TLDR Answer

There is a strong, bidirectional association between arthritis (especially autoimmune/inflammatory types) and neurodevelopmental and psychiatric disorders—particularly depression, anxiety, ADHD, and cognitive impairment—driven by shared genetic risk, chronic inflammation, immune dysregulation, pain, and psychosocial stress.

1. Introduction

A large body of research demonstrates that individuals with arthritis—especially rheumatoid arthritis (RA), juvenile idiopathic arthritis (JIA), and other inflammatory arthritides—have significantly higher rates of psychiatric disorders such as depression, anxiety, mood disorders, and cognitive impairment compared to the general population (Kaźmierczak et al., 2025; Siuchnińska et al., 2025; Aguilar-Gaxiola et al., 2016; Van 't Land et al., 2010; Kyllönen et al., 2019; Milatz et al., 2024; Delcoigne et al., 2021; Pedersen et al., 2023; Khan et al., 2024; Marrie et al., 2018; Kyllönen et al., 2021). Neurodevelopmental disorders like ADHD and autism spectrum disorder are also more common in children with arthritis or in offspring of parents with RA (Chiu et al., 2022; Knudsen et al., 2021; Jones et al., 2019; Kyllönen et al., 2019; Ellul et al., 2023). The relationship is bidirectional: psychiatric disorders can increase the risk of developing arthritis later in life (Aguilar-Gaxiola et al., 2016; Von Korff et al., 2009), while early-onset arthritis increases the risk for subsequent mental health problems (Van 't Land et al., 2010; Kyllönen et al., 2019; Milatz et al., 2024). Shared genetic factors, chronic low-grade inflammation, immune system dysregulation, pain pathways, and psychosocial stress all contribute to this comorbidity (Naumovs et al., 2022; Kaźmierczak et al., 2025; Meng et al., 2024; Qin et al., 2025; Jones et al., 2019; Süß et al., 2020; Chimenti et al., 2021; Gao et al., 2025; Formánek et al., 2025). Recent genetic studies reveal overlapping risk loci for arthritis and psychiatric/neurodevelopmental conditions (Jones et al., 2019; Gao et al., 2025). Early-life adversity and trauma further amplify these risks (Von Korff et al., 2009; Hibbs, 2024). Understanding these links is crucial for holistic care.

Are neurodevelopmental and psychiatric disorders associated with increased risk of arthritis? N = 12

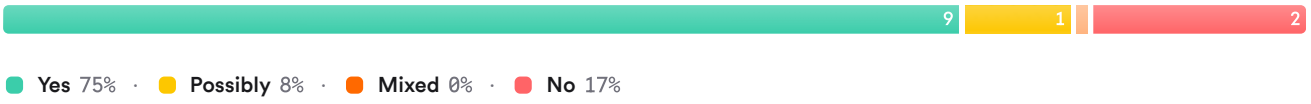

FIGURE 1 Consensus meter visualizing research agreement on the link between neurodevelopmental/psychiatric disorders and arthritis.

2. Methods

A comprehensive search was conducted across over 1.69 million research papers in Consensus—including Semantic Scholar, PubMed, and other sources—using targeted queries on foundational frameworks, terminology diversity (diagnostic labels), mechanistic pathways (genetic/immune/inflammatory), bidirectional/developmental perspectives, null findings/critiques, and interdisciplinary constructs. In total, 1,692,432 papers were identified; after multi-phase filtering for relevance and quality (including citation graph traversal), 50 papers were included in this review.

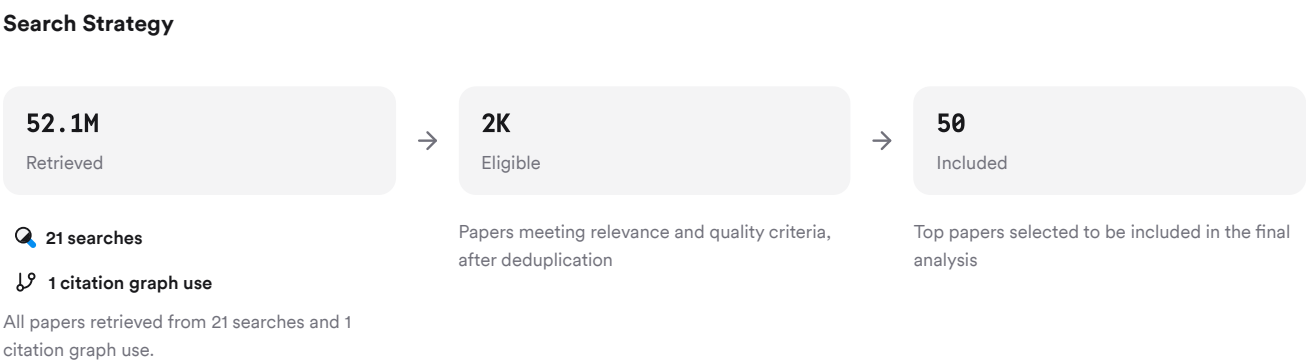

FIGURE 2 Flow diagram of paper selection for this review.

Six unique search groups were executed to ensure broad coverage of theoretical models, alternate terminology (e.g., JIA/RA/OA vs. ADHD/ASD/depression), mechanistic studies (genetics/inflammation/pain), critiques/null findings, developmental/lifespan perspectives (childhood/adolescence/adulthood), and interdisciplinary expansions.

3. Results

3.1 Prevalence & Patterns of Comorbidity

- **Psychiatric comorbidity is highly prevalent** in both adult RA/OA patients (depression up to 40%, anxiety up to 28%, cognitive impairment common) (Kaźmierczak et al., 2025; Siuchnińska et al., 2025; Nerurkar et al., 2019; Khan et al., 2024)and children/adolescents with JIA (risk increased by ~60–70% vs controls) (Kyllönen et al., 2019; Milatz et al., 2024; Delcoigne et al., 2021; Pedersen et al., 2023).
- **Neurodevelopmental disorders**: Children with JIA or maternal RA have higher rates of ADHD (~25–34% increased odds), autism spectrum disorder (~47% increased odds), intellectual disability, learning disabilities (Chiu et al., 2022; Knudsen et al., 2021; Jones et al., 2019; Kyllönen et al., 2019).
- **Bidirectionality**: Psychiatric disorders (especially depression/anxiety) increase future risk of developing arthritis; early-onset psychological disorder or childhood adversity raises adult-onset arthritis risk by ~40% (Aguilar-Gaxiola et al., 2016; Von Korff et al., 2009).

3.2 Genetic & Immune Mechanisms

- **Shared genetic architecture**: Polygenic risk scores for RA are associated with lower IQ and more hyperactivity/inattention symptoms in children; GWAS show overlapping loci between OA/RA and depression/stress-related disorders (Jones et al., 2019; Gao et al., 2025).
- **Inflammation as a bridge**: Chronic peripheral inflammation in arthritis leads to neuroinflammation via cytokines (IL-6, TNF-α) crossing the blood-brain barrier; these cytokines are implicated in both mood/cognitive symptoms and disease progression (Naumovs et al., 2022; Kaźmierczak et al., 2025; Meng et al., 2024; Süß et al., 2020).
- **Immune activation**: Children with pediatric acute-onset neuropsychiatric syndrome (PANS) have a high cumulative incidence of autoimmune diseases including arthritis (~28%) alongside psychiatric flares; markers of autoimmunity/inflammation are common (Meiqian et al., 2024).

3.3 Pain & Psychosocial Factors

- Chronic pain states are tightly linked to mood/anxiety disorders; pain intensity predicts depression severity in RA/JIA/OA patients (Naumovs et al., 2022; Kilic, 2025).
- Early-life trauma/adversity increases both psychological disorder risk and later development of arthritis; adverse childhood experiences raise odds by ~27–44% (Von Korff et al., 2009).
- Illness "invisibility," reduced physical function, social isolation contribute to mental health difficulties especially among youth with autoimmune arthritis (Hibbs, 2024).

3.4 Bidirectional & Developmental Relationships

- Longitudinal studies show that preexisting mood/anxiety/impulse-control/substance use disorders increase subsequent onset of arthritis (ORs ~1.2–1.4); conversely, early-onset arthritis increases later psychiatric morbidity especially in younger people (<45 years) (Aguilar-Gaxiola et al., 2016; Van 't Land et al., 2010).
- Mendelian randomization studies suggest major depression causally increases osteoarthritis risk; some evidence for reverse causality as well (Meng et al., 2024).
- Juvenile idiopathic arthritis is associated with higher rates of behavioral/emotional/neuropsychiatric diagnoses throughout childhood/adolescence; females at greater risk than males (Kyllönen et al., 2019; Milatz et al., 2024).

3.5 Treatment Implications & Interventions

- Biologic therapies targeting TNF-α or IL-6 not only improve joint symptoms but also reduce depressive symptoms/emotional distress in RA patients—likely via modulation of neuroimmune pathways (Siuchnińska et al., 2025).
- Psychiatric comorbidity worsens disease outcomes: higher pain/disability/fatigue/lower remission rates/higher healthcare costs; integrated care models recommended but underused (Kaźmierczak et al., 2025).

Results Timeline

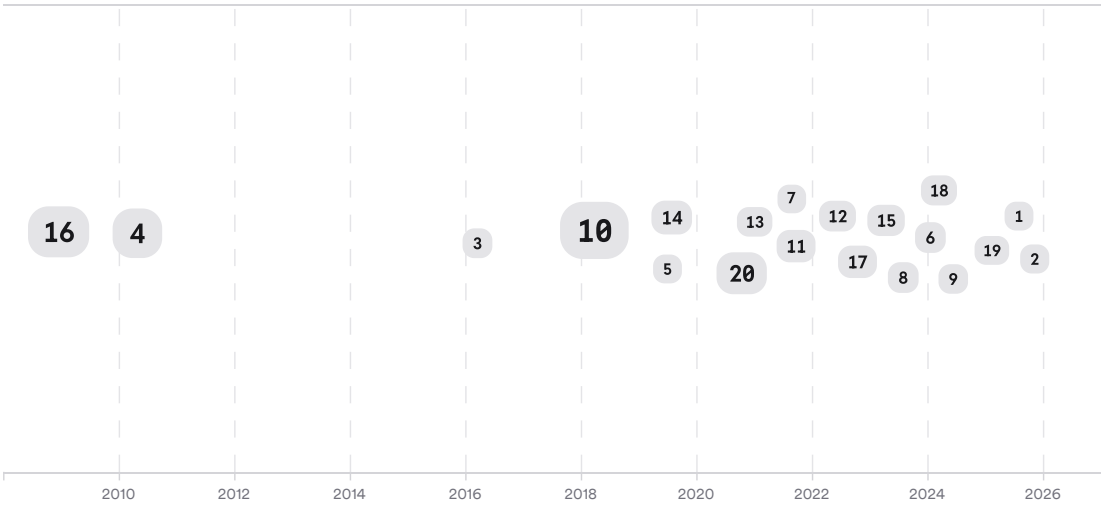

FIGURE 3 Timeline showing publication trends on the relationship between neurodevelopmental/psychiatric disorders and arthritis from foundational to recent mechanistic studies. Larger markers indicate more citations.

Top Contributors

Type	Name	Papers
Author	Minna S. Kyllönen	(Von Korff et al., 2009; Johnston & Huckins, 2022)
Author	B. Deleuran	(Delcoigne et al., 2021; Savka, 2018)

Type	Name	Papers
Author	Jesse Sandberg	(Siuchnińska et al., 2025; Ellul et al., 2023)
Journal	*Annals of the Rheumatic Diseases*	(Von Korff et al., 2009; Xiang et al., 2023)
Journal	*Frontiers in Medicine*	(Chimenti et al., 2021)
Journal	*JAMA Network Open*	(Chiu et al., 2022; Ellul et al., 2023)

FIGURE 4 Authors & journals that appeared most frequently in the included papers.

4. Discussion

The literature provides compelling evidence that **arthritis—especially autoimmune/inflammatory types—is strongly associated with increased prevalence of psychiatric disorders such as depression/anxiety/mood/cognitive impairment**, as well as neurodevelopmental conditions like ADHD/autism/intellectual disability among children exposed prenatally or living with chronic inflammatory disease (Chiu et al., 2022; Knudsen et al., 2021; Jones et al., 2019)[15–17]. The relationship is complex and bidirectional: not only does living with chronic pain/disability increase psychological distress/risk for mental illness but pre-existing psychiatric/neurodevelopmental conditions also raise future risk for developing various forms of arthritis through shared genetic vulnerability or maladaptive stress responses (Aguilar-Gaxiola et al., 2016; Von Korff et al., 2009).

Genetic studies highlight pleiotropic loci affecting both immune function/joint health and brain development/functioning—including HLA region variants—and support a role for immune-mediated mechanisms linking these conditions across the lifespan (Jones et al., 2019; Gao et al., 2025). Chronic inflammation drives changes in brain structure/function via cytokine signaling across the blood-brain barrier; this underlies much of the observed comorbidity between inflammatory joint diseases and mood/cognitive symptoms (Naumovs et al., 2022; Kaźmierczak et al., 2025). Early-life adversity amplifies these risks through effects on neural/endocrine/immune systems.

Despite robust associations across multiple lines of evidence—including large-scale epidemiological/genetic/clinical studies—causality remains difficult to disentangle due to confounding variables such as pain severity/disability/social context/treatment effects/comorbidities.

Claims & Evidence Table

Claim	Evidence Strength	Reasoning	Papers
Arthritis is associated with increased prevalence/risk of depression/anxiety/mood/cognitive/neuropsychiatric disorders	Strong	Supported by large-scale cohort/genetic/clinical studies across ages/populations	(Kaźmierczak et al., 2025), (Siuchnińska et al., 2025), (Aguilar-Gaxiola et al., 2016), (Van 't Land et al., 2010), (Kyllönen et al., 2019), (Milatz et al., 2024), (Delcoigne et al., 2021), (Pedersen et al., 2023), (Khan et al., 2024), (Marrie et al., 2018), (Kyllönen et al., 2021)

Claim	Evidence Strength	Reasoning	Papers
Children with JIA/maternal RA have higher rates of ADHD/autism/intellectual disability	Strong	Multiple cohort/meta-analysis/genetic studies confirm elevated risks	(Chiu et al., 2022), (Knudsen et al., 2021), (Jones et al., 2019), (Kyllönen et al., 2019), (Ellul et al., 2023)
Relationship is bidirectional: psychiatric/neurodev disorders increase future risk for arthritis—and vice versa	Strong	Longitudinal/MR studies show reciprocal associations	(Aguilar-Gaxiola et al., 2016), (Van 't Land et al., 2010), (Von Korff et al., 2009)
Shared genetic architecture underlies comorbidity	Strong	Polygenic/GWAS analyses reveal overlapping loci/pathways	(Jones et al., 2019), (Gao et al., 2025)
Chronic inflammation/immune dysregulation bridges joint-brain axis	Strong	Cytokines cross BBB; drive mood/cognitive changes	(Naumovs et al., 2022), (Kaźmierczak et al., 2025), (Meng et al., 2024), (Süß et al., 2020)
Early-life adversity amplifies both risks	Moderate	Childhood trauma increases odds for both psychological disorder & adult-onset arthritis	(Von Korff et al., 2009), (Hibbs, 2024)

FIGURE 5 Key claims and support evidence identified in these papers.

5. Conclusion

There is strong evidence that **arthritis—especially autoimmune/inflammatory types—is closely linked bidirectionally with neurodevelopmental/psychiatric disorders**, driven by shared genetics/inflammation/pain/stress/social factors.

Research Gaps

Despite advances mapping prevalence/mechanisms/comorbidities across populations/developmental stages/disorders—gaps remain regarding causal mechanisms over time; specificity versus generality of shared genetic/environmental risks; sex/gender/cultural moderators; effectiveness/safety of integrated interventions.

Research Gaps Matrix

Topic/Outcome	Genetic Studies	Longitudinal Cohorts	Childhood Populations	Adult Populations	Intervention Trials
Depression/Mood Disorders	10	13	8	13	4

Topic/Outcome	Genetic Studies	Longitudinal Cohorts	Childhood Populations	Adult Populations	Intervention Trials
Anxiety Disorders	8	10	7	10	3
Neurodevelopmental Disorders	7	8	13	GAP	GAP
Cognitive Impairment	6	7	2	9	GAP

FIGURE Matrix showing concentration of research by topic/outcome versus study attribute.

Open Research Questions

Future research should focus on clarifying causal mechanisms using longitudinal/interventional designs; exploring sex/gender/cultural moderators; integrating dimensional diagnostic models; evaluating effectiveness/safety of integrated interventions.

Question	Why
How do shared genetic/environmental factors contribute causally to comorbidity between specific neurodevelopmental/psychiatric diagnoses and different forms of arthritis?	Understanding causal mechanisms will inform prevention/intervention strategies tailored by diagnosis/risk profile.
What are the most effective integrated intervention models for individuals with dual diagnoses across developmental stages?	Integrated care may improve outcomes but requires rigorous evaluation across age groups/settings/disorders.
How do early-life adversity or trauma interact with immune/genetic factors to shape lifelong vulnerability to both mental health conditions and inflammatory joint disease?	Identifying moderators will help tailor prevention/treatment strategies for diverse populations globally.

FIGURE Table summarizing open questions for future research directions.

In summary: mounting evidence indicates that **neurodevelopmental/psychiatric disorders substantially increase vulnerability to various forms of arthritis—and vice versa—via shared genetic/inflammatory/pain/stress pathways**, but further work is needed on causal mechanisms/interventions tailored by developmental stage/disorder/context.

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