

Understanding Pediatric Experiences with Symptomatic Varicoceles: A Mixed Methods Study of an Online Varicocele Community

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Abstract

Background: Varicoceles affect up to 30% of postpubertal adolescent males. Studying this population remains difficult due to this topic's sensitive nature. Using the popularity of social media in this cohort and natural language processing (NLP) techniques, our aim was to identify perceptions of adolescent males on an internet varicocele forum to inform how physicians may better evaluate and counsel this pediatric population.

Objective: To characterize themes of discussion and specific concerns expressed by adolescents using a mixed methods approach involving quantitative NLP and qualitative annotation of an online varicocele community.

Methods: We extracted posts from the Reddit community r/Varicocele (5100 members) with criteria of discussant age ≥21 & word count >20. We employed qualitative thematic analysis using validated constant comparative method & an NLP technique called the meaning extraction method with principal component analysis (MEM/PCA) to identify discussion themes. We then interrogated 150 random posts to further characterize content based on NLP identified themes and calculated Kaiser-Meyer-Olkin (KMO) statistic and Bartlett's test.

Results: 1103 posts met eligibility criteria from 7/2015 to 6/2022. MEM/PCA and qualitative thematic analysis separately revealed key themes: varicocele overview (27%), management (19%), post-procedural experience (19%), seeking community (17%) & second opinion after visiting a physician (18%). KMO>0.60 & Bartlett's test <0.01 indicated appropriateness for MEM/PCA. Mean age was 17.5 y/o (range 14-21) trending toward higher grade (89% were 2+), left-sided varicoceles. Urologists account for over 50% of discussions among discussants and varicocelectomy remains the intervention of most intrigue. 60% of discussants described symptomatic varicoceles (90/150) with 62/90 reporting pain, 24/90 reporting hypogonadism symptoms and 45/90 reporting aesthetic as the primary concern.

Conclusions: We applied a mixed methods approach to identify uncensored concerns of adolescents with varicoceles. Adolescents often turned to social media as an adjunct to doctors' visits and to seek peer support. This population prioritized symptom control with emphasis on pain, aesthetics, sexual function and hypogonadism. This data highlights how adolescents may approach varicoceles uniquely, informing urologists how to better interface with this pediatric population. Clinical Trial: N/a

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Original Manuscript

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DATA AVAILABILITY

Posts that met inclusion criteria have been included as a supplementary file. To uphold privacy, we have made access restricted.

INTRODUCTION

Varicoceles affect 5-30% of postpubertal 12- to 18-year-old males [1]. Definitive management guidelines in this population remain poorly defined, but generally speaking, varicocele repair is recommended to preserve or improve fertility in pain-free adolescents with ipsilateral reduction in testicular size and/or evidence of abnormal semen analysis [2,3]. Families are presented with a range of management options including longitudinal observation with serial follow up versus an interventional approach. However, there remains a paucity of evidence that procedural treatment of adolescent varicocele is associated with improved testicular size or sperm concentration, and ultimate effects on fertility and paternity rates are unknown [3-5]. Because of the uncertain natural history, the treatment algorithm is complex to navigate for providers and often relies on patient preferences.

Social media provides a unique opportunity to understand adolescents' viewpoints and anxieties on how they navigate varicocele diagnosis, management, and treatment. Reddit is one such discussion platform with over 430 million monthly active users globally that has gained popularity in the discussion of health-related topics [6]. *R/varicocele* is the largest varicocele discussion board on Reddit and provides a platform for users to anonymously share their experiences, seek knowledge, disseminate resources, provide advice, belong to a community, and interact with each other [7]. Analysis of these sites can be informative for urologists to understand some of the concerns that adolescents with varicoceles and may aid in understanding key drivers of decision making. Additionally, the emergence of natural language processing (NLP) techniques has led to innovative uses in healthcare, however its use on patient centered experiences is limited. There remains discussion on how best to approach these methodologies [8]. Previous work has highlighted the role of web-based forums as a means of eliciting the sexual health problems of a group that has been reluctant to consult practitioners, peers, and others for personal health advice and information [9,10]. Additionally, recent studies have leveraged these discussions to uncover patient perspectives on erectile dysfunction, hypogonadism, and nephrolithiasis [11-13]; however, utilization specific to an

adolescent varicocele population has not been studied.

Due to the sensitive nature of the topic, there remains limited literature evaluating perceptions of varicoceles experienced in the pediatric population. Using a mixed methods approach, our aim was to understand adolescent patient perspectives and concerns on varicocele management. We hypothesized the content of online discussions posted by adolescents with varicoceles can be classified into themes that may inform how physicians evaluate, counsel, and treat this patient population. Specifically, we predicted discussants would focus chief complaints on sexual function, aesthetics, hypogonadism, and pain. This study may help providers improve interactions and communications with adolescent patients and ultimately allow for the provision of patient-centered care [10].

METHODS

We employed a convergent design for this mixed methods research study, whereby qualitative and quantitative data were collected and analyzed during a similar timeframe [14]. Prior studies have used this methodology to answer similar research questions and highlight the complementary roles of convergent design [11,12,15]. The study was exempt from institutional review board evaluation due to its use of anonymized, publicly available data from the internet. The study was comprised of four phases: 1) data extraction from Reddit; 2) classic qualitative thematic analysis; 3) NLP-based quantitative analysis to identify themes of discussion; and 4) manual mining of a subset of posts. We define a post as the discussant's original text entry onto the forum.

To obtain these data, we retrospectively extracted posts from the largest varicocele discussion board on the Reddit community, *r/varicocele* (<https://www.reddit.com/r/varicocele/>) [7]. A word count criterion (>20 words per post) was then placed to exclude potential spam, deleted text, and posts containing only a link to a website. All posts were then manually evaluated for self-reported age ≤ 21 . All remaining posts underwent NLP-based quantitative analysis while only a subset

underwent qualitative thematic analysis and manual mining.

Demographic information was manually solicited from the cohort of posts since authors frequently started discussions by providing information about their age and background. One challenge for data acquisition was the free form nature inherent to the website, thus all information was self-reported and not verified. In the event of ambiguity, we did not collect demographic data from that post. Therefore, all analyzed posts had an identifiable, self-reported age ≤ 21 . For other variables such as varicocele laterality or grade, this information was not uniformly available; however, a large subset self-reported this data. We extracted the following data: demographics (age, sex); relevant medical history (varicocele grade, laterality); health care visits (emergency room [ER], primary care physician [PCP], urologist, interventional radiology [IR], endocrinologist); treatment modalities discussed (observation, embolization, varicocelectomy); and any specific testing that may have occurred (such as bloodwork/semen analysis, and imaging like ultrasound). Discussions that mentioned multiple modalities were categorized separately and therefore not doubly counted.

Qualitative thematic analysis

We performed qualitative thematic analysis using 150 randomly selected posts. This number was selected based on prior studies demonstrating this quantity of posts as required to achieve thematic saturation, whereby no additional themes were identified with analysis of each additional post [12,13,15]. The study protocol specifically allowed for the addition of 50 more posts if thematic saturation was not reached by 150. This process would have been iteratively repeated until thematic saturation had been reached. The basis of our analysis used validated grounded theory and constant comparative methodology [16,17]. Two investigators independently analyzed text from each post to identify preliminary themes. These preliminary themes were then discussed among all authors before finalizing summary themes. Summary themes were independently identified for the 150 selected

posts and agreed upon by all reviewers. This method has been previously validated [13].

NLP-based quantitative analysis

Posts were separately subjected to an NLP technique called the meaning extraction method (MEM) with principal component analysis (PCA). MEM/PCA tracks words that cluster together to derive themes quantitatively [18]. This approach has been previously validated to reveal information about individuals' personalities, communication strategies, and behaviors [18-20].

To automate MEM, we used the topic modeling application Meaning Extraction Helper (MEH) version 2 [21]. Using MEH, each post was deconstructed into its component words while articles, prepositions, and transition words were removed. Remaining words were ranked by their frequencies of appearance in each post. Words were then subjected to PCA with varimax rotation using SPSS version 25 (Armonk, NY). PCA identified clusters of words that frequently appeared together. Each word was conferred a factor loading, representing the correlation coefficient between the word and cluster to which it belonged. We assigned a descriptive theme to each cluster based on the words within it. To assess applicability of PCA to each dataset, we calculated the Kaiser-Meyer-Olkin (KMO) statistic, a measure of sampling adequacy (>0.60), and Bartlett's test for sphericity, which determines whether significant correlations exist among variables of interest [22].

Ethical Considerations

All data used were publicly available and only used to observe public behaviors of patients experiencing symptomatic varicoceles. For further protections, all data obtained was anonymous, further de-identified during data analysis, and only available for pertinent research staff throughout the study.

RESULTS

We extracted 8542 posts from *r/varicocele* of which 6804 met inclusion criterion from inception (7/2015) to 6/2022. 1103 posts were identifiably posted by a discussant with a self-reported age ≤ 21 . All 1103 posts underwent quantitative NLP while 150 randomly selected posts underwent qualitative analysis and manual annotation. **Appendix Table 1** contains additional representative quotations that feature each theme described in the qualitative analysis. Of note, representative quotations have been abridged in the interest of space and profane language has been filtered.

Demographics are presented in **Table 1**. For those patients who reported specifics of their condition, the predominant discussant was an adolescent male with a left-sided varicocele that trended toward higher grade in presentation.

Table 1. Demographic details of the 150 randomly selected patients that underwent qualitative analysis. Data obtained was self-reported from the social media platform, *r/Varicocele* from 7/2022 until 6/2022. All eligible posts were required to self-report age however the rest of the reported details were not universally disclosed.

Demographic	
Age	17.5 years (SD: 2.2; Range: 14-21)
Varicocele Grade	
Not Mentioned	105
Grade 1	5 (+1)
Grade 2	10 (+3)
Grade 3	30 (+2)
Sidedness of Varicocele	
Not Mentioned	102
Left	76
Right	0
Bilateral	8
Timeline of post	
Prior to Procedure	120
After Procedure	30
Poster	
Individual	146

Other	4
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Qualitative Thematic Analysis

Young men turned to receive education about varicoceles. It was common for discussants to ask if varicoceles were associated with multiple conditions, including hypogonadism, infertility, cessation of puberty, chronic testicular pain, and malignancy.

I'm a 17 year old [sic] male and I just had lab work done to determine my testosterone levels since I've been experiencing ED, fatigue, depression, and such ...What do you guys think? Is there a definitive answer on varicoceles and T?

Discussants sought additional information about the efficacy of supplements which included horse chestnut, diosmin plus, and L-carnitine/acetyl-L-carnitine.

One of my friends also has a grade 3 varicocele and told me about how he takes horse chestnut extract pills.

Discussants at all stages of management used social media to find shared experiences among a common community. Young men often asked if people in the community had experienced similar symptomology.

I can still feel it but it's not as sensitive as the right one which I find to be concerning. Does anyone have a similar experience to this? Also, after having read through postings, y'all seem like a super supportive bunch and it makes me happy to see I'm not alone.

Many patients were distressed by their varicoceles and used r/varicocele as a source of emotional support. A subset of discussants felt their varicocele made them less masculine, and many discussants attributed poor sexual performance to varicocele presence.

It really started to stress me when it flared up and hindered my sex life. What really gets me angry is talking to doctors who say me feeling less masculine is all in my head!!!! I am deeply depressed to the point the point I'm contemplating suicide.

Young men used discussion forums as substitutes for doctors' visits. It was common to ask the community to diagnose their condition instead of seeking evaluation with a provider.

Im [sic] 16 years old and ive [sic] had pain in my left testicle/veins for 4 days now. My testicle feels heavy and i [sic] think it has gotten bigger. What is going on? Is this a varicocele?

Separately, discussants also used the forum to interpret lab/imaging results and receive a second opinion.

****Prolactin: 27.2 µg/L**** (range <20)

[...]

****SHBG: 36 nmol/L**** (18.3-54.1)

Seems Prolactin and LH are high, while FSH and Free Test are low. What could these values mean?

Discussants also queried treatment options of their varicoceles including conservative versus procedural management. For surgical management, discussants often worried about procedural risks and benefits.

So I just turned 20 and have had a huge grade 3 left side. The worry for me is the size of my left testicle. It's noticeably smaller than my right and since I sag constantly, I'm worried about the damage. If I get a surgery this year, will the size return to normal? What are the downsides?

Additionally, discussants asked if they were candidates for surgical management.

Is that enough to warrant embolization? I know embolization is a pretty safe procedure but I guess the idea of coils just being kind of left in my body scare [sic] me a bit. If the pain/discomfort I get from my varicocele is livable, do I not bother?

For the subset of individuals who underwent procedural varicocele management, it was common to discuss post-operative experiences. Discussants frequently shared their experience regarding procedural side effects as well as concerns regarding non-improving varicocele following procedural management. Adolescents were concerned about post-operative aesthetics. Additionally, those who successfully recovered reviewed what remedies they found helpful to address common post-operative complaints.

Just had microsurgery. I'm just a 17y/o kid and wanted to get it out before college. I've had a few sexual partners mention it after the fact, and I feel embarrassed when they mention it because I don't know how to explain, so its [sic] an insecurity as well. I want to know if your varicose veins will go away post op, or if there is anyway it'll get smaller.

Quantitative Thematic Analysis

Results of NLP are shown in **Table 2**. Using MEM/PCA, we identified thematic word clusters, which included words with a factor loading > 0.30 . The following themes emerged: concerns with surgery; basics of varicoceles; management; hypogonadism; varicocele evaluation; and semen analysis. KMO > 0.60 and Bartlett's test < 0.01 indicated appropriateness of MEM/PCA for these datasets.

Table 2. Quantitative analysis results. All 1103 eligible posts from r/Varicocele (7/2015-6/2022) underwent a natural language processing technique called the meaning extraction method (MEM) with principal component analysis (PCA). Using MEH, all textual data was deconstructed into its component words. PCA then identified word clusters of words that frequently appeared together and assigned a factor loading score (FL). Topics of discussion were then manually assigned by two independent reviewers. To assess for suitability, we calculated the Kaiser-Meyer-Olkin (KMO) statistic (>0.60) and Bartlett's test for sphericity.

Concerns with Surgery		Basics of Varicoceles		Management		Hypogonadism		Varicocele Evaluation	
Word	FL	Word	FL	Word	FL	Word	FL	Word	FL
Bed	0.548	Young	0.464	Procedure	0.545	Testosterone	0.538	Testicle	0.538
Walk	0.492	People	0.387	Coil	0.516	Libido	0.523	Left	0.492
Room	0.470	Condition	0.375	Embolization	0.483	Low	0.479	Ultrasound	0.470
Hospital	0.457	Research	0.346	Radiologist	0.465	Range	0.436	Lump	0.457
Wake	0.444	Mind	0.336	Perform	0.399	Test	0.434	Right	0.444
Sit	0.435	Live	0.333	Microsurgery	0.324	Erection	0.402	Dull	0.435
Swelling	0.432	Lead	0.327	Risk	0.306	Level	0.393	Ache	0.432
Hour	0.421	Worse	0.315	Post	0.304	Blood	0.386	Side	0.421
Day	0.401	Life	0.312			Normal	0.384	Small	0.401
Incision	0.400	Doctor	0.308			Sex	0.376		
Move	0.389	Affect	0.303			Weight	0.356		
Recovery	0.381	Call	0.301			Eat	0.331		
Update	0.377	Care	0.300			Lift	0.327		
Stay	0.335								
Painful	0.334								
Leg	0.324								
Better	0.318								
Week	0.318								
Easy	0.313								
Area	0.308								
Pain	0.308								
Push	0.307								
Longer	0.304								
Wear	0.303								
Under	0.303								
Stand	0.302								
Lay	0.302								
Night	0.301								

Management and provider discussions

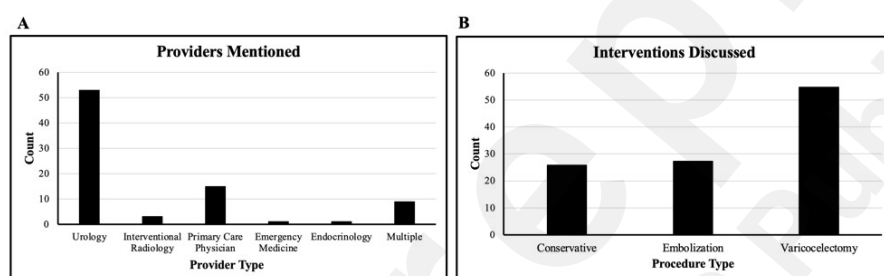
The most common reason discussants (27%, 40/150) sought *r/varicocele* was to learn about varicoceles; however, it remained common for adolescents to seek communal experiences (17%, 26/150); ask questions about management (19%, 29/150); share post-operative experiences (19%, 28/150); and receive information to supplement a doctor's visit (18%, 27/150) (**Figure 1A**).

When discussing experiences, at least 60% of discussants (90/150) reported symptomatic varicoceles. Most commonly, patients reported pain (62/90) and signs of hypogonadism (24/90). A

sizable cohort of patients discussed their concern with varicocele aesthetics (45/90).

When examining specific management, discussants were most likely to mention their experiences with urologists (53/82 of posts mentioning a provider) and most likely to discuss varicocelectomy when treatment was a topic of discussion (50%, 54/108) (**Figure 1B**). Additionally, 14% (21/150) mentioned an imaging modality; 52% (78/150) mentioned a physical exam finding; and 25% (38/150) mentioned testing for an associated condition (i.e. hormone testing and semen analysis).

Figure 1. Self-reported providers mentioned and interventions discussed. **(A)** Histogram of self-reported provides mentions. Note that some posts list more than one provider type. **(B)** Histogram of self-reported intervention discussed. Note that some posts list more than one intervention.



The convergent mixed methods design employed in this study allowed for analysis of areas of convergence or divergence between quantitative and qualitative datasets. The results of the qualitative analysis were verified by the quantitative analysis. Specifically, the quantitative portion provided a statistical and objective backbone to identifying topics of discussion.

DISCUSSION

This study represents an evaluation of a social media community focused exclusively on varicoceles using a mixed methodology. Both quantitative and qualitative thematic analysis revealed that a major reason adolescents engaged with internet discussion forums was to educate themselves on basic information related to varicoceles and associated symptoms, discuss post-operative

expectations, and guide decision-making for interventional management. Additionally, this platform served as an outlet for a second opinion.

We identified that 26% of discussants either described symptoms of hypogonadism or asked about serum testosterone testing. The prevalence of isolated hypogonadism in either adolescent or adult males with varicoceles has not been described; however, prior research has examined the effect of surgical repair on changes in serum testosterone level in adult males who underwent varicocelectomy for infertility, finding an increase in serum testosterone levels following repair [23]. Despite this finding, the surgical treatment of varicocele in an adult male for hypogonadism is controversial. Furthermore, diagnosing hypogonadism in adolescents is even less clear since classic symptoms of hypogonadism commonly found in older males such as decreased libido or erectile dysfunction are not usually present in this younger demographic. Additionally, there is no established reference range for serum testosterone in the developing adolescent male [24]. Understanding adolescent concerns surrounding hypogonadism is important so that this population can be correctly educated on the uncertain relationship between uncorrected adolescent varicocele and concurrent hypogonadism.

At every point in management, patients discussed sexual function, aesthetics, and hypogonadism as key drivers of decision-making. A sizable cohort discussed their concern with varicocele aesthetics, commenting that partners had mentioned it in the context of sexual activity which often made discussants feel embarrassed or insecure. Others felt it negatively affected their masculinity. Having a varicocele may negatively impair an adolescent male's self-esteem and hamper their ability to establish a positive sexual identity as a large portion of self-esteem during adolescence is derived from sexual identity [25]. Thus it is important for urologists to explore the degree of bother associated with the aesthetics of the adolescent's varicocele and for these concerns to not be dismissed.

Beyond filling gaps in factual knowledge, many individuals used social media to find shared

experiences among a common community, allowing them to communicate with their peers, seek advice, and receive emotional support. In this way, peer sexual communication provides a wealth of experiential information which could help adolescents manage anxiety and cope with uncertainty [26]. Prior studies have shown that young people frequently go online to ask if their sexual situations are “normal” or socially acceptable¹⁰. Advice from “similar others” – common experience, background, and views – is more powerful than advice from experts when it comes to online health information [26,27]. Results from our analysis may inform strategies for enhanced communication with adolescent varicocele patients.

Our study is not without limitations. First, Reddit is an anonymous forum on which information is self-reported and therefore not standardized, leaving much individual patient data unavailable. However, anonymity also allows for unfiltered discussions that many patients would feel uncomfortable discussing in a professional, in-person setting. Next, there are several steps where sampling bias may have occurred. Discussion forums likely overrepresent adolescents with higher grade varicoceles who may be more likely to undergo procedural management. Lastly, while MEM/PCA provides an objective method to analyze textual data, it may be limited in rendering textual valence and context to many of the posts. However, classic qualitative thematic analysis filled in that gap in offering insight. Future work is underway to utilize more advanced NLP models to provide nuanced contextual understanding which may help bridge the gap between quantitative and qualitative analysis.

CONCLUSIONS

This work sheds light on themes of discussion among adolescent males with varicoceles, an understudied population. Though online discussion boards offer adolescents an anonymous environment to address sexual health issues, available information may be inaccurate. As a result, adolescents may receive misleading information, be given incorrect diagnosis/treatment

recommendations, and may be steered towards unstudied supplements. Considering how frequently adolescents engage with social media, it is important to understand their use of networking sites so that physicians are better equipped to address adolescent concerns surrounding sensitive topics such as varicoceles, are prepared to dispel myths discovered online, and can improve communication and interactions with this patient population. Informed by these findings, a potential avenue for future research is to employ a qualitative approach to understand perspectives of adolescents undergoing urology evaluation for varicoceles.

DISCLOSURES

No generative artificial intelligence was used in any stage or component of this study.

AUTHOR CONTRIBUTIONS

JNM, JSS, and SVE provided oversight and principal investigator support for the study. GES, TJ, and VO drafted the manuscript and conceived of project design. IF and MHZ provided qualitative and quantitative analysis. All authors read and approved the final manuscript.



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Supplementary Files

Untitled.

URL: <http://asset.jmir.pub/assets/93ef983aac94b205922b741690503a76.xlsx>

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URL: <http://asset.jmir.pub/assets/f4b87fcbefb75a1eafd558a03fddb2a1.docx>

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URL: <http://asset.jmir.pub/assets/658ef82bbdfd9102e7dd34fb0245c7dc.docx>

Figures

Table 1. Demographic details of the 150 randomly selected patients that underwent qualitative analysis. Data obtained was self-reported from the social media platform, r/Varicocele from 7/2022 until 6/2022. All eligible posts were required to self-report age however the rest of the reported details were not universally disclosed.

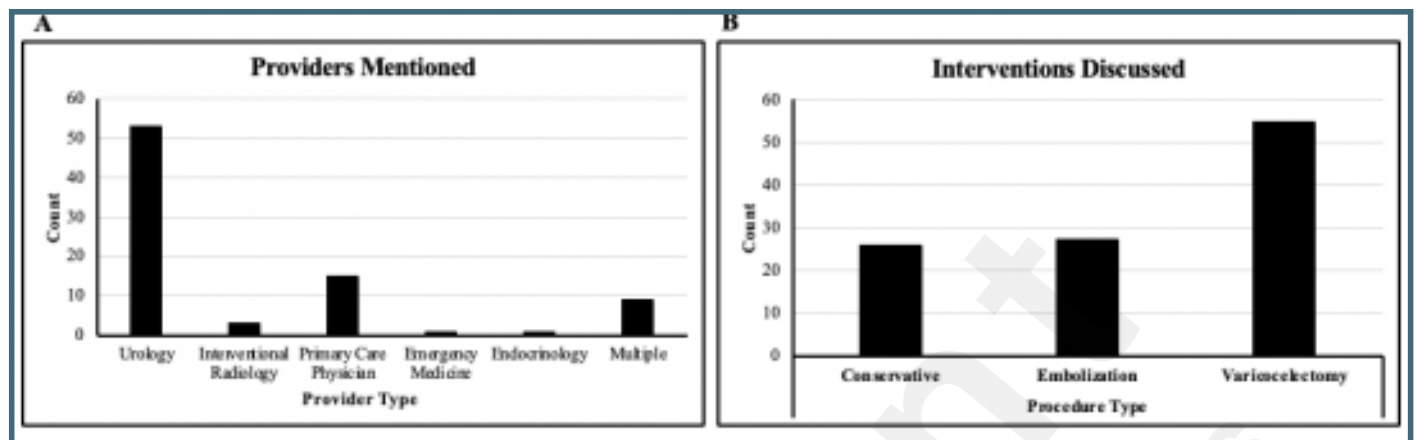
Table 1	
Demographic	
Age	17.5 years (SD: 2.2; Range: 14-21)
Varicocele Grade	
Not Mentioned	105
Grade 1	5 (+1)
Grade 2	10 (+3)
Grade 3	30 (+2)
Sidedness of Varicocele	
Not Mentioned	102
Left	76
Right	0
Bilateral	8
Timeline of post	
Prior to Procedure	120
After Procedure	30
Poster	
Individual	146
Other	4

Table 2. Quantitative analysis results. All 1103 eligible posts from r/Varicocele (7/2015-6/2022) underwent a natural language processing technique called the meaning extraction method (MEM) with principal component analysis (PCA). Using MEH, all textual data was deconstructed into its component words. PCA then identified word clusters of words that frequently appeared together and assigned a factor loading score (FL). Topics of discussion were then manually assigned by two independent reviewers. To assess for suitability, we calculated the Kaiser-Meyer-Olkin (KMO) statistic (>0.60) and Bartlett's test for sphericity.

 **Table 2**

Concerns with Surgery		Basics of Varicoceles		Management		Hypogonadism		Varicocele Evaluation		Semen Analysis	
Word	FL	Word	FL	Word	FL	Word	FL	Word	FL	Word	FL
Bed	0.548	Young	0.464	Procedure	0.545	Testosterone	0.538	Testicle	0.538	Count	0.560
Walk	0.492	People	0.387	Coil	0.516	Libido	0.523	Left	0.467	Sperm	0.556
Room	0.470	Condition	0.375	Embolization	0.483	Low	0.479	Ultrasound	0.403	Analysis	0.554
Hospital	0.457	Research	0.346	Radiologist	0.465	Range	0.436	Lump	0.369	Semen	0.500
Wake	0.444	Mind	0.336	Perform	0.399	Test	0.434	Right	0.366	Worm	0.321
Sit	0.435	Live	0.333	Microsurgery	0.324	Erection	0.402	Dull	0.329		
Swelling	0.432	Lead	0.327	Risk	0.306	Level	0.393	Ache	0.326		
Hour	0.421	Worse	0.315	Post	0.304	Blood	0.386	Side	0.318		
Day	0.401	Life	0.312			Normal	0.384	Small	0.306		
Incision	0.400	Doctor	0.308			Sex	0.376				
Move	0.389	Affect	0.303			Weight	0.356				
Recovery	0.381	Call	0.301			Eat	0.331				
Update	0.377	Care	0.300			Lift	0.327				
Stay	0.335										
Painful	0.334										
Leg	0.324										
Better	0.318										
Week	0.318										
Easy	0.313										
Area	0.308										
Pain	0.308										
Push	0.307										
Longer	0.304										
Wear	0.303										
Under	0.303										
Stand	0.302										
Lay	0.302										
Night	0.301										

Self-reported providers mentioned and interventions discussed. (A) Histogram of self-reported providers mentioned. Note that some posts list more than one provider type. (B) Histogram of self-reported interventions discussed. Note that some posts list more than one intervention.



Multimedia Appendixes

Table 1. Demographic data.

URL: <http://asset.jmir.pub/assets/048e15accaeb110097c472890d8005e9.docx>

Table 2. Quantitative thematic analysis.

URL: <http://asset.jmir.pub/assets/d07391f9e8a1aefed6520697c2a6ab82.docx>

Self-reported providers mentioned and interventions discussed. (A) Histogram of self-reported providers mentioned . Note that some posts list more than one provider type. (B) Histogram of self-reported intervention discussed. Note that some posts list more than one intervention.

URL: <http://asset.jmir.pub/assets/8f5ff30da7d776a192ff7e4392c7aae8.pptx>

Posts that met inclusion criteria have been included as a supplementary file. To uphold privacy, we have made access restricted.

URL: <http://asset.jmir.pub/assets/efbdeef7cb562a732cebff7a767c2d1a.xlsx>

STROBE checklist.

URL: <http://asset.jmir.pub/assets/7d5ae9b8c34a9675a82ba6abfa27da89.docx>

Tracked changes document to reflect editorial team's recommendations.

URL: <http://asset.jmir.pub/assets/b2873a8f8a37567ffaf960bf8d3f7260.docx>