

## Male Infertility Practice Among Filipino Urologists: A Road Less Traveled

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**Introduction:** Advancement in male infertility were evident during the past several decades where a shift to evidence-based management is becoming apparent. However, there is still a knowledge gap among training urologists in the said field where the Philippines is no exception. This is the first study that would determine the current trend of practice in male infertility among Filipino urologists and recommend solutions to this problem

**Materials and Methods:** A 42-item self-administered survey questionnaire was carried out using the Survey Monkey. This Institutional Review Board (IRB)-approved online survey consisted of 3 parts: demographics, adherence to the guidelines and clinical practice. The authors contacted the Philippine Urological Association (PUA) via email and requested for confidential distribution of an online survey. The participants were given 4 weeks from the date of initial mailing until end of the survey process. STATA 15.0 was used for data analysis.

**Results:** A total of 131 respondents participated in the survey. Only 13% responded that they are “very interested” in the specialty of male infertility. About 84% of respondents see less than 5 male infertility cases per month with 67% of them reporting that male infertility constitutes less than 10% of their practice. For the treatment, 36% of them prescribe testosterone for empiric medical therapy of male infertility which is contraindicated in the treatment of male infertility and only 5% of respondents offer the gold standard microsurgical varicocelectomy in patients with varicocele. Only 8% of respondents are affiliated with IVF centers, which is troubling with regards to how men with poor reproductive potential are treated especially in azoospermic men. Two percent of the respondents rated their exposure to male infertility during residency as “excellent” while only 3% of them rated their knowledge as excellent. With this, responders suggest more exposure to the specialty, more postgraduate courses, lectures, and webinars, more training opportunities, a local guideline for Filipino urologists to follow, and more exposure to professional networks.

**Conclusion:** Practice of male infertility in the Philippines is inadequate in terms of knowledge and treatment for these patients. Most respondents follow the male infertility guidelines available, but it does not translate into practice, highlighting their own preferences in diagnosis and treatment. Even though they consider it as a necessary part of Urology, lack of exposure to cases, surgical loads, and research makes it a challenge when faced with these cases in their clinics. A change in the residency, postgraduate, and national level are recommended to have the best clinical outcome and well-being for these patients.

**Key words:** infertility, urological practice, varicocelectomy

## **Introduction**

Advancement in the field of male infertility had made significant strides during the past several decades. With the development of basic research and scientific thinking in male infertility, a gradual paradigm shift to evidence-based management is becoming apparent.<sup>1</sup> Nevertheless, the knowledge gap in this field for urologists is evident. In a study done by Ghayda et. al., it was concluded that both American and European urology residents shared the same frustration regarding their education and exposure to andrology and male infertility during their residency training.<sup>2</sup>

Associating it to a developing country like the Philippines, the same dilemma of lack of structured exposure to male infertility is obvious when compared to other subspecialties in urology. Time allocated to exposure of residents in male infertility including surgical loads, research, educational activities was far from satisfactory. Surgical load deficiency could be caused by lack of surgical microscope and microsurgical training modules while research and didactics inadequacy could be due to non-dedicated and non-standardized academic curriculum and the underestimation of the importance of andrology as one of the foundations of urologic training. Furthermore, the absence of fellowship-trained physicians within the group or department is a significant aspect for the residents' experience. In the US, nearly 80% of urology training institutions have a fellowship-trained microsurgeon which contrasts with local setting.<sup>3</sup> As a result, graduates of Urology are not competent when they encounter patients with problems of male infertility leading to improper care for the patients.

There are already numerous surveys regarding residents' exposure to male infertility.<sup>2,4,5</sup> However, current practice trends of Filipino urologists in male infertility are lacking. With this survey, the investigators would like to identify the gaps observed in the field and recommend solutions for this problem.

The objective of the study was to determine the current practice pattern of Filipino urologists in male infertility.

## **Methods**

A 42-item self-administered survey was carried out using the Survey Monkey ([www.surveymonkey.com](http://www.surveymonkey.com)). This was in accordance with the Checklist for Reporting Results of Internet E-Surveys. Conducted in English, the survey assessed the current practice patterns of Filipino urologists on the subspecialty of male infertility. Survey questions were formulated by the authors. The male infertility specialist assessed the quality of the survey for expert opinion. They performed a careful and critical examination of the questionnaire to assess for ambiguity, bias and dilemma in questions and possible responses. The author tested the usability and technical functionality of the survey before administering it to the participants. The online survey consisted of 3 parts: demographics, adherence to the guidelines and clinical practice. Survey can be answered with multiple choice options, five-point Likert scale and short answers and self-report numeric ratings. An introductory invitation letter included the objectives of the survey and the concept of anonymity of the respondents. Participants were informed that they are were obliged to complete the survey. They were assured that all data collected were anonymized. Their names and institutions were not mentioned. Responses were submitted anonymously to ensure confidentiality. No identifying information was collected. The survey specifically included the following: numerical rating of the subspecialties they are interested in, male infertility guidelines they are using, the need to request for the second semen analysis if the initial test is abnormal, sperm concentration that warrants the request for hormone testing, tests they request for azoospermic men, use of orchidometer to measure testicular size, use of medication for empirical treatment of infertile men, the minimum sperm concentration to initiate empirical treatment, the duration of month they prescribe medication for empirical treatment, the importance of male infertility subspecialty exposure to their practice as consultants, their knowledge and confidence on treating infertile men, their microsurgical exposure related to male infertility.

This survey was approved by the Jose B. Lingad Memorial Regional Hospital Research Ethics Committee (JBLMRH-REC 2019-488). The authors contacted the Philippine Urological Association (PUA) via email and requested for confidential distribution of an online survey. The inclusion criteria were all Associate Members and Fellows of the PUA. Urology residents and urologists under fellowship training were excluded from this study. The participants were given 4 weeks from the date of initial mailing until the end of the survey process. Non respondents received reminder emails weekly to maximize response rate. After providing consent via consent button, the respondents were directed to the survey proper. A separate button was also provided for those who were not willing to give their consent to the survey. When the button is clicked, the survey would be immediately terminated. Filling in the survey means giving consent of participation. The number of questionnaire items per page was indicated. There were back buttons or a review step which displayed the summary of the responses. IP address of the client computer was used to determine the potential duplicate entries. Duplicate database entries having the same user ID were eliminated before the analysis. This is one of the properties of the above survey platform. There was an automatic method for capturing the responses. Data were stored in the above online platform which has a secure web-link. No incentives were provided to the respondents. Incomplete surveys were excluded.

### *Statistical Analysis*

#### Quantitative Data Analysis

Descriptive statistics was used to summarize the general and clinical characteristics of the participants. Frequency and proportion were used for nominal variables, median and range for ordinal variables, and mean and standard deviation for interval/ratio variables. All valid data were included in the analysis. Missing data were neither replaced nor estimated. STATA 15.0 was used for data analysis.

#### Qualitative Data Analysis

Question 42 was open-ended and analyzed qualitatively. Answers were grouped into general themes about what respondents wanted to recommend improving male infertility exposure or practice for Filipino urologists. Some themes have not reached saturation but are still worth mentioning.

#### Results

The authors surveyed a total of 131 practicing urology consultants. Half of the respondents were below 45 years old and 95% were males. Half of the respondents were also NCR-based, and 51% have been in practice for at least 10 years as seen in table 1.

**Table 1.** Demographic profile of urologists (n=131).

	Frequency (%)
Sex	
Male	124 (94.66)
Female	7 (5.34)
Area of practice	
NCR	70 (53.44)
Luzon, outside NCR	42 (32.06)
Visayas	10 (7.63)
Mindanao	8 (6.11)
Abroad	1 (0.76)

When asked whether male infertility was interesting as a subspecialty, there were 17 (12.98%) who were “very interested,” 51 (38.93%) were somewhat interested, and 32 (24.43%) who were neutral. Thirty one (23.6%) were uninterested in male infertility as a subspecialty. (Table 2) On ranking, half had it ranked it within Top 5 and another half within Top 6 to 10 as seen in figure 1.

Over 90% of the respondents see only approximately 10 or less male infertility patients per month (Figure 2). Consequently, more than half of the respondents estimate that male infertility

constitutes only less than 10% of their patients. Eleven (8.40%) respondents refer those cases to male infertility specialists (Table 3).

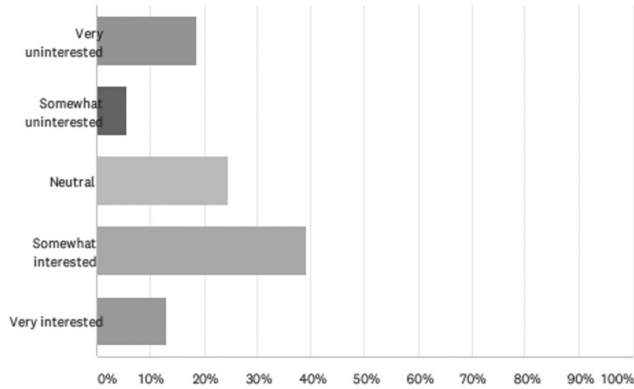


Figure 1. Interest in male infertility as a subspecialty (N=131).

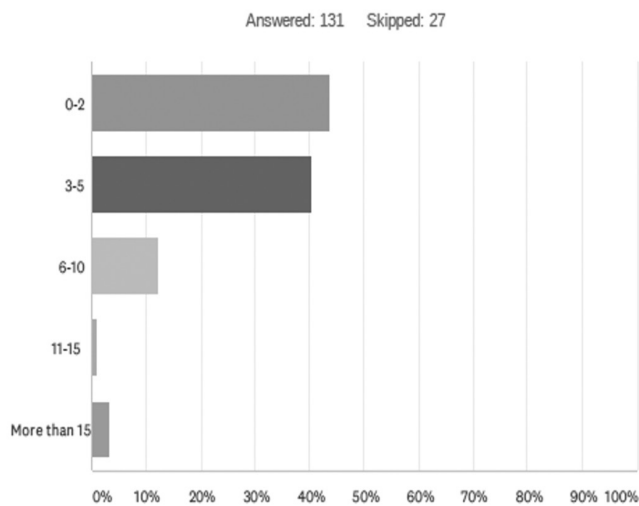


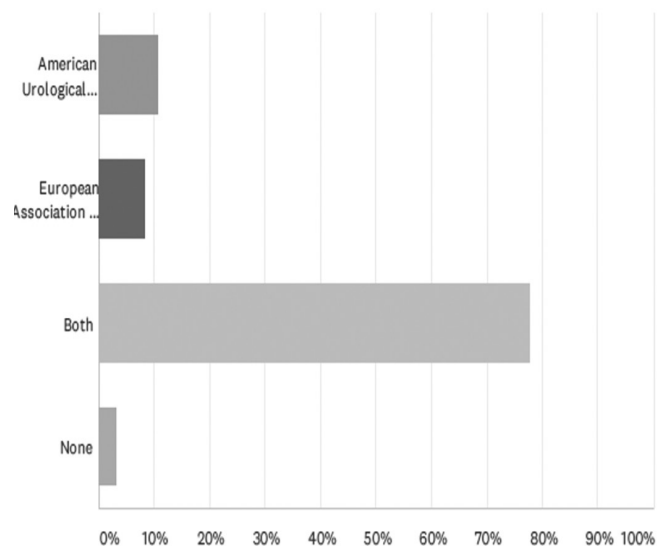
Figure 2. Male infertility cases seen in a month.

Table 2. Clinical experience in male fertility (N=131).

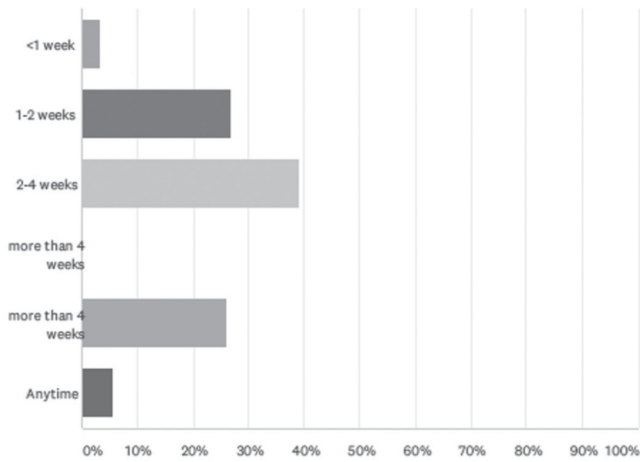
	Frequency (%)
Proportion of patients that are male infertility cases	
Refers patients to male infertility specialists	11 (8.40)
Male infertility constitutes less than 10% of patients	77 (58.78)
Male infertility constitutes 10-20% of patients	38 (29.01)
Male infertility constitutes 21-50% of patients	3 (2.29)
Male infertility constitutes 51-80% of patients	1 (0.76)
Male infertility constitutes >80% of patients	1 (0.76)

In evaluating patients consulting for male infertility, the common guidelines used were both American Urological Association (AUA) and European Association of Urology (EAU) guidelines. Nearly all respondents except two would typically request for a second semen analysis when the initial results are abnormal, within 1-4 weeks for most cases. Most of the respondents consider hormone testing when the sperm count is below 10 million/ml. The most common hormones requested are FSH and total testosterone. Genetic testing is typically requested only for men with azoospermia, or sperm counts below 10 million/ml. For men with severe oligozoospermia and non-obstructive azoospermia, 60% of the respondents do not request tests. Only 11 respondents request for sperm deoxyribonucleic acid (DNA) fragmentation testing; they do so for in vitro fertilization/intracytoplasmic injection (IVF/ICSI) failure, intrauterine insemination (IUI) failure, recurrent pregnancy loss, and less commonly for clinical varicocele and men with risk factors. Orchidometer or calipers for testicular size is used only by 15 (11.45%) respondents. When asked what they consider as advanced paternal age, 69% of the respondents replied 50 or 60 years old and above (Figures 3a-3h).

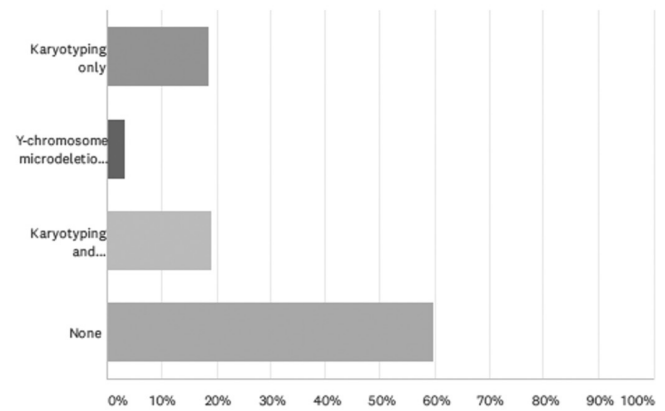
Figures 3a-3h. Clinical practices of urologists in evaluating patients consulting for male infertility



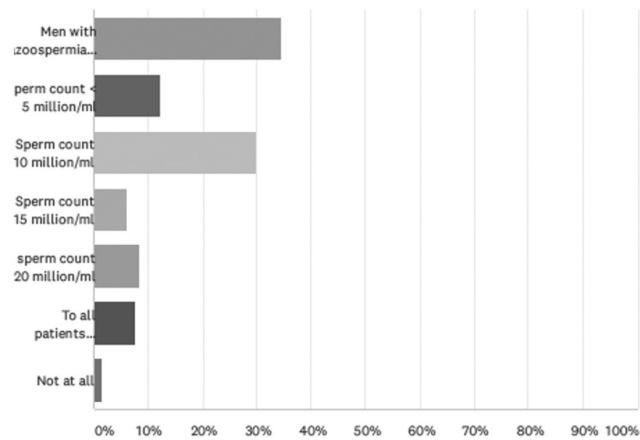
3a. Guidelines used in managing infertility cases



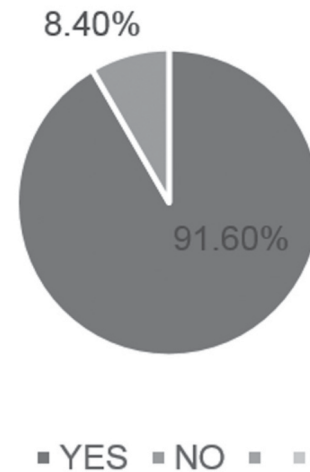
3b. Time to request for second semen analysis if the initial result showed abnormal semen parameters



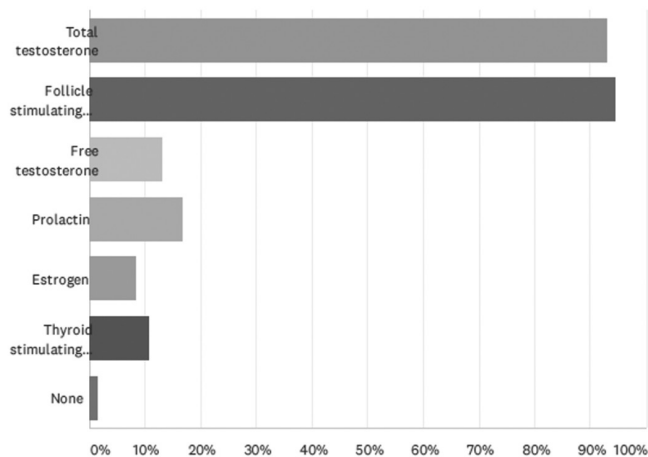
3e. Tests requested in men with severe oligozoospermia and non-obstructive azoospermia



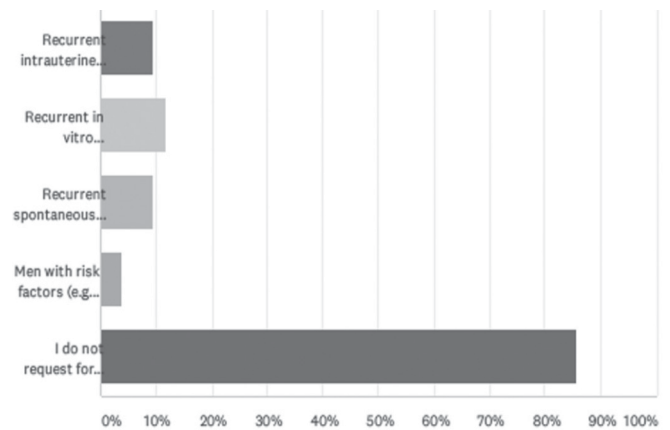
3c. Indication for requesting hormone testing



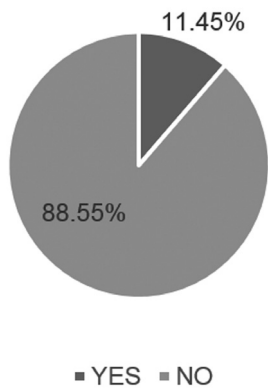
3f. Request for DNA fragmentation



3d. Initial test requested



3g. Indication for requesting sperm DNA fragmentation testing



3h. Uses an orchidometer to determine testicular size

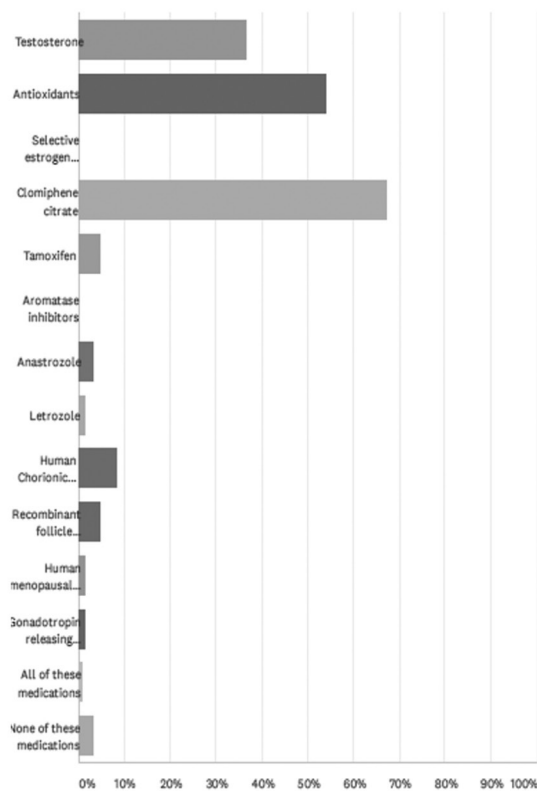
The three most commonly cited empirical treatment for male infertility are clomiphene citrate (67.94%), antioxidants (54.96%), and testosterone (37.40%), and these three are also the most commonly prescribed treatments (Figure 4a). At

least a third of the respondents initiate treatment at <20 million/ml sperm count, and 53% reevaluate after 2-3 months.

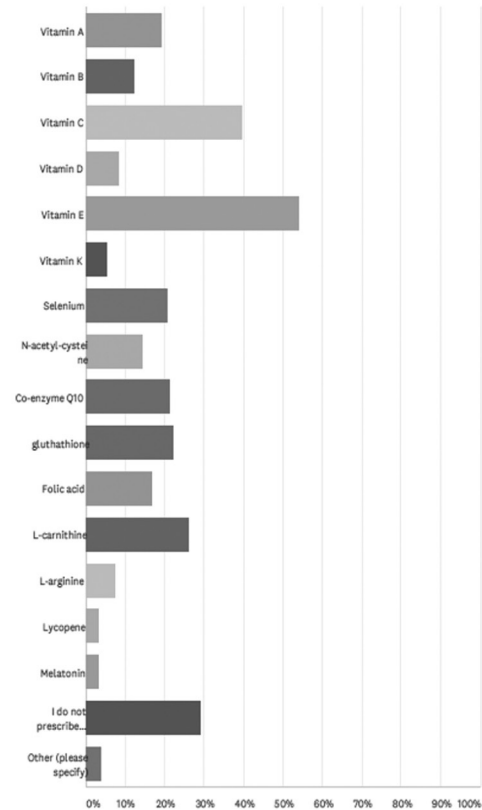
There were 86 (65.65%) who prescribed antioxidants. The most common antioxidants were Vitamin E, Vitamin C, L-carnitine, and glutathione. For a fifth of the respondents, there is no threshold for sperm concentration to initiate antioxidants; majority of the respondents re-evaluate after within 6 months of treatment (Figure 4b).

For pyospermia, 61 (46.56%) urologists request for semen culture and sensitivity, while 32% treats it empirically and 15% treats symptomatically. There were eight respondents who preferred to observe first.

In the management of male infertility, adoption is offered as an option by 71.76% of the respondents. Sperm cryopreservation is offered by 44.27% of the respondents. Assisted reproductive technologies are offered by 46.56%. Eleven respondents were affiliated with an IVF center (Table 3).



(a) Medications usually prescribed for infertility



(b) Antioxidants prescribed

Figure 4. Usual medications prescribed in practice

Scrotal ultrasound is requested routinely for varicoceles by 71.76% of the respondents. In varicocelectomy, 38.17% prefer to do an inguinal approach while 33.59% prefer to do a subinguinal approach. The instruments used in varicocelectomy were surgical microscope and vascular doppler (46.56%), surgical loupe only (42.75%), surgical

microscope (4.58%), and vascular doppler only by one surgeon (Table 4).

Thirty-three (25.19%) urologists perform microsurgical varicocelectomy, and 17 (12.98%) do microsurgical vasectomy reversal.

Diagnostic testicular biopsies to differentiate between obstructive versus non-obstructive

**Table 3.** Clinical practices of urologists in the management of patients consulting for male infertility (N=131).

	Frequency (%)
Affiliated to any IVF center	11 (8.40)
Offers assisted reproductive technologies (e.g. IUI, IVF, ICSI) as treatment options to infertile couples	61 (46.56)
Offers adoption as part of treatment option for infertile couples	94 (71.76)
Offers sperm cryopreservation/freezing	58 (44.27)

**Table 4.** Exposure to surgical procedures (n=131).

	Frequency (%)
Request for scrotal ultrasound for patients with varicoceles	
Routinely	94 (71.76)
Sometimes	33 (25.19)
Never	4 (3.05)
Microsurgical inguinal or subinguinal	25 (19.08)
Open retroperitoneal high ligation	7 (5.34)
Laparoscopy	4 (3.05)
Sclerotherapy	0
Embolization	0
Scrotal operation	1 (0.76)
Instrument used in varicocelectomy procedure	
Surgical microscope and vascular doppler	61 (46.56)
Surgical loupe only	56 (42.75)
Surgical microscope only	6 (4.58)
Vascular doppler only	1 (0.76)
None	
Microdissection testicular sperm extraction (micro-TESE)	8 (6.15)
Sperm retrieval techniques performed for non-obstructive azoospermia	
Percutaneous epididymal sperm aspiration (PESA)	3 (2.31)
Microsurgical epididymal sperm aspiration (MESA)	4 (3.08)
Testicular sperm aspiration (TESA)	11 (8.46)
Conventional testicular sperm extraction (TESE)	17 (13.08)
Microdissection testicular sperm extraction (micro-TESE)	9 (6.92)
Sperm retrieval techniques performed for obstructive azoospermia	
Percutaneous epididymal sperm aspiration (PESA)	6 (4.62)
Microsurgical epididymal sperm aspiration (MESA)	7 (5.38)
Testicular sperm aspiration (TESA)	13 (10.00)
Conventional testicular sperm extraction (TESE)	20 (15.38)
Microdissection testicular sperm extraction (micro-TESE)	7 (5.38)
Others	1 (0.77)

azoospermia are routinely performed by 36.64% of the respondents. Twenty six urologists have performed sperm retrieval techniques: testicular sperm extraction (TESE), micro-TESE, microsurgical epididymal sperm aspiration (MESA), testicular sperm aspiration (TESA), and percutaneous epididymal sperm aspiration (PESA) as seen in table 4.

Over 90% of the respondents agreed that male infertility exposure is an important element

of residency training, but more than 50% of the respondents perceived their exposure to male infertility cases as fair, poor, or very poor. Half of the respondents also perceived their knowledge of male infertility as “fair,” and were “fairly confident” to handle male infertility cases.

Respondents were asked to give recommendations to improve male infertility exposure or practice (Table 5).

**Table 5.** Recommendations to improve male infertility exposure/practice.

General recommendations	Specific recommendations
More exposure	<ul style="list-style-type: none"> <li>• In general</li> <li>• Improve during residency, rotation</li> <li>• To more cases</li> <li>• To particular surgeries, procedures, disciplines</li> <li>• To trends</li> </ul>
CME and post grad	<ul style="list-style-type: none"> <li>• CME in general</li> <li>• Providing opportunities</li> <li>• Providing more topics in post grad</li> </ul>
Lectures, webinars, short courses, conferences, workshops	<ul style="list-style-type: none"> <li>• In general</li> <li>• In pandemic time</li> <li>• On male infertility in particular</li> </ul>
More training opportunities or programs, rotation	<ul style="list-style-type: none"> <li>• More training opportunities in general</li> <li>• Training program</li> <li>• Train with subspecialists</li> <li>• Have rotations in infertility centers, IVF clinics</li> <li>• Rotation involving sperm retrieval</li> </ul>
Set up a society, a program	<ul style="list-style-type: none"> <li>• Medical society development</li> <li>• Program development</li> </ul>
Need for clinical practice guidelines	<ul style="list-style-type: none"> <li>• Produce clinical practice guidelines</li> <li>• For culture</li> </ul>
For PUA	<ul style="list-style-type: none"> <li>• Knowledge sharing</li> </ul>
Referral system	<ul style="list-style-type: none"> <li>• In general</li> <li>• Create system</li> </ul>
More surveys on needs, for reflection	
Good mentors	<ul style="list-style-type: none"> <li>• Having good mentors</li> <li>• Improve mentors</li> </ul>
Fellowship training or subspecialty training	<ul style="list-style-type: none"> <li>• Fellowship training</li> <li>• Subspecialty training</li> <li>• Train abroad</li> </ul>
Infrastructure improvements	
Hospital system improvement	



*More exposure*

Some respondents said that there has to be more exposure in general, while some mentioned the need for increased exposure and improved during residency and rotation. Some recommended exposure to more cases.

Some respondents talked about their need to improve their exposure to particular surgeries, procedures, and disciplines. One respondent said he would call “residents for exposure to microsurgical procedures for training purposes,” and “let them observe” for the reason of it not being part of their residency training programs.

Some respondents said there has to be more exposure to “current trends” in diagnosis and management, and also an “up to date training curriculum” for residents.

*Continuing Medical Education and post graduate courses*

Respondents recommended continuing medical education, which can be done through opportunities like making it twice a year for urologists, or by “strengthening the Infertility Society” where opportunities will be provided. Other respondents wanted “more post grad topics on infertility,” and “exposure on varied cases of male infertility.”

*Lectures, webinars, short courses, conferences, workshops*

Some respondents wanted lectures, webinars, short courses, conferences, workshops, and other learning opportunities like video presentations and the exposure or access to more journals. A respondent said having “more virtual lectures” would be appropriate, during this ongoing pandemic.

Other respondents said they wanted these learning opportunities for male infertility in particular.

*More training opportunities or programs, rotation*

Respondents mentioned the need for more training opportunities. A respondent suggested having a 3 to 6 month training program for all practicing urologists. Another respondent wanted the opportunity to train with subspecialists.

Most respondents recommended giving residents rotations in infertility centers and IVF clinics. A respondent suggested a rotation in a center “performing sperm retrieval techniques” in particular.

*Set up a society, a program*

Respondents wanted a society for infertility “which will include both obgyn and urologist infertility experts,” or a “Urologic Andrology Society.”

Other respondents wanted a program set up for training in male infertility for residency or taken as a subspecialty.

*Need for clinical practice guidelines*

Some respondents recommended that clinical practice guidelines be produced, and some mentioned how clinical practice guidelines should be “tailored to the Filipino culture” or is “adapted for the Filipinos”.

*For the Philippine Urological Association*

Some respondents suggested that “sharing of knowledge among urologists” and making it “a part of our annual convention” could improve male infertility exposure and practice.

*Referral system*

Respondents said referral systems has to be developed. Such would help in choosing an institution or hospital, and in knowing when to refer to gynecologists.

*More surveys on needs, for reflection*

A respondent said that surveys are “very enlightening,” and make one “realize how much we can shortchange infertility patients.”

*Good mentors*

Some respondents said that having good mentors are helpful, while some said that there should be “better guidance during training.”

### *Fellowship training or subspecialty training*

Respondents recommended that Filipino urologists take fellowship or subspecialty training after residency. It is interesting to note that some respondents recommended residents “training abroad.”

### *Infrastructure improvements*

Some respondents recommended that infrastructure improvements be made, such as those needed in sperm banking, a “regional fertility center,” and to make these male infertility specialty centers “more locally accessible.”

### *Hospital system improvement*

In relation to recommendations made for infrastructure improvements, one respondent suggested that the hospital system be improved through the creation of a “department or subsection” for male infertility.

## **Discussion**

In terms of male infertility in the Philippines, this is the first study that aims to explore the current trends of practice of Filipino urologists in the said field which could identify inadequacies and suggest solutions for this problem. Regarding interest of the participants, only 39% said that they are “somewhat interested” in the field with 16% of the respondents answering that they will place it last for their top 10 most interesting subspecialty in urology. In terms of exposure in their practice, 59% of the respondents see male infertility patients approximately less than 10% of their patients every month with 11 urologists responding that they will immediately refer infertility cases to a specialist.

Most of the participants (78%) use both the EUA and AUA guidelines in the management and treatment of infertile men but it did not reflect on actual practice. Majority (98%) will request for a second sperm analysis after an abnormal finding on the first one but heterogenous responses were noted on the timing of the second sperm analysis. Surprisingly, requests for genetic testing,

karyotyping, y-chromosome microdeletion, and DNA fragmentation are still not yet considered by other responders even if there are clear indication for its use.<sup>6,7</sup> One of the novel tests in the diagnosis of male infertility is the sperm DNA fragmentation testing.<sup>8</sup> High DNA fragmentation index is associated with poor fertilization and implantation rate and high miscarriage rate. It is likewise associated with low pregnancy and live birth rate.<sup>8</sup> Even with this evidence, nine out of ten respondents are not requesting for Sperm DNA fragmentation. Use of an orchidometer as an assessment tool for these patients is recognized by only 11% of the respondents even though this is already a validated tool, and which can be a surrogate of ultrasound in the assessment of testicular volume. The age of 40 years as an advanced age is only recognized by 29% of the respondents which could have detrimental therapeutic and prognostic implications for these patients.

Usual medications that Filipino urologists prescribe are presented in table 5 with the top response being clomiphene citrate, antioxidants, and testosterone. Disconcerting finding of use of testosterone for empiric and medical management of male infertility is noted in 36% of respondents. This finding is comparable in one study where general urologist would most frequently prescribe clomiphene and testosterone while fellowship-trained specialist would usually prescribe clomiphene and anastrozole with testosterone ranked 2nd to the last in list of commonly prescribed antioxidants. Another study showed majority of Nigerian doctors (81.8%) would prescribe testosterone believing that use of this drug would increase spermatogenesis.<sup>9</sup> Use of testosterone is contraindicated for male infertility because of its inhibitory effects on the FSH and LH, which in turn inhibits actions of Sertoli and Leydig cell, causing decrease in spermatogenesis.<sup>10</sup> In addition, use of testosterone for male infertility patients is already not recommended by the EAU and AUA guidelines.<sup>6,7</sup> Prescription of supplements, specifically antioxidant, are still being done by the majority with 71% of respondents prescribing vitamin e (54%), vitamin C (40%), and L-carnitene (26%) comprising the top 3 most given supplements. This finding is also consistent with the recent article that showed these 3 supplements are the

most popular supplements bought in the market. Furthermore, analysis of these supplements showed grade A evidence that these supplements have a positive effect on male infertility.<sup>11</sup> A global survey of spanning 6 continents showed these medications are among the top 5 most prescribed antioxidants. However, 86% of them prescribe antioxidant even if more than 50% of the respondents admit that evidence on its use are only modest at most.<sup>12</sup>

Varicocele is a common finding in patients with male infertility comprising about 35-44%. Exact association of varicocele and infertility is unknown but increase in scrotal temperature, hypoxia and reflux of toxic metabolites may be the possible cause.<sup>7</sup> Physical examination is already adequate in diagnosing this disease with scrotal ultrasound only requested for inconclusive physical examination or possible recurrence after varicocelectomy.<sup>7</sup> In contrast, majority of our respondents (72%) routinely request for scrotal ultrasound in diagnosing varicocele. In terms of treatment, there are numerous approaches in treating this disease. One meta-analysis compared the different surgical and procedural treatments for varicocele management and showed that inguinal and subinguinal micro-varicocelectomy had the highest pregnancy rate, with low odds of complication<sup>13</sup> with this high level of evidence, this approach is already recommended as the standard of care for these patients.<sup>4,5</sup> In the Philippines setting, only 19 percent offer inguinal/subinguinal micro surgical varicocelectomy where only 5% of respondents use microscope and vascular doppler. Although 46% are doing loupe assisted varicocelectomy, it is still considered a substandard care as shown in one study which shows its inferiority to standard care in terms of preservation of internal spermatic arteries and ligation of veins.<sup>6,7</sup> About 42% of respondents do not use any special instruments in their procedure.

Some of the treatment of male infertility would require assisted reproduction especially for azoospermic men. Experienced andrologists as well as embryologists are required to treat these patients with severe infertility.<sup>3</sup> However, only 8% of respondents are affiliated to IVF centers which is troubling with regards to how these patients are being managed currently. It is also notable that exposures of responders to different sperm retrieval

techniques (PESA, MESA, TESA, TESA TESE, mincro-TESE) was unsatisfactory ranging from 2-16% only.

In terms of exposure and knowledge in the field, only 2% of respondents graded it as excellent. Likewise, only 3% graded their knowledge in male infertility as excellent with only 6 percent saying that they are very confident in managing these patients. On the contrary, 90% of them agree that this specialty is important part in the training future urologists.

Current findings are congruent with the study done by Ghayda et. al.<sup>12</sup> which evaluated andrology/infertility exposure of urology residents during their training in the United States. Same with our finding, residents felt that their knowledge was unsatisfactory in 72% of respondents reporting inadequate exposure in 77% resulting to 78% of them not confident when faced with a male infertility patient.<sup>4</sup> These findings are not isolated cases as stated in the study by the same author which showed that both residents from Europe and United States showed the same frustration regarding their education and exposure to andrology and male infertility.<sup>2</sup> Another study was done by Lujan, et al. (2016) focuses on European resident's management on male infertility patient and their adherence to the EAU guideline. They concluded that overall, residents have poor adherence to the guidelines.<sup>14</sup>

Proper patient care is proportional to the adequacy of training of its health care providers. There are already multiple studies which show training and education are correlated to better patient outcomes. This is already proven using different measures across both medical and surgical field.<sup>15,16,17</sup> This is a landmark study regarding the present situation of the practice of male infertility in the country. As stated, exposure and knowledge of Filipino urologist in this specialty needs further improvement to provide satisfactory care for these patients. Overall, respondents wanted more depth and breadth of exposure to their practice, which could be done in residency, fellowship, post grad in general, or through continuing medical education. A supplement would be the use of lectures, webinars, short courses, conferences, and workshops. Another thing respondents wanted is the exposure to professional networks, such as being able to work under good mentors or being able to meet other

professionals through medical societies such as PUA and the other proposed societies to be made. Knowledge sharing is also important, which is why respondents wanted sharing among urologists to be part of the annual convention or asked for clinical practice guidelines for the Philippine setting. There were few recommendations about the improvements that can be done in the hospital setting or the infrastructure quality and quantity. While respondents want even more experiences and opportunities, it appears that the solution is to find mentors who have the knowledge, through a process of navigation which can be difficult. Perhaps this is why some respondents also suggest looking for mentors abroad.

There is still limitation on how the study was conducted. Even with the good participant turn-out, the population was not well-represented with 85% of them coming from Luzon. Future studies could be done where recruitment with homogenous and equal number of participants all throughout the country would better represent all the urologists across the Philippines. The study also did not assess where the participants trained during residency (private/government) which could affect their perception to the specialty with private institutions having more access to microsurgical equipment as compared to some government-funded institution. Another avenue that could be explored is to focus on residents as participants to have direct assessment of the training of urology in the country.

## Conclusion

Practice of male infertility in the Philippines is inadequate in terms of knowledge and treatment for this set of patients. Most respondents follow the EUA and AUA male infertility guidelines, but they do not translate into practice, highlighting their own preferences in diagnosis and treatment. Even though they consider it as a necessary part of Urology, lack of exposure to cases, surgical loads, and research makes it a challenge when faced with these cases in the clinic. A change in the residency, postgraduate, and national level is recommended to have the best clinical outcome and well-being for these patients.

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