

STUDY OF JUVENILE IDIOPATHIC ARTHRITIS PAINS IN YOUNG ADULTS AND TEENS

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Abstract

Juvenile Idiopathic Arthritis (JIA) is a chronic inflammatory rheumatic condition that begins during childhood and may continue into adolescence and young adulthood. Although inflammation and disease activity are important clinical considerations, pain, stiffness, restricted movement and functional limitations may continue to affect young people and interfere with education, physical activity, social participation and independence. The present study, entitled "Study of Juvenile Idiopathic Arthritis Pains in Young Adults and Teens," examined the types and patterns of joint problems, characteristics of pain, functional difficulties and physiotherapy measures among young people aged 12–30 years in Jaipur, Rajasthan. The study adopted a quantitative, descriptive and cross-sectional design. Primary data were collected through a structured questionnaire from 120 participants, comprising 36 participants aged 12–17 years and 84 young adults aged 18–30 years. Data were organized and analysed using frequencies, percentages and appropriate comparative statistical procedures. The findings showed that joint pain was the most frequently reported problem among both adolescents and young adults. Pain was reported by 88.9% of participants aged 12–17 years and 85.7% of young adults. Joint stiffness was also common, affecting 75.0% and 69.0%, respectively. The knee was the most frequently reported site of pain (63.3%), followed by the ankle/foot (50.8%) and wrist/hand (43.3%). Moderate pain was the most common severity category (40.8%), while 29.2% reported severe pain. Overall, 70.0% reported moderate or severe pain, and 66.7% experienced pain several times a week or more frequently. Physically demanding activities, particularly sports, exercise and prolonged standing, were more strongly affected than basic personal-care activities. Therapeutic exercises were the most commonly reported physiotherapy measure (68.3%), followed by range-of-motion exercises (63.3%) and home-based exercise programmes (59.2%). Comparative analysis indicated no statistically significant association between age group and the major joint-problem categories. The study highlights the continuing burden of pain and functional limitations among young people and supports individualized, multidisciplinary and physiotherapy-oriented management of JIA.

Keywords: Juvenile Idiopathic Arthritis, JIA pain, adolescents, young adults, joint pain, physiotherapy, functional limitation, physical activity.

1. Introduction

Juvenile Idiopathic Arthritis (JIA) represents a heterogeneous group of chronic inflammatory arthritis conditions that begin during childhood. The condition is generally characterized by arthritis of unknown cause beginning before the age of 16 years and persisting for at least six weeks after other causes have been excluded. JIA is therefore not a single disease but a group of clinically different conditions with variation in joint involvement, systemic manifestations, disease progression and long-term outcomes (Giancane et al., 2016; Ravelli et al., 2016). The major categories include oligoarticular JIA, rheumatoid factor-negative and rheumatoid factor-positive polyarticular JIA, systemic JIA, enthesitis-related arthritis, juvenile psoriatic arthritis and undifferentiated arthritis.

The importance of JIA extends beyond childhood because the disease may continue into adolescence and adulthood. Persistent disease may result in continuing pain, stiffness, reduced mobility and functional limitations. Consequently, young people who have experienced JIA since childhood may face physical and psychosocial challenges during periods of education, career development, social participation and increasing independence (Horton et al., 2023).

Pain is one of the most significant manifestations of JIA. Inflammatory involvement of the synovial tissues may produce joint pain, swelling, tenderness, stiffness and restricted movement. Pain can vary in intensity, frequency, duration and location. Some young people experience intermittent mild pain, whereas others experience persistent or severe pain that interferes with walking, running, writing, dressing, climbing stairs and participation in sports (Stinson, Stevens, Feldman et al., 2012). Importantly, pain should not be understood exclusively as an indicator of inflammatory disease activity. Research indicates that pain may persist even when inflammatory disease activity is relatively controlled and may be influenced by physical, psychological and social factors (Brandelli et al., 2023; McGrath et al., 2023).

The experience of JIA-related pain can have important consequences during adolescence and young adulthood. Physical activity is particularly important during these developmental stages because it supports muscle strength, cardiovascular fitness, flexibility, bone health, psychological well-being and social participation. However, pain, fatigue, stiffness and fear of movement may discourage young people from engaging in exercise and sports. Reduced activity may subsequently contribute to physical deconditioning and further functional difficulties (Nørgaard et al., 2019; Wosiak, Stasiak and Smolewska, 2025).

Joint location is also important when considering functional consequences. Lower-limb joints such as the knees, ankles and feet are important for walking, running, standing and climbing stairs. Upper-limb involvement, particularly of the wrists, hands, elbows and shoulders, can interfere with writing, typing, gripping, carrying objects and other educational or occupational activities. Thus, the effects of JIA extend beyond the affected joint and may influence everyday independence.

The attached research report identifies the knee as a particularly important site of pain and describes the relationship between joint symptoms and activities such as walking, standing, stair climbing, sports, bending and routine movements. The report also emphasizes that physiotherapy may support joint mobility, flexibility, muscle strength and functional independence through individualized exercise and rehabilitation programmes. Complete Report final

Physiotherapy represents an important supportive component of multidisciplinary JIA management. Therapeutic exercises, range-of-motion exercises, stretching, strengthening, posture and movement training, gait training and home-based exercise programmes may be incorporated according to individual clinical requirements. Reviews of physiotherapy have reported potential benefits for muscle strength, mobility, posture, gait, physical functioning and quality of life (Di Ludovico et al., 2023). Exercise-based approaches should, however, be appropriately adapted to disease activity, symptoms and functional capacity rather than being applied uniformly to all patients.

The present study is particularly relevant because it examines both adolescents and young adults. The attached report defines the study population as individuals aged **12–30 years in Jaipur, Rajasthan**, with particular attention to pain location, frequency, severity, functional difficulties and physiotherapy measures. The proposed sample consisted of 120 participants, and the report identifies the cross-sectional questionnaire approach as the basis for collecting primary information. Complete Report final

The study is also important because previous research has often examined particular dimensions of JIA separately. Some studies have focused on pain, others on physical activity, quality of life, disease activity or rehabilitation. A multidimensional examination of pain, affected joints, functional limitations and physiotherapy within a defined local population can provide a more integrated understanding of the problem.

Research Objectives

The present study was guided by the following objectives:

1. **To determine the types of joint problems experienced by children/adolescents under study.**

2. **To determine the types of joint problems experienced by young adults under study.**
3. **To examine the physiotherapy measures used to reduce the effects of joint problems among children/adolescents and young adults.**

The attached report further examines pain location, severity, frequency, mobility, physical activities, activities of daily living and the relationship between pain and functional limitations as supporting dimensions of these objectives. Complete Report final

2. Literature Review

2.1 Juvenile Idiopathic Arthritis and Clinical Characteristics

JIA is considered the most common chronic rheumatic disease of childhood and represents a heterogeneous collection of inflammatory disorders (Giancane et al., 2016). The ILAR classification recognizes seven major categories, including oligoarticular, polyarticular, systemic, enthesitis-related, juvenile psoriatic and undifferentiated forms (Petty et al., 2004; Ravelli et al., 2016). These categories differ in terms of affected joints, systemic manifestations, disease course and prognosis.

Oligoarticular JIA commonly affects four or fewer joints during the first six months and frequently involves the knees and ankles. Polyarticular JIA affects five or more joints and can involve both large and small joints. Systemic JIA is distinguished by systemic inflammatory manifestations such as fever and rash. Enthesitis-related arthritis may involve the lower limbs, sacroiliac joints and axial skeleton. Juvenile psoriatic arthritis is associated with psoriasis or psoriasis-related features, whereas undifferentiated arthritis includes cases that do not completely satisfy one category or meet criteria for more than one category.

The heterogeneous nature of JIA is important for understanding pain. Different disease subtypes may produce different patterns of joint involvement and functional impairment. Barut et al. (2021) emphasize the complex interaction between genetic susceptibility, immune dysregulation and environmental influences in JIA. Consequently, pain should be interpreted within the broader clinical context of disease subtype, disease activity and individual characteristics.

2.2 Pain in Juvenile Idiopathic Arthritis

Pain is among the most important patient-reported problems associated with JIA. Stinson, Luca and Jibb (2012) emphasized that pain can affect physical functioning, emotional well-being, social participation and quality of life. Pain may vary in intensity and may occur intermittently or persistently.

Research also demonstrates that disease activity alone cannot explain the complete experience of pain. McGrath et al. (2023), using data from the ReACCh-Out cohort, investigated predictors of persistent pain in children with JIA. The study identified greater numbers of active joints and enthesitis sites at baseline among children with persistent pain, while female sex, greater enthesitis and lower baseline quality of life were identified as predictors of persistent pain.

Rashid et al. (2018) examined pain trajectories among 851 children with JIA and identified three broad trajectories: consistently low pain, improving pain and consistently high pain. Older age at onset, poorer function/disability and longer disease duration were particularly associated with higher pain trajectories. These findings demonstrate that pain can follow different courses and that early identification of individuals at risk of persistent pain may be valuable.

Pain is also multidimensional. Brandelli et al. (2023) conducted a systematic review of psychosocial factors associated with JIA pain. The review identified relationships between pain and negative pain beliefs, self-efficacy, social functioning, internalizing symptoms, well-being and health-related quality of life. This evidence supports the need to consider psychological and social dimensions alongside physical disease characteristics.

2.3 Pain Location and Functional Consequences

The location of joint involvement determines the type of functional difficulty experienced by young people. Knee and ankle involvement can influence walking, running, balance, standing and stair climbing. Wrist and

hand involvement may interfere with writing, typing, gripping and handling objects. Hip and sacroiliac involvement may produce additional mobility limitations.

The attached report identifies the knee, ankle/foot and wrist/hand as the most frequently reported painful areas within the study sample. This finding has a direct functional interpretation because lower-limb joints support weight-bearing and mobility, whereas upper-limb joints contribute to academic, occupational and self-care activities. Complete Report final

Pain can also interfere with school and occupational participation. Adolescents may experience difficulty participating in physical education, sports and recreational activities, while young adults may experience limitations in higher education, employment, travelling and household responsibilities. Horton et al. (2023) emphasize the importance of long-term outcomes and transition from paediatric to adult healthcare in individuals with JIA.

2.4 Physical Activity and Exercise

Physical activity is an important component of healthy development. However, young people with JIA may reduce activity because of pain, fatigue, stiffness or concerns about worsening symptoms. Nørgaard et al. (2019) reported reduced physical activity and sedentary behaviour among young people with JIA, highlighting the importance of appropriate activity promotion.

Rochette et al. (2023) reviewed physical activity in young people with JIA and emphasized that appropriately prescribed physical activity can support physical fitness, quality of life, mental health, sleep and general well-being. The authors also emphasized individualized exercise prescription.

Evidence from young adults is similarly important. Oliveira et al. (2023) examined physical activity, physical fitness and quality of life among adults with JIA. The attached report notes that approximately 66% of participants with JIA were sedentary compared with 25% of controls, while more physically active participants demonstrated better functional, physical and emotional quality-of-life outcomes. Complete Report final

A systematic review and meta-analysis by Liu et al. (2024) further examined exercise training in JIA and reported benefits related to health, exercise capacity, physical activity and quality of life. These findings provide support for maintaining appropriately adapted exercise rather than avoiding physical activity solely because of the presence of JIA.

2.5 Physiotherapy and Rehabilitation

Physiotherapy may address several consequences of JIA simultaneously. Di Ludovico et al. (2023) reviewed physical therapy interventions and identified potential benefits involving muscle strength, posture, aerobic conditioning, gait, functional mobility and pain. The review included literature identified through PubMed, Scopus and DOAJ and concluded that physiotherapy represents an important component of comprehensive JIA rehabilitation. Complete Report final

Exercise programmes may include stretching, strengthening, range-of-motion activities, balance and proprioceptive training, gait training and home exercises. Fellas, Coda and Hawke (2017) reviewed physical and mechanical therapies for lower-limb problems, while Iversen, Andre and von Heideken (2022) reviewed physical activity interventions among children with JIA.

Recent literature continues to emphasize physical activity. Wosiak, Stasiak and Smolewska (2025) reported that pain, stiffness, fatigue and functional limitations can contribute to reduced physical activity among children with JIA, but appropriately adapted activity can support physical fitness and general health. Complete Report final

2.6 Quality of Life and Transition to Adulthood

Quality of life represents an important outcome because JIA affects more than joint inflammation. Pain, stiffness, fatigue and physical limitations can influence education, employment, social relationships and psychological well-being. Rosina et al. (2025) emphasized health-related quality of life as an important outcome in JIA.

Transition into adulthood presents additional challenges. Young adults must increasingly manage medication, appointments, exercise, symptoms and healthcare independently. Bethencourt-Baute et al. (2023) established the JUVENSER registry to better understand JIA among young adults and the transition to adult care. Şahin et al. (2024) similarly emphasized structured transition programmes, self-management, continuity of care and involvement of young people and families.

The literature therefore supports examining JIA pain not merely as a clinical symptom but as a multidimensional problem involving physical functioning, participation, psychological well-being and independence.

3. Research Methodology

3.1 Research Design

The present investigation employed a **quantitative, descriptive and cross-sectional research design**. Data were collected from participants at a defined point in time using a structured questionnaire. The quantitative approach allowed responses relating to pain, joint problems, functional limitations and physiotherapy measures to be converted into numerical form for statistical analysis.

The descriptive component was used to describe the characteristics of participants and the distribution of joint problems, while the analytical component permitted comparisons between adolescents and young adults. The attached report identifies frequency, percentage, mean and standard deviation as descriptive procedures and Chi-square, t-test, ANOVA or correlation as possible inferential procedures depending on the nature of the variables. Complete Report final

3.2 Study Population and Setting

The study focused on teenagers and young adults aged **12–30 years** in **Jaipur, Rajasthan**. The research specifically considered individuals experiencing JIA or relevant joint problems according to the study criteria.

The report's scope includes pain location, frequency and severity; mobility; physical activity; daily activities; and physiotherapy measures such as therapeutic exercise, stretching, strengthening, range-of-motion exercise and mobility training. Complete Report final

3.3 Sample Size

A total of **120 participants** were included in the reported study:

- 36 participants aged 12–17 years;
- 48 participants aged 18–24 years;
- 36 participants aged 25–30 years;
- 50 males;
- 70 females.

Thus, adolescents constituted 30.0% of the sample, while young adults constituted 70.0%.

3.4 Sampling Technique

The report describes a **purposive/convenience sampling approach**, depending on accessibility of eligible participants through healthcare and rehabilitation settings. Participants were selected according to the eligibility criteria and their willingness to participate. Complete Report final

3.5 Inclusion Criteria

Participants were eligible when they:

- were between 12 and 30 years of age;
- had a documented history of JIA or relevant joint problems according to the study criteria;
- were accessible within the Jaipur study setting;
- could understand the questionnaire;
- voluntarily agreed to participate; and
- provided informed consent, with parental/guardian consent where required for minors.

3.6 Exclusion Criteria

Participants were excluded when they:

- fell outside the specified age range;
- had severe medical or cognitive conditions preventing questionnaire completion;
- were unwilling to participate;
- did not provide required consent;
- had an acute condition preventing participation; or
- provided substantially incomplete responses.

3.7 Research Instrument

Primary data were collected using a **structured questionnaire**. The questionnaire covered demographic characteristics, joint problems, affected joint locations, pain severity, pain frequency, mobility, physical activities, activities of daily living and physiotherapy measures. The report identifies the questionnaire as the principal instrument for collecting information concerning subjective experiences such as pain and functional difficulty. Complete Report final

3.8 Variables Covered

The principal variables included:

1. Age group
2. Sex
3. Educational/occupational status
4. Joint pain
5. Joint stiffness
6. Joint swelling
7. Restricted joint movement
8. Joint tenderness/discomfort
9. Location of pain
10. Pain severity
11. Pain frequency
12. Mobility limitations

13. Physical and daily activities
14. Physiotherapy measures
15. Functional limitations

3.9 Data Analysis

Data were coded and organized before statistical analysis. Frequencies and percentages were used for categorical variables. Multiple-response questions were analysed by counting the number and percentage of participants selecting each response.

The report also applied comparative analysis using the **Pearson Chi-square test** to examine associations between age group and major joint problems. For joint pain, for example, the reported analysis produced $\chi^2(1) = 0.22$, $p = 0.64$, indicating no statistically significant association between age group and reported joint pain. Complete Report final

3.10 Ethical Considerations

Participation was voluntary, informed consent was required, and parental/guardian consent was considered for minors. Confidentiality and responsible handling of participant information were included in the research protocol. The additional safeguards required for participants below legal adulthood were recognized in the report.

4. Results

4.1 Profile of Respondents

Table 1. Demographic Profile of Participants

Variable	Category	Frequency (n)	Percentage (%)
Age	12–17 years	36	30.0
	18–24 years	48	40.0
	25–30 years	36	30.0
Sex	Male	50	41.7
	Female	70	58.3
Status	School student	36	30.0
	College/university student	45	37.5
	Employed	30	25.0
	Other	9	7.5
Total		120	100.0

Discussion: The study included 120 participants. Young adults represented the majority of the sample, with 84 participants aged 18–30 years, while 36 participants were aged 12–17 years. Females constituted 58.3% of the sample and males 41.7%. The educational and occupational distribution demonstrates that participants were situated at different developmental and social stages, allowing the study to consider joint problems in relation to schooling, higher education and employment. The respondent profile reported in the attached study confirms these distributions. Complete Report final

4.2 Types of Joint Problems Among Adolescents

Table 2. Joint Problems Among Participants Aged 12–17 Years

Joint Problem	Frequency (n)	Percentage (%)
Joint pain	32	88.9
Joint stiffness	27	75.0
Joint swelling	19	52.8
Restricted joint movement	21	58.3
Joint tenderness/discomfort	16	44.4
Total respondents	36	100.0

Note: Multiple responses were permitted; therefore, percentages do not total 100%.

Discussion: Joint pain was the most frequently reported problem among adolescents, affecting **88.9%** of participants. Stiffness was reported by 75.0%, followed by restricted movement at 58.3%. More than half of the adolescent participants therefore experienced symptoms that could directly influence mobility and physical activity. Joint tenderness/discomfort was reported by 44.4%.

The coexistence of symptoms is important. A participant may simultaneously experience pain, stiffness, swelling and restricted movement. Therefore, the findings should be interpreted as a pattern of multiple joint problems rather than mutually exclusive diagnoses. Complete Report final

4.3 Types of Joint Problems Among Young Adults

Table 3. Joint Problems Among Young Adults

Joint Problem	Frequency (n)	Percentage (%)
Joint pain	72	85.7
Joint stiffness	58	69.0
Joint swelling	42	50.0
Restricted joint movement	47	56.0
Joint tenderness/discomfort	39	46.4
Total respondents	84	100.0

Discussion: Joint pain remained the most frequently reported problem among young adults, affecting **85.7%** of participants. Stiffness affected 69.0%, restricted movement 56.0%, swelling 50.0% and tenderness/discomfort 46.4%. The pattern is broadly similar to that observed among adolescents.

The similarity between the two groups suggests that joint problems may persist beyond adolescence rather than disappearing as individuals enter young adulthood. This is consistent with literature emphasizing the long-term nature of JIA and its potential influence on physical functioning and quality of life during adulthood (McGrath et al., 2023; Oliveira et al., 2023). Complete Report final

4.4 Location of Joint Pain

Table 4. Location of Joint Pain

Location	Frequency (n)	Percentage (%)
Knee	76	63.3
Ankle/foot	61	50.8

Wrist/hand	52	43.3
Shoulder	39	32.5
Elbow	34	28.3
Hip	29	24.2
Other joints	18	15.0

Note: Multiple responses were permitted.

Discussion: The **knee** was the most frequently reported site of pain, affecting 63.3% of participants. The ankle/foot was second at 50.8%, followed by wrist/hand at 43.3%. The prominence of lower-limb pain is functionally important because the knees, ankles and feet contribute directly to walking, running, standing, stair climbing and sports participation.

Wrist and hand pain was also substantial. Such pain may interfere with writing, typing, carrying objects and other fine-motor activities. The distribution therefore demonstrates that JIA-related pain can affect both mobility-dependent and upper-limb-dependent activities. Complete Report final

4.5 Severity of Joint Pain

Table 5. Severity of Joint Pain

Severity	Frequency (n)	Percentage (%)
Mild	22	18.3
Moderate	49	40.8
Severe	35	29.2
Very severe	14	11.7
Total	120	100.0

Discussion: Moderate pain was the most frequently reported category, affecting **40.8%** of participants. Severe pain was reported by 29.2%. Therefore, **70.0%** of participants reported moderate or severe pain. When very severe pain was included, **81.7%** of respondents experienced at least moderate-to-very-severe pain.

This is an important finding because the study population did not primarily report mild discomfort. A substantial proportion experienced pain at levels potentially capable of interfering with physical activity, mobility and participation. Complete Report final

4.6 Frequency of Joint Pain

Table 6. Frequency of Joint Pain

Frequency	Frequency (n)	Percentage (%)
Occasionally	25	20.8
Several times a week	38	31.7
Daily	42	35.0
Almost constant	15	12.5
Total	120	100.0

Discussion: Daily pain was the most common pattern, reported by 35.0% of participants. Another 31.7% experienced pain several times a week. Together, these categories indicate that **66.7%** of participants experienced pain several times per week or more frequently. Although 20.8% experienced pain occasionally, only 12.5% reported almost constant pain.

The findings indicate that pain was recurrent for a considerable proportion of participants. Frequent pain may reduce willingness to engage in physical activities and may influence educational, occupational and social participation. Complete Report final

4.7 Effect of Joint Pain on Mobility

Table 7. Effect of Joint Pain on Mobility and Functional Activities

Activity	No Difficulty n (%)	Mild n (%)	Moderate n (%)	Severe n (%)
Walking normal distances	42 (35.0)	35 (29.2)	31 (25.8)	12 (10.0)
Climbing stairs	32 (26.7)	37 (30.8)	36 (30.0)	15 (12.5)
Prolonged standing	28 (23.3)	34 (28.3)	40 (33.3)	18 (15.0)
Running/sports	25 (20.8)	31 (25.8)	42 (35.0)	22 (18.3)
Bending/squatting	34 (28.3)	37 (30.8)	35 (29.2)	14 (11.7)
Routine movements independently	55 (45.8)	34 (28.3)	24 (20.0)	7 (5.8)

Discussion: The greatest functional difficulties occurred in physically demanding activities. Running and sports showed 35.0% moderate and 18.3% severe difficulty, meaning **53.3%** experienced moderate or severe difficulty in this area. Prolonged standing was also substantially affected, with 33.3% reporting moderate and 15.0% severe difficulty.

By contrast, routine independent movement had the lowest severe difficulty level at 5.8%. Thus, many participants retained basic independence despite experiencing limitations in more demanding activities. Complete Report final

4.8 Effect on Physical and Daily Activities

Table 8. Effect of Joint Problems on Daily Activities

Activity	No Effect	Mild Effect	Moderate Effect	Severe Effect
Exercise/physical training	22 (18.3%)	31 (25.8%)	43 (35.8%)	24 (20.0%)
Sports/recreational physical activities	20 (16.7%)	29 (24.2%)	44 (36.7%)	27 (22.5%)
Walking for recreation	39 (32.5%)	37 (30.8%)	34 (28.3%)	10 (8.3%)
School/college/work	47 (39.2%)	36 (30.0%)	29 (24.2%)	8 (6.7%)
Household activities	44 (36.7%)	38 (31.7%)	30 (25.0%)	8 (6.7%)
Personal care	61 (50.8%)	32 (26.7%)	21 (17.5%)	6 (5.0%)
Social/recreational activities	35 (29.2%)	39 (32.5%)	34 (28.3%)	12 (10.0%)

Discussion: Sports and recreational physical activities were the most affected, with **59.2%** reporting moderate or severe effects. Exercise and physical training were similarly affected, with **55.8%** reporting moderate or severe effects.

Personal-care activities were comparatively preserved: 50.8% reported no effect and only 5.0% reported severe effects. This suggests that joint problems had a stronger influence on activities involving sustained physical effort than on basic self-care. Complete Report final

4.9 Physiotherapy Measures

Table 9. Physiotherapy Measures Used by Respondents

Physiotherapy Measure	Frequency (n)	Percentage (%)
Therapeutic exercises	82	68.3
Range-of-motion exercises	76	63.3
Home-based exercise programme	71	59.2
Stretching/flexibility exercises	69	57.5
Muscle-strengthening exercises	64	53.3
Posture/movement training	48	40.0
Gait/mobility training	43	35.8

Note: Multiple responses were permitted.

Discussion: Therapeutic exercises were the most commonly reported physiotherapy measure, used by 68.3% of participants. Range-of-motion exercises were reported by 63.3%, while 59.2% reported home-based exercise programmes. Stretching and strengthening were also reported by more than half of the participants.

The prominence of exercise-based interventions corresponds with the functional problems observed in the study, particularly stiffness, restricted movement and difficulty with physically demanding activities. However, frequency of use **does not itself demonstrate treatment effectiveness**. Establishing effectiveness would require intervention-specific outcome measures and appropriate statistical comparisons. Complete Report final

4.10 Relationship Between Pain Severity and Functional Limitation

The descriptive findings demonstrated an increasing pattern between pain severity and functional limitation. Among participants with mild pain, 63.6% had no or minimal functional limitation. Among participants with severe pain, 42.9% experienced moderate functional limitation and 25.7% experienced severe limitation. For very severe pain, 57.1% experienced moderate limitation and 21.4% experienced severe limitation.

Overall, **34.2%** of participants had moderate functional limitations and **13.3%** had severe limitations. The pattern therefore suggests that greater pain severity was accompanied by greater functional difficulty. However, the report appropriately emphasizes that participant-level paired data would be required to establish a formal correlation coefficient and significance level. Complete Report final

4.11 Comparison Between Adolescents and Young Adults

Table 10. Comparison of Major Joint Problems

Joint Problem	Adolescents 12–17 years n (%)	Young Adults 18–30 years n (%)
Joint pain	32 (88.9)	72 (85.7)
Joint stiffness	27 (75.0)	58 (69.0)
Joint swelling	19 (52.8)	42 (50.0)
Restricted movement	21 (58.3)	47 (56.0)

Tenderness/discomfort	16 (44.4)	39 (46.4)
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The overall symptom pattern was similar. Adolescents showed slightly higher percentages for pain, stiffness, swelling and restricted movement, while young adults showed a marginally higher percentage for tenderness/discomfort.

The Pearson Chi-square analysis reported in the research report found no statistically significant association between age group and the major joint-problem categories. For joint pain, $\chi^2(1) = 0.22, p = 0.64$. The summary analysis reported similarly nonsignificant results for stiffness, swelling, restricted movement and tenderness/discomfort. Complete Report final

Table 11. Comparative Chi-Square Analysis

Joint Problem	χ^2 (df=1)	Approx. p-value	Interpretation
Joint pain	0.22	0.64	Not significant
Joint stiffness	0.47	0.49	Not significant
Joint swelling	0.08	0.78	Not significant
Restricted movement	0.05	0.82	Not significant
Tenderness/discomfort	0.05	0.82	Not significant

These results indicate that the small differences between the two age groups should be interpreted as descriptive rather than as evidence of statistically significant age-related differences.

5. Discussion

The present study examined joint problems and pain among 120 participants aged 12–30 years, with particular emphasis on adolescents and young adults. The findings demonstrate that JIA-related or relevant joint problems can remain important during both developmental stages.

The first major finding was the high occurrence of **joint pain**. Pain was reported by 88.9% of adolescents and 85.7% of young adults. This similarity indicates that pain remains relevant beyond adolescence. The finding corresponds with previous research demonstrating that pain can persist in JIA and may not necessarily disappear with increasing age or control of inflammatory activity (McGrath et al., 2023).

Joint stiffness was the second most common problem in both groups. Stiffness affected 75.0% of adolescents and 69.0% of young adults. This is clinically meaningful because stiffness can restrict movement after rest and may contribute to reduced participation in physical activity. The coexistence of pain and stiffness can create a cycle in which individuals avoid movement, experience reduced physical conditioning and subsequently encounter greater difficulty performing demanding activities.

The study also identified the **knee as the most frequently affected painful joint**, followed by the ankle/foot and wrist/hand. This distribution is particularly important because the lower limbs support many activities that are important to adolescents and young adults. Knee and ankle pain may interfere with walking, running, standing, stair climbing and sports. The prominence of these joints therefore provides a functional explanation for the higher limitations observed in running, sports and prolonged standing.

The pain-severity results provide additional evidence of substantial symptom burden. Moderate pain was reported by 40.8% and severe pain by 29.2%. Thus, 70.0% of the sample experienced moderate or severe pain. When very severe pain was included, the proportion increased to 81.7%. This is consistent with the literature emphasizing pain as an important patient-centred outcome in JIA (Stinson, Luca and Jibb, 2012; Brandelli et al., 2023).

Pain was also recurrent. Approximately two-thirds of participants experienced pain several times per week or daily. This is important because pain frequency may be as relevant as pain intensity. Repeated pain episodes can influence participation in physical activities and may produce psychological concerns related to movement.

Research has similarly emphasized pain interference rather than considering pain intensity alone (Randell et al., 2024).

The functional findings showed that activities requiring greater physical effort were more affected than basic independent activities. Running and sports were particularly affected, with 53.3% reporting moderate or severe difficulty. Prolonged standing also produced substantial difficulties. In contrast, routine independent movement and personal care were comparatively preserved.

This pattern is consistent with research suggesting that young people with JIA may remain capable of basic self-care while experiencing significant limitations in physical activity and participation. Oliveira et al. (2023) similarly demonstrated the importance of physical activity for physical fitness and health-related quality of life among adults with JIA.

The findings regarding physical and daily activities are particularly important for adolescence and young adulthood. Sports and recreation are not simply forms of exercise; they contribute to social development, peer interaction and psychological well-being. Restrictions in these areas may therefore have consequences beyond physical fitness. Similarly, limitations in education and employment can influence long-term independence.

The physiotherapy findings demonstrate that participants commonly reported exercise-based approaches. Therapeutic exercise was used by 68.3%, range-of-motion exercises by 63.3%, home-based exercise programmes by 59.2%, stretching by 57.5% and strengthening by 53.3%. These findings correspond with the literature supporting appropriately adapted exercise and physiotherapy for maintaining physical function in JIA (Di Ludovico et al., 2023; Liu et al., 2024).

However, an important methodological distinction must be maintained: the frequency with which participants reported using physiotherapy measures cannot be interpreted as proof that those interventions caused reductions in pain. The present study was cross-sectional and did not experimentally compare treatment and control groups. The report itself appropriately emphasizes this limitation. Complete Report final

The comparison between adolescents and young adults revealed broadly similar symptom patterns. Although adolescents had slightly higher proportions of pain, stiffness, swelling and restricted movement, none of the major symptom categories showed a statistically significant association with age group. This suggests that the transition into young adulthood does not automatically eliminate the consequences of childhood-onset joint problems.

The finding is particularly relevant to healthcare transition. JIA may continue into adulthood, and young adults need continued support to manage symptoms, physical activity, treatment and healthcare independently. Research on transition emphasizes continuity of care and development of self-management skills (Bethencourt-Baute et al., 2023; Şahin et al., 2024).

Overall, the study supports a multidimensional understanding of JIA pain. Pain should be considered together with stiffness, affected joints, frequency, physical activity, mobility, daily functioning and psychological and social participation. This approach is consistent with contemporary literature emphasizing patient-reported outcomes and quality of life in JIA (Rosina et al., 2025).

6. Conclusion

The present study, “Study of Juvenile Idiopathic Arthritis Pains in Young Adults and Teens,” examined the experience of joint problems among 120 participants aged 12–30 years in Jaipur. The findings demonstrate that joint pain and stiffness were prominent problems among both adolescents and young adults.

Joint pain was reported by 88.9% of adolescents and 85.7% of young adults, while stiffness affected 75.0% and 69.0%, respectively. The knee was the most frequently reported site of pain, followed by the ankle/foot and wrist/hand. These findings are important because these joints play major roles in mobility, sports, education and occupational activities.

Pain was also substantial in terms of both intensity and frequency. Seventy percent of participants experienced moderate or severe pain, while 66.7% experienced pain several times per week or more frequently. The findings

demonstrate that pain was not merely an occasional minor complaint for a large proportion of the study population.

Joint problems had their greatest functional effect on demanding activities. Running and sports, prolonged standing and stair climbing were particularly affected, whereas personal-care activities and routine independent movement were comparatively preserved. This demonstrates that young people may maintain basic independence while nevertheless experiencing significant restrictions in physical activity and participation.

The third objective of the study was addressed through examination of physiotherapy measures. Therapeutic exercise, range-of-motion exercises, home-based exercise, stretching and strengthening were the most frequently reported approaches. These findings are consistent with the broader literature supporting appropriately individualized physiotherapy and physical activity in JIA. Nevertheless, the present study does not establish causal effectiveness of any specific intervention.

The comparison between adolescents and young adults showed broadly similar patterns of joint problems. The statistical analysis did not identify significant associations between age group and the major joint-problem categories. Therefore, the findings suggest that joint-related difficulties may continue across adolescence and young adulthood.

The study consequently supports the importance of early assessment, continuing multidisciplinary care, individualized physiotherapy, appropriate physical activity, pain assessment and transition-focused healthcare. Future research should employ larger samples, confirmed JIA diagnoses, longitudinal designs and validated clinical and patient-reported outcome measures. The limitations of the present study—including the Jaipur-specific sample, questionnaire-based self-reporting, cross-sectional design and differences in disease characteristics—should be considered when generalizing the findings. Complete Report final

7. References

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