



Urologist Workforce and Services in Ethiopia

Anteneh Tadesse Kifle¹ · Chandra Shekhar Biyani² · Jacques Bogdanowicz³ ·
Tilaneh Leyeh Demilow⁴ · Getaneh Tesfaye Teferi⁴ · Tizazu Abebayehu Tsega⁴

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Abstract

Background Urological conditions are a cause of diminishing quality of life, hence affecting productivity. Despite the need for urological treatment, it was excluded from receiving priority in both United Nation and Lancet commission. Most of the surgeries in sub-Saharan Africa are open surgeries. The lack of basic endourology equipment and a shortage of experts have limited Africans from receiving the privileges of minimally invasive surgeries, especially in urology. This study describes the socio demographics of the urologists in Ethiopia, the field of services they provide and their access to endourology equipment.

Methods This study presents data from a survey of urologists in Ethiopia who are members of Urology Society of Ethiopia (USE).

Results Thirty-three urologists of the 43 responded, making the response rate 76.5%. Qualification by urology residency in Ethiopia accounted for 66.7% of participants, followed by 21.2% by fellowship training abroad after general surgery training. All respondents practice open surgeries and 75.8% perform endourology. Video endoscope and cystoscopy sets were available to all those practicing endourology, with Direct Visual Internal Urethrotomy (DVIU) sets having the next highest availability and Flexible UreteroRenoScope(URS) and laser lithotripters the least accessible.

Conclusions Urology in Ethiopia is in its infancy, where the lack of advanced medical equipment combined with a paucity of qualified urologists have created a huge challenge for the provision of these services.

Introduction

The United Nations 2030 Agenda for sustainable development has 17 goals to ensure healthy lives and promote well-being for all ages. One of the objectives is achieving universal health coverage including financial risk protection and access to quality essential health care services [1]. Surgery has been neglected as part of the essential health care services because of the perception that it is too complex, too expensive or too limited to play a major role in alleviating the global burden of disease [2]. In January 2014, Jim Kim, President of the World Bank, urged the global health community to challenge the injustice of global inequity in surgical care, stating that “surgery is an

✉ Anteneh Tadesse Kifle
antyeneh@gmail.com

¹ Department of Surgery, Mudulla Hospital, Po Box 16, Snnpr, Ethiopia

² Department of Urology, St James’s University Hospital, Leeds Teaching Hospitals NHS Trust, Beckett Street, Leeds LS97TF, West Yorkshire, UK

³ Department of Urology, Kilimanjaro Christian Medical Center, Moshi, Tanzania

⁴ Department of Surgery, Hawassa University, Hawassa, Ethiopia

indivisible, indispensable part of health care and of progress toward universal health coverage” [3].

Global surgery is defined as an area for study, research, practice, and advocacy that places priority on improving health outcomes and achieving health equity for all people worldwide who are either affected by surgical conditions or have a need for surgical care. Global surgery incorporates all surgical specialties (obstetric and gynecological, anesthesia, perioperative care, aspects of emergency medicine, rehabilitation, palliative and nursing care, and the allied health professions involved in the care of the surgical patient). It encompasses surgical care for underserved populations in all countries and populations affected by conflict, displacement, and disaster while promoting access to safe and quality care [4].

The Lancet commission reported that 5 billion people lack access to essential safe, affordable surgical and anesthesia care. Access is the worst in low-income and lower-middle-income countries (LMIC). In addition to inaccessibility, of the 313 million procedures undertaken worldwide annually, only 6% occur in poor countries, where over a third of the world’s population lives. Low operative volumes are associated with high case-fatality rates from common, treatable surgical conditions. To save lives and prevent disability, 143 million additional surgical procedures are needed in LMICs yearly [5].

Essential surgery, the ‘bellwether procedures,’ primarily cesarean sections, laparotomies and open fracture repairs can be delivered safely and cost-effectively even in low resource settings. [5, 6]. Elective general surgery is only available in a few urban hospitals staffed by specialist surgeons, which has resulted in preventable morbidity and mortality as well as persistent morbidity that diminishes the productivity of survivors. [6].

Urological conditions including infection, trauma and malignancy are responsible for significantly diminishing quality and productivity of life [7]. Despite the need, urological treatments were not prioritized in either the United Nation or Lancet commissions [8].

The College of Surgeons of East, Central and Southern Africa (COSECSA) is an independent body that fosters postgraduate education in surgery and provides surgical training throughout East, Central and Southern Africa. In the ten countries which are members of COSECSA, 1690 surgeons are active with an overall ratio of 0.53 surgeons per 100,000 inhabitants. Urological surgeons vary between nonexistent to 13% of the total surgeon’s workforce, the average being 6% [9]. The urologist workforce in the COSECSA region is 0.025 per 100,000 population, while it is 2.13 for the United Kingdom and 3.99 for the USA [10], 11.

Benign prostatic hyperplasia (BPH), urethral stricture disease, prostate cancer, bladder cancer, urolithiasis and urethral/ureteric trauma are among the most common

urological conditions treated by sub-Saharan urologists [12]. Despite technological advancements and a shift toward minimally invasive procedures in urology, most of the surgeries in sub-Saharan Africa are open surgeries. Lack of basic endourology equipment and a shortage of expertise have limited Africans from the benefits of minimally invasive surgeries, especially in urology [13]. Surgical missions have tried to bridge this gap with unknown impact, as entities vary from individuals to well-organized groups with varying medical equipment availability and expertise [7]. Philanthropic organizations like IVUmed, Intersurgeon, Société Internationale d’Urologie (SIU), Urolink and MediTech Trust have formed an alliance with different hospitals in LMIC and supported them by donating equipment as well as training locals and subsequently assessing the sustainability of service and transference of skill [7, 13].

According to World Bank, Ethiopia is an East African country with a population of nearly 120 million in 2021. Total Health Expenditure (THE) per capita is \$25.26 with an average life expectancy of 63.7 years. Ethiopia has a total of 12,174 medical doctors, 2813 of which are medical specialists. The physician-to-population ratio is 1.09 per 100,000. The Urology Society of Ethiopia was inaugurated in 2021 and has 43 members. It conducted its first Annual general meeting and scientific conference in May 2022.

Methodology

An online survey with 24 variables was developed in English on Google forms. The survey was adaptive, and its length varied depending on the information provided by the respondent. Surveys were distributed to all urologists in Ethiopia using personal contact by the authors and the Urology Society of Ethiopia’s (USE) official social network sites.

The questionnaire was adapted from previous publications. Socio-demographic data including age, sex, training and work location of the respondent urologist were obtained. Questions pertaining to urology services were chosen to assess type of facilities and the working environment, including ward and operation table and type and number of endourology versus open surgeries. Availability of endourology equipment sets was also assessed.

Results

Thirty-three urologists out of the 43 members (76.5%) of the USE responded to the online survey. The mean age of the respondents was 40.76 ± 10.59 years. Thirty-two (97%) of respondents were male, with noticeably only one

female urologist practicing in the country. All respondents were Ethiopians.

Twenty-two (66.7%) acquired their qualification by urology residency training in Ethiopia, while seven (21.2%) were by fellowship training abroad post general surgery training. One respondent is renal transplant fellowship trained, while the rest has general urology training.

Twenty-eight (84.8%) of the urologists were practicing full-time in government hospitals, and 20 (71.4%) had part-time jobs in private hospitals. Twenty-five (75.76%) are clinical academicians who worked in university teaching hospitals, most of whom reside in big cities like Addis Ababa [18] and Hawassa [5]. Refer to Fig. 1.

Fifteen (45.5%) respondents practice in their own Urology Units. Only 11 (33%) have a separate urology ward. The number of urology beds ranges from 6 to 24 in the separate urology wards, while 12 (37.5%) have a separate urology operation theater. The urology follow-up and outpatient clinics range from 1 to 6 days per week with a mean of $2.9 \pm SD1.72$ days per week. The average number

of patients per clinic day ranges from 5 to 90 with a mean of $38.48 \pm SD19.24$ patients per clinic per respondent.

All respondents practice open surgeries including simple prostatectomy, open stone surgeries, urethroplasty, trauma surgeries and pediatric surgeries such as hypospadias and orchidopexy. Oncologic surgeries are often limited to radical nephrectomy, which is done by all respondents. The least common procedures are radical prostatectomy 2 (6.7%), radical cystectomy 9 (27.3%) and testicular biopsy 19 (57.6%).

Endourology is practiced by 25 (75.8%) while laparoscopic surgery is done by only 5 (15.2%). The most common endourology procedure is diagnostic cystoscopy, done by all 25 practicing endourology, while Retrograde IntraRenal Surgery (RIRS) is the least common, provided by 3 (9.1%). Refer Fig. 2

Video endoscope and cystoscopy sets were available for all who reported practicing endourology, followed by DVIU sets, while flexible ureterorenoscope and laser lithotripter are the least available. Refer to Fig. 3

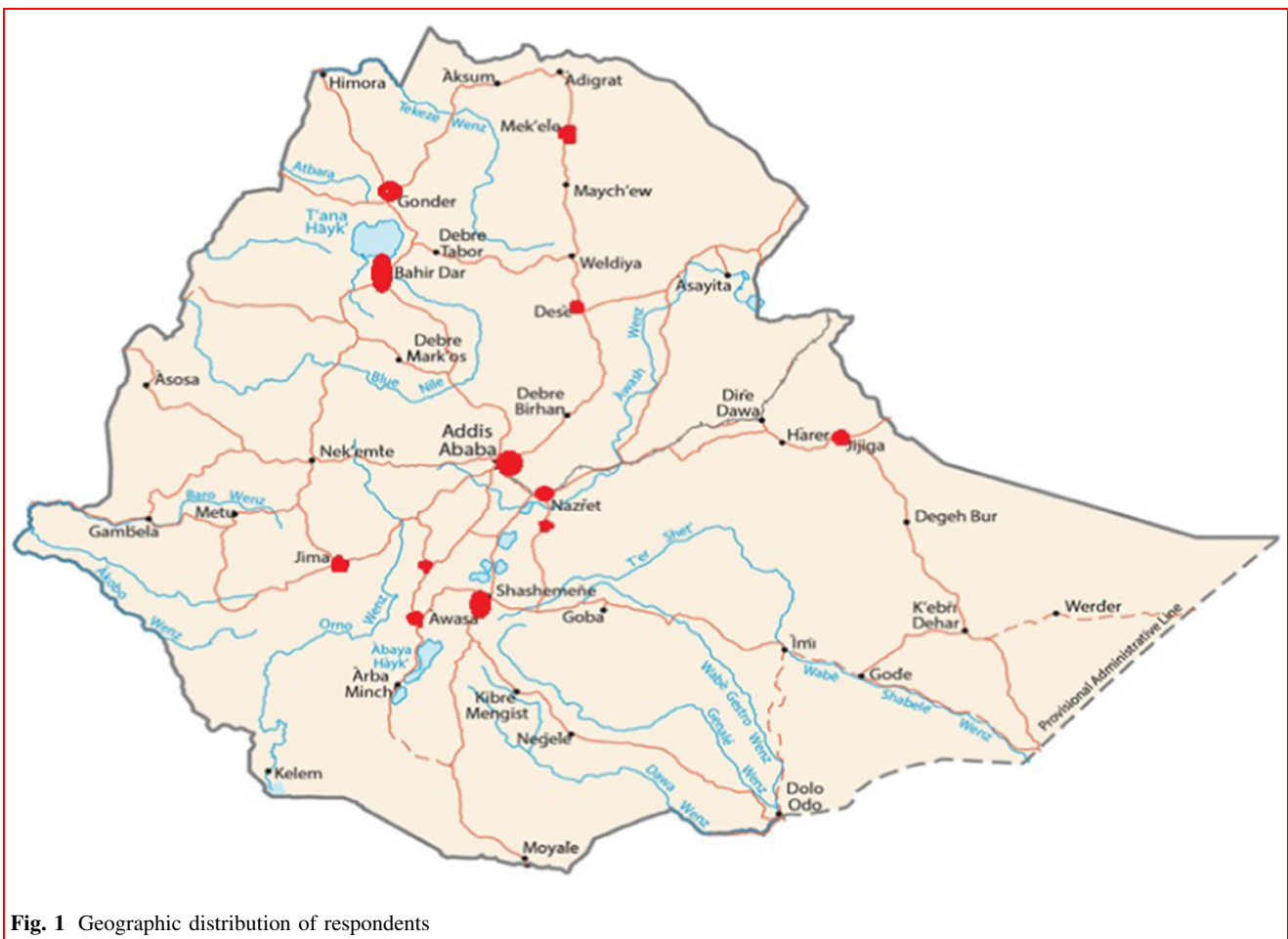


Fig. 1 Geographic distribution of respondents

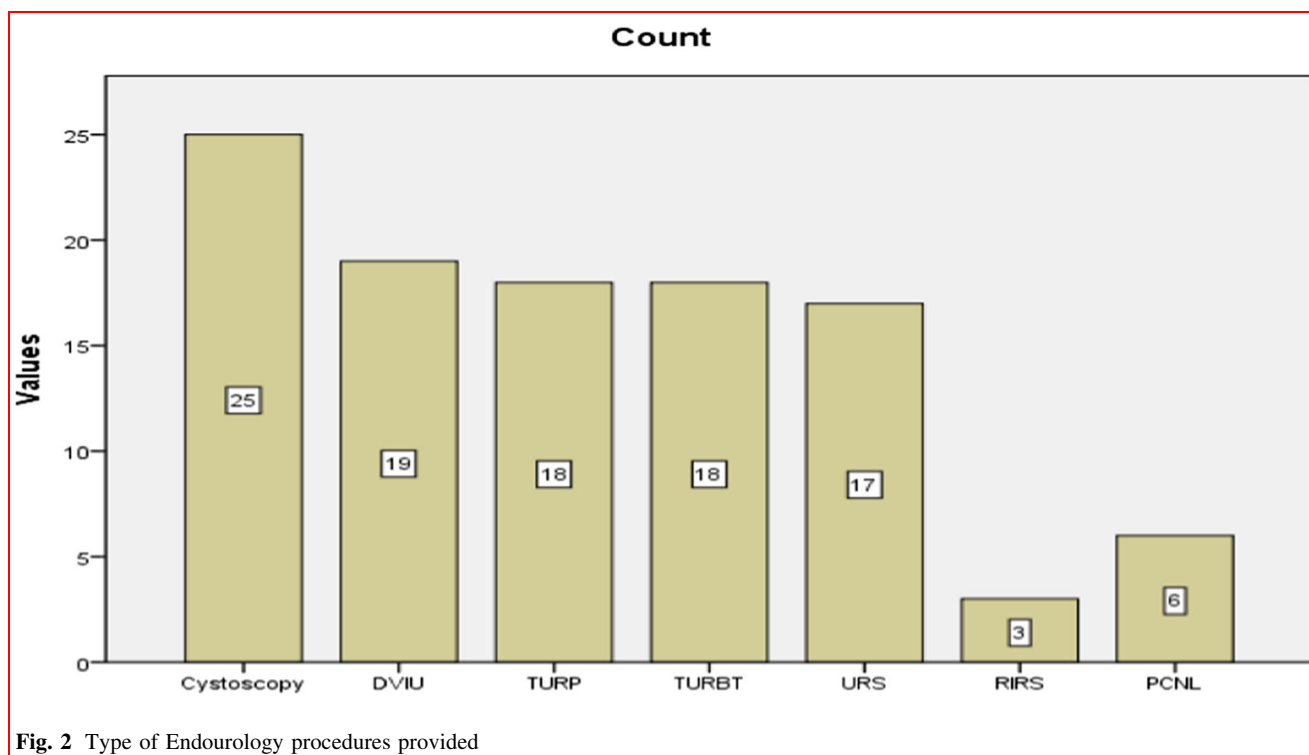


Fig. 2 Type of Endourology procedures provided

Discussion

In 2022, the complete membership of the USE was 43 for a country with a population of 120 million. One urologist is to almost 2.8 million people (0.036/100,000 inhabitants). This is comparable to figures from COSECSA countries (0.025 per 100,000 populations) [8]. According to O'Flynn et. al., in 2016, there were 12 urologists in Ethiopia (0.012 per 100,000) [9], a number which has tripled within the last 6 years. Also, the exact number of urologists needed is not well defined. Our finding is a far lower ratio compared to India, UK and America [8], 14. Ethiopian urology residency training started in 2005 at the Tikure Anbessa Hospital, Addis Ababa [15]. In this study, we found that 75.8% of respondents were trained in Ethiopia. The opening of another urology residency training site at Saint Paul's Millennium Medical College, Addis Ababa in 2017 is also expected to improve the number of urologists beginning in 2022.

In 2016, Ethiopia launched a 5-year national flagship initiative, Saving Lives through Safe Surgery, as part of its goal of achieving universal health coverage. It has eight major pillars, including infrastructure development, equipment supplies, and management and human resource development. The 5-year plan was to train only 50 more urologists out of 1910 surgeons [16]. This depicts the poor emphasis accorded the field.

Urological infections are usually treated by non-urologists [14]. A survey in Europe showed that a chunk of pediatric urology, urogynecology, adrenal gland surgery, treatment of infertility, and renal transplantation are shared between different surgical subspecialties including urologists [17]. This could explain why testicular biopsy is only performed by 19 (57.58%) urologists.

Urethral stricture is one of the most common and challenging urologic abnormalities faced by urologists in LMIC [18]. The management varies from dilatation, internal urethrotomy to different urethroplasty methods [19]. All respondent urologists in this study perform urethroplasty. A study at Mekelle, Ethiopia has shown that direct vision internal urethrotomy (DVIU) is a simple, quick and cost-effective mode of operation in urethral strictures for maintaining acceptable voiding patterns [20]. In our study, 19 respondents who have access to the DVIU set are able to do it, which corresponds to the conclusion. Being the ultimate expert to provide specialist care in a small group and often with ineffective equipment, it is an enormous challenge to manage the resultant huge workload.

Endourological services in sub-Saharan Africa have been constrained due to the lack of endoscopic urological equipment [13]. This is consistent with our finding, as 8 respondents (24.2%) have no access. It is not only lack of access, but also having the appropriate instruments which affects the services provided. In our study, 6 (25%) out of

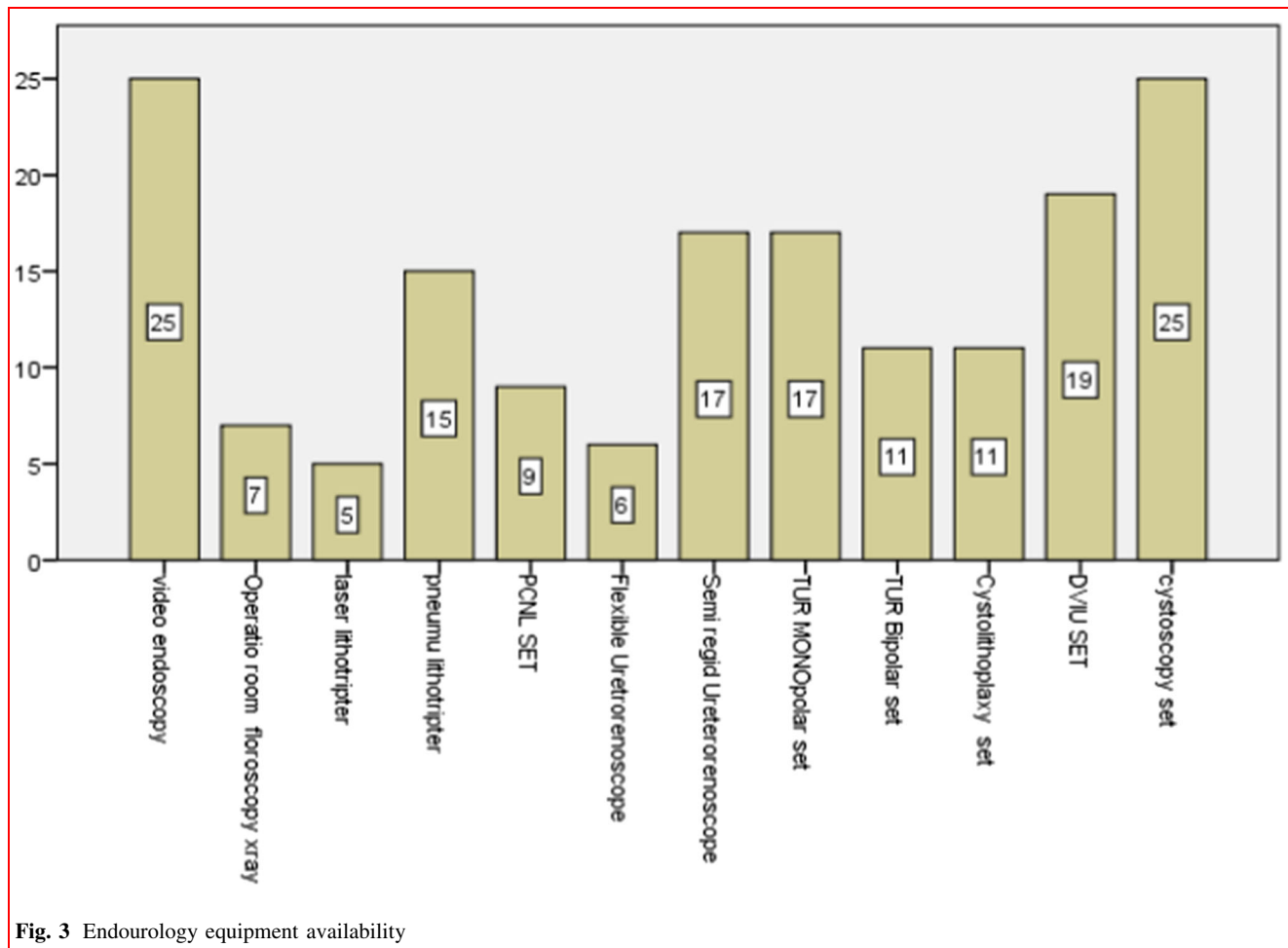


Fig. 3 Endourology equipment availability

25 who are able to provide endourology services are only able to provide DVIU and cystoscopy. They do not have the necessary instruments to perform transurethral resection of bladder or prostate pathology, nor are they able to perform upper urinary tract endoscopic diagnosis or treatment.

Eighteen (54.5%) are able to do transurethral resection of bladder and prostate tumors. Ten use both Monopolar and Bipolar resectoscope sets, seven use monopolar sets only and one uses a bipolar set only. There is one respondent who has access to bipolar resectoscope but is unable to perform either TURBT or TURP (Table 1).

The surgical management of upper urinary tract stones is based on the stone location, size and number of stones. It is made even more complex by the choice of the patient and the individual expertise of the consulted doctor and his available equipment.

Modern management of urolithiasis include external shock wave lithotripsy (ESWL), percutaneous nephrolithotomy (PCNL), ureterorenoscopy (URS) including flexible and semi-rigid ureterorenoscopy. Management of urological stone diseases in Ethiopia is

Table 1 Transurethral resection set availability

Procedure Type	Available sets for urologists				
	TURBT		TURP		
	Yes Count	No Count	Yes Count	No Count	
TUR Monopolar set	Yes	17	0	17	0
	No	1	7	1	7
TUR Bipolar set	Yes	10	1	10	1
	No	8	6	8	6

mainly open surgery by general surgeons. Stones managed endoscopically range from 34- 50% of urolithiasis patients in centers where urologists practice them [21–23]. PCNL is practiced by six urologists while nine of them have access to the PCNL set. The access to lithotripter is also limited, as five out of five who have access to laser lithotripter deliver URS and three out of five deliver PCNL. Similarly, 14/15 respondents who have pneumatic or ultrasonic

Table 2 Cross-tabulation of PCNL and URS services with the necessary equipment

		PCNL		URS	
		Yes Count	No Count	Yes Count	No Count
ORxray	Yes	4	3	5	2
	No	2	16	12	6
Laser lithotripter	Yes	3	2	5	0
	No	3	17	12	8
pneumatic/ultrasonic lithotripter	Yes	5	10	14	1
	No	1	9	3	7
PCNL SET	Yes	6	3	8	1
	No	0	16	9	7
Flexible URS	Yes	4	2	5	1
	No	2	17	12	7
Semi-Rigid URS	Yes	5	12	16	1
	No	1	7	1	7

lithotripter deliver URS, while only five are practicing PCNL (Table 2).

Poor access to equipment is detrimental to the provision of services, but still there are respondents who have access to equipment yet are unable to deliver the service. This could be because of scarcity of necessary technical skills. In a study from Nigeria, most urology training sites have no access to endourology services except basic cystoscopy. This has clearly affected the services they provide afterward [24]. This well-known training inadequacy was improved by surgical workshops, seminars, overseas training and onsite training with the support of different organizations from High Income Countries (HIC).

Overseas training might open the door for brain drain. To avoid this, an onsite training has become a preferred option. Urololink has supported Hawassa University in Ethiopia. After conducting assessment of needs, they have provided TUR and PCNL equipment and trained cystoscopy and urethra reconstructions through onsite workshops [13]. The European Association of Urology, as coordinator of the Global Philanthropic Committee, has also supported an Intensive Interactive Training Program (IITP) which brings experts who are academicians to Kilimanjaro Christian Medical Center, Tanzania to train residents from different African countries. They have successfully conducted a number of onsite trainings on transurethral resections, urethral reconstruction, endoscopic stone management, URS, PCNL, pediatric reconstructive urology, uro-oncology and neurogenic bladder [25]. Similar successful initiatives are run by International Volunteers in Urology (IVUmed), with the motto of ‘teach one, reach many,’ focusing on teaching teachers to create self-reliant surgical residency programs [26].

Research has been a main gatekeeper and gateway for knowledge provision and influencing policy makers [27]. There is very little published data on urology in Ethiopia, which has created an enormous gap in knowledge about the current achievements and challenges faced. There is a need for improvement in the quantity and quality of research done. As 75% of the respondents work in academic institutions, universities should encourage and support these initiatives.

Conclusion

Urology in Ethiopia is in its infancy, where the lack of advanced medical equipment in addition to few urologists has created a huge challenge for the services. Increasing the number of urologists through home-based residency programs with onsite skill transfer workshops is seen as the best option to tackle the problem associated with number and skills. The lack of basic endourology and laparoscopic equipment has prevented rendering minimally invasive urology surgeries to the population.

Recommendation

The USE has a lot to do starting from advocacy, policy making, equipment procurement and allocation to urologists and their institutions. It has to develop partnerships with different urology societies from HIC for training and support supervision of the urologists in Ethiopia to acquire new skills and advancements in minimally invasive equipment utilization. Research to show the challenges and

achievements of urology in Ethiopia should be done by the society and individual urologists.

Declarations

Conflict of interest No conflict of interests or disclosures.

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Anteneh Tadesse Kifle was born and raised in Ethiopia. He obtained his medical degree and general surgery training from Hawasa University. Dr. Tadesse has undertaken a urology fellowship at the Kilimanjaro Christian Medical Center in Tanzania. He is currently working at the PCEA Chogoria Hospital as an instructor and urologist. His research focuses on improving minimally invasive urologic surgery in Africa and defining global urology. In

addition to his surgical career, he has a passion for reading biographies and analyzing the politics of Ethiopia and sub-Saharan Africa.