JOURNAL OF
CONTEMPORARY MEDICINE

DOI:10.16899/jcm.1913413
J Contemp Med 2026;16(3):147-153

Original Article / Orijinal Araştırma

The Relationship Between Pain Perception and Colour Preferences in the Paediatric Population: A Cross-Sectional Study

Pediatrik Popülasyonda Ağrı Algısı ve Renk Tercihleri Arasındaki İlişki: Kesitsel Bir Çalışma

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Abstract

Aim: Children's color preferences serve as significant projective indicators of their internal emotional states and sensory experiences.This study aimed to investigate the relationship between localized pain (joint, chest, throat, head, and abdominal) and color selection among pediatric patients diagnosed with Familial Mediterranean Fever (FMF).

Material and Method: In this cross-sectional clinical study, 93 pediatric FMF patients visiting a Pediatric Dentistry clinic were evaluated. Participants were questioned regarding the presence and localization of pain characteristic of FMF. Color preferences during both symptomatic and asymptomatic periods were recorded. Initial data categorization included a broad spectrum (white, red, blue, purple, yellow, black, and green), which was subsequently refined into reduced color clusters (white, red, blue, and black) for advanced statistical modeling. Statistical analysis of the data was performed using IBM SPSS v23 software.

Results: Statistical analysis revealed no significant correlation between unique color preferences and the presence of joint, chest, head, or abdominal pain ($p>0.05$). Similarly, color choices remained consistent during pain-free intervals. However, when utilizing reduced color groupings, a statistically significant association was identified specifically between the presence of throat pain and color preference ($p=0.038$).Observations indicated a notable shift toward the color red during episodes of sore throat.

Conclusion: While the presence of generalized FMF-related pain does not universally dictate color choice, the specific correlation between sore throats and an increased preference for red suggests that certain physiological stressors trigger distinct emotional and perceptual associations.These findings indicate that color-based assessment tools can serve as valuable non-verbal adjuncts for dental and medical practitioners in decoding the subjective pain experiences of children.

Keywords: Familial Mediterranean fever (FMF), pain perception, colour preferences, projective tests, paediatric dentistry

Öz

Amaç: Çocukların renk tercihleri, içsel duygusal durumlarının ve duyusal deneyimlerinin önemli yansıtıcı göstergeleri olarak hizmet eder. Bu çalışma, Ailevi Akdeniz Ateşi (AAA) tanısı konulan pediatrik hastalarda lokalize ağrı (eklem, göğüs, boğaz, baş ve karın) ile renk seçimi arasındaki ilişkiyi incelemeyi amaçlamıştır.

Gereç ve Yöntem: Bu kesitsel klinik çalışmada, bir Pedodonti kliniğini ziyaret eden 93 pediatrik AAA hastası değerlendirilmiştir. Katılımcılar, AAA'ne özgü ağrı varlığı ve lokalizasyonu açısından sorgulanmış hem semptomatik hem de asemptomatik dönemlerdeki renk tercihleri kaydedilmiştir. İlk veri kategorizasyonu geniş bir yelpazeyi (beyaz, kırmızı, mavi, mor, sarı, siyah ve yeşil) kapsarken, daha sonra gelişmiş istatistiksel modelleme için bu veriler daraltılmış renk kümelerine (beyaz, kırmızı, mavi ve siyah) dönüştürülmüştür. Verilerin istatistiksel analizi IBM SPSS v23 yazılımı kullanılarak gerçekleştirilmiştir.

Bulgular: İstatistiksel analizler; eklem, göğüs, baş veya karın ağrısı varlığı ile özgün renk tercihleri arasında anlamlı bir korelasyon olmadığını ortaya koymuştur ($p>0.05$). Benzer şekilde, ağrısız dönemlerde de renk seçimlerinin tutarlı kaldığı görülmüştür. Ancak, daraltılmış renk gruplandırmaları kullanıldığında, özellikle boğaz ağrısı varlığı ile renk tercihi arasında istatistiksel olarak anlamlı bir ilişki saptanmıştır ($p=0.038$). Gözlemler, boğaz ağrısı atakları sırasında kırmızı renge doğru belirgin bir kayma olduğunu göstermiştir.

Sonuç: AAA ile ilişkili genel ağrı varlığı renk seçimini her zaman doğrudan belirlemese de boğaz ağrısı ile artan kırmızı tercihi arasındaki spesifik korelasyon, belirli fizyolojik stres faktörlerinin belirgin duygusal ve algısal çağrışımları tetiklediğini düşündürmektedir. Bu bulgular, renk temelli değerlendirme araçlarının, çocukların öznel ağrı deneyimlerini anlamlandırmada diş hekimleri ve tıp doktorları için değerli, sözel olmayan yardımcı yöntemler olarak kullanılabileceğini göstermektedir.

Anahtar Kelimeler: Ailevi Akdeniz ateşi (AAA), ağrı algısı, renk tercihleri, projektif testler, pedodonti (çocuk diş hekimliği)

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Received *(Geliş Tarihi)*: 21.03.2026 **Accepted *(Kabul Tarihi)*:** 26.04.2026

INTRODUCTION

Familial Mediterranean Fever (FMF) is a chronic autoinflammatory disease characterised by recurrent fever and serositis attacks.[1] It is caused by mutations in the MEFV gene encoding the pyrin protein, leading to excessive innate immune activation and persistent subclinical inflammation even during attack-free periods.[2] Other typical symptoms include abdominal pain, chest pain, arthritis, and erythema resembling erysipelas, usually seen in the lower extremities.[3]

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Toothache, stomach ache, headache, limb pain, and chest or back pain are experienced occasionally or frequently by up to 30% of children.[4] In the detection and assessment of pain, the patient's own statement is considered the most reliable "gold standard".[5] However, the situation is more complex in paediatric patients; their lack of sufficient life experience regarding pain and their limited vocabulary to describe their feelings make it difficult for them to convey their pain clearly.[6] For this reason, unlike adults, children usually express their pain indirectly through their parents or caregivers.[5,7] In this indirect communication process, the behavioural responses exhibited by the child and the parent's capacity for observation become complementary elements in terms of the accuracy of the clinical diagnosis. Pain perception and expression in the paediatric population varies according to the child's cognitive maturity and the environmental factors to which they are exposed.[8-10] The methodologies used in clinical pain assessment range from self-report scales (numerical, facial, or colour scales) to behaviour-focused composite systems and the monitoring of physiological parameters reflecting autonomic nervous system responses.[11]

In the literature, it has been observed that children possess the ability to communicate their emotions through colours from the age of four onwards, and that they tend to choose bright colours or their 'favourite' colours, particularly for characters they associate positively with. Conversely, it has been noted that darker or less preferred colours are generally used in the depiction of figures associated with negative emotions. Current research shows that children can encode not only single emotions but also complex (both positive and negative) emotional states through the use of colour. In this context, analysing colour choices in children's drawings remains a critical diagnostic and communication tool for understanding the child's inner world in clinical assessments, educational processes, and forensic interviews.[12]

The colours a child chooses when drawing are a fundamental means of expression that reflect their emotional attitude towards the subject they are working on.[13] It is widely accepted in the literature that children's colour choices are not random, but are directly influenced by the emotions they feel towards the figure or theme being drawn.[14-16] In line with these scientific findings, clinical specialists and art therapists meticulously observe and interpret the use of colour in patients' artwork, both as an assessment criterion and as a building block of the therapeutic process.[15,17]

The use of colour in paediatric psychology provides important evidence in identifying various emotional difficulties such as trauma, depression, fear or anxiety.[18] In addition, the quality of the child's relationship with their parents, attachment dynamics and adaptation processes to the school environment can also be analysed through the symbolic language of colours.[18] In medical clinics, this method enables in-depth insights into the physical pain and psychological processes experienced by children during their hospital treatment.[19,20]

Children with systemic chronic conditions—such as those requiring frequent hospital visits and repeated medical interventions—often develop a physiological and psychological response to pain that differs significantly from the general population. Continuous exposure to clinical environments and invasive procedures can lead to heightened dental anxiety or altered pain perception thresholds. For the pediatric dentist, recognizing these unique behavioral patterns is crucial; it requires a specialized clinical approach that integrates psychological sensitivity with traditional treatment. Understanding how these children project their internal experiences through non-verbal cues, such as color, allows the dental practitioner to adapt their management strategy, ensuring a more empathetic and effective therapeutic environment. The primary aim of this study is to determine which colours children with Familial Mediterranean Fever (FMF) use to code the pain they feel in different parts of their body, thereby demonstrating the diagnostic value of colour usage in paediatric pain assessment.

MATERIAL AND METHOD

This cross-sectional study included 93 paediatric patients diagnosed with Familial Mediterranean Fever (FMF) who attended the Paediatric Dentistry Clinic at the Faculty of Dentistry, Tokat Gaziosmanpaşa University, for routine check-ups between 2020 and 2021.

Ethical Approval

Ethical approval for the study was obtained from the Tokat Gaziosmanpaşa University Clinical Research Ethics Committee (Date: 02.07.2019, Decision No: 19-KAEK-167/560). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Power Analysis

The sample size for the study was calculated using G*Power (v3.1.9.7) software. The power analysis revealed that a

minimum of 88 participants were required to detect significant differences/distributions in colour preferences within a single group at a 95% confidence interval, with a medium effect size and 80% test power. Taking into account possible data losses and compliance issues during the research period, the study was completed with a total of 93 children and the targeted statistical power was achieved.

Inclusion Criteria

- Being a patient with a confirmed medical diagnosis of Familial Mediterranean Fever (FMF).
- Being a child or adolescent aged between 4 and 18 years.
- Possessing a cognitive level sufficient to distinguish colours.
- Having a signed informed consent form from a parent or legal guardian.

Exclusion Criteria

- Having additional systemic or neurological disorders that could cause chronic pain other than FMF.
- Colour blindness or visual impairment.
- Diagnosis of mental retardation or psychiatric disorder to a degree that impairs communication.
- Presence of severe acute dental pain that prevents cooperation during the questionnaire or interview.

Data Collection

Clinical Assessment: The data of participants included in the study were recorded using a comprehensive clinical assessment form. The following parameters were analysed within the scope of this form:

- **Demographic data**: Patients' current ages and gender distributions were recorded.
- **Medical history**: The age at which symptoms first appeared, the age at which a definitive diagnosis was made, the presence of a family history of FMF, and the degree of kinship between parents were queried.
- **Clinical symptoms**: The presence of fever, abdominal pain, chest pain and joint pain (arthritis/arthralgia) experienced during attack periods was recorded along with the localisation of symptoms.
- **Classification of disease severity**: The Pras disease severity score was used to determine the clinical severity of patients. In this system, the following parameters were scored: age at disease onset, attack frequency, presence of arthritis and erysipelas-like erythema, amyloidosis status, and colchicine dosage. To reflect differences specific to the paediatric population, the scoring criteria modified by Özen et al.[21] (adapted to paediatric age and colchicine dosage) were used (**Table 1**).

Based on the total scores obtained, patients were classified into the following three categories:

1. **Mild:** 3–5 points
2. **Moderate:** 6–8 points
3. **Severe:** 9 points and above

Table 1. Modified Pras disease severity scoring system for FMF

Characteristics	Scores
Age of onset (yr)	
11–20	2
6–10	3
<6	4
Numbers of attacks per month	
<1	1
1–2	2
>2	3
Arthritis	
Acute	2
Protracted	3
Erysipelas-like erythema	2
Amyloidosis	3
Dose of colchicine	
Less than appropriate* dose	0
Appropriate dose	1
More than appropriate dose	2

Mild disease 3–5; Moderate disease 6–9; Severe disease >9
*Starting colchicine doses for children <5 years 0.5 mg/day; 5–10 years 1.0 mg/day; >10 years 1.5 mg/day.

Colour Selection Procedure: The study investigated the presence of pain based on the localisation of symptoms experienced by patients during attack periods (joint, chest, throat, head, and abdominal pain). The colours preferred by patients when they experienced pain and when they were pain-free were recorded. Patients were specifically asked to provide their responses while reflecting on the most severe pain they had ever experienced in their lives. Two standard circles labelled 'Presence of Pain' and 'Absence of Pain' were drawn on A5-sized white paper. During the application, each child was asked, 'Which colour would you like to use when you have pain?' and 'Which colour would you like to use when you do not have pain?' The children made their choices from the colour palette provided in response to these questions and coloured the relevant circles (**Figure 1**). A standardized palette consisting of seven basic colours (red, black, blue, yellow, green, purple, and white) was presented to all participants. This specific set was chosen to represent a broad spectrum of easily identifiable chromatic categories while remaining accessible to the children's developmental stage, ensuring procedural consistency across the study group. In the initial analysis, several color categories exhibited low frequencies ($n<5$), which limited the reliability of the Chi-square test. To address this and increase statistical power, the color categories were reorganized. While Red, Blue, and Black were kept as distinct categories, White, Purple, Yellow, and Green were merged into a combined category for the secondary analysis. This grouping rationale was based on ensuring a sufficient number of observations per cell to satisfy statistical assumptions while preserving the most frequently utilized colors in pain assessment literature.

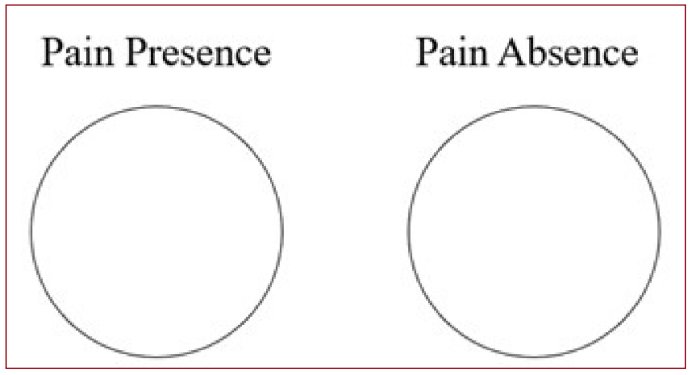

Figure 1. Color identification form for the presence and absence of pain used in the study

Statistical Analysis

Data analysis was performed using IBM SPSS v23 software. Descriptive statistics are presented as frequencies and percentages. The chi-square test was used to evaluate relationships between categorical variables, and a statistical significance level of $p<0.05$ was accepted in all analyses.

RESULTS

The age distribution of the children included in the study ranged from 5 to 17 years, with the highest participation concentrated in the 12-year-old age group (**Figure 2**).

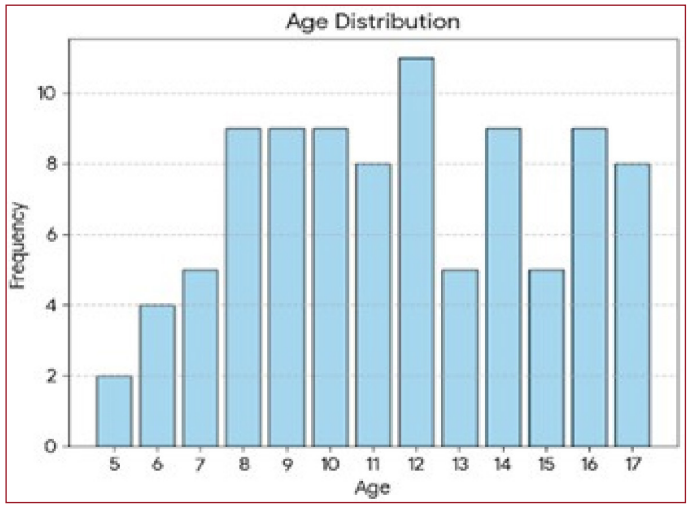

Figure 2. Distribution of participants by age

According to the assessment based on the modified Pras disease severity score, the vast majority of participants were in the moderate severity group (62.4%; n=58), followed by patients with mild (24.7%; n=23) and severe (12.9%; n=12) disease (**Figure 3**). The most frequently reported clinical symptoms were fever, abdominal pain, and joint pain. When examining the colour preferences accompanying these symptomatic conditions, red and black (66.67%) (**Table 2**) were the dominant preferences in the presence of pain, while white and blue (54.84%) (**Table 3**) were the dominant preferences in the absence of pain.

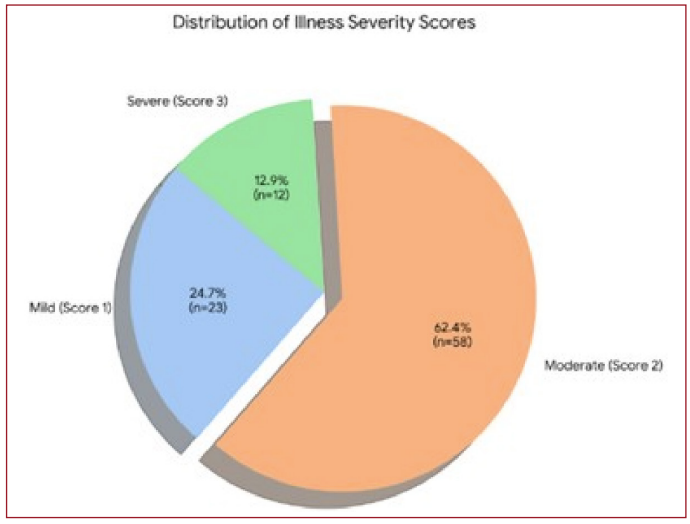

Figure 3. Illness Severity Score Distribution

Table 2. Color Distribution for Pain Presence

Color	Frequency (n)	Percentage (%)
Red	41	44.09%
Black	21	22.58%
Blue	11	11.83%
Yellow	7	7.53%
Green	6	6.45%
Purple	6	6.45%
White	1	1.08%
Total	93	100.00%

Table 3. Color Distribution for Pain Absence

Color	Frequency (n)	Percentage (%)
White	29	31.18%
Blue	22	23.66%
Green	12	12.90%
Yellow	12	12.90%
Purple	9	9.68%
Black	5	5.38%
Red	4	4.30%
Total	93	100.00%

In analyses conducted across seven basic colour categories, no statistically significant relationship was found between the presence of joint, chest, throat, head, and abdominal pain and colour preferences ($p>0.05$) (**Table 4**). No correlation was observed between colour groups and symptom localization in the absence of pain (**Table 5**). In the analysis of reduced colour groups applied to increase statistical test power, a statistically significant association was found between the presence of sore throat and preferred colours ($p=0.038$) (**Table 6**). A significant association was found between sore throat and reduced colour groups ($p=0.038$). Fifty-one per cent of those with sore throat preferred red, while this rate was 36.4 per cent in the absence of pain. No significant association was found between joint pain, chest pain, headache, abdominal pain and reduced colour groups ($p>0.05$) (**Table 6**). No correlation was observed between reduced colour groups and symptom localization in the absence of pain (**Table 7**).

Table 4. Comparisons by colors in the presence of pain

	Color in the Presence of Pain							p
	White	Red	Blue	Purple	Yellow	Black	Green	
Joint pain								
Present	1 (1.2)*	37 (44.6)	11 (13.3)	6 (7.2)	4 (4.8)	18 (21.7)	6 (7.2)	0.097
Absent	0 (0)	4 (40)	0 (0)	0 (0)	3 (30)	3 (30)	0 (0)	
Chest pain								
Present	1 (1.4)	31 (43.1)	8 (11.1)	4 (5.6)	6 (8.3)	17 (23.6)	5 (6.9)	0.963
Absent	0 (0)	10 (47.6)	3 (14.3)	2 (9.5)	1 (4.8)	4 (19)	1 (4.8)	
Throat pain								
Present	1 (2)	25 (51)	2 (4.1)	4 (8.2)	4 (8.2)	9 (18.4)	4 (8.2)	0.168
Absent	0 (0)	16 (36.4)	9 (20.5)	2 (4.5)	3 (6.8)	12 (27.3)	2 (4.5)	
Headache								
Present	1 (3.2)	13 (41.9)	4 (12.9)	1 (3.2)	0 (0)	9 (29)	3 (9.7)	0.242
Absent	0 (0)	28 (45.2)	7 (11.3)	5 (8.1)	7 (11.3)	12 (19.4)	3 (4.8)	
Abdominal pain								
Present	0 (0)	21 (42)	7 (14)	2 (4)	3 (6)	12 (24)	5 (10)	0.512
Absent	1 (2.3)	20 (46.5)	4 (9.3)	4 (9.3)	4 (9.3)	9 (20.9)	1 (2.3)	

* Frequency (%), p<0.05, Data are presented as n (%).

Table 5. Comparisons by colors in the absence of pain

	Color in the Absence of Pain							p
	White	Red	Blue	Purple	Yellow	Black	Green	
Joint pain								
Present	26 (31.3)	4 (4.8)	18 (21.7)	9 (10.8)	11 (13.3)	3 (3.6)	12 (14.5)	0.184
Absent	3 (30)	0 (0)	4 (40)	0 (0)	1 (10)	2 (20)	0 (0)	
Chest pain								
Present	23 (31.9)	3 (4.2)	13 (18.1)	7 (9.7)	9 (12.5)	5 (6.9)	12 (16.7)	0.157
Absent	6 (28.6)	1 (4.8)	9 (42.9)	2 (9.5)	3 (14.3)	0 (0)	0 (0)	
Throat pain								
Present	15 (30.6)	1 (2)	10 (20.4)	6 (12.2)	9 (18.4)	3 (6.1)	5 (10.2)	0.482
Absent	14 (31.8)	3 (6.8)	12 (27.3)	3 (6.8)	3 (6.8)	2 (4.5)	7 (15.9)	
Headache								
Present	10 (32.3)	1 (3.2)	7 (22.6)	3 (9.7)	4 (12.9)	1 (3.2)	5 (16.1)	0.988
Absent	19 (30.6)	3 (4.8)	15 (24.2)	6 (9.7)	8 (12.9)	4 (6.5)	7 (11.3)	
Abdominal pain								
Present	16 (32)	1 (2)	11 (22)	6 (12)	9 (18)	2 (4)	5 (10)	0.5
Absent	13 (30.2)	3 (7)	11 (25.6)	3 (7)	3 (7)	3 (7)	7 (16.3)	

p<0.05, Data are presented as n (%).

Table 6. Colors in the presence of pain according to reduced color categories

	Color in the Presence of Pain				p
	White	Red	Blue	Black	
Joint pain					
Present	17 (20.5)	37 (44.6)	11 (13.3)	18 (21.7)	0.569
Absent	3 (30)	4 (40)	0 (0)	3 (30)	
Chest pain					
Present	16 (22.2)	31 (43.1)	8 (11.1)	17 (23.6)	0.932
Absent	4 (19)	10 (47.6)	3 (14.3)	4 (19)	
Throat pain					
Present	13 (26.5)	25 (51)	2 (4.1)	9 (18.4)	0.038
Absent	7 (15.9)	16 (36.4)	9 (20.5)	12 (27.3)	
Headache					
Present	5 (16.1)	13 (41.9)	4 (12.9)	9 (29)	0.665
Absent	15 (24.2)	28 (45.2)	7 (11.3)	12 (19.4)	
Abdominal pain					
Present	10 (20)	21 (42)	7 (14)	12 (24)	0.862
Absent	10 (23.3)	20 (46.5)	4 (9.3)	9 (20.9)	

p<0.05, Data are presented as n (%).

Table 7. Colors in the absence of pain according to reduced color categories

	Color in the Absence of Pain				p
	White	Red	Blue	Black	
Joint pain					
Present	58 (69.9)	4 (4.8)	18 (21.7)	3 (3.6)	0.06
Absent	4 (40)	0 (0)	4 (40)	2 (20)	
Chest pain					
Present	51 (70.8)	3 (4.2)	13 (18.1)	5 (6.9)	0.089
Absent	11 (52.4)	1 (4.8)	9 (42.9)	0 (0)	
Throat pain					
Present	35 (71.4)	1 (2)	10 (20.4)	3 (6.1)	0.542
Absent	27 (61.4)	3 (6.8)	12 (27.3)	2 (4.5)	
Headache					
Present	22 (71)	1 (3.2)	7 (22.6)	1 (3.2)	0.879
Absent	40 (64.5)	3 (4.8)	15 (24.2)	4 (6.5)	
Abdominal pain					
Present	36 (72)	1 (2)	11 (22)	2 (4)	0.513
Absent	26 (60.5)	3 (7)	11 (25.6)	3 (7)	

p<0.05, Data are presented as n (%).

DISCUSSION

Assessing pain perception in children is a challenging process in clinical practice due to their cognitive development levels and limited vocabulary.[6,8] This study was conducted to evaluate how children diagnosed with FMF express their chronic and recurrent pain processes through the symbolic language of colours and to assess the potential of this projective method as a diagnostic tool. The most important findings of our research are that children with FMF prefer dark/striking colours such as red and black when they are in pain, and colours such as white and blue during pain-free periods. Another noteworthy result of the study is that a statistically significant relationship was found between throat pain and colour groups.

Mahon et al.[5] demonstrated in their study, conducted using the 'Rainbow Pain Scale' (RPS) they developed, that colours are a personalised and child-centred method with high concurrent validity for expressing children's pain intensity. In our study, the most frequently preferred colours in the presence of pain were red and black, which is supported by the finding in Mahon et al.'s[5] study that red was the most frequently selected colour (22.4%) to describe the most severe pain category. Furthermore, the observation in Mahon et al.'s[5] study that children maintained the colour codes they had chosen without changing them over a 13-month follow-up period suggests that colour use could be a stable and reliable means of communication in diseases such as FMF, which are characterised by chronic and recurrent pain attacks. While Mahon et al.[5] emphasise the importance of each child creating their own rainbow (individual colour palette) and that this offers an alternative means of communication for children whose numerical concepts are not yet developed; In our study, the statistically significant correlation identified between throat pain and specific colour groups demonstrates that this symbolic language may have diagnostic value in clinical assessments and could play a critical role in understanding the subjective pain experience of paediatric patients.

In a study conducted by Altan et al.[4] to determine toothache in children in the Turkish population, red was found to be the colour most strongly associated with the presence of pain; in our study, the preference for red in the presence of pain is consistent with this finding. Altan et al.[4] stated that children most strongly associated pain perception with the colour red. Children's preference for white and blue colours during pain-free periods coincides with the findings of Altan et al.[4], who associated white and light blue with the absence of pain. However, the strong association of yellow with the absence of pain in the study by Altan et al.[4] may be due to cultural differences in perception or the type of illness (acute toothache vs. chronic FMF).

Bulloch and Tenenbein[9] noted in their study conducted in a paediatric emergency department setting that visual scales used to express children's pain (Faces Pain Scale and Colour Analog Scale) demonstrated high reliability and validity, and that visual tools play a critical role, particularly in children whose numerical concepts are not yet fully developed. In our study, the preference for red and black colours in the presence of pain coincides with the trend observed in Bulloch and Tenenbein's[9] study, where the preferred visual stimuli tend to become darker or more distinct as pain intensity increases. Bulloch and Tenenbein[9] emphasised the necessity of selecting a scale appropriate to the cognitive level of the child; the importance of selecting the correct scale is crucial in enabling children to concretise complex FMF attacks and communicate them more effectively to clinicians.

In our study, the selection of red and black colours most frequently in the presence of pain parallels the findings of Crawford et al.[18] whose experiments showed that children most often chose dark colours such as black and brown when colouring 'bad/ugly' figures. However, Crawford et al.[18] noted that in production tasks, where children freely drew their own experiences, there was no systematic link between a particular colour and a specific emotion such as happiness or sadness; children tended to use their favourite colours regardless of emotional content.

Bulloch et al.[10] demonstrated in their study conducted in a paediatric emergency department that the Colour Analogue Scale (CAS) showed a high degree of reproducibility and reliability in both traumatic and non-traumatic pain aetiologies. In our study, the most frequently preferred colours in the presence of pain, red and black, are theoretically consistent with the wide and red upper end design used by Bulloch et al.[10] in their CAS tool to represent the most severe pain. Furthermore, the statistical significance identified in our study between throat pain and colour groups extends Bulloch et al.'s[10] findings that CAS is a reliable self-reporting tool for different pain types (abdominal pain, headache, etc.) to the paediatric FMF population.

The results of this study, which assessed pain perception in children with FMF through colours, are significantly supported by current literature discussions on the effectiveness of visual self-reporting tools in the paediatric population. It is of great importance in that it presents a self-reporting model that is cognitively appropriate, original, and clinically valid for paediatric groups for whom numerical concepts are insufficient in the literature.

Among the limitations of the study, the adoption of a single-centre design and the limited sample size of children with FMF are key factors limiting the generalisability of the findings. Furthermore, individual favorite color preferences and clinical confounders—such as disease severity, mood, and precise pain intensity—were not controlled or integrated into the statistical model. The subjective nature of FMF attacks and the immediate emotional state of children during the study may also influence colour assignments. Future studies designed with larger, multi-centre sample groups, including multi-variable analyses to isolate these confounding factors and comparing different age subgroups or cultural settings, will be important in supporting the validity of this method.

CONCLUSION

This study demonstrates that expressing pain perception through colours in children diagnosed with Familial Mediterranean Fever (FMF) may be a reliable, child-centred, and cognitively appropriate method in the clinical assessment process. The use of colours in a paediatric patient group that struggles to express numerical and abstract concepts can strengthen doctor-patient communication by concretising complex attack processes and can bring chronic pain monitoring to a more objective ground. Consequently, integrating colour-based self-reporting tools into clinical practice for diseases characterised by recurrent pain attacks, such as FMF, may be critically important for accurately understanding children's subjective pain experience and developing more effective pain management strategies..

ETHICAL DECLARATIONS

Ethics Committee Approval: Ethical approval for the study was obtained from the Tokat Gaziosmanpaşa University Clinical Research Ethics Committee (Date: 02.07.2019, Decision No: 19-KAEK-167/560).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The author declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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