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# Fatherhood concerns and reproductive awareness in ankylosing spondylitis and Behçet's disease: A cross-sectional study

## Ankilozan spondilit ve Behçet hastalığında babalık kaygıları ve reprodüktif farkındalık: Kesitsel bir çalışma

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## Abstract

**Objective:** This study aimed to evaluate fatherhood planning, fatherhood-related concerns, and paternal medication awareness among men with ankylosing spondylitis (AS) and Behçet's disease (BD) and to explore factors associated with these concerns, including disease activity, anxiety, and depressive symptoms.

**Methods:** This cross-sectional survey included male patients with AS according to the 1984 Modified New York criteria and with BD according to the 1990 International Study Group criteria. Participants completed a 12-item questionnaire assessing paternal history, fatherhood planning, awareness of medication use during conception, and fatherhood-related concerns. Disease activity was assessed using Ankylosing Spondylitis Disease Activity Score-C-reactive protein for AS and Behçet Syndrome Activity Score for BD. Anxiety and depressive symptoms were assessed using the anxiety (HADS-A) and depression (HADS-D) subscales of the Hospital Anxiety and Depression Scale (HADS). Between-group comparisons and exploratory within-disease analyses were performed.

**Results:** A total of 145 men were included: 99 with AS and 46 with BD. Mean age and disease duration were similar between groups. Of relevant respondents, 42.6% had consulted a rheumatologist before conception, whereas only 15.9% of the overall cohort knew whether their medications could harm the fetus/child. Nevertheless, 76.6% of respondents would consult a physician before future conception. Fear of disease transmission to offspring (67.6%) was the most frequent concern while 32.4% feared difficulty caring for a child because of their disease. In AS, depressive symptoms were associated with specific fatherhood-related concerns, whereas disease activity and structural findings were not associated with these concerns. In BD, no associations with disease-related factors, anxiety, or depressive symptoms remained significant after correction for multiple comparisons.

**Conclusion:** Men with AS and BD have substantial unmet needs regarding reproductive counseling, particularly concerning paternal medication awareness and fears of disease transmission. The high willingness to seek

## Özet

**Amaç:** Bu çalışmada, ankilozan spondilit (AS) ve Behçet hastalığı (BH) olan erkeklerde babalık planlaması, babalıkla ilişkili kaygılar ve paternal ilaç kullanımına ilişkin farkındalığın değerlendirilmesi; ayrıca hastalık aktivitesi, anksiyete ve depresif belirtiler dahil olmak üzere bu kaygılarla ilişkili faktörlerin araştırılması amaçlandı.

**Yöntem:** Kesitsel anket çalışmasına, 1984 Modifiye New York kriterlerine göre AS ve 1990 Uluslararası Behçet Hastalığı Çalışma Grubu kriterlerine göre BH tanısı alan erkek hastalar dahil edildi. Katılımcılara babalık öyküsü ve planlaması, konsepsiyon döneminde ilaç kullanımına ilişkin farkındalık ve babalıkla ilişkili kaygıları değerlendiren 12 soruluk bir anket uygulandı. Hastalık aktivitesi AS hastalarında Ankilozan Spondilit Hastalık Aktivite Skoru-C-reaktif protein, BH hastalarında Behçet Sendromu Aktivite Skalası ile değerlendirildi. Anksiyete ve depresif belirtiler, Hastane Anksiyete ve Depresyon Ölçeği'nin (HADS) sırasıyla anksiyete (HADS-A) ve depresyon (HADS-D) alt ölçekleri kullanılarak değerlendirildi. Gruplar arası karşılaştırmalar ve her hastalık grubu için keşifsel analizler yapıldı.

**Bulgular:** Çalışmaya toplam 145 erkek dahil edildi: 99'u AS'li, 46'sı ise BH'liydi. Ortalama yaş ve hastalık süresi gruplar arasında benzerdi. İlgili soruyu yanıtlayanların %42,6'sı konsepsiyon öncesinde bir romatoloğa danışmışken, tüm kohortun yalnızca %15,9'u kullandıkları ilaçların fetüse/çocuğa zarar verip veremeyeceğini biliyordu. Buna karşın, %76,6'sı gelecekteki bir konsepsiyon öncesinde hekime danışacağını belirtti. En sık bildirilen kaygı, hastalığın çocuğa geçmesi korkusuydu (%67,6); %32,4'ü ise hastalıkları nedeniyle çocuk bakımında güçlük yaşamaktan endişe duyuyordu. AS grubunda depresif belirtiler babalıkla ilişkili bazı kaygılarla ilişkiliyken, hastalık aktivitesi ve yapısal bulgularla ilişki saptanmadı. BH grubunda hastalıkla ilişkili faktörler, anksiyete veya depresif belirtilerle saptanan ilişkilerin hiçbiri çoklu karşılaştırma düzeltmesi sonrasında anlamlılığını korumadı.

**Sonuç:** AS ve BH olan erkeklerde, özellikle ilaç kullanımına ilişkin farkındalık ve hastalığın çocuğa geçmesine yönelik kaygılar açısından reprodüktif danışmanlık konusunda önemli karşılanmamış gereksinimler

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## Abstract

medical advice before future conception highlights an opportunity for proactive reproductive counseling in routine rheumatology care.

**Keywords:** Ankylosing spondylitis, Behçet's disease, fatherhood, reproductive counseling, anxiety, depression

## Özet

bulunmaktadır. Gelecekteki bir konsepsiyon öncesinde tıbbi danışmanlık alma isteğinin yüksek olması, rutin romatoloji pratiğinde proaktif reprodüktif danışmanlık için önemli bir fırsat sunmaktadır.

**Anahtar Kelimeler:** Ankilozan spondilit, Behçet hastalığı, babalık, üreme danışmanlığı, anksiyete, depresyon

## Introduction

Ankylosing spondylitis (AS) is a chronic inflammatory disease that predominantly affects men, typically with onset before the age of 40, and is characterized by involvement of the sacroiliac joints and spine. In addition to axial manifestations, peripheral and extra-articular features contribute to the overall disease burden.[1] Behçet's disease (BD) is a multisystem vasculitis characterized by recurrent oral and genital ulcers, ocular involvement, and various systemic manifestations, including vascular and neurological involvement. Although BD affects both sexes, young men tend to have a more severe disease course. Disease onset typically occurs in the second to fourth decades of life.[2]

Men living with chronic inflammatory rheumatic diseases may face several reproductive health challenges. Reduced fertility and impaired reproductive capacity have been reported in men with inflammatory arthritis. Moreover, concerns related to disease activity, long-term prognosis, and treatment exposure may influence decisions regarding fatherhood, including delaying parenthood or planning smaller families.[3]

Despite these potential challenges, reproductive health discussions in rheumatology have traditionally focused on women, and fatherhood planning in men remains relatively under-addressed in routine clinical care. Current international recommendations emphasize that men with rheumatic diseases should also receive individualized counseling regarding medication use in the peri-conception period.[4-6] However, limited awareness and uncertainty regarding paternal medication safety may complicate reproductive decision-making.[7]

Beyond medical considerations, psychosocial factors are also likely to shape fatherhood planning. Men with chronic inflammatory diseases may worry about transmitting their disease to their children, being unable to care for a child due to pain, fatigue, or disability, or experiencing worsening disease in the context of parenting responsibilities.[8,9]

Although AS and BD frequently affect individuals during their reproductive years and require long-term immunomodulatory treatment, data specifically addressing fatherhood planning, paternal awareness of medication, and parenting-related concerns among men with these conditions remain limited. In this study, we aimed to evaluate fatherhood planning attitudes, paternal medication awareness, and parenting-related concerns in men with AS and BD, and to explore their associations with disease-related factors and anxiety and depressive symptoms.

## Materials and Methods

This cross-sectional survey was conducted in a tertiary rheumatology outpatient clinic. Adult male patients (≥18 years) diagnosed with AS according to the 1984 Modified New York criteria or with BD according to the 1990 International Study Group criteria were consecutively recruited during routine visits.[10,11]

Ethical approval was obtained from the Kocaeli University Non-Interventional Clinical Research Ethics Committee (approval no: KÜ GOKAEK-2022/15.04, project no: 2022/245, date: 15.09.2022). Written informed consent was obtained from all patients.

Participants completed a 12-item questionnaire developed by the investigators for this study to assess reproductive history, parenthood planning, pre-conception consultation with the rheumatologist, awareness of medications during the conception period, and parenting-related concerns. The questionnaire was designed as a descriptive survey rather than a psychometric scale, and no composite score was calculated. Formal psychometric validation, including pilot testing, test-retest reliability, and assessment of internal consistency, was not performed.

### Statistical Analysis

Demographic and clinical data, disease duration, smoking exposure, and current treatments were recorded. For BD, major organ involvement was documented; for AS, imaging features were recorded. Disease activity was assessed using Ankylosing Spondylitis Disease Activity Score-C-reactive protein (ASDAS-CRP) in AS[12] and Behçet Syndrome Activity Score (BSAS) in BD.[13] Anxiety and depressive symptoms were evaluated using hospital anxiety and depression scale-anxiety (HADS-A) and HADS-depression (HADS-D).[14]

Continuous variables were presented as mean ± standard deviation or median [interquartile range] and compared using Student's t-test or the Mann-Whitney U test, as appropriate. Categorical variables were compared using the chi-square test or, when appropriate, an exact test; exact tests were used when expected cell counts were small. $p<0.05$ was considered statistically significant. Given the exploratory nature of the within-disease analyses and the number of comparisons

performed, the Benjamini-Hochberg procedure was additionally applied to control the false discovery rate.

## Results

A total of 145 male patients were included: 99 with AS and 46 with BD. The mean age was 40.5±8.45 years in the AS group and 39.5±8.62 years in the BD group, while the mean disease duration was 12.1±6.73 and 10.5±7.79 years, respectively. The median number of children was 2 [0-2] in both groups. Corticosteroids were used by 2.0% of patients with AS and 34.8% of those with BD, while anti-tumor necrosis factor (TNF) therapy was used by 82.8% of patients with AS and 15.2% of those with BD. In the BD group, colchicine (73.9%) and azathioprine (67.4%) were commonly used.

Disease activity in AS, categorized by ASDAS-CRP, was inactive in 19.2% of patients, low in 40.4%, high in 28.3%, and very high in 12.1%. In the AS group, sacroiliitis grades were predominantly 3-4. Grade 2 sacroiliitis was observed in 14.1-15.2% of patients, grade 3 in 40.4-42.4% of patients, and grade 4 in 42.4-43.4% of patients. Syndesmophytes were present in 42.4% of AS patients. In the BD group, mucocutaneous involvement was observed in 97.8% of patients. Notably, vascular (41.3%) and ocular (39.1%) involvement were also frequent, suggesting a BD cohort characterized by prominent clinically significant organ involvement. Articular involvement (17.4%), gastrointestinal involvement (8.7%), and neurological involvement (6.5%) were less common. Mean BSAS was 10.6±12.3 (Table 1).

**Table 1. Baseline characteristics and clinical features of the study groups**

| | AS (n=99) | BD (n=46) |
|---|---|---|
| **Age** | 40.5±8.45 | 39.5±8.62 |
| **Education duration (years)** | 10.4±3.28 | 10.2±3.23 |
| **Disease duration (years)** | 12.1±6.73 | 10.5±7.79 |
| **Smoking (pack-years)** | 5 (0-17.5) | 0 (0-3) |
| **Alcohol use, n (%)** | 12 (12.1%) | 5 (10.9%) |
| **Regular exercise, n (%)** | 42 (42.4%) | 16 (34.8%) |
| **Marital status, n (%)** | 92 (92.9%) | 38 (82.6%) |
| **Number of children** | 2 [0-2] | 2 [0-2] |
| **NSAIDs** | 33 (33.3%) | - |
| **Steroids** | 2 (2%) | 16 (34.8%) |
| **Sulfasalazine** | 5 (5.1%) | 1 (2.2%) |
| **Methotrexate** | 1 (1%) | - |
| **Colchicine** | - | 34 (73.9%) |
| **Azathioprine** | - | 31 (67.4%) |
| **Cyclosporine** | - | 1 (2.2%) |
| **Anti-TNF therapy** | 82 (82.8%) | 7 (15.2%) |
| **Secukinumab** | 3 (3%) | - |
| **ASDAS-CRP** | 2.06±0.99 | - |
| **ASDAS-CRP categories (inactive/low/high/very high), n (%)** | 19 (19.2)/40 (40.4)/28 (28.3)/12 (12.1) | - |
| **BSAS** | - | 10.6±12.3 |
| **HADS-A** | 6.52±4.22 | 5.98±3.54 |
| **HADS-A category (normal/borderline/abnormal), (%)** | 53 (55.2)/29 (30.2)/14 (14.6)* | 34 (73.9)/6 (13.0)/6 (13.0) |
| **HADS-D** | 6.02±4.25 | 6.41±3.56 |
| **HADS-D category (normal/borderline/abnormal), (%)** | 66 (68.8)/16 (16.7)/14 (14.6)* | 30 (65.2)/11 (23.9)/5 (10.9) |
| **Syndesmophyte presence, n (%)** | 42 (42.4%) | - |
| **BD involvements, n (%)** | - | Mucocutaneous 45 (97.8%)<br>Articular 8 (17.4%)<br>Gastrointestinal 4 (8.7%)<br>Ocular 18 (39.1%)<br>Vascular 19 (41.3%)<br>Neurologic 3 (6.5%) |

Values are shown as mean ± SD, median (IQR), or n (%). *HADS data were available for 96 of 99 patients with AS
AS: Ankylosing spondylitis, ASDAS-CRP: Ankylosing Spondylitis Disease Activity Score-C-reactive protein, BD: Behçet's disease, BSAS: Behçet Syndrome Activity Score, HADS: Hospital Anxiety and Depression Scale, IQR: Interquartile range, NSAID: Non-steroidal anti-inflammatory drug, SD: Standard deviation, TNF: Tumor necrosis factor

Overall, 39.3% of participants reported having a child after diagnosis (Q1). Among patients who conceived after diagnosis, treatment at the time of conception differed between the AS and BD groups: biologic treatment was more frequent in AS, whereas non-biologic treatment was more frequent in BD (Q2, p=0.002). Among respondents to the relevant item, 42.6% had consulted a rheumatologist before conception (Q3). Child health problems (Q4, 8.9%) and pregnancy complications (Q5, 14.5%) were uncommon. Approximately one-quarter of participants (24.1%) reported planning to have children (Q6), while 9.7% believed that their disease might affect their ability to become fathers (Q7), and 8.3% believed that medications might affect their ability to become fathers (Q8). Only 15.9% reported knowing whether their medications could harm the fetus/child (Q9), whereas 76.6% stated that they would consult a physician before a future conception (Q10). Fear that the child might develop the disease was the most frequently reported fatherhood-related concern (Q11, 67.6%), while 32.4% reported fear of difficulty in caring for a child because of their disease (Q12). The distribution of responses to Q11 differed between AS and BD (p=0.041), largely because the BD group had a higher proportion of "not sure" responses, whereas the proportion of "yes" responses was similar between the groups (Table 2).

Additional subgroup analyses were performed to explore potential clinical and psychological determinants of fatherhood-related concerns within each disease group.

In the AS group, no significant associations were observed between questionnaire items Q6-Q12 and disease activity, presence of syndesmophytes, or radiographic sacroiliitis grade. The HADS-A category was associated with fear that the child might develop the disease (Q11; Fisher's exact p=0.046) and with fear of difficulty in caring for a child due to the disease (Q12; Fisher's exact p=0.012). HADS-D category was associated with fear that the disease might affect the ability to become a father (Q7; Fisher's exact p=0.039), fear that the child might develop the disease (Q11; Fisher's exact p=0.006), and fear that caring for a child would be difficult due to the disease (Q12; Fisher's exact p=0.001). After the Benjamini-Hochberg correction for multiple comparisons, only the associations of HADS-D with Q11 and Q12 remained statistically significant.

Table 3 presents the exploratory evaluation of questionnaire items Q6-Q12 in the BD group, stratified by major organ involvement. Nominal associations were observed between Q8 and ocular involvement (p=0.024) and neurological involvement (p=0.028). No other significant associations were observed between major organ involvement and questionnaire responses.

**Table 2. Parenthood planning questionnaire results**

| Item | Total (n=145) | AS (n=99) | BD (n=46) | p |
|---|---|---|---|---|
| **Q1. Child after diagnosis (yes)** | 57 (39.3) | 42 (42.4) | 15 (32.6) | 0.260 |
| **Q2. Treatment at conception*** | | | | |
| **Non-biologic** | 23/55 (41.8) | 12/41 (29.3) | 11/14 (78.6) | **0.002** |
| **Biologic** | 28/55 (50.9) | 26/41 (63.4) | 2/14 (14.3) | |
| **None** | 4/55 (7.3) | 3/41 (7.3) | 1/14 (7.1) | |
| **Q3. Consulted rheumatologist before conception (yes)*** | 23/54 (42.6) | 17/41 (41.5) | 6/13 (46.2) | 0.766 |
| **Q4. Child health problems (yes)*** | 5/56 (8.9) | 3/43 (7.0) | 2/13 (15.4) | 0.580 |
| **Q5. Pregnancy complications (yes)*** | 8/55 (14.5) | 7/42 (16.7) | 1/13 (7.7) | 0.664 |
| **Q6. Planning children (yes/no/not sure)** | 35 (24.1)/89 (61.4)/21 (14.5) | 25 (25.3)/60 (60.6)/14 (14.1) | 10 (21.7)/29 (63.0)/7 (15.2) | 0.898 |
| **Q7. Disease may affect fatherhood (yes/no/not sure)** | 14 (9.7)/114 (78.6)/17 (11.7) | 8 (8.1)/79 (79.8)/12 (12.1) | 6 (13.0)/35 (76.1)/5 (10.9) | 0.638 |
| **Q8. Medications may affect fatherhood (yes/no/not sure)** | 12 (8.3)/91 (62.8)/42 (29.0) | 7 (7.1)/67 (67.7)/25 (25.3) | 5 (10.9)/24 (52.2)/17 (37.0) | 0.198 |
| **Q9. Knows drugs can harm fetus/child (yes/no/not sure)** | 23 (15.9)/99 (68.3)/23 (15.9) | 14 (14.1)/73 (73.7)/12 (12.1) | 9 (19.6)/26 (56.5)/11 (23.9) | 0.095 |
| **Q10. Would consult physician before conception (yes/no/not sure)** | 111 (76.6)/19 (13.1)/15 (10.3) | 81 (81.8)/11 (11.1)/7 (7.1) | 30 (65.2)/8 (17.4)/8 (17.4) | 0.070 |
| **Q11. Fear of child developing disease (yes/no/not sure)** | 98 (67.6)/29 (20.0)/18 (12.4) | 68 (68.7)/23 (23.2)/8 (8.1) | 30 (65.2)/6 (13.0)/10 (21.7) | **0.041** |
| **Q12. Fear of difficulty caring for child (yes/no/not sure)** | 47 (32.4)/79 (54.5)/19 (13.1) | 35 (35.4)/53 (53.5)/11 (11.1) | 12 (26.1)/26 (56.5)/8 (17.4) | 0.401 |

*Indicates questions applicable to specific subgroups; percentages are based on available responses. Values are presented as n (%), unless otherwise indicated. Q2 and Q3 were evaluated among participants who conceived after diagnosis. Q4 and Q5 were answered only by participants with children; denominators represent the number of participants with available responses for each item. For subgroup-specific items, values are presented as n/N (%)
AS: Ankylosing spondylitis, BD: Behçet's disease

| Table 3. Associations between Behçet's disease involvement and questionnaire items (Q6-Q12) | | | | | | |
|---|---|---|---|---|---|---|
| | Mucocutaneous | Articular | Ocular | Gastrointestinal | Vascular | Neurological |
| **Q6** | 1.000 | 0.729 | 0.686 | 0.188 | 0.835 | 0.171 |
| **Q7** | 1.000 | 0.659 | 0.877 | 0.129 | 0.883 | 0.069 |
| **Q8** | 0.478 | 0.451 | **0.024** | 0.559 | 0.696 | **0.028** |
| **Q9** | 1.000 | 1.000 | 0.846 | 0.484 | 0.278 | 0.572 |
| **Q10** | 1.000 | 0.527 | 0.117 | 0.263 | 0.377 | 0.733 |
| **Q11** | 1.000 | 0.716 | 0.335 | 0.423 | 0.374 | 0.067 |
| **Q12** | 1.000 | 0.201 | 0.840 | 1.000 | 0.331 | 0.743 |

p-values were unadjusted and calculated using Fisher's exact test. The Benjamini-Hochberg procedure was applied to account for multiple comparisons; none of the associations remained statistically significant after FDR correction
FDR: False discovery rate

BSAS scores differed according to responses to Q8 (p=0.012), while HADS-D category was associated with responses to Q9 (p=0.030) and Q11 (p=0.038). No significant associations were observed between HADS-A category and questionnaire responses. None of these associations remained statistically significant after Benjamini-Hochberg correction for multiple comparisons. Given the small number of patients with neurological involvement (n=3), these findings should be interpreted cautiously.

In age-stratified analyses of the overall cohort (<40 vs. ≥40 years), among patients aged <40 years, AS patients more frequently reported planning to have children (Q6) (p<0.001) and consulting a physician before attempting conception (Q10) (p=0.040), whereas fear that the disease may prevent fatherhood (Q7) was more frequent in BD patients (p=0.007).

## Discussion

In this cross-sectional study, we evaluated fatherhood planning, paternal medication awareness, and parenting-related concerns among men with AS and BD. Our findings demonstrate important gaps in reproductive counseling and medication-related knowledge and substantial concerns regarding disease transmission and future parenting.

One of the most notable findings was the limited use of preconception counseling. Among respondents to the relevant item, only 42.6% reported having consulted a rheumatologist before conception. Furthermore, only 15.9% of the cohort reported knowing whether their medications could harm a fetus or a child. In contrast, 76.6% stated that they would consult a physician before a future conception. This discrepancy between previous counseling experience and willingness to seek future medical advice suggests an important opportunity for rheumatologists to address reproductive health more proactively. Current recommendations emphasize individualized counseling for men with rheumatic diseases during the peri-conception period, particularly regarding the reproductive safety of antirheumatic medications.[4-7]

Concerns about fatherhood extended beyond medication safety. Fear that the child might develop the disease was the most frequently reported concern, affecting 67.6% of participants. In addition, 32.4% reported fear of having difficulty caring for a child because of their disease, although only 9.7% believed that the disease might affect their ability to become fathers. These findings suggest that concerns about heredity and future parenting responsibilities may be more prominent than concerns about the ability to achieve fatherhood. Previous studies have similarly shown that men with inflammatory rheumatic diseases may experience uncertainty regarding heredity, reproductive health, and their future role as parents, which may influence family-planning decisions.[8,9]

Uncertainty regarding medication use also remains clinically relevant. Although only 8.3% of participants believed that their medications might affect their ability to become fathers, 29.0% were unsure, indicating substantial uncertainty concerning paternal treatment exposure. Current evidence is generally reassuring for several commonly used antirheumatic treatments in men, particularly TNF inhibitors. Studies evaluating pregnancy outcomes among partners of men exposed to TNF inhibitors have not demonstrated an increased risk of adverse pregnancy outcomes, while available studies have not shown clinically relevant impairment of sperm quality associated with TNF inhibitor therapy.[15-19] Providing patients with evidence-based information regarding paternal medication exposure may therefore help reduce uncertainty and support informed reproductive decision-making.[4-7,19]

Exploratory analyses in BD identified nominal associations between ocular and neurological involvement and concerns about the potential effects of medications on fatherhood (Q8). BSAS scores also differed according to responses to Q8, suggesting a possible relationship between disease activity and medication-related concerns. However, none of these associations remained statistically significant after correction for multiple comparisons, which may reflect, in part, the limited sample size of the BD group (n=46). Moreover, neurological involvement was present

in only three patients, further limiting the robustness of the subgroup analyses. Therefore, these findings should be interpreted cautiously and considered hypothesis-generating. Although overall fertility in BD has generally been reported to be comparable to that of the general population, concerns regarding treatment-related gonadotoxicity may still influence reproductive decision-making, particularly in patients exposed to potentially gonadotoxic agents.[20,21]

In AS, fatherhood-related concerns were not associated with ASDAS-CRP, syndesmophyte presence, or radiographic sacroiliitis grade. In contrast, depressive symptoms were associated with specific fatherhood-related concerns; the associations between HADS-D and fear of disease transmission to the child (Q11) and difficulty caring for a child (Q12) remained significant after correction for multiple comparisons. Anxiety and depressive symptoms are common in axial spondyloarthritis and have been associated with greater disease burden and poorer patient-reported outcomes.[22,23] Although parenting-related concerns in men with rheumatic diseases remain relatively understudied, previous research has identified issues related to disease heritability, medication effects on offspring, and the ability to fulfill parenting responsibilities owing to pain, fatigue, or disability. Such issues may also be infrequently addressed during routine rheumatology care, highlighting an unmet need for reproductive and parenting-related information among male patients.[9]

Sexual dysfunction may represent an additional burden in this context. Meta-analytic data indicate a higher prevalence of erectile dysfunction among men with AS compared with healthy controls.[24] Similarly, impaired sexual function has been reported in men with BD and has been associated with anxiety and depressive symptoms and poorer quality of life.[25] These difficulties may further contribute to fatherhood-related concerns and reproductive decision-making, even when biological fertility is not clearly impaired.

### Study Limitations

This study has several limitations. Its cross-sectional, single-center design limits causal interpretation and generalizability. The relatively small sample size, particularly in the BD group and specific organ involvement subgroups, limited the statistical power of the exploratory analyses. Fatherhood-related concerns were self-reported, and detailed biological fertility parameters and partner-related factors were not assessed. In addition, the 12-item questionnaire was developed specifically for this study and did not undergo formal psychometric validation or pilot testing, which should be considered when interpreting the findings.

Taken together, our findings indicate a clear gap between reproductive information needs and the provision of counseling among men with AS and BD. The low level of paternal medication awareness, despite a high willingness among fathers to seek medical advice before future conception, suggests that reproductive health could be discussed more proactively in routine rheumatology care. In AS, the associations between depressive symptoms and specific fatherhood-related concerns further suggest that reproductive counseling should consider not only medication safety but also patients' concerns regarding disease transmission and future parenting responsibilities. Individualized, evidence-based counseling may therefore facilitate informed reproductive decision-making among men with chronic inflammatory rheumatic diseases.[4-7,19]

## Conclusion

Men with AS and BD have important unmet needs in reproductive counseling, particularly the safety of paternal medications and the risk of disease transmission to offspring. Despite limited medication-related knowledge and previous preconception counseling, most participants expressed a willingness to seek medical advice before future conception. Integrating individualized reproductive counseling into routine rheumatology care may help address these informational needs and support informed fatherhood planning.

### Ethics

**Ethics Committee Approval:** Ethical approval was obtained from the Kocaeli University Non-Interventional Clinical Research Ethics Committee (approval no: KÜ GOKAEK-2022/15.04, project no: 2022/245, date: 15.09.2022).

**Informed Consent:** Written informed consent was obtained from all patients.

### Footnotes

This study was previously presented as an oral presentation at a national rheumatology meeting (Spondiloartritler 2024).

### Authorship Contributions

Concept: A.K., Ö.S.Ç., A.Y., A.Ç., Design: A.K., Data Collection and Processing: A.K., Ö.S.Ç., S.Ş., Analysis or Interpretation: A.K., D.T.K., A.Y., A.Ç., Literature Search: A.K., Writing: A.K., Ö.S.Ç., D.T.K.

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