed to delineate the distinctive characteristics of BIF via comparative analysis involving individuals with normal intellectual functioning and those with ID. Given the considerable heterogeneity in assessment tools employed across studies, we adopted a narrative review approach to avoid potential distortion of findings.

METHODS

Literature search

A systematic search strategy was employed to identify relevant studies. The researcher conducted a two-step literature search. In the first step, a comprehensive search was conducted in the PubMed, Web of Science, PsychInfo, and ERIC databases. The search encompassed the period from database inception to January 2025. Search terms included:

("borderline developmental disabilit*" OR "minor intellectual disabilit*" OR "borderline intellectual function*" OR "borderline intellectual disabilit*" OR "borderline IQ" OR "borderline learning disabilit*" OR "borderline mental retardation" OR "mild mental deficienc*" OR "general learning disabilit*" OR "general learning disorder" OR "slow learner*" OR "nonspecific learning disabilit*" OR "borderline ID" OR "borderline intelligence" OR "below average IQ").

In the second step, the reference lists of the retrieved studies and reviews were manually searched for additional relevant publications. Eligible articles were selected according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement (Figure 1). The full-text articles were read and independently assessed by two researchers (MJ and ES). Any differences were discussed until a consensus was reached.

Selection criteria

The studies included in the present review met the following criteria.

Participants

Studies including individuals with IQs ranging between 71 and 84 (accounting for margins of error) were considered to be eligible. There was no restriction on the type of IQ assessment tool utilized as long as standardized measures were used. No age restrictions were applied.

Study design

Any studies reporting original data, including cohort studies, case-control studies, and cross-sectional studies, were included. Intervention studies were also included if they provided relevant baseline information. The minimum sample size required for inclusion was 10 or more participants.

Outcome measures

Studies investigating mental health outcomes in BIF groups were included if they addressed either subjective well-being, emotional or behavioral characteristics, or the prevalence of psychiatric illness. The secondary outcomes of interest included comparisons between BIF individuals and those with ID or average IQ (when data were available). Research was considered to be ineligible if it presented only amalgamated data from BIF groups and participants with different cognitive functioning classifications, such as mild ID.

Publication type

Peer-reviewed articles.

Language: written in English

The retrieved studies were reviewed by MJ and ES, who independently assessed final eligibility based on the abovementioned criteria. The corresponding author was asked to evaluate any disagreements.

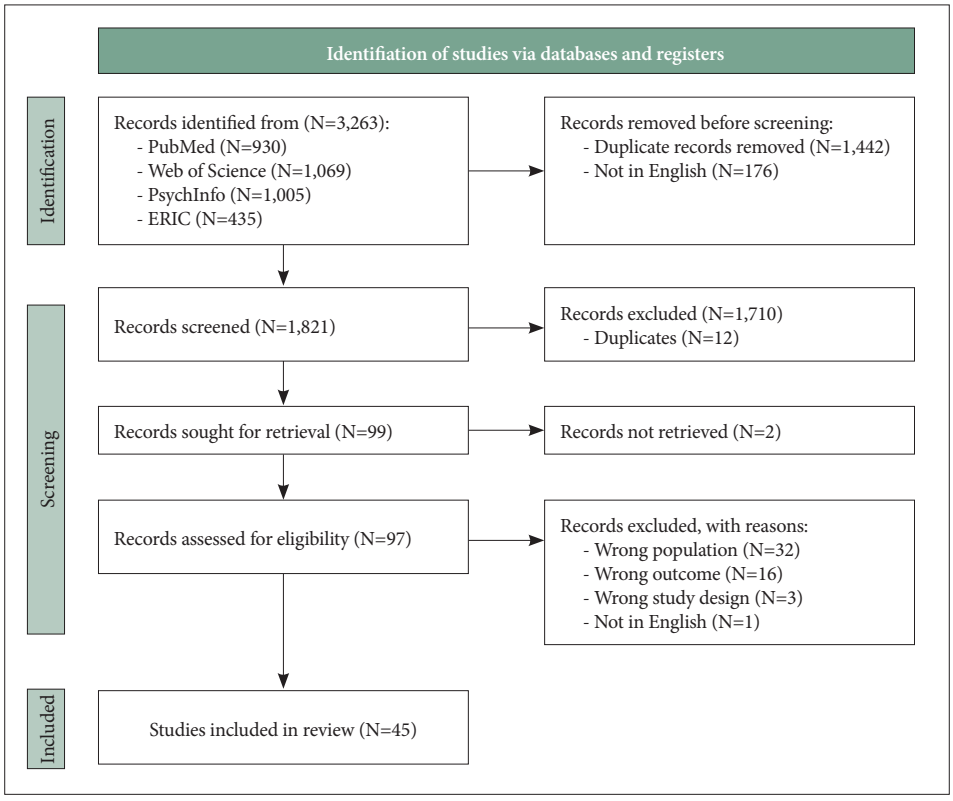

Figure 1. PRISMA flow diagram.

Data extraction

The following details were collected from the included studies: author, year of publication, study location, sample characteristics, assessment tools, comparison groups, psychometric data, effect estimates, and main findings. Baseline data were used when considering intervention studies. Data extraction was performed by the first author and reviewed by the second author.

Quality assessment

The quality of the included studies was assessed according to the Mixed Methods Appraisal Tool (MMAT), V.2018,[18] which was designed for assessing reviews including articles of various study designs. Two reviewers (MJ and ES) independently applied the MMAT criteria. Any disputes were resolved via discussion.

RESULTS

Our literature search obtained 45 studies included in the overall synthesis (Figure 1). This resulted in a dataset including 93,396 individuals with borderline intelligence. All included studies presented mental health outcomes of BIF populations, with detailed psychiatric disorder prevalence rates summarized in Supplementary Table 1 and emotional/behavioral findings presented in Supplementary Table 2. The age distribution of participants ranged from 3 to 88 years across studies, with 20 studies (46.7%) restricting their scope to children and adolescents, while the remaining studies included adult participants either exclusively or in combination with younger populations. The study characteristics and participant demographics are listed in Table 1. The mean quality rating of the papers according to the MMAT was 4.55 (SD=0.70) out of a possible 5 points. A full assessment of methodological quality is provided in Table 2.

Subjective well-being

Two studies (n=176) focused on the quality of life (QoL) of BIF populations without comparative analysis. One found significant associations between QoL and parental socioeconomic status,[19] while another identified relationships with individual monthly income and, among those with ADHD, symptom severity.[20] A sex-based analysis of the latter study's data confirmed that both monthly income and ADHD symptom effects remained significant across male and female participants.[21] The impact of education settings (being in special education) was unclear, showing no significant association[19] or significance found only in subgroup analyses of participants under 28 years of age.[20]

Comparative studies consistently demonstrated that indi-

Table 1. Study demographics and sample characteristics

Author (year)	Country	N	BIF (N)	BIF IQ (range)	IQ assessment tools	Age (range, yr)	Male (%)
Wang et al. (2024)[2]	UK	14,094	2,234	70–85	Four cognitive tests (including general ability)	44–50	54.7
Singh et al. (2024)[22]	India	80	40	80.5 (3.7)*	Raven's standard progressive matrices	18–45	50.0
Rudra et al. (2024)[23]	UK	6,872	666	70–79	NART	57.2 (19.0)*	44.3
Wexler et al. (2023)[49]	USA	2,516	523	70–79	WISC-IV/-V	6–13‡	69.1
Karande et al. (2023)[46]	India	100	100	73–80	WISC-R or Binet-Kamat Test of Intelligence	15.0–16.8	67.0
Peltopuro et al. (2023)[8]	Finland	417	156	70–85	Various cognitive tests (including Kohs block test)	41–53	57.1
Wagemaker et al. (2022)[42]	Netherlands	40	19	71–83	WISC-V	12–15	52.6
Lim et al. (2022)[3]	UK	21,796	2,786	70–85	NART	16–74	45.9‡
Karande et al. (2022)[38]	India	100	100	74–80	WISC-R or Binet-Kamat Test of Intelligence	14.0–15.2	65.0
Hetland et al. (2021)[24]	Norway	162	29	70–85	WASI	26.1 (8.4)*	62.1
Galletta et al. (2020)[56]	Italy	55	25	71–84	WAIS-R	27.6 (9.3)*	16.0
Predescu et al. (2020)[34]	Romania	85	16	70–85	N/A	6–11	-
Melby et al. (2020)[26]	Norway	176	30	70–84	WAIS-III	19.2 (0.5)*	33.0
Kashyap et al. (2020)[45]	India	50	25	70–85	MISIC	10 (3.5)*	68.0
Blasi et al. (2020)[35]	Italy	36	36	70–85	WISC-III	6–11	50.0
Smirni et al. (2019)[44]	Italy	116	65	71–84	WISC-IV	12.6–13.4	53.8
King et al. (2019)[4]	Australia	2,950	262	Below 1–2 SD	LOI	14–15	-
Hassiotis et al. (2019)[40]	UK	15,453	2,108	71–85	Various cognitive tests (including Copying Designs Test)	26–42	-
Szumski et al. (2018)[19]	Poland	49	49	69–85	WISC	11–36	69.4
Ozkan et al. (2018)[43]	Turkey	60	30	70–85	WISC-R	8.6 (1.0)*	73.0
Barnevik Olsson et al. (2017)[50]	Sweden	50	50	70–84	WPPSI-III	9–13	91.8
Nouwens et al. (2017)[57]	Netherlands	250	141	70–85	WPPSI-III, WISC-III, WAIS-III	3–70†‡	60.8‡
Hassiotis et al. (2017)[28]	UK	15,983	1,701	70–85	NART	16–74	-
Wieland and Zitman (2016)[32]	Netherlands	4,265	96	70–84	WAIS-III	16–88‡	24.0
Panicker and Chelliah (2016)[25]	India	82	41	75–79	Binet Kamat Test of Intelligence	7–17	78.0
Fallea et al. (2016)[47]	Italy	700	270	71–84	-	6–47‡	59.0‡
Baglio et al. (2016)[51]	Italy	59	28	70–85	WISC-III	9.5 (1.3)*	57.1
Wieland et al. (2015)[55]	Netherlands	1,261	235	70–84	WAIS-III	33.4 (12.5)*	33.0
Wieland et al. (2014)[27]	Netherlands	1,261	235	70–84	WAIS-III	33.4 (12.5)*	33.0
Stinson and Robbins (2014)[30]	USA	235	55	70–85	Various cognitive tests (including WAIS-III)	18–63	86.0‡
Gigi et al. (2014)[29]	Israel	499,766	76,962	71–84	Cognitive test battery	16–17	100
Fenning et al. (2014)[54]	USA	172	24	77.8 (4.0)*	Stanford Binet Intelligence Scale-IV	5–6	58.0‡
Christensen et al. (2013)[48]	USA	184	20	71–84	Stanford Binet Intelligence Scale-IV	5–9	75.0
Hassiotis et al. (2011)[33]	UK	6,872	1,053	70–85	NART	42.3 (0.7)*	54.8
Emerson et al. (2010)[39]	Australia	3,370	408	70–84	Peabody Picture Vocabulary Test	6–7	-
Karande et al. (2008)[12]	India	100	55	71–84	WISC-R	8–17	63.6

Table 1. Study demographics and sample characteristics (continued)

Author (year)	Country	N	BIF (N)	BIF IQ (range)	IQ assessment tools	Age (range, yr)	Male (%)
Hassiotis et al. (2008)[13]	UK	8,450	1,040	70–84	NART	16–74	51.7
Van der Meere et al. (2008)[11]	Netherlands	40	40	71–75	WISC-R	10–12	100
Rimmerman et al. (2007)[20]	Israel	127	127	70–79	-	28.4 (4.8)*	48.0
Fenning et al. (2007)[52]	USA	217	29	71–84	Stanford Binet Intelligence Scale-IV	5–6	65.5
Crocker et al. (2007)[31]	Canada	281	84	71–85	EIHM	31.1 (8.5)*	100
Chen et al. (2006)[41]	USA	1,611	178	70–80	Stanford Binet Intelligence Scale-III	27–33	50.6
Rimmerman et al. (2005)[21]	Israel	127	127	69–85	-	28.4 (4.8)*	48.0
Finn (1992)[53]	USA	8,336	1,084	70–84	Revised Beta	25.0†	100
Thompson et al. (1990)[36]	USA	79	14	70–84	WISC-R	6–17	48.0

*mean (SD); †mean age at admission to prison; ‡sample characteristics (age and male % values) are based on BIF sample unless specific BIF data were not available, in which case total sample characteristics are reported. -, data were not reported; BIF, borderline intellectual functioning; NART, National Adult Reading Test; WISC-R, Wechsler Intelligence Scale for Children; WASI, Wechsler Abbreviated Scale of Intelligence-Revised; WAIS, Wechsler Adult Intelligence Scale; MISIC, Malin's Intelligence Scale for Indian Children; SD, standard deviation; LOI, Learning Outcome Index; WPPSI, Wechsler Preschool and Primary Scale of Intelligence; EIHM, E´preuve Individuelle d'Habilete´ Mentale (individual test of mental ability).

viduals with BIF report lower QoL than those with normal intellectual functioning[2,22-24] but higher QoL than those with mild ID,[2] though with mixed statistical significance across studies. Peltopuro et al.[8] represented the sole exception to this pattern, reporting the highest mean satisfaction in the mild ID group (88.6%), followed by the BIF group (84.4%) and the normal IQ group (79.5%). The normal IQ comparison group in this study comprised individuals with suspected ID who nevertheless achieved average scores on IQ assessments. Additionally, those with BIF exhibited higher resilience compared to those with normal IQs but with specific learning disorder.[25]

Mental health outcomes

General psychiatric conditions

The prevalence of general psychiatric disorders in individuals with BIF consistently exceeded that in populations with average IQs across multiple studies. Melby et al.[26] documented four-fold higher rates of any psychiatric disorder (53% vs. 12%), while Rudra et al.[23] reported elevated prevalence of common mental disorders (25.5% vs. 16.8%) and severe mental illness (6.5% vs. 3.6%). Wieland et al.[27] similarly reported higher V code rates (conditions that may require clinical attention but are not classified as mental disorders) in outpatient BIF cohorts (22.6%) than in both the normal IQ group (9.5%) and the mild ID group (13.2%).

Psychotic disorders and associated symptoms

The prevalence of psychotic disorders was significantly increased in the BIF sample compared with populations with normal IQ across the majority of included comparative studies. Two studies using national survey data (BIF, n=4,487) reported rates of probable psychosis ranging from 0.8%–1.9%, which were significantly elevated compared with the general population rates of 0.4%–0.6%.[3,28] Regarding specific symptoms, auditory hallucination was significantly more prevalent in the BIF group while persecutory ideation did not show a statistically significant difference.[28] Gigi et al.[29] examined a large cohort of Israeli males (BIF, n=76,962) and reported that both schizophrenia spectrum disorders (0.2% vs. 0.1%) and nonaffective psychosis (0.8% vs. 0.2%) were 2–4 times more frequently diagnosed in the BIF population. A smaller study (BIF, n=41) by Panicker and Chelliah[25] focused on children and adolescents and found schizophrenia in 2.4% of BIF participants, contrasting with zero cases in normal IQ participants. In contrast to these consistent findings, Wieland et al.[27] reported divergent results from a sample recruited from ID specialty clinics, showing lower prevalence of psychotic disorders among BIF group (6.8%) compared with those from regular mental health care (14.7%) or the mild ID group (15.1%).

Studies conducted within forensic settings[30,31] reported substantially high prevalence rates for psychotic disorders (61.8%) and schizophrenia spectrum disorders (6%), with no significant differences being observed between the BIF and ID populations.

Mood disorders and internalizing problems

The prevalence of mood disorders or major affective disorders in the BIF population varied considerably depending on

Table 2. Quality assessment of individual studies

Author (year)	Study design	Q1	Q2	Q3	Q4	Q5	MMAT score
Wang et al. (2024)[2]	Quantitative non-randomized	Y	Y	C	Y	Y	4
Singh et al. (2024)[22]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Rudra et al. (2024)[23]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Wexler et al. (2023)[49]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Karande et al. (2023)[46]	Quantitative descriptive	N	Y	Y	Y	Y	4
Peltopuro et al. (2023)[8]	Quantitative non-randomized	Y	Y	N	Y	Y	4
Wagemaker et al. (2022)[42]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Lim et al. (2022)[3]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Karande et al. (2022)[38]	Quantitative descriptive	N	Y	Y	Y	Y	4
Hetland et al. (2021)[24]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Galletta et al. (2020)[56]	Quantitative non-randomized	Y	Y	Y	Y	Y	4
Predescu et al. (2020)[34]	Quantitative non-randomized	Y	Y	C	Y	Y	4
Melby et al. (2020)[26]	Quantitative non-randomized	Y	Y	C	Y	Y	4
Kashyap et al. (2020)[45]	Quantitative RCT	Y	Y	Y	N	Y	4
Blasi et al. (2020)[35]	Quantitative non-randomized	Y	Y	Y	N	Y	4
Smirni et al. (2019)[44]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
King et al. (2019)[4]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Hassiotis et al. (2019)[40]	Quantitative non-randomized	Y	C	N	Y	Y	3
Szumski et al. (2018)[19]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Ozkan et al. (2018)[43]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Barnevik Olsson et al. (2017)[50]	Quantitative non-randomized	Y	Y	N	Y	Y	4
Nouwens et al. (2017)[57]	Quantitative non-randomized	Y	Y	C	Y	Y	5
Hassiotis et al. (2017)[28]	Quantitative non-randomized	Y	C	Y	Y	Y	4
Wieland and Zitman (2016)[32]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Panicker and Chelliah (2016)[25]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Fallea et al. (2016)[47]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Baglio et al. (2016)[51]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Wieland et al. (2015)[55]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Wieland et al. (2014)[27]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Stinson and Robbins (2014)[30]	Quantitative non-randomized	N	Y	Y	Y	Y	4
Gigi et al. (2014)[29]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Fenning et al. (2014)[54]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Christensen et al. (2013)[48]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Hassiotis et al. (2011)[33]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Emerson et al. (2010)[39]	Quantitative descriptive	Y	Y	Y	Y	Y	5
Karande et al. (2008)[12]	Quantitative non-randomized	N	N	Y	N	Y	2
Hassiotis et al. (2008)[13]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Van der Meere et al. (2008)[11]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Rimmerman et al. (2007)[20]	Quantitative non-randomized	Y	N	Y	Y	Y	4
Fenning et al. (2007)[52]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Crocker et al. (2007)[31]	Quantitative non-randomized	Y	Y	Y	C	Y	4
Chen et al. (2006)[41]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Rimmerman et al. (2005)[21]	Quantitative non-randomized	Y	N	Y	Y	Y	4
Finn (1992)[53]	Quantitative non-randomized	Y	Y	Y	Y	Y	5
Thompson et al. (1990)[36]	Quantitative non-randomized	Y	Y	Y	Y	Y	5

MMAT, Mixed Methods Appraisal Tool; RCT, randomized controlled trial; Y, yes; N, no; C, can't tell.

the study population, ranging from 0.3% to 3.0% in general samples,[26,29] escalating to 8.5%–67.3% within forensic settings[30,31] and reaching 17.4% in outpatient settings.[27] The majority of these investigations revealed non-significant disparities between BIF and normal IQ populations. However, two studies demonstrated statistically significant differences, with one military-based Israeli study demonstrating significantly elevated rates in the BIF group,[29] while another study with outpatient data suggested the opposite pattern.[27] Two large national surveys (BIF n=3,826) reported significantly increased prevalence of neurotic disorders (20.3%–22.7% vs. 13.1%–15.7%) and depressive episodes (4.1%–4.4% vs. 1.8%–2.1%) in the BIF group compared with the normal IQ group.[3,13] Conversely, a smaller investigation (n=82) comparing children and adolescents with BIF against peers with normal intelligence and comorbid specific learning disorder observed diminished rates of concurrent depression in the BIF group (2.4% vs. 7.3%).[25]

Research on depression severity in BIF populations yielded mixed findings depending on sample characteristics. Clinical outpatients with BIF and major depressive disorder exhibited significantly less severe overall symptoms than the counterparts with average IQ while comparable with mild ID.[32] Notably, age-related patterns emerged in community-based research, with adults with BIF showing higher depression scores compared to those with normal IQ,[33] while pediatric studies revealed no significant differences in self-reported[4,25] or parent-reported[34] depressive symptoms.

In addition to depression, comprehensive emotional difficulties in individuals with BIF were assessed with multiple validated instruments: the DISABKIDS chronic generic module parent (proxy) long-version (DCGM-37-P), the Symptom Checklist 90-Revised, the Strengths and Difficulties Questionnaire (SDQ), the Malaise Inventory, the General Health Questionnaire, and the Child Behavior Checklist (CBCL). Three studies examining CBCL subscale Total Internal Problems among students with BIF assessed by parents or professional staff, have reported mean T scores ranging from 50–65,[11,35,36] which fell below the clinically significant threshold (T ≥70) established for standardized scales.[37] Comparative research has consistently revealed that individuals with BIF exhibited significantly elevated psychological distress compared to peers with average IQs across developmental periods, including children and adolescents[4,36,38,39] as well as adults.[24,40,41] However, King et al.[4] found that these group differences were contingent upon informant type in their multi-informant study, with significant effects on the SDQ emotional questionnaire apparent only in parent-completed assessments but not in self-reports from children with BIF. Relative to groups with ID, individuals with BIF exhibited reduced emotional difficulties, with one study reporting statistically significant results,[36] whereas other studies did not report significant results.[39,42]

Difficulties in emotional awareness and regulation were also significantly more pronounced among individuals with BIF than those with average IQs.[22,43,44] Beyond overall differences, the groups exhibited divergent profiles of emotional regulation strategy use. Observational data from anger-induction experiments indicated that children with BIF demonstrated a restricted use of regulatory strategies, employing fewer both adaptive and maladaptive approaches than the comparison group.[34] Conversely, self-report findings from Kashyap et al.[45] indicated increased reliance on suppression strategies among the BIF group.

Anxiety disorders and associated symptoms

Individuals with BIF exhibited significantly elevated rates of anxiety disorders relative to those with normal IQs. Among psychiatric outpatients, the prevalence reached 34.5% in BIF individuals versus 23.1% in the normal IQ group,[27] while longitudinal studies of low-birth-weight cohorts revealed a fourfold difference between groups (23% vs. 5%).[26] Conversely, no significant differences emerged when comparing BIF populations to those with ID.[27] Forensic samples yielded prevalence rates of 5.5%–14.5% for anxiety disorders in BIF populations, though direct statistical comparisons with either normal IQ or mild ID groups were unfeasible due to limited sample sizes.[30,31]

Subtype-specific analyses across studies reported differential patterns of anxiety disorders in BIF populations. Karande et al.[46] employed a self-report questionnaire to assess students with BIF from a learning disability clinic and reported positive screens for separation anxiety (40%), social anxiety (32%), generalized anxiety disorder (31%), panic disorder (26%), and school avoidance (24%). Notably, these prevalence estimates considerably exceeded those derived from medical chart reviews or structured interviews in other investigations.[3,27] In the comparative analyses with normal IQ populations, significantly elevated rates were observed for agoraphobia (1.9%–2.7%), specific phobia (2.1%–4.1%) and posttraumatic stress disorder (PTSD) (12.0%–19.6%).[3,13,23,27] In one study of individuals diagnosed with PTSD, symptom severity showed no significant association with BIF status.[32] Conversely, panic disorder (1.0%–4.3% vs. 0.8%–5.6%) and obsessive-compulsive disorder (2.2%–3.0% vs. 1.1%–1.7%) showed no significant between-group differences.[3,27]

Despite the elevated prevalence of clinical anxiety disorders in BIF populations, mean anxiety levels were found to be comparable between children or adolescents with BIF and peers with normal intelligence in most studies.[4,34] Panicker and Chelliah[25] represented a notable exception, reporting of lower

anxiety in BIF children than in peers with normal-range IQ (but who were still suffering from specific learning problems). Studies comparing the results between the BIF and ID groups were scarce; however, Fallea et al.[47] examined dental anxiety (a form of specific phobia) and reported significantly lower levels in individuals with BIF compared to people with ID.

Neurodevelopmental disorders and deficits in social cognition

The prevalence of ADHD in children with BIF exhibited substantial variation across by sample sources: 3.6%–51.8% in learning disability clinics,[12,38,46] 15% in community agency,[48] 12.2%–51.8% in psychiatry outpatients,[25,49] and 27.8% in autism center.[50] Adults with BIF demonstrated prevalence of 14.5%–17%.[26,30] Comparative analyses conducted by two investigations revealed higher ADHD prevalence in BIF populations relative to the normal IQ group.[26,48] Similarly, Rudra et al.[23] documented higher neurodevelopmental disorder rates (ADHD or autism spectrum disorder [ASD]) among individuals with BIF compared to those with average IQ (15.0% vs. 9.1%).

Barnevik Olsson et al.[50] conducted a seven-year follow-up study of children with BIF children and pre-existing ASD diagnoses, examining concurrent neurodevelopmental conditions. Results indicated comorbid tic disorders (36.1%), developmental coordination disorder (16.7%), and learning disorders (13.9%), alongside ASD (58.3%). While ASD prevalence was not directly compared across studies, research indicates that individuals with BIF exhibit deficient social cognition, notably in theory of mind abilities, when compared to those with normal IQ populations.[51]

Disruptive behavioral conditions and externalizing problems

Oppositional defiant disorder was observed in 35% of BIF individuals according to Christensen et al.[48] which was greater than the normal IQ group (21.7%) but lower than that in the mild ID group (44.9%). Additionally, Panicker and Chelliah[25] reported that conduct disorder was observed in 2.4% of the BIF group.

Behavioral difficulties were assessed with the SDQ and the CBCL. Studies assessing external problems via CBCL among students with BIF have reported mean T scores between 50–60,[2,11,35,36,52] remaining consistently below the clinically significant criterion.[37] Sex differences in behavioral symptomatology, including inattentiveness and classroom hyperactivity, were not detected by Karande et al.[12] In contrast, Rimmerman et al.[21] reported significantly greater attentional impairments in women with BIF than in their male counterparts, with the scores of women exceeding the clinical threshold.

Compared with peers with average IQs, children with BIF consistently demonstrated greater behavioral difficulties, including hyperactivity and conduct problems, on the self-report questionnaire,[4,34,36,39,52] although one investigation failed to achieve statistical significance.[36] King et al.[4] found significant differences across both parent and self-reports, with stronger effects in parent-reported data. Moreover, Finn[53] found that BIF was significantly associated with elevated rates of violent behavioral incidents within correctional populations. In contrast to the aforementioned studies, Fenning et al.[52] demonstrated behavioral parity between children with BIF and average-intelligence peers when evaluated by external observers in naturalistic contexts. However, this discrepant result was ultimately reversed by Fenning et al.'s subsequent longitudinal study,[54] which observed significantly elevated behavioral difficulties among children with BIF following a 1-year observation period. Comparative studies examining BIF versus ID populations documented less severe behavioral problems among BIF participants, although statistical robustness varied across studies.[36,39,52,53]

Personality disorders

Four studies investigated the prevalence of personality disorders (PDs) within the population with BIF. Rates varied substantially, from 10.2% in male adolescents[29] to 37.4%–52.8% in adults.[13,55] The BIF group exhibited significantly higher prevalence rates than that reported in both normal IQ (4.6%–27.0%) and mild ID groups (33.6%).[13,29,55]

Cluster A PD prevalence in the BIF population ranged from 0% to 3.6%, with most studies finding no significant differences from the normal IQ group.[30,55] Nevertheless, subtype-specific analysis by Hassiotis et al.[13] identified significantly higher paranoid PD rates in individuals with BIF versus those with normal intelligence (11.0% vs. 3.1%). Individuals with BIF exhibited significantly higher rates of cluster B PDs compared to those with normal intelligence, including borderline PD (10.9%–15.3% vs. 4.3%–5.2%) and narcissistic PD (1.3% vs. 0.3%), with prevalence similar to ID populations.[13,30,55] The rates of antisocial PD in the BIF population generally fell between 0.5%–10.3%,[13,29,55] with a notable exception of 43.6% observed in the forensic population.[30] Compared with normal IQ, cluster C PDs in BIF populations were also more frequently reported, including dependent PD manifesting significantly higher prevalence rates (4.7%–7.4% vs. 0.3%–1.3%).[13,55] Wieland et al.[55] further demonstrated that dependent PD in the BIF group substantially exceeded that observed in individuals with ID (4.7% vs. 0.7%).

Substance-related disorders and dependencies

The prevalence of substance use disorders in BIF populations was evaluated in two studies involving participants from forensic settings 45.5%–61.9%,[30,31] while medical records

showed 52.0% substance abuse prevalence among BIF individuals with borderline PD.[56] According to these studies, no significant difference was observed compared with the normal IQ and ID groups.

Drug dependence rates (4.8%–9.5%) among individuals with BIF were significantly higher than in the average IQ population, while alcohol dependence prevalence (9.5%–20.2%) in BIF populations yielded inconsistent significance levels relative to normal IQ groups.[3,13,41] Similarly, Rudra et al.[23] (n=666) demonstrated comparable drug/alcohol dependence rates between the BIF and normal IQ groups (18.0% vs. 17.6%, respectively). Compared to the ID populations, BIF groups had higher rates of drug/alcohol abuse although with varying significance being observed.[41,57]

Suicidality

Studies have shown that 2.7%–10.0% of individuals with BIF engaged in self-harm or suicide attempts,[3,4,23,33] increasing to 43.6%–45.5% among forensic populations.[30] These prevalence rates significantly surpassed those of the normal IQ group[3,23,33] except in King et al.'s adolescent study,[4] which found no group differences. However, suicidal ideation was observed at similar rates between individuals with BIF and those with normal intellectual functioning.[4,33] When comparing BIF and mild ID populations in forensic settings, Stinson and Robbins[30] reported suicide attempt rates of 43.6% vs. 36.4% and self-harm rates of 45.5% vs. 49.1%, respectively, although no statistical testing was performed between these groups.

DISCUSSION

We comprehensively reviewed the mental health outcomes of the BIF group in terms of psychopathology, as well as emotional and behavioral profiles. Results indicate that individuals with BIF experience elevated rates of psychiatric disorders and emotional-behavioral difficulties. This elevated risk compared to those with normal intelligence was evident across multiple domains: general psychiatric disorders, neurotic disorders, anxiety disorders, and PDs. Individuals with BIF also exhibited increased vulnerability to subclinical symptoms, including psychological distress and deficits in emotional awareness and regulation. Such emotional fragility may reflect psychosocial stressors commonly experienced by individuals with BIF, including academic difficulties, social challenges, and reduced adaptive functioning. QoL outcomes paralleled this pattern, with the BIF group reporting lower subjective well-being than those with normal intellectual functioning. Notably, the magnitude of group differences between

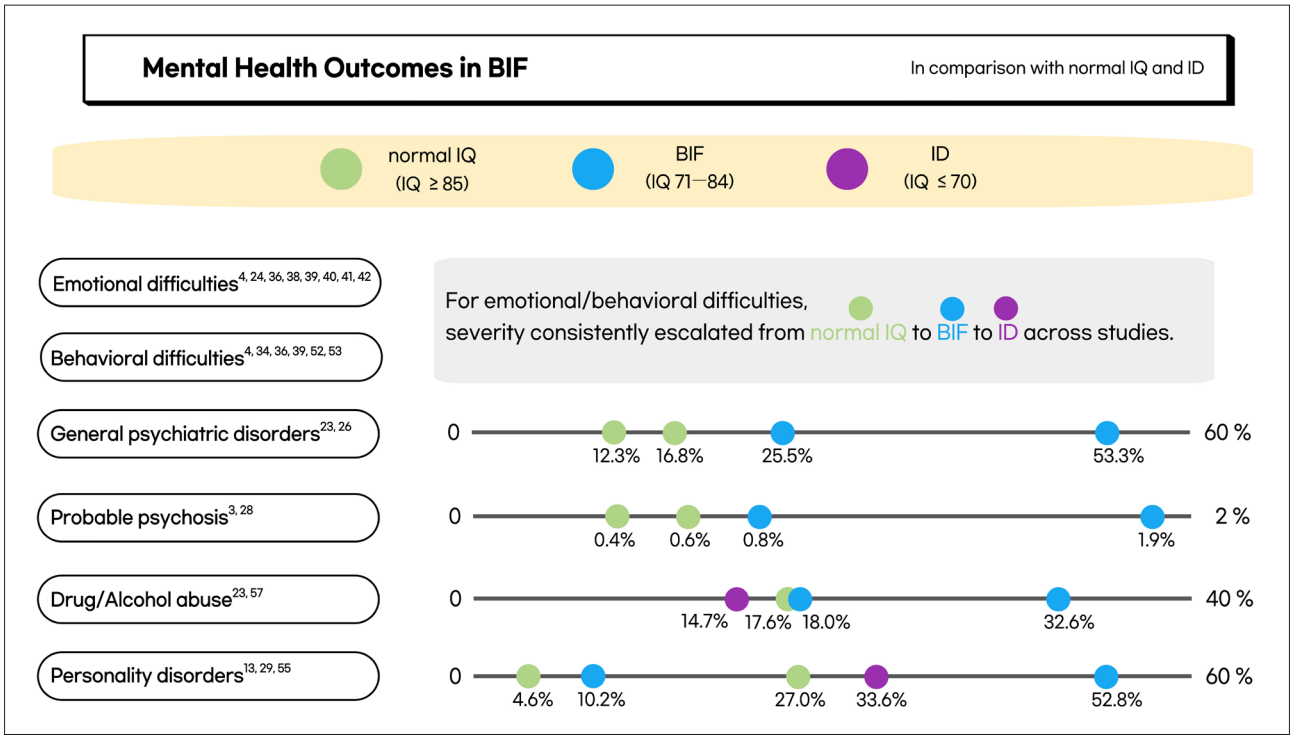

Figure 2. Mental health outcomes of BIF compared with normal IQ and ID groups each cognitive group is represented by colored circles: green for normal IQ (IQ ≥85), blue for BIF (IQ 71–84), and purple for ID (IQ ≤70). Emotional and behavioral difficulties were assessed using validated selfreport questionnaires, while other measures represent prevalence rates of specific psychiatric conditions derived from clinical assessments or structured interviews. The findings demonstrate that mental health outcomes in BIF individuals typically fall intermediate between normal IQ and ID populations; however, this pattern was not universal across all domains. BIF, borderline intellectual functioning; IQ, intelligence quotient; ID, intellectual disability.

the BIF and normal IQ groups was substantially greater for behavioral difficulties than for emotional symptoms. This differential pattern indicates that behavioral dysregulation constitutes the primary distinguishing feature of BIF-related psychopathology. This pattern was evident in self-harm behaviors, where individuals with BIF showed significantly higher rates of self-harm and suicide attempts than those with normal IQ, despite having comparable suicidal ideation rates.

Across multiple domains of emotional and behavioral difficulties, individuals with BIF demonstrated intermediate outcomes compared to normal IQ and ID groups (Figure 2). However, this pattern was not universal, as BIF populations showed elevated risks that exceeded even mild ID groups in areas including PDs, substance abuse, and self-harm behaviors. These findings indicate heightened vulnerability in these domains that challenges assumptions of graduated severity based solely on cognitive functioning.

Although the current study aimed to evaluate the direct influence of cognitive ability, the data suggested significant moderation by additional factors that warrant consideration. The association between depressive symptoms and intellectual ability demonstrated more substantial variation among adults compared with children and adolescents. The accumulation of life stressors might have intensified depressive tendencies among elderly individuals with cognitive impairments.[58] The sample source also significantly influenced psychiatric disorder prevalence rates. For example, the prevalence rates of mood disorders demonstrated significant variations, ranging from 0.3%–3.0% in community samples to 8.5%–67.3% in forensic samples. This pronounced difference suggests either that mental health difficulties in BIF populations lead to increased involvement by the justice system or that forensic environments reveal previously undiagnosed conditions. Although preliminary evidence suggests that ethnic factors may influence the prevalence of neurotic disorders, as indicated by the observation of potential doubled risk in Asian communities in the study by Hassiotis et al.,[13] the paucity of research precludes definitive conclusions. In addition to these demographic factors, parental SES or income emerged as the most robust predictor of perceived QoL among individuals with BIF. This association may be mediated via enhanced resource accessibility or the cultivation of beneficial psychological attributes.[59]

Assessment methodology significantly influenced research conclusions, with different evaluation approaches yielding notably different outcomes. In adolescent samples, the severity of problems was underestimated by using naturalistic observations[52] or self-reports,[4] in contrast with assessments based on parental responses, which were the predominant choice in the included studies. This pattern reflects established cross-informant disagreement in adolescent populations, where parents typically identify greater symptomatology than adolescents themselves report.[60,61] Such informant-dependent variations may have amplified the observed distinctions between BIF and normal IQ groups, necessitating multi-informant approaches for comprehensive assessment.

Studies have demonstrated that individuals with BIF scored below clinical cutoffs on average in emotional or behavioral assessments when evaluated using standardized tests. Although this finding implies that not all individuals with BIF require psychiatric treatment, the increased prevalence of overall psychiatric disorders warrants clinical attention towards this group. Given the increasing psychiatric morbidity in BIF populations reported by Lim et al.,[3] mental health professionals must recognize the vulnerability of these individuals and ensure adequate assessment and intervention. Early intervention can improve functioning and QoL while preserving limited healthcare resources, as demonstrated by Lee and Cheon.[62]

Beyond clinical care, educational institutions must implement individualized learning strategies and transition programs that facilitate meaningful academic and vocational pathways. Educational support requests for students with learning impediments have experienced significant growth,[63] which presumably reflects expanded awareness of this population's educational needs.[64] Social welfare systems should also establish specialized support frameworks that address housing, financial assistance, and the development of daily living skills. The higher functional capacity and reduced support requirements of the BIF population (relative to individuals with ID) result in more favorable cost-benefit ratios for interventions. Consequently, resources for this group should be substantially expanded to align with their favorable intervention outcomes.

Limitations

This study had several limitations. First, we defined the BIF group based on the borderline IQ range (70–84), which may have excluded relevant studies. Nevertheless, this clear cutoff facilitates the understanding of individuals within this specific IQ range and provides clinical considerations for treating the borderline IQ group in the absence of comprehensive information on functional aspects, which is a frequently occurring situation. Second, the sample characteristics and assessment tools used in each included study were heterogeneous. We adopted a narrative review because this heterogeneity precluded the quantitative summation of the results.

Conclusion

The evidence presented underscores that individuals with BIF constitute a vulnerable population requiring heightened clinical awareness and targeted support, yet they remain in-

adequately understood within existing research paradigms. Critical gaps persist in differentiating BIF from adjacent populations, particularly in delineating whether observed difficulties represent qualitatively distinct patterns compared to average IQ individuals or quantitative extensions beyond mild ID presentations. Age-specific investigations are needed, as our findings suggest potential differences in mental health presentation between adolescent and adult populations with BIF, with depression severity patterns showing variation by age group. Rather than advocating for new diagnostic categories, the field must recognize BIF as a distinct risk profile that demands adapted educational, therapeutic, and preventive approaches. The challenge lies not in classification but in developing flexible, evidence-based frameworks that address the unique intersection of cognitive limitations and environmental demands that characterize the BIF experience.

Supplementary Materials

The Supplement is available with this article at https://doi.org/10.30773/pi.2025.0209.

Availability of Data and Material

The datasets generated or analyzed during the study are available from the corresponding author on reasonable request.

Conflicts of Interest

Min-Hyeon Park, a contributing editor of the *Psychiatry Investigation*, was not involved in the editorial evaluation or decision to publish this article. All remaining authors have declared no conflicts of interest.

Author Contributions

Conceptualization: Myeongju Cho, Bora Kim. Data curation: Myeongju Cho, Eunseol Ko. Formal analysis: Myeongju Cho, Eunseol Ko. Funding acquisition: Min-Hyeon Park. Methodology: Myeongju Cho, Min-Hyeon Park. Supervision: Min-Hyeon Park. Validation: Myeongju Cho, Eunseol Ko. Visualization: Myeongju Cho, Eunseol Ko. Writing—original draft: Myeongju Cho. Writing—review & editing: Eunseol Ko, Haemi Cho, Hyun Jung Kim, Dong-Gyun Han, Bora Kim, Min-Hyeon Park.

ORCID iDs

Myeongju Cho	https://orcid.org/0000-0002-3294-5338
Eunseol Ko	https://orcid.org/0009-0008-0176-0868
Haemi Choi	https://orcid.org/0000-0002-8946-4666
Dong-Gyun Han	https://orcid.org/0009-0001-7863-8595
Hyun Jung Kim	https://orcid.org/0009-0007-1683-8202
Bora Kim	https://orcid.org/0000-0003-2827-6888
Min-Hyeon Park	https://orcid.org/0000-0002-1731-1388

Funding Statement

This research received support from the Korea Health Technology R&D Project through the Korea Health Industry Development Institute (KHIDI), funded by the Ministry of Health & Welfare, Republic of Korea (grant number RS-2023-00266131) and the National Research Foundation of Korea (NRF) grant, funded by the Korea government (Ministry of Science and ICT) (RS-2025-00556589).

Acknowledgments

None

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