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Quality and Readability of Online Resources for Prostate Artery Embolisation to Support Shared Decision Making

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Abstract

Background: Online searching for health-related information is becoming increasingly popular when it comes to patient selecting and deciding their treatment options. Therefore, it is essential that internet-based information should be of high quality to aid in decision making.

Objective: The aim of this study was to assess the readability and quality of online resources about Prostate Artery Embolisation (PAE) to help patients considering it as a treatment option for Benign Prostatic Hypertrophy (BPH).

Methods: This systematic review was performed across three main search engines as per Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Common search phrases 'Prostate Artery Embolization and 'Prostate Embolization' were employed into 3 famous search engines (Google, Yahoo and Bing). The searches were performed from 16th to 20th September 2021. Final results were assessed using three validated scoring instruments: Flesch–Kincaid Reading Ease Score for readability, IPDAS (IPDASi, v4.0) and DISCERN for quality of content.

Results: The average Flesch-Kincaid Reading Ease score was much higher than recommended for patient-oriented health information 50.18 (SD+/-16.52, Range 20.8-89.5). Looking at the quality of the content DISCERN score 2.92 (SD+/-0.81, range 1.7-4.2). IPDAS 6.5 (SD+/-1.88, range 3-10). No website met the minimum standard for shared decision making across these three tools.

Conclusion: Online health related information regarding prostate artery embolization is of poor quality and does not help in decision making. More research and input are needed from medical professionals to produce high quality patient targeted information.

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Introduction

Benign Prostrate Hyperplasia (BPH) is one of the most common problems in men above 50 years of age [1]. It is one of the most common cause of Lower Urinary Tract Symptoms (LUTS) such as urinary urgency, frequency, nocturia and poor urine steam [2]. The severity of these symptoms has significant effect on quality of life and they play a major role while deciding treatment options [3]. Over the past few years, there has been predilection towards minimal invasive procedures [4]. In this scenario, Prostate artery embolization (PAE) is a relatively new treatment option in the world of interventional radiology. Multiple studies have shown that it has less complications as compared to Transurethral Resection of Prostate (TURP) [5]. . However, TURP is sill a gold standard procedure in patients with severe LUTS associated with BPH. Guidelines on the management of LUTS by European Association of Urology 2019 states that patients who will benefit from PAE still needs to be defined.

Due to lack of clear guidance, patients tend to seek knowledge from internet. Information regarding possible treatment options is usually provided by health care professionals. However, people search for online resources before talking to their health care provider [6]. It has been observed that verbal guidance is not very well retained (20%). However, when combined with a written resource it retains up to 50% [7]. Therefore, it is important that online material should be easy to understand and should be of good quality.

The aim of this study was to assess the readability and quality of online resources about PAE to help patients considering it as a treatment option for BPH.

Methods and materials

This review was in line with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guideline [8]. (Figure 1). The search phrases 'Prostate Artery Embolization 'and 'Prostate Embolization' were employed into 3 famous search engines i.e. Google (www.google.co.uk, Mountain View, California, USA), Bing (www.bing.com, Microsoft, Redmond, Washington, USA) and Yahoo (www.yahoo.co.uk, Sunnyvale, California, USA). The searches were performed from 16th to 20th September 2021. Websites from first 2 pages were included in this study since 92% of internet users do not go beyond the first few page [9].

Data collection

Data was collected and analysed by two authors separately on Microsoft Excel spreadsheet. Disputes were settled by discussion and general agreement. All websites were screened for any duplications and then finalised by applying inclusion and exclusion criteria (Table 1).

Data analysis

These searches were assessed with 3 scoring tools - Flesch –Kincaid Reading Ease Score for readability IPDAS and DISERN for quality.

Flesch-kincaid reading ease score

The Flesch Kincaid Reading Ease score is a widely used readability formula which assesses the approximate reading grade level of a text. The formula was developed in the 1940s by Rudolf Flesch and J Peter Kincaid. The scores range from 0 to 100. 100 means that the content is very simple and easy to read and is understandable by 13yrs old. A score of 60-70 means that your content is perfect for intermediate readers referring to 8th or 9th-graders, and a score of 0-30 can be best understood by university graduates. To calculate this score, we used an online automated tool (https://www.webfx.com/tools/read-able/) for each website.

IPDAS score

International Patient Decision Aids Standards (IPDAS v4.0) is a validated scoring system used to assess the health-related information based on quality, certifying and qualifying criteria. A modified version of this scoring tool was used which comprised of 12 points checklist and applied against each website. This was in accordance with the previous study which mentioned these modifications [10].

DISCERN score

This is a validated tool which assesses the quality of the information mentioned on health-related websites for patients. This scoring system is used to assess the quality of written information pertaining to that disease and treatment. DISCERN scoring comprises of 16 questions and has three sections: Reliability (Questions 1–8), quality information about treatment choices (Questions 9–15), and overall score (Question 16). These 16 questions are rated on Likert 5 points scale where 1 signifies that the content is of poor quality, 5 means high quality and 2-4 means partial satisfaction. For any ambiguities, DISCERN manual was used to resolve and verify the score [11].

Results

Search results

A total of 184 websites were extracted from the initial two pages across the three search engines (Google, Yahoo, Bing) (Fig:1). After applying inclusion and exclusion criteria and removing all the duplicates 28 websites were included in this review which were then analyzed for readability and quality by using Flesch-Kincaid Reading Ease Score and IPDAS, DISERNS respectively.

Readability

The average Flesch-Kincaid Ease of Reading score across all websites was 50.18 (SD+/-16.52, Range 20.8-89.5) Table: 2. This score signifies that 10th grader or above would able to understand the content provided in the websites. This is much higher than what is recommended for patient education related content, which recommends a score from 80 to 100 [12].

IPDAS

International Patient Decision Aids Standards (IPDAS v4.0) was used to screen all websites for qualifying, certifying and quality criteria. Average score was 6.5 (SD+/-1.88, range 3-10). According to IPDAS recommendations, websites should meet all criteria for minimum decision-making standards i.e. a score of 12 [13]. Looking at the scoring criteria mentioned in table 3, none of the source achieved the standard. Domains that scored well were mostly from qualifying criteria i.e. description of health condition, possible options and their positive and negative features. However, most of the websites failed to describe the certifying criteria such as citation, publication, update policy and funding. Only 3 websites reached the score of 10 which is deemed to be the highest (Figure 2).

DISCERN score

DISCERN tool was applied across all the 28 extracted sources by using 16 questions (Table 4). None of the website achieved a maximum score of 5 (Figure 3). The Mean score was 2.92(SD+/-0.81, range 1.7-4.2). Generally, websites scored well in describing aims and their achievement, relevancy and multiple treatment choices. Domains that scored poorly were about source of information, additional support and areas of uncertainty.

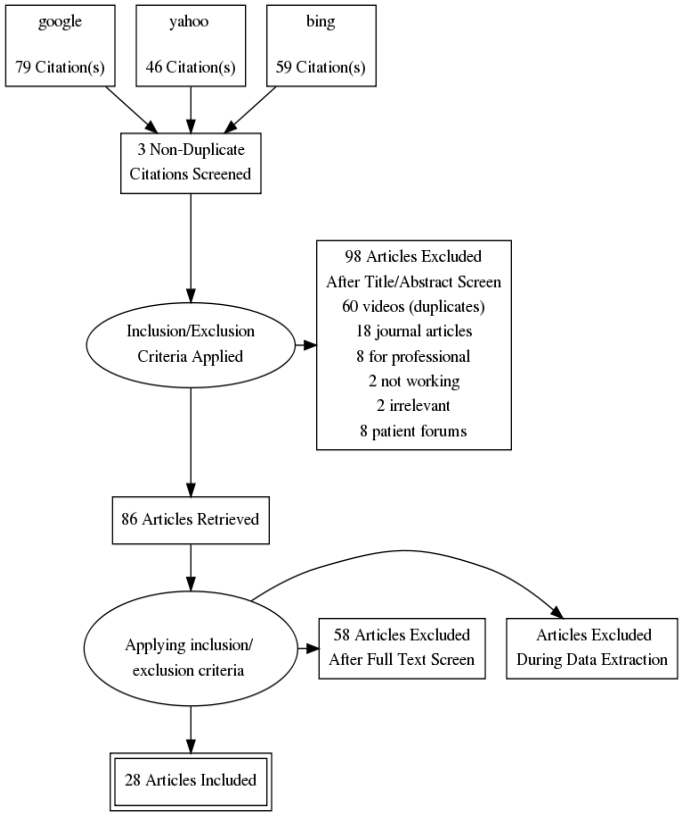

Figure 1: Prisma Flow chart.

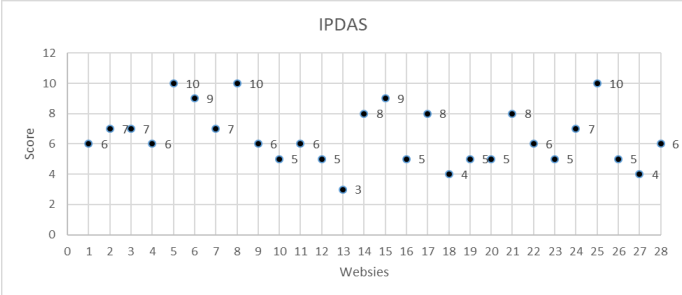

Figure 2

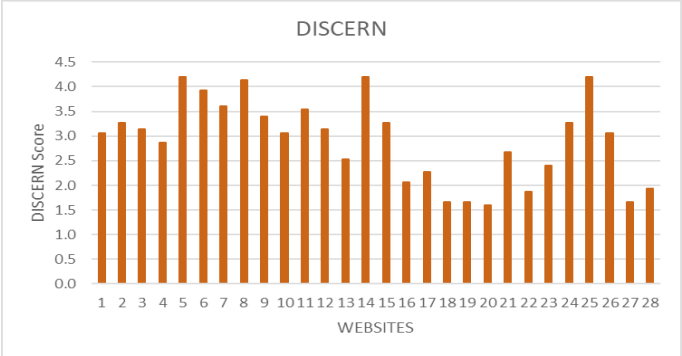

Figure 3

Table 1: Inclusion and Exclusion Criteria.

Inclusion Criteria	Exclusion Criteria
Websites fulfilling search criteria of "Prostate Artery Embolization" and "Prostate Embolization"	Adverts for Private institutions
First two pages of each search engine	Journalist articles
Resources aimed at patients and not medical professionals	Websites requiring subscription
English language medium	Academic journals and scientific papers
	Videos resources (e.g., YouTube)

Table 2: Readability scoring.

Websites	Readability Score
http://www.yalemedicine.org/conditions/prostate-artery-embolization	47.3
http://www.uhs.nhs.uk/OurServices/Radiology-scansandimaging/PatientInformation/Prostatearteryembolisation.aspx	61.3
http://www.spirehealthcare.com/treatments/urology/prostate-artery-embolisation-pae/	62.2
http://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/prostatic-artery-embolization	45.5
http://en.wikipedia.org/wiki/Prostatic_artery_embolization	38.4
http://www.nbt.nhs.uk/sites/default/files/attachments/Prostate%20Artery%20Embolisation%20%28PAE%29_NBT003172.pdf	89.5
http://www.bsir.org/patients/pae-patient-information-leaflet/	51.6
http://www.nbt.nhs.uk/our-services/a-z-services/imaging-x-ray/imaging-patient-information/prostate-artery-embolisation-pae	52.2
http://www.spirehealthcare.com/spire-southampton-hospital/treatments/a-z/prostate-artery-embolisation-pae/	60
http://www.med.unc.edu/radiology/wp-content/uploads/sites/416/2018/04/PAE-Prostatic-Artery-Embolization.pdf	75.6
http://www.bsir.org/patients/prostate-artery-embolisation-pae/	35.7
http://interventionalnews.com/uks-nice-recommends-prostate-artery-embolization/	47.7
http://eurotreatmed.co.uk/prostatic-artery-embolisation-cost-uk-and-abroad/	47.5

http://advantage-ir.com/patient-resource/how-does-prostate-artery-embolization-work	56.9
http://www.uhcw.nhs.uk/download/clientfiles/files/118829_Prostate_Artery_Embolisation_(PAE)_(1839)_Apr2019.pdf	45
http://www.uclh.nhs.uk/patients-and-visitors/patient-information-pages/prostate-artery-embolisation-pae	24.9
http://www.pennmedicine.org/for-patients-and-visitors/find-a-program-or-service/interventional-radiology/prostate-artery-embolization	32.4
http://www.mountsinai.org/care/interventional-radiology/services/bph/pae	57.4
http://www.londonbridgeurology.net/Prostate_Embolisation.html	55.4
http://www.hcahealthcare.co.uk/our-services/treatments/prostate-artery-embolisation	20.8
http://www.dgft.nhs.uk/leaflet/prostate-artery-embolisation/	85.6
http://www.cirse.org/patients/ir-procedures/embolisation-of-the-prostatic-artery/	36.9
http://www.berkshireimaging.co.uk/treatments/prostate-artery-embolisation/	54.5
http://www.alatehealth.com/blog/what-is-the-success-rate-of-prostate-artery-embolization	64.3
http://prostateenlargement.co.uk/	42.5
http://nyulangone.org/conditions/male-urinary-dysfunction/treatments/prostate-artery-embolization-for-male-urinary-dysfunction	45.2
http://i-med.com.au/procedures/prostate-artery-embolisation-pae	44.9
http://health.ucsd.edu/specialties/radiology/ir/pages/prostate-artery-embolization.aspx	23.9

Table 3: IPDAS.

Qualifying Criteria	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Describe health condition	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1
States explicit decision	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1
Describes options	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	0	0	0	1	0	0	1	1	1	0	1
Describes positive features	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Describes negative features	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	1	0	1	0	1	1	1	0	1	1	0	1
Describes the experience of the consequences	1	0	0	1	1	0	0	0	0	0	0	1	0	1	0	1	1	1	1	0	1	0	1	0	1	0	1	1
Certifying Criteria																												
Balanced and equal details for all options	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Citation to the evidence	0	0	0	0	1	1	1	1	0	0	1	0	1	1	0	0	1	0	0	0	0	1	0	1	1	0	0	0
Publication date provided	0	1	1	0	1	1	1	1	0	0	0	0	1	0	1	1	1	0	0	1	0	1	0	1	1	0	0	0
Update policy provided	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Information about levels of uncertainty around	0	1	0	0	0	0	0	0	1	1	1	0	0	1	1	1	0	0	1	0	1	0	0	0	0	0	1	0
Funding source	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	0	1	0	0	1	1	1	0	0	1	0	0	0
Total score out of 12	**6**	**7**	**7**	**6**	**10**	**9**	**7**	**10**	**6**	**5**	**6**	**5**	**3**	**8**	**9**	**5**	**8**	**4**	**5**	**5**	**8**	**6**	**5**	**7**	**10**	**5**	**4**	**6**

Table 4: DISCERN.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Are the aims clear?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	3	3	2	4	3	3	5	5	3	3	4
Does it achieve its aims?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	3	3	2	4	3	3	4	5	3	2	3
Is it relevant?	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	3	5	3	4	5	5	3	3	4
Is it clear what sources of information were used to complete the publication?	1	1	1	1	4	5	5	5	1	1	5	1	3	4	1	1	3	1	2	3	4	4	3	5	5	1	1	1
Is it clear when the information used or reported in the publication was produced?	1	1	1	1	4	5	5	5	1	1	5	1	3	4	1	1	1	1	1	2	4	4	2	5	5	1	1	1

Is it balanced and unbiased?	3	4	3	3	4	3	3	5	3	1	1	1	1	3	3	1	1	1	1	1	3	1	2	3	4	1	1	1
Does it provide details of additional sources of support and	1	2	1	1	5	5	1	5	1	5	5	5	5	5	1	1	1	1	1	1	2	1	3	3	5	4	2	3
Does it refer to areas of uncertainty?	1	4	3	1	4	1	1	1	4	5	3	3	1	3	3	1	1	1	1	1	1	1	2	2	3	3	2	1
Does it describe how each treatment works?	3	2	3	3	5	3	3	3	3	3	3	3	1	5	3	2	2	2	1	1	3	1	2	1	4	5	1	1
Does it describe the benefits of each treatment?	2	2	2	2	4	3	3	3	4	3	3	2	1	4	3	2	2	2	1	1	2	2	2	2	4	5	1	1
Does it describe the risks of each treatment?	4	4	4	3	4	4	3	5	4	3	3	2	1	4	3	2	2	1	1	1	2	1	2	2	3	5	1	1
Does it describe what would happen if no treatment is used?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
Does it describe how the treatment choices affect overall quality of	5	4	4	3	3	4	4	4	4	2	1	4	3	5	5	1	1	2	1	1	1	1	2	4	4	4	3	2
Is it clear there may be more than one possible treatment choice?	5	5	5	5	5	5	5	5	5	3	5	5	1	5	5	1	3	1	1	1	1	1	2	3	5	5	1	3
Does it provide support for shared decision-making?	4	4	4	4	5	5	5	5	5	3	3	4	2	5	5	3	3	1	2	3	3	1	3	4	4	2	2	2
Overall quality	**3.1**	**3.3**	**3.1**	**2.9**	**4.2**	**3.9**	**3.6**	**4.1**	**3.4**	**3.1**	**3.5**	**3.1**	**2.5**	**4.2**	**3.3**	**2.1**	**2.3**	**1.7**	**1.7**	**1.6**	**2.7**	**1.9**	**2.4**	**3.3**	**4.2**	**3.1**	**1.7**	**1.9**

Discussion

It has been observed that around 72% of UK users look for internet based related to their disease and possible treatment options [14]. Therefore, the online available information influence patients treatment choices and aids in shared decision making [15]. In this study we have assessed the quality of online patient information about PAE which is a relatively new technique for treatment of BPH usually affecting elderly. This was done using a simulated 'patient search' to score online material across validated tools to assess quality and readability of available content. Nowadays, patients are more inclined towards minimal invasive techniques as there is exponential rise in minimal invasive procedures in every aspect of health care. This is supported by constant increase in minimal invasive options, in this scenario PAE, for BPH [16].

We found that 28 internet searches matched our inclusion criteria. The three assessment tools used in this study have demonstrated that overall online information on PAE sources is most frequently low to moderate quality. Firstly, Flesch –Kincaid Reading Ease Score for readability was higher than recommended for patient education material. According to Cotunga *et al.* patient healthcare content should ideally score between 80 and 100 on Flesch-Kincaid Reading tool to be of an appropriate level of readability [12]. Similar studies done over the past few years on readability of online healthcare resources concluded that health related content has inappropriately high reading level [10,17,18]. But given that BPH affects an aging population with proven lower levels of health literacy [19]. It is essential that medical professionals should optimize the level of readability keeping in mind the target population by assessing readability prior to publication [20]. Secondly, quality assessment by IPDAS has demonstrated that none of the website met the minimum criteria required for making a decision about the PAE. The last tool for quality assessment was DISCERN has verified our two previous results of being unable to meet the criteria for patient information material studies.

In our study, we included patient information material aimed at general population and did not analyze adverts by private institutions and videos in spite of increasing popularity among patients as an easily accessible source of information [21]. Also, notable limitation of our study was including only first two pages of search engine. This limitation fails to include those who would potentially go beyond initial pages. However, this can be justified by the fact that 92% of population does not go beyond initial few search pages [9].

The authors conclude that multidisciplinary approach should be made by Urologists, Intervention radiologist and health care institutions to work on improving the readability and quality of online material for PAE to aid in consenting and shared decision-making process. Further research is needed to ascertain the importance of video and other digital media platforms in providing relevant patient information material for PAE.

Conclusions

Online health related information regarding prostate artery embolization is of poor quality and does not help in decision making. High quality and more readable content written by medical professionals bodies in order help patients with shared decision making.

Compliance with ethical standards

Conflict of interest: The authors declare no conflict of interest.

Ethical approval: This study did not involve human participants and/or animals by any of the authors.

Informed consent: For this type of study informed consent is not required.

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