

Prostatic Diseases and Male Voiding Dysfunction

Surgical Advances in Treating Benign Prostatic Hyperplasia in Africa: What About the Endoscopic Approach?

Ziba Ouima Justin Dieudonne, Saleh Abdelkerim Nedjim, Anteneh Tadesse Kifle, Kaleab Habtemichael Gebreselassie, Botcho Gnimdou, Mahamat Ali Mahamat, Muhawenimana Emmanuel, Coulibaly Noel, Ndoye Alain Khassim, Abdullahi Khalid, Lazarus John, Kirakoya Brahima, Ouattara Adama, and Kabore Fasnewende Aristide

OBJECTIVE	To assess the practices, trends, and challenges associated with the use of endoscopic techniques in Africa related to the surgical treatment of benign prostatic hyperplasia
METHODS	The questionnaire, which was based on Google Forms, assessed several points related to the surgical management of benign prostatic hyperplasia.
RESULTS	In 67.4% of the centers, BPH was the primary pathology requiring surgical management. In all 43 centers, approximately 1/3 of the urologists (n = 41) are able to perform an endoscopic procedure for the management of prostatic hypertrophy. Of the 43 centers, 30 had a block equipped with endourology equipment, and 56.6% (n = 17) performed endourological surgery exclusively for the surgical management of BPH. TURP is the most widely used endoscopic technique. Open prostatectomy was the only surgical technique used in 14 centers (32.5%). In the remaining centers, both procedures (endoscopy and open surgery) were used depending on the surgeon's skills. Twenty-six (60.5%) centers expressed the need for training in endoscopic management of BPH.
CONCLUSION	The main challenges encountered relate to the lack of competent personnel, the unavailability of equipment and materials, and the high cost to patients. It is essential to develop modern urology in Africa, particularly in terms of endourological practices. UROLOGY xx: xxx-xxx, xxxx. © 2024 Elsevier Inc. All rights reserved.

Benign prostatic hyperplasia (BPH) is a common condition among elderly men and is highly prevalent worldwide. Its global prevalence increased by 70.5% between 2000 and 2019, posing an absolute burden, especially in low- and middle-income countries undergoing rapid demographic and epidemiological changes.¹ This condition is defined as a non-malignant

increase in prostate volume that leads to urinary disturbances.² In a study by Fall et al,³ conducted in Senegal, it was reported that BPH is the cause of urinary retention in 66.5% of men over 50 years of age with urological emergencies. Depending on its characteristics (symptom severity, impact, and complications), BPH management can be either medical or surgical.⁴ Surgical intervention is recommended for patients with moderate-to-severe lower urinary tract symptoms that are unresponsive to medical treatment or those with complicated BPH.⁵ Various techniques ranging from open surgery to minimally invasive and endoscopic procedures are available, with the latter being the standard.⁴ Several new minimally invasive techniques have been developed to enhance treatment efficacy compared to pharmacological therapy while minimizing the impact on sexual function.⁶ In developed countries, surgical management is predominantly performed via endoscopic or minimally invasive approaches.⁷ In a review of 21 articles from Africa, Zubair et al⁸ concluded that open surgery still holds a significant place in BPH management and is the

The authors declare that they have no relevant financial interests.

From the Modern Urology For Africa Association; the University Teaching Hospital Yalgado Ouédraogo, Burkina Faso; the University Teaching Hospital Ibn Rochd, Casablanca, Morocco; the University Teaching Hospital, la Référence Nationale, N'Djamena, Chad; the PCEA CHOGORIA Hospital, Kenya; the Worabe Comprehensive Specialized Hospital, Ethiopia; the University of Kara, Urology Department at the Regional Hospital Center of Sokodé, Togo; the University Teaching Hospital of Kigali, Kigali, Rwanda; the University Teaching Hospital of Treichville, Abidjan, Ivory Coast; the Le Dantec Hospital, Dakar, Senegal; the University Teaching Hospital Usmanu Danfodiyo, Sokoto, Nigeria; the Grootte Schuur Hospital, Cape Town, South Africa; and the University Teaching Hospital Sourou Sanon, Burkina Faso

Address correspondence to: ZIBA Ouima Justin Dieudonné, Modern Urology For Africa Association; University Teaching Hospital Yalgado Ouédraogo, Burkina Faso. E-mail: ouimzib@gmail.com

Submitted: February 23, 2024, accepted (with revisions): April 16, 2024

sole technique used in certain centers. Taking these findings into account, a survey was carried out by authors affiliated with the Modern Urology for Africa Association on African referral centers in order to evaluate the state of endoscopic procedures for the treatment of BPH on the continent today.

METHODOLOGY

The study was conducted as part of an official research project of the Modern Urology for Africa (MUFA) association. The survey was based on a questionnaire sent to urology departments in African referral centers. The questionnaire, which was based on Google Forms, assessed several points related to the surgical management of BPH. The survey was sent from September to December 2024 by e-mail or WhatsApp. The respondents were primarily the department heads. All the questions had to be answered. The focus was on the type of surgery that was performed. The data requested covered the country, city and institution, human and material resources, diagnostic means, techniques used, with an emphasis on endo-urological techniques, main difficulties, and need for training. The data were automatically collected. After checking the database in Excel (removing duplicates), analysis was performed arithmetically. The results were expressed as absolute, average, or percentage values. No correlation was observed.

RESULTS

The data for this survey were obtained from 43 African centers in 29 countries. These countries are divided into the following geographical zones: Central Africa, East Africa, West Africa, North Africa, and Southern Africa. The mapping is illustrated in [Figure 1](#). For the entire set of 43 centers, there were 157 urologists, of whom 124 practiced basic endourology. Approximately one-third ($n = 41$) perform transurethral resection of the prostate. In terms of epidemiology, 42/43 centers (97.7%) reported BPH as one of the top 3 main pathologies they encounter. It was the primary pathology encountered in 29/43 centers (67.4%). [Table 1](#) presents all the institutions that participated in the survey.

Among the urological investigations available within the diagnostic framework of BPH, uroflowmetry, ultrasound, and cystoscopy were reported by 13 (30.2%), 30 (69.7%), and 34 (79.1%) centers, respectively.

At the time of the survey, 34 centers reported having an operating room equipped with endourological surgery equipment, of which 30 (88.2%) performed endoscopic surgery. Of these 30 centers, 17 (56.6%) routinely performed endourological surgery for the surgical treatment of BPH. Open prostatectomy was the only surgical technique available for BPH in 14 centers (32.5%).

Among the reported endoscopic techniques, transurethral resection of the prostate (TURP) is most

frequently used. The different treatment techniques (endoscopic and/or surgical) are presented in [Table 2](#).

Among the 17 centers routinely practicing endourology for the surgical management of BPH, 6 have been doing so for 10 years, 8 for 5 to 10 years, and 3 for less than 5 years. The majority of the centers reported difficulties related to the absence of skilled personnel and the availability of equipment and consumables. 26 centers (60.5%) expressed the need for training in endourological techniques for managing BPH.

DISCUSSION

Many African countries, particularly sub-Saharan Africa, face challenges in the endoscopic management of urological pathologies. This is due to political, training, and equipment issues, and, on the other hand, socio-economic factors. This situation translates into a clear imbalance between urology practice in Africa and elsewhere, revealing a notable disparity between practice and standard recommendations in the African centers studied.

Tertiary-level urologic surgical care is considered a poorly addressed issue in many African countries, and the challenge is more pronounced in the sub-Saharan region. Among the poorly addressed urologic specialties and subspecialty services, endoscopic management of BPH is at the top of the list. Multiple socioeconomic and political challenges can be pointed out as reasons for the huge imbalance between endourologic surgical needs and actual service delivery. These include the non-inclusiveness of healthcare policies to address specific urologic diseases, limited endourology training capacity, leading to only a few skilled endo-urologists, poor availability of the necessary equipment and gadgets due to inadequate budgeting, and poor prioritization strategy.^{7,9,10}

There are more than a dozen treatment options for BPH, which are stratified based on various clinical, imaging, and patient-based parameters. Most of these options are available in developed countries, and many patients with BPH have the privilege of choosing from a cocktail of endourological procedures after discussing them with their urologists.^{3,7}

Our study revealed that the practice in most of the surveyed centers was far from the standard recommendations. For instance, among the 43 centers surveyed in our study, only 17 centers (39%) performed at least 1 type of endourologic BPH treatment, whereas 14 centers did not perform any kind of endourologic BPH treatment. Many centers in Africa rely on open prostatectomy, a surgical technique that is currently being abandoned and replaced with advanced minimally invasive techniques.^{4,9} These include laser enucleation and ablation of the prostate. Surprisingly, none of the 43 centers surveyed performed these procedures to treat their patients.

As most patients with BPH are older and have comorbidities, the decision to choose a treatment modality can be challenging. Clinical parameters that are



Figure 1. The countries with participating centers in the study are highlighted in orange.

considered during the decision on BPH treatment include the success rate of a specific modality, long-term outcomes, complication rates, hospital stay, need to continue anticoagulation, risk of retrograde ejaculation, and need for catheterization.^{11,12} The fact that more than a dozen endourological treatment options have been introduced indicates that BPH treatment should be individualized. Our study indicates that most centers do not have the capacity or expertise to provide individualized treatment options based on specific patient characteristics. According to our survey, 2 major challenges were identified as bottlenecks to the advancement of care: a lack of expertise and the unavailability of resources.

In developed countries, the frequency of open prostatectomies has gradually decreased in favor of

endoscopic treatments, which have evolved to address larger prostate volumes.¹¹ Similarly, endoscopic techniques have diversified both in their approach (resection, vaporization, or enucleation) and the energy sources used (bipolar current and lasers).⁹ This shift toward endoscopic approaches for BPH has posed certain challenges in Africa, given its unique healthcare landscape and resource constraints. According to the Benign Prostatic Hyperplasia Collaborators, the prevalence of BPH in Sub-Saharan in 2020 was 1,420,000 (1,050,000-1,930,000), and the age-standardized prevalence was 1200 (888-1610).¹² According to World Health Report, the prevalence and incidence of BPH are likely to increase in Africa as the population ages, reducing risks and promoting a healthy life (100). In a typical low-

Table 1. The institutions that participated in the survey.

Country	Hospital	Institution
Bénin	Porto Novo	Centre Hospitalier Universitaire Départementale Ouémé Plateau
	Cotonou	Centre National Hospitalier Universitaire HKM
Burkina Faso	Bobo Dioulasso	Centre Hospitalier Universitaire Souro Sanou
	Ouagadougou	CHU Yalgado Ouedraogo
Burundi	Bujumbura	Centre Hospitalier Universitaire de Kamenge
Cameroon	Douala	Laquintini Hospital Douala
	Douala	Hôpital Général de Douala
	Bamenda	Regional Hospital Bamenda
Congo	Brazzaville	Centre Hospitalier Universitaire de Brazzaville
	Brazzaville	Hôpital de référence de Talangaï
Côte d'Ivoire	Abidjan	Centre Hospitalier Universitaire de Treichville
Djibouti	Arta	Hôpital Régional d'Arta
Ethiopia	Addis Ababa	Saint Paul's Hospital Millennium Medical College
Ghana	Cape Coast	Cape Coast Teaching Hospital
Guinée	Conakry	Hôpital National Ignace Deen
Kenya	Chogoria	PCEA chogoria Hospital
	Eldoret	Moi Teaching and Referral Hospital
	Nairobi	Aga Khan University Hospital
Liberia	Monrovia	John F. Kennedy Medical Center
Madagascar	Antananarivo	Centre Hospitalier Universitaire Joseph Ravoahangy Andrianavalona
Mali	Bamako	Centre Hospitalier Universitaire Kati
	Bamako	Centre Hospitalier Universitaire du Point G
Maroc	Casablanca	CHU Ibn Rochd
	Rabat	Ibn Sina Hospital
Mauritanie	Kiffa	Centre hospitalier de Kiffa
	Nouakchott	Cheikh zayed
Niger	Niamey	Hopital Amirou Boubacar Diallo
Nigeria	Sokoto	Usmanu Danfodiyo University and Teaching Hospital
Nigeria	Kano	Aminu Kano Teaching Hospital
R D Congo	Lubumbashi	Cliniques universitaires de Lubumbashi
République Centrafricaine (RCA)	Bangui	Centre Hospitalier Universitaire de l'Amitié Sino-Centrafricaine
Rwanda	Kigali	University Teaching Hospital of Kigali
Sénégal	Dakar	Hopital general Idrissa Pouye
	Dakar	Hôpital A Le Dantec
South Africa	Cape Town	Groote Schuur Hospital
Sudan	Wad Medani	Gezira Hospital for Renal Disease and Surgery
	Port Sudan	Prince osman Digna referral Hospital
	Khartoum	Ibn Sina Specialized Hospital
Tanzania	Moshi	Kilimanjaro Christian Medical centre
Tchad	N'djamena	Hôpital de la Renaissance
	N'djamena	Centre hospitalo-universitaire la Référence Nationale
Togo	Sokodé	Centre Hospitalier Régional de Sokodé
Zambia	Lusaka	Levy Mwanawasa University Teaching hospital

income country with low health insurance coverage, hospital-based studies report that men diagnosed with BPH, whose early clinical features are LUTS, mostly present in appropriate hospitals later with complications in addition to LUTS, such as bladder stones, urine retention, deranged renal function, hematuria, and catheterization.¹³ In addition to financial constraints, many reasons have been proposed to explain why men with BPH come late to the hospital, including beliefs that it is an aging process, gaps in knowing that it is treatable, fear of embarrassment in discussing problems, and fear of complications from treatment.¹⁴ Zubair et al stated that open prostatectomy is the most commonly offered surgical management in Africa for BPH; however, endoscopic management, including TURP, HoLeP, and TUNA, is being used in some centers with a decreasing

frequency.⁸ TURP is the gold standard surgical management approach for patients with BPH and is used to measure the efficacy, effectiveness, and safety of other interventions for LUTS/BPH.¹⁵ In their scoping review of BPH management in Africa, Zubair et al stated that open prostatectomy had the highest rates of complications among all surgical options, whereas HoLeP had the lowest rates of complications compared with TURP. Although minimally invasive procedures such as TURP and HoLeP have significantly improved patient outcomes, this study has shown that they are not practiced in most African countries. A number of reasons have been provided for low adaptation to these surgical approaches, including a shortage of endoscopic and newer technologies, a few number of adequately trained experts, delayed presentation resulting in higher volumes at

Table 2. Distribution of centers by treatment technique (endoscopic and/or surgical).

Institution, City, Country	Type of Surgery Performed	
	Endoscopy	Open surgery
Centre Hospitalier Universitaire Départementale Ouémé Plateau, Porto Novo, Bénin	Yes	Yes
Centre National Hospitalier Universitaire HKM, Cotonou, Bénin	Yes	Yes
Centre Hospitalier Universitaire Souro Sanou, Bobo Dioulasso, Burkina Faso	No	Yes
CHU Yalgado Ouedraogo, Ouagadougou, Burkina Faso	Yes	Yes
Centre Hospitalier Universitaire de Kamenge, Bujumbura, Burundi	No	Yes
Laquintini Hospital Douala, Douala, Cameroon	Yes	Yes
Hôpital Général de Douala, Douala, Cameroon	Yes	Yes
Regional Hospital Bamenda, Bamenda, Cameroon	Yes	Yes
Centre Hospitalier Universitaire de Brazzaville, Brazzaville, Congo	Yes	Yes
Hôpital de référence de Talangai, Brazzaville, Congo	Yes	Yes
Centre Hospitalier Universitaire de Treichville, Abidjan, Côte d'Ivoire	No	Yes
Hôpital Régional d'Arta, Arta, Djibouti	No	Yes
Saint Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia	No	Yes
Cape Coast Teaching Hospital, Cape Coast, Ghana	No	Yes
Hôpital National Ignace Deen, Conakry, Guinée	No	Yes
PCEA chogoria Hospital, Chogoria, Kenya	Yes	Yes
Moi Teaching and Referral Hospital, Eldoret, Kenya	Yes	Yes
Aga Khan University Hospital, Nairobi, Kenya	Yes	Yes
John F. Kennedy Medical Center, Monrovia, Liberia	Yes	Yes
Centre Hospitalier Universitaire Joseph Ravoahangy Andrianavalona, Antananarivo, Madagascar	No	Yes
Centre Hospitalier Universitaire Kati, Bamako, Mali	Yes	Yes
Centre Hospitalier Universitaire du Point G, Bamako, Mali	Yes	Yes
CHU Ibn Rochd, Casablanca, Maroc	Yes	Yes
Ibn Sina Hospital, Rabat, Maroc	Yes	Yes
Centre hospitalier de Kiffa, Kiffa, Mauritanie	Yes	Yes
Cheikh Zayed Hospital, Mauritanie	Yes	Yes
Hopital Amirou Boubacar Diallo, Niamey, Niger	Yes	Yes
Usmanu Danfodiyo University and Teaching Hospital, Sokoto, Nigeria	Yes	Yes
Aminu Kano Teaching Hospital, Kano, Nigeria	Yes	Yes
Cliniques universitaires de Lubumbashi, Lubumbashi, R D Congo	No	Yes
Centre Hospitalier Universitaire de l'Amitié Sino-Centrafricaine, Bangui, République Centrafricaine	No	Yes
University Teaching Hospital of Kigali, Kigali, Rwanda	Yes	Yes
Hopital general Idrissa Pouye, Dakar, Sénégal	Yes	Yes
Hôpital Aristide Le Dantec, Dakar, Sénégal	Yes	Yes
Groote Schuur Hospital, Cape Town, South Africa	Yes	Yes
Gezira Hospital for Renal Disease and Surgery, Wad Medani, Sudan	Yes	Yes
Prince Osman Digna referral Hospital, Port Sudan, Sudan	Yes	Yes
Ibn Sina Specialized Hospital, Khartoum	Yes	Yes
Kilimanjaro Christian Medical Centre, Moshi, Tanzania	Yes	Yes
Hôpital de la Renaissance, N'djamena	No	Yes
Centre hospitalo-universitaire la Référence Nationale, N'djamena, Tchad	No	Yes
Centre Hospitalier Régional de Sokodé, Sokodé, Togo	No	Yes
Levy Mwanawasa University Teaching Hospital, Lusaka, Zambia	Yes	Yes

diagnosis and treatment planning, and a steeper learning curve for minimally invasive BPH treatment.¹⁶ There is no standardized ratio of urologists to the population, and there is a great discrepancy in the number and ratio across countries. The USA had 13,352 practicing urologists in 2020¹⁷ while the UK¹⁸ and India had 1474 and 2425,¹⁹ respectively. The urologist to 100,000 population in the above-mentioned countries is 4.07 in the USA, 2.13 in the UK, and 0.17 in India. The exact number of urologists in Africa is not known, as there is no continental registry or governing body. A 2022 study by Madeline Moore et al have shown that the urologist-to-population ratio in West Africa was 0.015 and in East

Central and South Africa to be 0.025.²⁰ According to the WHO, the current population of sub-Saharan Africa is 1.2 billion. Taking the average of the ratios from the regions, sub-Saharan Africa currently has 240 urologists. Africa will need more than 2000, 25,000, and 48,000 urologists to reach the current status of India, the United Kingdom, and the USA, respectively.

In contrast to the lack of basic endourology equipment in most parts of Africa, developing African countries such as South Africa have included recent minimally invasive surgical treatment options, such as water vapor energy (WAVE) ablation with the Rezūm system, in the armamentarium of BPH management.²¹

With advances in technology, the surgical management of BPH is dynamic. New surgical management devices are rapidly emerging.²² In developed countries, endoscopic and minimally invasive procedures form the basis of surgical treatment for benign hypertrophy. Open prostatectomy remains popular in several countries.⁸ It is also the only technique available in some African reference centers.²³ The implementation of endoscopic approaches to BPH treatment in Africa faces several challenges. Ofoha et al¹¹ reported a lack of equipment, power supply, and training. In addition, there is a lack of specialized medical centers and infrastructure, technical skills, and expertise, and the absence of insurance or health coverage, making the cost difficult. To overcome these challenges, it is important to establish a clear policy to identify local obstacles and challenges, and define sustainable actions and strategies to improve this practice. It should be remembered that endoscopic and minimally invasive techniques expose patients to fewer complications and have the advantage of allowing rapid resumption of activity.²⁴

To develop endourology in Africa, it is crucial to assess and address training needs, allocate the necessary resources, and foster collaboration between healthcare professionals and institutions. The establishment of African regional endourology training centers based on the experience from developed nations is of paramount importance and achievable with collaboration and partnerships between academia, societies, and industry that all have patient safety and education as their shared goals.¹²

Training programs should be designed to enhance urologists' skills and knowledge of endourological procedures. Adequate resources, including advanced medical equipment and facilities, must be allocated to support the implementation of endourological techniques. The Urolink partnership with Hawassa University, which began with a visit and on-site need assessment, staff training, donation of endourology equipment, and subsequent on-site supervision, has allowed the hospital to offer TURP since its inception, making it simple for local urologists to acquire the necessary skills.¹² Establishing a regional training and excellence center for the sustainability of training is of paramount importance. The collaboration between IVUmed and the Hopital General de Grand Yoff (HOGGY), Senegal, has trained urologists throughout Francophone West Africa.²⁵ Additionally, fostering collaboration between local and international experts, medical institutions, and organizations can contribute to knowledge exchange, skill transfer, and the overall advancement of endourological practices in the African healthcare landscape. Training systems should enable the development of standardized programs to quickly enhance African urologists' endourology and minimally invasive surgery skills. The Intensive Interactive Training Programme (IITP) at the Kilimanjaro Christian Medical Center in Tanzania by

the European Association of Urology and its Global Philanthropic Committee has trained residents by international academicians and experts, tailored to each resident's capacity, and has shown a fast-tracked improvement in the skills of the residents. The program has also donated and equipped the theater with modern endourology equipment, improving the educational quality at the center.²⁶

CONCLUSION

Tertiary-level urologic surgical care encounters considerable obstacles in several African nations, especially in sub-Saharan Africa, where endoscopic treatment of BPH is significantly overlooked. This stems from socioeconomic and political barriers, resulting in a considerable gap between the demand for endourological procedures and their implementation. Challenges include non-inclusive healthcare policies, limited endourology training, and insufficient budgeting for essential equipment. This study underscores the substantial disparity between practice and standard recommendations in surveyed African centers, where open prostatectomy persists despite advancements in minimally invasive techniques. Identified obstacles include a lack of expertise and material resources, despite some countries incorporating modern options such as water vapor energy ablation. Implementing endoscopic approaches in Africa encounters challenges such as equipment shortages, power supply issues, limited training, and the absence of specialized centers, necessitating clear policies and sustainable strategies. Developing endourology requires addressing training needs, allocating resources, and fostering collaboration with partnerships, which are vital for establishing regional training centers. These collaborative efforts are essential to the development of modern urology in Africa.

Ethical Statement

The study was approved by the Ethics Committee of Teaching University Yo.

Research Involving Human Participants and/or Animals

The following manuscript is the result of a survey on urological practice and does not contain any studies with human participants or animals.

Informed Consent

A formal consent is not required for this type of study.

Declaration of Competing Interest

The authors declare that they have no relevant conflict of interest.

Acknowledgments. All the centers participated in the survey.

References

1. GBD 2019 Benign Prostatic Hyperplasia Collaborators. The global, regional, and national burden of benign prostatic hyperplasia in 204 countries and territories from 2000 to 2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Healthy Longev.* 2022;3:e754–e776.
2. Roehrborn CG. Benign prostatic hyperplasia: an overview. *Rev Urol.* 2005;7(Suppl 9):S3.
3. Fall B, Diao B, Fall PA, et al. Les urgences urologiques en milieu hospitalier universitaire à Dakar: aspects épidémiologiques, cliniques et thérapeutiques. *Prog En Urol.* 2008;18:650–653.
4. L. Bastien, R.O. Fourcade, B. Makhoul, et al. Hyperplasie bénigne de la prostate. 3723. 2012. 1. 29.ISSN 1166-7087, <http://dx.doi.org/PUROL-12-2012-22-HS6-1166-7087-101019-201205101>.
5. Descazeaud A, Robert G, Delongchamps NB, et al. Initial assessment, follow-up and treatment of lower urinary tract symptoms related to benign prostatic hyperplasia: guidelines of the LUTS committee of the French Urological Association. *Progres En Urol J Assoc Francaise Urol Soc Francaise Urol.* 2012;22:977–988.
6. Checcucci E, Veccia A, De Cillis S, et al. New ultra-minimally invasive surgical treatment for benign prostatic hyperplasia: a systematic review and analysis of comparative outcomes. *Eur Urol Open Sci.* 2021;33:28–41.
7. Lokeshwar SD, Harper BT, Webb E, et al. Epidemiology and treatment modalities for the management of benign prostatic hyperplasia. *Transl Androl Urol.* 2019;8:529–539.
8. Zubair A, Davis S, Balogun DI, et al. A scoping review of the management of benign prostate hyperplasia in Africa. *Cureus.* 2022;14:e31135.
9. Fourmarier M., Chérasse A., Misrai V., Techniques récentes et émergentes dans le traitement de l'hyperplasie bénigne de prostate symptomatique, Volume, Issue, /2020, Pages, ISSN 1283–0879, [http://dx.doi.org/10.1016/S1283-0879\(20\)42395-9](http://dx.doi.org/10.1016/S1283-0879(20)42395-9) ([http://www.sciencedirect.com/science/article/pii/S1283-0879\(20\)42395-9](http://www.sciencedirect.com/science/article/pii/S1283-0879(20)42395-9)).
10. Rudnicka E, Napierala P, Podfigurna A, et al. The World Health Organization (WHO) approach to healthy ageing. *Maturitas.* 2020;139:6–11.
11. Tubaro A, de Nunzio C. *The current role of open surgery in BPH.* EAU-EBU Update Ser. 4. 2006; 2006:191–201.
12. Awedew AF, Han H, Abbasi B, et al. The global, regional, and national burden of benign prostatic hyperplasia in 204 countries and territories from 2000 to 2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Healthy Longev.* 2022;3:e754–e776.
13. Speakman M, Cheng X. Management of the complications of BPH/BOO. *Indian J Urol.* 2014;30:208.
14. Nnabugwu II, Okoronkwo IL, Nnabugwu CA. Lower urinary tract symptoms in men: challenges to early hospital presentation in a resource-poor health system. *BMC Urol.* 2020;20:87. <https://doi.org/10.1186/s12894-020-00651-0>
15. Foster HE, Barry MJ, Dahm P, et al. Surgical management of lower urinary tract symptoms attributed to benign prostatic hyperplasia: AUA Guideline. *J Urol.* 2018;200:612–619.
16. Olapade-Olaopa EO, Onawola KA. Challenges for urology in sub-Saharan Africa in 2006. *J Mens Health Gen.* 2006;3:109–116.
17. Nam CS, Daignault-Newton S, Kraft KH, Herrel LA. Projected US urology workforce per capita, 2020-2060. *JAMA Netw Open.* 2021;4:e2133864.
18. Cresswell J. BAUS: our urological community. *Trends Urol Mens Health.* 2023;14:23–25.
19. Goel A. Urology in India: numbers and practice. *Indian J Urol.* 2019;35:245–247. https://doi.org/10.4103/iju.IJU_246_19. PMID: 31619860; PMCID: PMC6792408.
20. Moore M, Mabedi C, Phull M, et al. The utility of urological clinical and simulation training for Sub-Saharan Africa. *BJU Int.* 2022;129:563–571.
21. Spies P. The dawn of minimal invasive surgical therapies for benign prostate hyperplasia in South Africa: water vapour energy ablation with Rezūm. *Afr Urol.* 2023;3:44–46.
22. Cetinkaya M, Onem K, Rifaioğlu MM, Yalcin V. 980-Nm diode laser vaporization versus transurethral resection of the prostate for benign prostatic hyperplasia: randomized controlled study. *Urol J.* 2015;12:2355–2361.
23. Guilbert JJ. The World Health Report 2002 - reducing risks, promoting healthy life. *Educ Health Abingdon Engl.* 2003;16:230.
24. Ofoha CG, Raphael JE, Dakum NK, et al. Surgical management of benign prostate hyperplasia in Nigeria: open prostatectomy versus transurethral resection of the prostate. *Pan Afr Med J.* 2021;39:165.
25. Jalloh M, Wood JP, Fredley M, deVries CR. IVUmed: a nonprofit model for surgical training in low-resource countries. *Ann Glob Health.* 2015;81:260–264.
26. EAU supports urology training in Tanzania to enhance residents' knowledge and understanding of modern urology - Uroweb [Internet]. [cité 16 déc 2023]. Disponible sur: (<https://uroweb.org/news/eau-supports-urology-training-in-tanzania-to-enhance-residents-knowledge-and-understanding-of-modern-urology>).