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+15878858911
editorial-office@sciformat.ca

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PREVALENCE OF DEPRESSIVE SYMPTOMS AMONG CHILDREN AND ADOLESCENTS WITH RHEUMATIC DISEASES

Julia Szklarska-Komenda *(Corresponding Author, Email: juliaszklarskakomenda@gmail.com)*
105th Military Hospital SP ZOZ, Żary, Poland
ORCID ID: 0009-0000-9914-4917

Maciej Komenda
105th Military Hospital SP ZOZ, Żary, Poland
ORCID ID: 0009-0009-7327-417X

Katarzyna Garncarz
5th Military Clinical Hospital with Polyclinic SPZOZ, Kraków, Poland
ORCID ID: 0009-0001-7554-2715

Krzysztof Jamroch
5th Military Clinical Hospital with Polyclinic SPZOZ, Kraków, Poland
ORCID ID: 0009-0003-2562-1276

Aleksandra Marek
Central Teaching Hospital of the Medical University of Lodz, Łódź, Poland
ORCID ID: 0009-0002-3391-5082

Karolina Dziki
5th Military Clinical Hospital with Polyclinic SPZOZ, Kraków, Poland
ORCID ID: 0009-0005-1720-3810

Wiktoria Dybizbańska
Independent Public Healthcare Institution of the Ministry of the Interior and Administration, Kraków, Poland
ORCID ID: 0009-0000-9899-7272

Zofia Nowakowska
Upper Silesian Medical Center of the Medical University of Silesia, Katowice, Poland
ORCID ID: 0009-0000-8030-7341

Agnieszka Burzej
5th Military Clinical Hospital with Polyclinic SPZOZ, Kraków, Poland
ORCID ID: 0009-0003-0066-3197

Mateusz Kacalak
The Nicolaus Copernicus Provincial Multispecialty Center for Oncology and Traumatology, Łódź, Poland
ORCID ID: 0009-0006-3386-0906

ABSTRACT

Background. Although rheumatic disorders are commonly associated with adulthood, a considerable number of cases occur in children and adolescents. Paediatric rheumatic diseases such as juvenile idiopathic arthritis (JIA), childhood-onset systemic lupus erythematosus (cSLE) and juvenile fibromyalgia (JFM) are chronic conditions that significantly affect everyday activities and quality of life.
Aim. This review aims to condense existing evidence regarding the prevalence of depressive symptoms among affected children and adolescents while emphasizing methodological challenges that shape reported outcomes.
Material and methods. The literature search was conducted in PubMed (2013–2025) using terms related to depression, JIA, cSLE, JFM, rheumatology and paediatrics. Studies including children and adolescents were analysed, while adult-only papers were excluded.
Results. Beyond physical symptoms JIA, cSLE, and JFM increase vulnerability to depressive symptoms. It is an under-recognised burden among paediatric patients. Despite this, the available research remains scarce, outdated, and methodologically inconsistent.
Conclusion. Across the studies, depressive symptoms were consistently more common in paediatric rheumatologic patients than in healthy peers. However, prevalence varied widely depending on the assessment method. Self-report questionnaires detected far higher rates than clinical diagnoses. Early psychiatric screening and appropriate psychological support are crucial, as the visibility of rheumatic symptoms (e.g., joint deformities, rashes, mobility impairments) and the resulting difficulties with social integration may further exacerbate emotional distress. Improving understanding of these associations will contribute to better clinical care and enhanced quality of life for this vulnerable patient population.

KEYWORDS

Juvenile Idiopathic Arthritis, Childhood-Onset Systemic Lupus Erythematosus, Juvenile Fibromyalgia, Depression, Rheumatology, Paediatrics

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Introduction

Rheumatic and musculoskeletal diseases (RMDs) consist of a diverse group of over 200 conditions that mainly impact joints, but may also affect muscles, bones, connective tissues, and nearly any internal organ.[1] Significant examples of RMDs are rheumatoid arthritis (RA), osteoarthritis (OA), psoriatic arthritis (PsA), ankylosing spondylitis (AS), systemic lupus erythematosus (SLE), systemic sclerosis (SSc), Sjogren's syndrome and polymyositis (PM). They are usually long-term, progressive and painful, leading to limitations in function and participation. Moreover, while rheumatic diseases in total are among the most common of all medical issues, the individual diseases are uncommon or even rare. Across these conditions, patients present a typical set of symptoms: ongoing joint pain, stiffness, swelling, fatigue, decreased mobility, sleep issues and diminished physical ability, frequently alongside organ failures. Chronic inflammation or ongoing structural damage can cause irreversible joint degradation, deformity, and functional limitations over time, resulting in work disabilities requiring assistance in daily activities. They also contribute substantially to morbidity and premature mortality.

Rheumatic diseases are typically viewed as disorders of middle-aged and older individuals. However, children and adolescents can also suffer from them. Juvenile idiopathic arthritis (JIA) is the most common rheumatic disease reported in children of the Western world. JIA is a clinical concept that encompasses several complex and heterogeneous conditions characterised by arthritis persisting for six weeks or more, which present in patients under the age of 16. In the paediatric population, the annual incidence rates (IRs) for Juvenile Idiopathic Arthritis (JIA) in children under 16 years old ranged from 24.0 to 38.7 cases per 100,000 children.[2]

Another well-known rheumatic disease is childhood-onset systemic lupus erythematosus (SLE). In brief, it is a chronic systemic autoimmune disease that causes significant morbidity and mortality. Although adults are more commonly affected, a higher burden of disease and a different disease expression with a more aggressive course have been observed in patients with childhood-onset systemic lupus erythematosus (SLE). In this population-based study, it was found that the incidence and prevalence of childhood-onset SLE using the EULAR/ACR criteria were 0.7 and 1.1 per 100,000 children, respectively. [3]

Further example of rheumatic disease in the paediatric population is juvenile fibromyalgia (JFM). Juvenile primary fibromyalgia syndrome (JPFS) is a chronic, musculoskeletal pain syndrome affecting children and adolescents, most commonly adolescent girls. The syndrome has a multifactorial ethology, with altered central pain processing playing an important role. The hallmark symptom is severe, widespread musculoskeletal pain. Other symptoms include sleep and mood disturbances, headaches, stiffness, and subjective joint swelling. The estimated prevalence of JFM ranges from 1.2 to 6.2%. [4]

Mental health issues might be more prevalent in these conditions compared to healthy people and have demonstrated to have adverse impacts on functioning. RMDs collectively significantly affect quality of life, work capacity, and health-care usage. The physical burden of chronic rheumatic disease is closely intertwined with mental health. In the study by Dregan et al. data from 538,707 British patients with inflammatory diseases (including those with RMDs) were analysed from a primary care register. It was found that the risk of depression and anxiety disorders among people with chronic inflammatory diseases was overall 16% higher than in the control group. [5] It means that these patients have a higher chance of struggling with their mental health.

Rheumatic diseases in children and adolescents show up during a very important stage of life, when relationships, academic success, and the development of autonomy and identity are the most crucial. Consequently, it can be understood that frequent hospitalisations, physical changes (such as joint deformities, rashes, or delays in growth), and activity restrictions are particularly stigmatising and anxiety-inducing. It can all increase the risk of emotional difficulties. Unlike in adult rheumatology, where a large body of research exists, information concerning depression in children and adolescents with rheumatic diseases is scattered and variable methodologically. This review seeks to summarise current evidence relating to depressive symptoms among children and adolescents with rheumatic diseases. This review focuses on the prevalence estimates derived from different depression assessment tools across specific paediatric rheumatic diagnoses.

Objective

Rheumatic diseases impact a significant percentage of the paediatric population. Compared to their healthy peers, children and adolescents with these conditions are more likely to experience stressful situations, which can lead to maladaptive coping strategies and perpetuate a vicious cycle of psychological distress. A thorough understanding of this relationship is essential for healthcare professionals, as it can support the development of more effective and empathetic patient care.

The aim of this review is to provide a comprehensive summary of current evidence on the coexistence of depressive symptoms and rheumatic diseases in paediatric patients, as well as to raise awareness of this common yet frequently overlooked clinical issue among clinicians, patients, and caregivers.

Methods

The review was based on literature from the PubMed database covering the years 2013-2025. Key search terms included: depression, rheumatic diseases, juvenile idiopathic arthritis (JIA), childhood-onset SLE, juvenile fibromyalgia, paediatrics. Studies concentrating on paediatric literature were included, and for mixed paediatric/adult samples, information related to youth was gathered. Research articles that emphasised only adults were typically omitted.

Juvenile Idiopathic Arthritis (JIA)

Aside from its physical symptoms, JIA often creates a significant psychosocial burden and symptoms of depression. Over the last few years, several studies have measured the prevalence of depression in paediatric JIA groups, investigated related risk factors, and assessed the effectiveness of various screening tools. These studies have significant variation in methodology, patient demographics, sample sizes, and the selection of depression measurement instruments, for instance, CES-DC, BDI-FS, MFQ, PHQ-9, RCADS, PROMIS Depression and ICD-10 diagnosis. It makes direct comparisons challenging while offering a comprehensive, multidimensional perspective on the mental health requirements of this population. From each study, only paediatric participants were taken under consideration.

Table 1. Prevalence of depressive symptoms with JIA.

Study	Year	Country	Sample size	Age group	Depression measure	% with depressive symptoms
Fair D. et al. [6]	2022	USA	84	8-17	PROMIS	17.9%
Yan Y. et al. [7]	2020	USA	148	8-17	PROMIS	10.1%
Milatz F. et al. [8]	2024	Germany	660 000	12-20	ICD-10	5.1%
Berthold E. et al. [9]	2022	Sweden	640	Median age: 8.7	ICD-10	14.5%
Milatz F. et al. [10]	2024	Germany	1 150	12-21	PHQ-9	25.8%
Li L. et al. [11]	2023	Canada	80	12-18	RCADS	23.8%
Roemer J. et al. [12]	2023	Germany	148	13-18	BDI-FS	13%
Bano S. et al. [13]	2020	Pakistan	35	6-15	CES-DC	57.1%

Table 1 provides a summary of research evaluating the occurrence of depressive symptoms in children and adolescents with Juvenile Idiopathic Arthritis (JIA). As expected, the choice of measurement tool significantly affected the reported occurrence of depressive symptoms. Self-administered questionnaires, specifically CES-DC (57.1%) [13] and PHQ-9 (25.8%) [10], consistently identified higher rates of depressive symptoms compared with registry-based ICD-10 diagnoses, which showed prevalence rates between 5.1% [8] and 14.5% [9]. Self-report questionnaires (like CES-DC, PHQ-9, MFQ, PROMIS, and RCADS) typically revealed considerably higher rates of depressive symptoms, as they capture both clinical and subclinical emotional distress. In comparison, studies based on ICD-10 only accounts for formally diagnosed depressive disorders, producing the most cautious estimates. The ICD-10 classification demands a comprehensive clinical diagnosis instead of merely identifying symptoms, which likely leads to an underestimation of the actual impact of depressive symptoms in everyday clinical practice. The study's design led to additional variations. While population-based registry data offer a more through but cautious estimate, clinical cohorts typically report higher prevalence rates. It is probably because they include symptomatic patients who are actively seeking care. While longitudinal cohorts provide valuable insights into the persistence or progression of depressive symptoms over extended periods of time, cross-sectional studies serve a different purpose by capturing a single moment in time and may reflect transient distress. Studies carried out in Pakistan, Germany, Sweden, Canada, the United Kingdom and the United States of America revealed noticeably different prevalence rates due to variations in healthcare access, cultural norms surrounding mental health reporting, and socioeconomic circumstances. These geographic and cultural factors also contribute to heterogeneity. To sum up routine mental-health screenings are crucial across all stages of JIA and there is a need for culturally sensitive, developmentally appropriate assessment strategies.

Childhood-onset SLE (cSLE)

Juvenile Idiopathic Arthritis is not the only paediatric rheumatic disease that causes psychiatric symptoms. Another equally important example is childhood-onset systemic lupus erythematosus. There are a few studies that focus on depressive symptoms among children and adolescents suffering from cSLE. The following table aims to summarise the most recent ones. CDI, PHQ-A, CES-DC, DSM-5 and PHQ-9 were used as a depression measure. By presenting these studies, the table seeks to highlight the differences in reported results and the impact of the selected assessment approach on identifying depressive symptoms in this sample size.

Table 2. Prevalence of depressive symptoms with childhood-onset SLE.

Study	Year	Country	Sample size	Age group	Depression measure	% with depressive symptoms
Duangmala P. et al. [14]	2025	Thailand	91	8-18	CDI	31.8%
Donnelly C. et al. [15]	2018	USA	50	8-20	CDI	26%
Datyner E. et al. [16]	2025	USA	592	≥12	PHQ-A	17%
Neufeld K. et al. [17]	2024	Canada	51	8-18	CES-DC	35%
Quilter M. et al. [18]	2021	Canada	56	9-17	CES-DC	35.7%
					Clinical depression according to DSM-5	Current: 5.3% During lifetime: 10.7%
Rubinstein T. et al [19]	2023	USA and Canada	106	12-21	PHQ-9	24%
Davis A. et al. [20]	2018	USA	51	7-22	PHQ-9	58.8%

The table summarises seven studies assessing depressive symptoms in children and adolescents with rheumatologic or chronic pain conditions, conducted across various countries and using different psychometric tools. It has to be noted that sample sizes ranged widely—from small cohorts of approximately 50 participants to large samples exceeding 500 individuals. Two studies used the Children's Depression Inventory (CDI)- one from Thailand and one from the United States. In these studies, there was a very similar prevalence- 31.8% [14] and 26% [15] participants screened positive for depressive symptoms. Even more similar prevalence can be observed in studies using the CES-DC. In these Canadian studies 35% [17] and 35.7% [18] participants had symptoms of depression. Studies using the PHQ-A and PHQ-9 produced a broader range of results, from 17% [16] to 58.8% [20]. Notably, one Canadian study additionally distinguished between CES-DC questionary (reporting 35.7%) and clinical depression according to DSM-5. Then it also distinguished between current and lifetime prevalence of clinical depression based on DSM-5 criteria, reporting 5.3% and 10.7%, respectively. [18] This difference is notable and corresponds with the results shown in the earlier table related to ICD-10 diagnoses, where the prevalence from structured clinical evaluations was significantly lower than that acquired through self-report surveys. It highlights a fundamental issue in mental health research: self-administered questionnaires tend to identify a substantially larger group of "at-risk" individuals than formal clinical diagnostic systems (DSM-5 or ICD-10). There are a few credible explanations for this. Screening tools are specifically designed to be highly sensitive, allowing to detect even subclinical discomfort and brief mood changes that might otherwise go unnoticed. Additionally, it is also worth mentioning that since questionnaires rely on self-reporting, the outcomes are solely based on the participant's honesty, awareness, and comprehension. Respondents may exaggerate or underreport symptoms either deliberately or accidentally—and there is no method to verify the accuracy of their answers. In contrast, DSM-5 and ICD-10 diagnoses require clinical assessment, and evaluation of functional impairment, making them far more resistant to bias, misinterpretation, or deliberate misreporting. To conclude, the studies suggest a high burden of depressive symptoms in young patients with Childhood-onset SLE but also reveal substantial methodological inconsistencies.

Juvenile fibromyalgia

Juvenile fibromyalgia is characterised by chronic widespread pain, fatigue and sleep disturbances. All of them affect adolescents and children who are at elevated risk for emotional distress. The studies included in the table below illustrate this variability, encompassing different countries, sample sizes, age ranges, and approaches to assessing mood symptoms—from standardised self-report instruments such as the CDI and ABQ to clinical evaluation based on medical and psychiatric history.

Table 3. Prevalence of depressive symptoms with juvenile fibromyalgia.

Study	Year	Country	Sample size	Age group	Depression measure	% with depressive symptoms
Lynch-Jordan A. et al. [21]	2023	USA and Canada	203	12-17	CDI-2	33% (CDI-2 ≥ 24 = “very elevated”)
Çagliyan TÜrk A. et al. [22]	2019	Turkey	35	9-17	ABQ – Depression subscale (mood symptoms)	31.4%
Arnold L. et al. [23]	2015	USA	116	13-17	Medical and psychiatric history	16.4%
Durmaz Y. et al. [24]	2013	Turkey	61	12-18	CDI	42.6%

Despite the limited number of accessible publications on this subject, it is evident that, similar to the previous tables, the variation in prevalence is mostly caused by differences in assessment tools, participant numbers, diagnostic sensitivity, age groups and cultural background. Each of them plays a role in shaping the reported percentages. Studies that use standardised questionaries that focus mainly on depressive symptoms often tend to show a higher percentage than medical history-based assessments that follow stringent diagnostic criteria such as ICD-10, DSM-5 and other standardised systems. They are stricter because they only depict depression in its entirety rather than its individual symptoms. The study that assessed depressive symptoms through a comprehensive clinical review of both medical and psychiatric history, instead of using a standardised questionnaire, reported a considerably lower prevalence rate of 16.4%. [23] This finding mirrors a consistent pattern observed across other diagnostic categories: self-report questionnaires generally identify more adolescents as having significant depressive symptoms than clinician-based assessments. One research did not assess clinical depression using psychiatric instruments. It included a specific “depression” subscale from the Adolescent Lifestyle Behaviour Questionnaire (ABQ), which focuses on mood-related depressive symptoms. According to this measure, it was revealed that 31.4% of adolescents and children with juvenile fibromyalgia experienced elevated depressive mood symptoms, a rate that was significantly higher than that of the control group. [22] This measure cannot be directly compared with validated depression scales (for example CDI, PHQ-9, RCADS), yet it provides additional information on mood-related symptoms. The largest cohort included 203 participants- all aged between 12 and 17 years. Using the CDI-2, it was found that 33% of adolescents scored at or above the threshold indicating “very elevated” depressive symptoms (CDI-2 ≥ 24). [21] The study that used an older version of this depression measure tool- CDI, reported 42.6% symptom prevalence. [24] One of the most significant challenges that was encountered during the review process revolved around the lack of research specifically targeting depressive symptoms in juvenile fibromyalgia. The quantity of accessible publications is extremely restricted, and numerous of the existing ones are outdated and are based on small sample sizes. This indicates a serious gap in the knowledge that we have about this issue. Therefore, it is clear there is an urgent need for more up-to-date and through studies investigating this topic to be conducted. The scarcity of research regarding depressive symptoms in juvenile fibromyalgia causes a significant challenge in understanding the prevalence and impact of depression in this age group. By conducting more research that addresses this topic, researchers can deepen our understanding and ultimately enhance the quality of care and support provided to adolescents struggling with fibromyalgia and depression, to make their lives a little easier.

Summary

Apart from the differences in the results and percentage in the presented studies, they all highlight the psychological burden experienced by children and adolescents living with juvenile idiopathic arthritis (JIA), juvenile fibromyalgia, and systemic lupus erythematosus (SLE). Besides the differences in methodology, the overall pattern shows that symptoms of depression were consistently more frequent in their groups. Depressive symptoms are more common among the population of children and adolescents with chronic diseases and health conditions, regardless of diagnostic tool or geographic region. Unlike many internal medical conditions, rheumatic diseases often manifest externally through visible skin defects, joint swelling and difficulty in moving. These features make it significantly more challenging for individuals to "blend in" with their peers. In addition, the physical manifestations of rheumatic conditions, such as pain, stiffness, and reduced functional capacity frequently limit participation in school, sports, and other social activities. This causes social withdrawal and a feeling of "sticking out", further affecting psychological development.

Furthermore, this article highlights the lack of high-quality fresh research on this subject. Most of the studies are small and use different depression screening tools, making the comparison difficult. More research in this area would allow for the evaluation by comparing outcomes using a single depression scale. However, this was not possible in this article due to the limited number of available studies.

In addition, rheumatic diseases are themselves very diverse, and it is important to recognize them. Juvenile idiopathic arthritis (JIA) can be taken as a perfect example. This condition includes a number of distinct subtypes, each characterised by its own unique mix of symptoms, outcomes, and different treatment needs. Understanding these differences is essential for customising one's own treatment plans so as to effectively address the specific challenges faced by each patient. Future research would allow to examine and compare depressive symptoms across these specific disease subtypes, allowing for a more complex understanding of how each subtype might influence mental health outcomes. Additionally, considering a variety of factors such as medication type, disease activity, duration, and pain conditions would also provide much clearer and more profound insights.

Overall, while current evidence strongly suggests a higher prevalence of depressive symptoms among children and adolescents with rheumatic conditions, this area of research remains insufficiently studied and underexplored. Therefore, it requires significantly more attention. Conducting more targeted and in-depth research is essential to be able to support the emotional well-being of this uniquely vulnerable patient population. After all, a sense of security is very often based on a sense of predictability and belonging in life. However, in the context of rheumatic diseases, changes in life situation can happen suddenly, leading to quite difficult psychological and emotional experiences among young patients and their families. Therefore, rheumatology patients always need to undergo appropriate psychological testing, in order to make a correct diagnosis, and quickly initiate effective treatment.

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