

**Original Article – Andrology****How Do Urologists Approach Hematospermia? A Cross-Sectional Study Among Specialists and Residents**

Ürologlar Hematospermiye Nasıl Yaklaşır? Uzmanlar ve Asistanlar Arasında Yapılan Kesitsel Bir Çalışma

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Abstract

Objective: To investigate the diagnostic, therapeutic, and clinical attitudes of urology residents and specialists in Türkiye toward hematospermia.

Materials and Methods: A cross-sectional electronic survey was conducted between July 17 and August 17, 2025, among urology specialist and residents actively practicing in Türkiye. The questionnaire assessed participants' demographic characteristics, frequency of hematospermia (HS) cases, diagnostic and treatment preferences, and perceptions regarding the condition's psychosocial impact. Descriptive statistics were used, and group comparisons were performed using Pearson's chi-square or Fisher's exact test.

Results: A total of 101 urologists (56 specialists and 45 residents) participated. While 57.4% had managed over 10 HS cases, 68.3% reported most patients were between 30–50 years old. Physical examination was routinely performed by over half of both groups. Residents were more likely than specialists to order urine cultures (86.7% vs. 57.1%, $p=0.003$). Recurrent HS and urinary symptoms were common triggers for further diagnostic evaluation. Quinolones were the most preferred antibiotics, significantly more so among specialists (81.8% vs. 40.0%, $p<0.001$). Specialists had higher experience with surgical/interventional procedures ($p=0.001$). Most participants considered patient age, symptoms, and clinical context in their overall approach. Approximately 60% of urologists believed HS negatively impacted patients sexual lives.

Conclusion: Despite general agreement on a symptom-guided approach, notable differences exist between urology residents and specialists regarding diagnostic tests, antibiotic use, and procedural interventions for HS. The findings highlight the need for standardized management guidelines and improved educational strategies.

Keywords: hematospermia, cross-sectional studies, residency, specialists

Özet

Amaç: Türkiye'deki üroloji asistanları ve uzmanlarının hematospermiye yönelik tanı, tedavi ve klinik yaklaşımlarını araştırmak.

Gereçler ve Yöntemler: 17 Temmuz ile 17 Ağustos 2025 tarihleri arasında, Türkiye'de aktif olarak çalışan sertifikalı ürologlar ve asistanlar arasında kesitsel bir elektronik anket gerçekleştirildi. Anket, katılımcıların demografik özelliklerini, hematospermi (HS) vakalarının sıklığını, tanı ve tedavi tercihlerini ve bu durumun psikososyal etkisine ilişkin algılarını değerlendirdi. Tanımlayıcı istatistikler kullanıldı ve grup karşılaştırmaları Pearson ki-kare testi veya Fisher'in kesin testi kullanılarak yapıldı.

Bulgular: Toplam 101 ürolog (56 uzman ve 45 asistan) katıldı. Katılımcıların %57,4'ü 10'dan fazla hematospermi vakası yönetmişken, %68,3'ü çoğu hastanın 30-50 yaşları arasında olduğunu bildirmiştir. Her iki grubun da yarısından fazlası rutin olarak fizik muayene yapmıştır. Asistanlar, uzmanlara göre idrar kültürü isteme eğiliminde daha fazladır (%86,7'ye karşı %57,1, $p=0,003$). Tekrarlayan hematospermi ve üriner semptomlar, ileri tanı değerlendirmesi için yaygın tetikleyicilerdi. Kinolonlar en çok tercih edilen antibiyotiklerdi ve uzmanlar arasında bu oran önemli ölçüde daha yüksekti (%81,8'e karşı %40,0, $p<0,001$). Uzmanlar cerrahi/girişimsel prosedürler konusunda daha fazla deneyime sahipti ($p=0,001$). Katılımcıların çoğu, genel yaklaşımlarında hastanın yaşını, semptomlarını ve klinik bağlamı dikkate aldı. Ürologların yaklaşık %60'ı hematosperminin hastaların cinsel yaşamlarını olumsuz etkilediğine inanıyordu.

Sonuç: Semptom odaklı yaklaşım konusunda genel bir fikir birliği olmasına rağmen, hematospermi için tanı testleri, antibiyotik kullanımı ve prosedürel müdahaleler konusunda üroloji asistanları ve uzmanları arasında önemli farklılıklar bulunmaktadır. Bulgular, standartlaştırılmış tedavi kılavuzlarına ve iyileştirilmiş eğitim stratejilerine duyulan ihtiyacı vurgulamaktadır.

Anahtar kelimeler: hematospermi, kesitsel çalışmalar, asistanlık, uzmanlar

Introduction

Hemospermia (HS), characterized by the presence of blood in semen, is a relatively rare clinical finding that often causes significant concern for patients despite its typically benign nature. While a specific etiology is frequently not identified, underlying infectious, inflammatory, or—less commonly—malignant conditions may occasionally be responsible [1]. Although HS is often a self-limiting condition, further evaluation may be warranted based on factors such as the patient's age, recurrence of symptoms, and the presence of accompanying findings. Diagnostic assessments may include urinalysis, urine or semen cultures, digital rectal examination, prostate-specific antigen (PSA) testing, transrectal ultrasonography, and pelvic magnetic resonance imaging in selected cases [2]. The 2025 guidelines of the European Association of Urology (EAU) on Male Sexual and Reproductive Health propose a structured diagnostic pathway for HS, recommending further evaluation particularly in men over 40 years of age, in cases of recurrent episodes, or when accompanied by additional urological symptoms [3].

Nevertheless, despite the presence of evidence-based guidelines, diagnostic and therapeutic approaches to HS remain highly variable in routine clinical settings. In Türkiye, factors such as differences in clinical experience, institutional protocols, and educational backgrounds may contribute to this variability among urologists. However, there is a lack of data on how HS is actually evaluated and managed in everyday urological practice across the country. This study aimed to assess the diagnostic and treatment approaches toward HS among practicing urologists and residents in Türkiye through a pilot cross-sectional survey involving participants from diverse institutions.

Material and Methods

Study Design and Participants

This study was designed as a cross-sectional survey conducted between July 17, 2025, and August 17, 2025. The target population consisted of urology specialists and residents actively practicing in Türkiye. Inclusion criteria were: (1) being urology specialist or resident in training within Türkiye, (2) providing informed consent at the beginning of the survey, and (3) completing the questionnaire fully and consistently. Participants who did not provide consent, were not affiliated with urology, or submitted incomplete or inconsistent responses were excluded.

Data Collection

Data were collected via an anonymous, self-administered electronic questionnaire distributed during national, regional, and local urology congresses, symposiums, and scientific meetings. At each event, the researchers presented a brief explanation of the study's purpose and invited voluntary participation. Participants completed the survey electronically using a secure, anonymous link. No personally identifiable or contact information was collected.

Survey Content

The questionnaire included items assessing participants' demographic characteristics (e.g., academic title, years of experience, institutional setting), the number of HS cases they had encountered, their diagnostic and therapeutic approaches, and their perceptions of HS's psychosocial impact. The survey was designed specifically for this study and underwent internal validation by the research team prior to distribution.

Ethical Considerations

Participation was entirely voluntary and anonymous. All participants were informed that they could withdraw at any time without penalty. The study protocol was reviewed and approved by the institutional ethics committee of Haydarpaşa Numune Training and Research Hospital (HNEAH-GOAEK/KK/2025/79), in accordance with the Declaration of Helsinki and Good Clinical Practice (GCP) guidelines.

Statistical Analysis

All statistical analyses were conducted using IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize the data. Categorical variables were presented as frequencies and percentages. Comparisons between urology residents and specialists were performed using Pearson's chi-square test. When the expected frequency in any cell was less than 5, Fisher's exact test was applied. A p-value of <0.05 was considered statistically significant. For multiple-response questions, each answer option was treated as a separate binary variable (selected vs. not selected), and comparisons between groups were performed using Pearson's chi-square or Fisher's exact test accordingly. Individual p-values for each response item are reported in the corresponding tables.

Results

A total of 101 urologists participated in the study, including 56 specialists (55.4%) and 45 residents (44.6%). Among the residents, the largest proportion were in their third year of training (n=20, 19.8%), followed by fourth-year or higher (n=13, 12.9%), second year (n=7, 6.9%), and first-year (n=5, 5.0%) trainees. Regarding clinical experience, 12 participants (11.9%) had less than 2 years of practice, 36 (35.6%) had 3–5 years, 18 (17.8%) had 6–10 years, and 35 (34.7%) had over 10 years of professional experience. The majority of respondents were affiliated with training and research hospitals (59.4%), followed by university hospitals (24.8%), state hospitals (8.9%), and private institutions (6.9%) (**Table 1**).

In terms of HS case exposure, 57.4% of participants reported having seen more than 10 patients with HS, whereas 27.7% had seen between 1–5 cases and 12.9% had encountered 6–10 cases. Only 2 participants (2.0%) reported no prior experience with HS cases. When asked about the age group most commonly affected, 68.3% of urologists indicated that the majority of their HS patients were aged between 30–50 years. Younger patients (<30 years) and those older than 50 years were reported less frequently (13.9% and 15.8%, respectively). Among 22 participants who had diagnosed malignancy in HS cases, prostate cancer was the most commonly identified (77.3%), followed by bladder cancer (13.6%) and testicular cancer (9.1%) (**Table 1**).

When evaluating patients presenting with HS, most respondents—both residents (55.6%) and specialists (51.8%)—reported routinely performing a physical examination that includes the testes, prostate, and perineum. A substantial proportion, however, indicated that they perform such examinations only in the presence of symptoms (residents: 37.8%, specialists: 37.5%). There was no statistically significant difference between groups ($p=0.870$). In terms of initial diagnostic testing, urinalysis was the most commonly ordered investigation by both residents (93.3%) and specialists (83.9%). Notably, residents were significantly more likely to request a urine culture (86.7% vs. 57.1%, $p=0.003$). Ejaculate culture was requested by approximately one-third of both groups, while condom testing was rarely used. Interestingly, 8.9% of specialists reported not ordering any tests during the initial episode, whereas none of the residents did so. Regarding indications for further diagnostic evaluation, recurrent HS was universally cited by residents (100%) and commonly by specialists (69.4%) as a trigger. Other frequently reported factors included accompanying urinary symptoms or hematuria (residents: 73.3%, specialists: 85.7%),

abnormal digital rectal examination findings (77.8% vs. 69.6%), and a family history of prostate cancer (82.2% vs. 76.8%). Age over 40 was more often considered an indication by specialists (69.6%) than residents (46.7%), though the difference was not statistically significant ($p=0.055$) (**Table 2**).

The majority of both groups preferred a selective approach to PSA testing, with 73.3% of residents and 75.0% of specialists indicating they would order PSA only in patients older than 40 years with recurrent HS. Routine PSA testing was less common (residents: 20.0%, specialists: 21.4%), and a small number of participants reported never ordering PSA (6.7% and 3.6%, respectively; $p=0.815$). In terms of imaging, recurrent HS (residents: 86.7%, specialists: 76.8%) and accompanying hematuria (77.8% vs. 80.4%) were the most common indications. Age over 40 and palpable testicular mass were also frequently reported as triggers. Notably, specialists were more likely than residents to perform imaging in all patients regardless of findings (26.8% vs. 6.7%; $p=0.122$). The most frequently preferred imaging modality was urinary system ultrasonography (residents: 66.7%, specialists: 69.6%), followed by scrotal ultrasonography (35.6% vs. 46.4%) and pelvic magnetic resonance imaging (35.6% vs. 39.3%). Transrectal ultrasound was less frequently used, and no participants reported using computed tomography as their primary imaging method ($p=0.638$) (**Table 2**).

Regarding the initiation of antibiotic therapy in HS, most respondents reported that the presence of infectious findings was the primary determinant, particularly among residents (66.7%) compared to specialists (46.4%). Although not statistically significant ($p=0.071$), specialists were more likely to initiate antibiotics for all patients at the first visit (12.5% vs. 4.4%) or to refrain from prescribing antibiotics altogether (7.1% vs. 0%). There was a statistically significant difference in the choice of antibiotic group between the two groups ($p<0.001$). Quinolones were the most preferred antibiotics among both groups but were markedly more common among specialists (81.8%) than residents (40.0%). Residents were more likely to prefer alternatives such as trimethoprim-sulfamethoxazole (28.9% vs. 12.7%) and tetracyclines (22.2% vs. 5.5%). Broad-spectrum beta-lactams were selected by a small proportion of residents (8.9%) and none of the specialists (**Table 3**).

When asked about prior experience with interventional procedures for HS, specialists reported significantly higher rates of surgical or diagnostic interventions ($p=0.001$). These included

transrectal aspiration of prostatic cysts (23.2% vs. 8.9%), cystourethroscopy with fulguration of prostatic varices (23.2% vs. 4.4%), and transurethral incision of utricular cysts (23.2% vs. 11.1%). While most residents (82.2%) had not performed any procedure for HS, this proportion was notably lower among specialists (57.1%). Finally, 25.0% of specialists and 17.8% of residents reported having diagnosed malignancy in patients followed for HS, though the difference did not reach statistical significance ($p=0.382$) (**Table 3**).

When asked about their overall clinical approach to HS, the majority of both residents (68.9%) and specialists (69.6%) reported that their management strategies vary depending on patient-related factors such as age, accompanying symptoms, and overall clinical context. A smaller proportion of participants stated that they primarily exclude infectious causes and recommend follow-up (residents: 20.0%, specialists: 17.9%). A more cautious approach was adopted by 12.5% of specialists and 6.7% of residents, who indicated that they perform a thorough evaluation in all patients due to the potential risk of malignancy. Only a few residents (4.4%) considered HS to be a benign and self-limiting condition requiring no further investigation. The differences between groups were not statistically significant ($p=0.419$) (**Table 4**).

In terms of the perceived impact of HS on patients' sexual lives, a substantial proportion of respondents believed that the condition caused anxiety and led to reduced sexual activity in most patients (residents: 64.4%, specialists: 46.4%). Others felt the impact was usually temporary (31.1% vs. 44.6%), while only a minority believed HS had no significant effect (2.2% and 7.1%, respectively). The difference in perceptions between residents and specialists did not reach statistical significance ($p=0.232$) (**Table 4**).

Discussion

Although HS is most often a benign and self-limiting finding, it continues to elicit heterogeneous clinical approaches and may impose considerable psychological burden on patients. The present study, based on responses from urologists across various institutions in Türkiye, revealed notable differences between specialists and residents in terms of diagnostic testing, antibiotic preferences, and attitudes toward interventional procedures, thereby highlighting the educational dimension of HS management.

International literature indicates that HS rarely requires extensive diagnostic evaluation. The 2025 guidelines of the European Association of Urology recommend further investigations

only in men over 40 years of age, in cases of recurrent episodes, or when concomitant urinary symptoms are present [3]. Hakam et al. [4], in a large U.S. claims database analysis, reported that the association between HS and malignancy is exceedingly weak, with risks of 0.01% in individuals under 40 years and 0.11% in those aged 40 years and above. These findings suggest that aggressive diagnostic interventions are often unnecessary, particularly in younger patients. Nevertheless, persistent variation in test and imaging preferences among clinicians indicates that guideline recommendations are not fully translated into everyday practice and underscores the need for greater standardization within urology training programs.

Considerable heterogeneity is likewise observed in treatment strategies. Efesoy et al. [2] highlighted infection as the primary indication for initiating antibiotic therapy, while Dittmar et al. [5] demonstrated a strong association between epididymitis and HS, underscoring the pivotal role of infection in clinical decision-making. Yet, the tendency of some clinicians to rely on broad-spectrum regimens raises substantial concerns regarding antimicrobial resistance. Cinnamon et al. [6] reported that junior residents were more likely to prescribe broad-spectrum antibiotics compared with their senior counterparts, a finding not specific to HS but illustrative of how variability in prescribing practices may reflect broader knowledge gaps and shortcomings in educational mentorship. The relatively high preference for quinolone antibiotics, particularly among specialists, may reflect established prescribing habits or a lack of updated guidance specific to HS management. While quinolones are commonly used for urogenital infections, their widespread use raises concerns in the context of antibiotic stewardship and resistance development. These findings further underscore the need for updated, evidence-based protocols and enhanced training on rational antibiotic use within urology education programs. Consistent with these observations, Sebel et al. [7], in their SWOT analysis of urology residency, emphasized that antibiotic stewardship, structured decision-making algorithms, and adherence to standardized protocols are still insufficiently incorporated into residency curricula. Similarly, Makarov et al. [8], in the American Urological Association consensus statement, underscored that shared decision-making—an essential component of patient-centered care—remains only partially integrated into urological practice and should be more robustly embedded within training programs.

Although HS is biologically of little clinical significance in most cases, its psychosocial impact is considerable. Gönültaş et al. [1], in a multicenter study, reported that a substantial proportion of patients diagnosed with HS experienced elevated levels of anxiety and adverse effects

on sexual life. Similarly, Suh et al. [9] emphasized that despite its generally benign biological nature, HS can impose a significant psychological burden on patients. Moreover, Barry et al. [10] identified shared decision making as a cornerstone of patient-centered care, while Makarov et al. [8] highlighted that the application of this model in urological practice strengthens physician–patient interaction, enhances patient satisfaction, and promotes active engagement in the treatment process.

The strength of this study lies in its inclusion of clinicians from different levels of experience and institutional backgrounds across Türkiye. However, certain limitations should be acknowledged. As a survey-based study, the findings rely on self-reported data and may be subject to recall or reporting bias. In addition, the voluntary nature of participation may have introduced selection bias, since urologists with a particular interest in HS may have been more likely to respond. Furthermore, the relatively modest sample size may limit the representativeness of the findings at a national level. The exclusive inclusion of participants from Türkiye may also limit the generalizability of the results to other healthcare settings. Future prospective, multicenter, and observational studies integrating both self-reported information and objective clinical data would provide more robust evidence regarding diagnostic and therapeutic variations. Overall, the heterogeneous approaches to HS management observed in this study reflect not only clinical diversity but also educational gaps. Stronger integration of standardized diagnostic and therapeutic algorithms into residency curricula, enhanced awareness of antimicrobial resistance, and the development of communication skills remain essential to improve the quality of urology training and promote greater consistency in clinical practice.

Conclusion

This cross-sectional survey revealed considerable heterogeneity in the diagnostic and therapeutic approaches to HS among urology specialists and residents in Türkiye. While most participants reported adopting a symptom-based evaluation strategy, significant differences were noted between groups regarding the frequency of test requests, antibiotic preferences, and experience with surgical interventions. Recurrent HS and accompanying urinary symptoms were the most frequently reported indications for further investigation. Nevertheless, some respondents still considered HS to be a benign and self-limiting condition. Additionally, many urologists

perceived HS as a factor that may negatively impact patients' sexual lives, highlighting the psychosocial dimension of the condition.

These findings, while limited by sample size, may help raise clinical awareness, identify educational needs, and inform the development of standardized guidelines for HS management. However, the cross-sectional design of the study and the voluntary nature of participation may introduce potential response bias and limit the generalizability of the results. Therefore, the results should be interpreted as exploratory and hypothesis-generating, and further studies with larger, representative samples are warranted.

Ethics Committee Approval: Ethical approval was obtained from the Ethics Committee of Haydarpaşa Numune Training and Research Hospital (Date: 17.06.2025, Protocol No: HNEAH-GOAEK/KK/2025/79).

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References

- [1] Gönültaş S, Baydilli N, Solakhan M, Güzel A, Kardaş S, Demirci A, et al. Etiology of hematospermia in Turkish men: multicentric study. *Balkan Med J* 2025;42:212–21. <https://doi.org/10.4274/balkanmedj.galenos.2025.2024-12-37>
- [2] Efesoy O, Cayan S, Akbay E. Novel algorithm for the management of hematospermia. *Turk J Urol* 2022;48:398–405. <https://doi.org/10.5152/tud.2020.20428>
- [3] Salonia A, Capogrosso P, Boeri L, Cocci A, Corona G, Dinkelman-Smit M, et al. European Association of Urology Guidelines on Male Sexual and Reproductive Health: 2025 Update on Male Hypogonadism, Erectile Dysfunction, Premature Ejaculation, and Peyronie's Disease. *Eur Urol* 2025;88:76–102. <https://doi.org/10.1016/j.eururo.2025.04.010>
- [4] Hakam N, Lui J, Shaw NM, Nabavizadeh B, Smith JF, Eisenberg ML, et al. Hematospermia is rarely associated with urologic malignancy: analysis of United States claims data. *Andrology* 2022;10:919–25. <https://doi.org/10.1111/andr.13189>

- [5] Dittmar F, Rosellen J, Reiser L, Fritzenwanker M, Hauptmann A, Diemer T, et al. Comprehensive evaluation of hematospermia in patients with acute epididymitis compared to patients with isolated hematospermia. *Andrology* 2024;12:1001–11. <https://doi.org/10.1111/andr.13489>
- [6] Cinnamon KA, Schulz LT, Sheehy AM, O'Neill SM, Lalik E, Fox BC. Antibiotic utilization variability among training services at an academic medical center: An observational study. *Infect Control Hosp Epidemiol* 2021;42:943–7. <https://doi.org/10.1017/ice.2020.1317>
- [7] Sebel LE, Katz EG, MacLachlan LS. A SWOT Analysis of urology residency. *Curr Urol Rep* 2021;22:61. <https://doi.org/10.1007/s11934-021-01080-8>
- [8] Makarov D V., Chrouser K, Gore JL, Maranchie J, Nielsen ME, Saigal C, et al. AUA White paper on implementation of shared decision making into urological practice. *Urol Pract* 2016;3:355–63. <https://doi.org/10.1016/j.urpr.2015.10.006>.
- [9] Suh Y, Gandhi J, Joshi G, Lee MY, Weissbart SJ, Smith NL, et al. Etiologic classification, evaluation, and management of hematospermia. *Transl Androl Urol* 2017;6:959–72. <https://doi.org/10.21037/tau.2017.06.01>
- [10] Barry MJ, Edgman-Levitan S. Shared decision making — The pinnacle of patient-centered care. *N Engl J Med* 2012;366:780–1. <https://doi.org/10.1056/NEJMp1109283>

Table 1. Demographic characteristics, clinical experience, and hematospermia-related case exposure of surveyed urologists

Title	(n: 101, %)
	Specialist: 56 (55.4%) Resident: 45 (44.6%)
Residency year (among residents only, n: 45)	1st Year: 5 (5.0%) 2nd Year: 7 (6.9%) 3rd Year: 20 (19.8%) 4th Year and above: 13 (12.9%)
Clinical experience duration	0–2 years: 12 (11.9%) 3–5 years: 36 (35.6%) 6–10 years: 18 (17.8%) >10 years: 35 (34.7%)
Institution	Training and research hospital: 60 (59.4%) University hospital: 25 (24.8%) State hospital: 9 (8.9%) Private hospital/clinic: 7 (6.9%)
Number of hematospermia cases encountered	0: 2 (2.0%) 1-5: 28 (27.7%) 6-10: 13 (12.9%) >10: 58 (57.4%)
Age group of hematospermia patients	>50 years: 16 (15.8%) 30-50 years: 69 (68.3%) <30 years: 14 (13.9%)
Diagnosed malignancies among HS patients	(n: 22, %) Prostate cancer: 17 (77.3%) Bladder cancer: 3 (13.6%) Testis cancer: 2 (9.1%)

Table 2. Diagnostic approaches of urology residents and specialists in the evaluation of hematospermia

	Resident (n:45)	Specialist (n:56)	P
Q6. Do you routinely perform a physical examination (testes, prostate, perineum, etc.) during the initial evaluation of patients presenting with hematospermia?			0.870 ¹
A1. Yes, always	25 (55.6%)	29 (51.8%)	
A2. Only if the patient is symptomatic	17 (37.8%)	21 (37.5%)	
A3. No	3 (6.7%)	6 (10.7%)	
Q7. Which tests do you typically request during the first episode of hematospermia?			0.003²
A1. Urine analysis	42 (93.3%)	47 (83.9%)	
A2. Urine culture	39 (86.7%)	32 (57.1%)	
A3. Ejaculate culture	14 (31.1%)	20 (35.7%)	
A4. Condom test	1 (2.2%)	0 (0%)	
A5. I do not request any tests	0 (0%)	5 (8.9%)	
Q8. Which of the following factors would prompt you to request advanced diagnostic evaluation in a patient with hematospermia?			0.055 ²
A1. Age >40	21 (46.7%)	39 (69.6%)	
A2. Recurrent hematospermia	45 (100%)	54 (69.4%)	
A3. Accompanying urinary symptoms or hematuria	33 (73.3%)	48 (85.7%)	
A4. Abnormal digital rectal examination findings	35 (77.8%)	39 (69.6%)	
A5. Family history of prostate cancer	37 (82.2%)	43 (76.8%)	
A6. I never request advanced diagnostic evaluation	0 (0%)	0 (0%)	
Q9. Do you request PSA testing in patients with hematospermia?			0.815 ¹
A1. Yes, always	9 (20.0%)	12 (21.4%)	
A2. Only if the patient is over 40 and has recurrent hematospermia	33 (73.3%)	42 (75.0%)	
A3. I do not request PSA	3 (6.7%)	2 (3.6%)	
Q10. Under which conditions do you request imaging for patients with hematospermia?			0.122 ²
A1. Age >40	19 (42.2%)	25 (44.6%)	
A2. Recurrent hematospermia	39 (86.7%)	43 (76.8%)	
A3. Accompanying hematuria	35 (77.8%)	45 (80.4%)	
A4. Palpable testicular mass	36 (80.0%)	44 (78.6%)	
A5. I request imaging for all patients	3 (6.7%)	15 (26.8%)	
A6. I never request imaging	0 (0%)	0 (0%)	
Q11. What is your most frequently preferred imaging modality in patients with hematospermia?			0.638 ²
A1. Scrotal ultrasound	16 (35.6%)	26 (46.4%)	
A2. Transrectal ultrasound	11 (24.4%)	19 (33.9%)	
A3. Urinary system ultrasound	30 (66.7%)	39 (69.6%)	
A4. Pelvic Magnetic Resonance Imaging	16 (35.6%)	22 (39.3%)	
A5. Computed tomography	0 (0%)	0 (0%)	

¹: Fisher Exact test; ²: Chi-square; Q: Question; A: Answer

Table 3. Therapeutic and interventional approaches in the management of hematospermia among urology residents and specialists

	Resident (n:45)	Specialist (n:56)	P
Q12. What is the most important factor guiding your decision to initiate antibiotic therapy in a patient with hematospermia?			0.071 ¹
A1. Presence of infectious findings	30 (66.7%)	26 (46.4%)	
A2. I start antibiotics for all patients at first visit	2 (4.4%)	7 (12.5%)	
A3. Presence of recurrent hematospermia	13 (28.9%)	19 (33.9%)	
A4. I do not initiate antibiotic therapy	0 (0%)	4 (7.1%)	
Q13. Which group of antibiotics do you generally prefer in patients with hematospermia?			<0.001 ¹
A1. Quinolones	18 (40.0%)	45 (81.8%)	
A2. Trimethoprim-sulfamethoxazole	13 (28.9%)	7 (12.7%)	
A3. Tetracyclines	10 (22.2%)	3 (5.5%)	
A4. Broad-spectrum beta-lactams	4 (8.9%)	0 (0%)	
Q14. Which of the following diagnostic or therapeutic procedures have you previously performed for patients with hematospermia?			0.001 ²
A1. Transrectal aspiration of prostatic cyst	4 (8.9%)	13 (23.2%)	
A2. Seminal vesiculectomy	3 (6.7%)	3 (5.4%)	
A3. Diagnostic cystourethroscopy with fulguration of prostatic varices	2 (4.4%)	13 (23.2%)	
A4. Seminal vesiculoscopy	1 (2.2%)	5 (8.9%)	
A5. Transurethral incision of utricular cyst	5 (11.1%)	13 (23.2%)	
A6. I have not performed any surgical/interventional procedure	37 (82.2%)	32 (57.1%)	
Q15. Have you ever diagnosed malignancy in a patient followed for hematospermia?			0.382 ²
A1. Yes	8 (17.8%)	14 (25.0%)	
A2. No	37 (82.2%)	42 (75.0%)	

¹: Fisher Exact test; ²: Chi-square; Q: Question; A: Answer

Table 4. General clinical attitudes and perceived psychosocial impact of hematospermia: comparison between urology residents and specialists

	Resident (n:45)	Specialist (n:56)	P
Q16. Which of the following best describes your overall approach to patients with hematospermia?			0.419 ¹
A1. I generally consider it a benign and self-limiting condition; further investigation is not necessary	2 (4.4%)	0 (0%)	
A2. I primarily rule out infectious causes and recommend follow-up in most cases	9 (20.0%)	10 (17.9%)	
A3. My approach varies depending on the patient's age, accompanying symptoms, and overall clinical picture	31 (68.9%)	39 (69.6%)	
A4. I try to perform a thorough evaluation in all patients due to the possibility of malignancy	3 (6.7%)	7 (12.5%)	
Q17. Based on your clinical observations or patient feedback, do you think hematospermia affects patients' sexual life?			0.232 ¹
A1. Yes, most patients feel anxious and reduce sexual activity	29 (64.4%)	26 (46.4%)	
A2. Some patients are temporarily affected	14 (31.1%)	25 (44.6%)	
A3. It has no significant effect on sexual life	1 (2.2%)	4 (7.1%)	
A4. I cannot comment on this matter	1 (2.2%)	1 (1.8%)	

¹: Fisher Exact test; ²: Chi-square; Q: Question; A: Answer