

Preferred and actual methods of hysterectomy: A survey of current practices among members of the South African Society of Obstetricians and Gynaecologists

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Background. Hysterectomy remains one of the most common operative procedures for benign uterine diseases. Total abdominal hysterectomy (TAH) constitutes the most common approach despite the advantages of minimally invasive hysterectomy (MIH).

Objectives. To explore the current opinion on hysterectomy choices amongst members of the South African Society of Obstetricians and Gynaecologists (SASOG), as well as the perceptions and potential barriers that may inhibit gynaecologists from offering MIH to their patients.

Methodology. An anonymous survey designed to explore the preferences of practising obstetrician gynaecologists regarding the optimal hysterectomy procedure, and perceived barriers towards MIH.

Results. The average age of the respondents ($N=152$) was 45.7 years, with 88.2% having >5 years' experience in private practice. When asked about the preferred route of hysterectomy for themselves or their relatives, 46.2% chose vaginal hysterectomy (VH), 25.4% chose total laparoscopic hysterectomy (TLH), 15% chose laparoscopic assisted vaginal hysterectomy (LAVH) and 8.5% chose TAH. However, the most commonly performed hysterectomy procedure undertaken by the respondents in the last year was TAH. Only half of the respondents wished to increase their rate of VH and a lesser number to extend their laparoscopic hysterectomy rates.

Conclusion. Although the majority of the respondents preferred the minimally-invasive VH or TLH for themselves or their relatives, TAH remains the most common hysterectomy method among SA gynaecologists. This difference could present an ethical dilemma for the gynaecologist. The desire of a minority to change their approach to VH indicates the difficulty in changing attitudes and the need to promote VH as a technique within SASOG.

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Hysterectomy is one of the most common operative procedures for benign gynaecological diseases.^[1] It can be performed abdominally, vaginally or laparoscopically, with or without robotic assistance. At present, total abdominal hysterectomy (TAH) constitutes the most common approach, despite the fact that vaginal hysterectomy (VH) or laparoscopic hysterectomy (LH) should be the preferred route based on their well-documented benefits.^[2]

It is estimated that ~20% of women living in England and Wales will have undergone a hysterectomy before the age of 55 years. Most surgeons perform up to 80% of these procedures via the abdominal route.^[3,4] The reason for this can be explained, in part, by personal preference, but is mainly due to a lack of training and experience, thus resulting in the surgeon's reluctance to perform VH. This is the case particularly in nulliparous woman in the presence of uterine enlargement, in women with previous gynaecological surgery or women who have undergone a previous caesarean section (CS). The above factors should not be considered as contraindications to performing VH.^[5-7] In the USA, one in three women undergoes hysterectomy by the age of 60 years. Of these women, 22% have undergone VH. The introduction of LH increased the number of VH (if the uterus is removed by that route) to 33%; however, the additional 11% were exclusively performed laparoscopically and not without that assistance.^[8] Despite the introduction of LH, 66.1%

of the hysterectomies performed in the USA are open abdominal hysterectomies.^[8] The benefits of VH are similar to those of LH, with minimal postoperative discomfort, less need for analgesics, shorter hospital stay and quicker return to normal daily activity compared with AH. There are also fewer postoperative complications and reduced hospital costs in VH than AH and even LH.^[9-11]

Objectives

To explore the potential provider-related obstacles to offering less invasive hysterectomies, evaluate provider attitudes toward mode of access and inquire about provider-perceived contraindications to performing VH or LH.

Methods

The study was based upon a two-page, anonymous, electronic survey that was designed to explore practising gynaecologists' preferences regarding the optimal hysterectomy procedure for benign uterine conditions and the perceived barriers towards MIH. The survey included questions on demographic characteristics, preferred approach to hysterectomy, the approximate number of surgical cases per year and potential barriers or contraindications for performing VH or LH. A question enquiring whether surgeons have any intention of changing their approach to hysterectomy in the future was also included.

The survey was created on Survey Monkey (Wufoo, USA). The questionnaire was designed to be brief and easy to read, so that practising gynaecologists need not spend an excessive amount of time completing it. The questionnaire was validated by 12 local practising gynaecologists who assessed the clarity and confirmed the relevance of the questions. Thereafter, the survey was amended to its present form. The study was approved by the Ethics Committee of the University of Witwatersrand (ref. no. M150462).

A link to the survey was emailed to all practising gynaecologists who are members of SASOG. A second email was sent out 2 weeks after the initial email to those who had failed to complete the questionnaire. To complete the survey, participants were asked to click on the link and thereby be directed to the survey. Since the completion of the survey was done online and the results were stored in bulk on the Survey Monkey server, anonymity was preserved. Moreover, no personal information was requested by the survey itself, so the identity of the participants was not revealed.

Results

A total of 152 responses were received from SASOG members, corresponding to a 29.5% response rate. The majority of the respondents were male (56.7%). The average age of respondents was 45.7 years (Fig. 1), and 81.2% had >5 years' experience in private practice (Fig. 2). More than half (51.2%) of the respondents practised in Gauteng Province, 27% in the Western Cape and less than 10% elsewhere in South Africa (SA). The most commonly performed hysterectomy procedure that had been undertaken by the respondents in the last year was TAH, followed by VH and TLH (Table 1). However, when asked about the preferred route of hysterectomy for themselves or their relatives, 25.5% chose TLH, 15.1% chose LAVH, 46.2% chose VH and 8.5% chose TAH (Fig. 3). Therefore, almost all of the respondents were more likely to choose a minimally invasive approach to hysterectomy, including VH, for the patient benefits offered, as opposed to TAH (Fig. 4). Despite this, a preference for TAH in the daily practice of respondents was evident (Table 1).

The most significant reported barrier to performing VH was the lack of training during registrar time (31.0%), followed by a lack of surgical experience (15.9%), and then malpractice concerns and length of operating time (Table 2).

The most significant reported barriers to performing LH were lack of registrar training (29.3%) and inadequate surgical experience (21.4%), followed by hospital/patient cost, potential for complications and malpractice concerns (Table 3).

When asked about their ideal mode of access when performing hysterectomy, 23.8% of respondents answered TLH, 42.4% VH, 17.9% LAVH and 21.7% TAH (Table 4). The most significant contraindications for performing VH were adnexal mass, a history of endometriosis, lack of uterine descent, followed by previous pelvic inflammatory disease, narrow introitus, uterus larger than 12 weeks, and previous CS. When asked about their intention regarding changing the mode of access through which they perform hysterectomy, the majority of the respondents (66%) indicated that they would like their TAH rates to remain the same. Only 29.1% of respondents stated that they would like to decrease their rates of TAH; 52.4 and 41.6% indicated that they intended to increase their VH and TLH rates, respectively, while keeping the same number of LAVHs (Table 5).

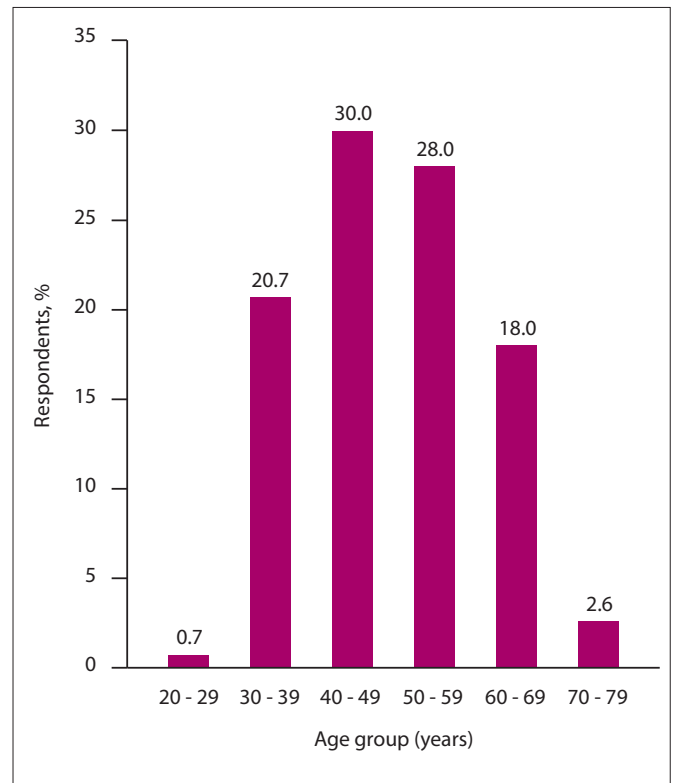


Fig. 1. Age distribution among respondents.

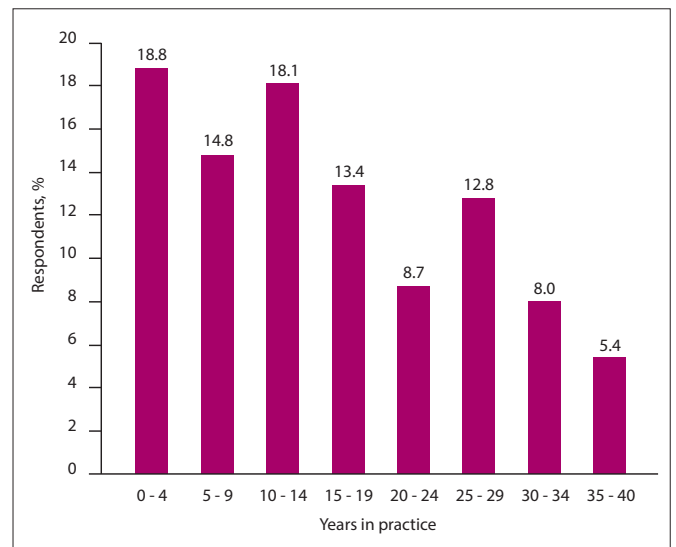


Fig. 2. Years in practice since completion of registration training.

Discussion

The majority of the respondents were between 30 and 69 years of age, with more than 5 years in practice since the completion of registrar training. All were members of SASOG. The survey was performed among practising gynaecologists with surgical experience in performing hysterectomy, with focus placed on their preferences between open and MIH, including VH. To the best of our knowledge, this was the first survey to evaluate barriers to performing less invasive hysterectomy in SA. The explicit aim of this study was to identify perceived barriers that deter practising gynaecologists from performing less invasive hysterectomy.

In our survey, we found discrepancies between practice patterns and physician preference. When practising gynaecologists were

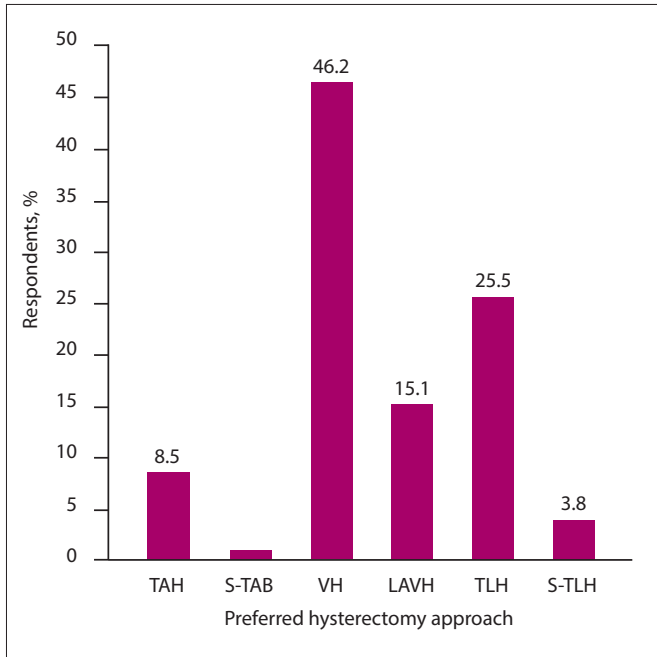


Fig. 3. Hysterectomy approach preferred for treatment of hypothetical non-malignant conditions to be applied to respondents or respondent's relatives. (TAH = total abdominal hysterectomy; S-TAB = subtotal abdominal hysterectomy; VH = vaginal hysterectomy; LAVH = laparoscopically assisted vaginal hysterectomy; TLH = total laparoscopic hysterectomy; S-TLH = subtotal laparoscopic hysterectomy.)

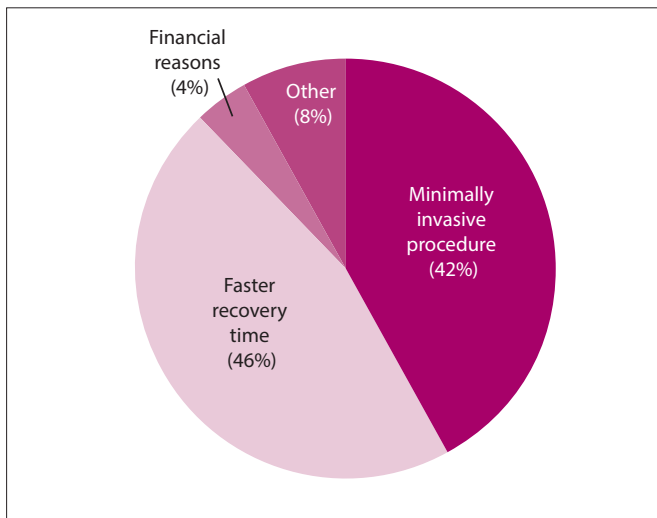


Fig. 4. The benefits of vaginal hysterectomy over total abdominal hysterectomy, as perceived by respondents.

asked to rank which hysterectomy approach they would prefer for themselves or their relatives, 86.8% would prefer a MIH, including TLH, LAVH and VH, compared with a TAH (8.5%). When asked which route of hysterectomy they considered the most ideal, 42.4% of survey participants chose VH, followed by TLH, TAH and LAVH. However, the reality of their practice is different, as TAH still makes up a large majority of hysterectomies performed by respondents over the course of a 1-year period. Our results are in agreement with Einarsson *et al.*^[12] whose survey was performed in the USA among practising gynaecologists. While 8% of their respondents chose TAH as the preferred form of hysterectomy for themselves or their relatives, TAH remained the most commonly performed method.^[12] This difference between preference and practice could present an ethical dilemma for gynaecologists if they are not able to offer potentially appropriate candidates the hysterectomy they would recommend for themselves or their relatives. This demonstrates that in spite of the well-documented patient benefits of MIH, including VH, LAVH and TLH, recognised by the respondents, the route of hysterectomy employed was still based on surgeon preference rather than patient benefits or condition. This seemed consistent with the findings of our study, as the participants expressed a desire to increase MIHs in their practice. They expressed a similar desire to increase their rates of LH (referring, in the context of this work, to both TLH and LAVH), as well as VH.

In the present study, the majority of the respondents indicated a reluctance to decrease the frequency of TAH and subtotal abdominal hysterectomy (S-TAB). These results are problematic in light of the fact that, although the majority of respondents recognised the benefits of MIH and, in particular, VH, they remained unwilling to change their approach. We explored the perceived barriers to performing VH in order to understand the discrepancy between attitude and practice. Lack of surgical experience and training during registrar time, followed by malpractice concerns and length of operating time, were the main perceived barriers. When practising gynaecologists were asked to rank the contraindications to performing VH, they prioritised adnexal mass, patients with endometriosis, patients with uterine fibroids, patients with previous CS, nulliparous patients, patients with previous laparotomies and lack of uterine descent.

Failure to achieve proficiency during training as a registrar was demonstrated in this survey as a severe obstacle to performing VH: lack of training and inadequate surgical experience featured in the majority of responses. Recent literature suggests that proficiency is achieved after 21 - 27 cases of VH are performed during residency.^[13,14] However, the current minimum requirement for VH in USA residency programmes is 15 cases, and in SA, only 5 VH cases are required before sitting the final Fellow of the College of Obstetricians and Gynaecologists (FCOG) examination. This number of cases

Table 1. Frequency of various modes of hysterectomy access used by the respondents per year

Hysterectomy access	Number of procedures per year, n (%)						Total
	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	
TAH	42.3 (44)	25.0 (26)	11.5 (12)	5.8 (6)	5.8 (6)	9.6 (10)	104
S-TAB	94.4 (84)	3.37 (3)	2.3 (2)	0	0	0	89
VH	60.0 (60)	20.0 (20)	8.0 (8)	6.0 (6)	3.0 (3)	3.0 (3)	100
LAVH	91.9 (60)	5.8 (5)	2.3 (2)	0	0	0	86
TLH	79.5 (79)	8.4 (7)	6.0 (5)	3.6 (3)	0	2.4 (2)	83
S-TLH	95.0 (75)	2.5 (2)	1.3 (1)	0	0	1.3 (1)	80

TAH = total abdominal hysterectomy; S-TAB = subtotal abdominal hysterectomy; VH = vaginal hysterectomy; LAVH = laparoscopically assisted vaginal hysterectomy; TLH = total laparoscopic hysterectomy; S-TLH = subtotal laparoscopic hysterectomy.

Table 2. The most significant barriers to performing VH, as perceived by respondents

Obstacle	Point scale,* n (%)					Total
	1	2	3	4	5	
Registrar training time	10 (13.5)	10 (13.5)	14 (18.9)	17 (23.0)	23 (31.1)	74
Operating time	26 (33.8)	24 (31.2)	15 (19.5)	6 (7.8)	6 (7.8)	77
Surgical experience	17 (20.7)	13 (15.9)	17 (20.7)	22 (26.8)	22 (15.9)	82
Malpractice concerns	25 (27.2)	19 (20.7)	23 (25.0)	17 (18.5)	8 (8.7)	92
Other	16 (21.6)	9 (12.2)	6 (8.1)	12 (16.2)	31 (41.9)	74

*Scale 1 - 5, where 1 represents the least significant barrier and 5 represents the most significant barrier.

Table 3. The most significant barriers to performing laparoscopic hysterectomy, as perceived by respondents

Obstacle	Point scale,* n (%)									Total (n)
	1	2	3	4	5	6	7	8	9	
Registrar training time	9 (12.0)	4 (5.3)	4 (5.3)	5 (6.7)	5 (6.7)	4 (5.3)	6 (8.0)	16 (21.3)	22 (29.3)	75
Operating time	10 (12.5)	12 (15.0)	11 (13.8)	9 (11.3)	7 (8.8)	8 (10.0)	6 (7.5)	10 (12.5)	7 (8.8)	80
Surgical experience	7 (8.3)	10 (11.9)	9 (10.7)	4 (4.8)	6 (7.1)	6 (7.1)	9 (10.7)	15 (17.9)	18 (21.4)	84
Technical difficulties	2 (2.4)	2 (2.4)	13 (15.7)	15 (18.1)	12 (14.5)	15 (18.1)	14 (16.9)	7 (8.4)	3 (3.6)	83
Hospital/patient costs	9 (11.4)	9 (11.4)	8 (10.1)	12 (15.2)	12 (15.2)	8 (10.1)	9 (11.4)	6 (7.6)	6 (7.6)	79
Potential complications	1 (1.3)	7 (8.8)	6 (7.5)	15 (18.8)	21 (26.3)	12 (15.0)	10 (12.5)	4 (5.0)	4 (5.0)	80
Equipment availability	9 (10.1)	10 (11.2)	16 (18.0)	7 (7.9)	13 (14.6)	12 (13.5)	13 (14.6)	2 (2.3)	7 (7.9)	89
Malpractice concerns	4 (4.7)	18 (20.9)	6 (7.0)	7 (8.1)	8 (9.3)	10 (11.6)	13 (15.1)	13 (15.1)	7 (8.1)	86
Other	19 (31.7)	3 (5.0)	5 (8.3)	1 (1.7)	1 (1.7)	2 (3.3)	2 (3.3)	9 (15.0)	18 (30.0)	60

*Scale 1 - 9, where 1 represents the least significant barrier and 9 represents the most significant barrier.

Table 4. Respondents' ideal mode of access when performing a hysterectomy

Hysterectomy access	Point scale,* n (%)						Total (n)
	1	2	3	4	5	6	
TAH	20 (21.7)	16 (17.4)	23 (25.0)	9 (9.8)	12 (13.0)	12 (13.0)	92
S-TAB	5 (5.9)	9 (10.6)	16 (18.8)	14 (16.5)	15 (17.7)	26 (30.6)	85
VH	39 (42.4)	26 (28.3)	14 (15.2)	5 (5.4)	4 (4.4)	4 (4.4)	92
LAVH	15 (17.9)	16 (19.1)	13 (15.5)	30 (35.7)	4 (4.8)	6 (7.1)	84
TLH	20 (23.8)	10 (11.9)	14 (16.7)	8 (9.5)	17 (20.2)	15 (17.9)	84
S-TLH	3 (3.5)	7 (8.1)	6 (7.0)	12 (14.0)	30 (34.9)	28 (32.6)	86

TAH = total abdominal hysterectomy; S-TAB = subtotal abdominal hysterectomy; VH = vaginal hysterectomy; LAVH = laparoscopically assisted vaginal hysterectomy; TLH = total laparoscopic hysterectomy; S-TLH = subtotal laparoscopic hysterectomy. *Scale 1 - 6, where 1 represents the most ideal option and 6 represents the last choice.

Table 5. Respondents' intended changes regarding the mode of access exploitation when pursuing hysterectomy

Hysterectomy access	Change, n (%)			Total
	To increase	To decrease	To remain unchanged	
TAH	5 (4.9)	30 (29.1)	68 (66.0)	103
S-TAB	4 (4.1)	33 (34.4)	59 (61.5)	96
VH	54 (52.4)	3 (2.9)	46 (44.7)	103
LAVH	40 (42.5)	9 (9.6)	45 (47.9)	94
TLH	40 (41.6)	9 (9.4)	47 (49.0)	96
S-TLH	13 (14.0)	22 (23.7)	58 (62.3)	93

TAH = total abdominal hysterectomy; S-TAB = subtotal abdominal hysterectomy; VH = vaginal hysterectomy; LAVH = laparoscopically assisted vaginal hysterectomy; TLH = total laparoscopic hysterectomy; S-TLH = subtotal laparoscopic hysterectomy.

provides exposure, but definitely cannot ensure proficiency in performing VH. The American Association of Gynecologic Laparoscopists (AAGL), recognising the insufficient training during residency and the benefits offered by VH (as compared with other

minimally invasive techniques to hysterectomy, has stated that 'surgeons without the requisite training and skills required for the safe performance of VH or LH should enlist the aid of colleagues who do or should refer patients requiring hysterectomy to such individuals for their surgical care'.^{2,15]}

The insufficient training in VH during residency results in a generation of gynaecologists unwilling to change their approach to hysterectomy. The reluctance among consultants to adapt to less invasive hysterectomy may have already affected the more recent generation of registrars, as one respondent in this study claimed that 'many consultants can't perform VH so can't train registrars in VH'. Considering the contraindications to performing VH mentioned by the respondents, one can draw the conclusion that in the absence of uterine descent or prolapse, all hysterectomies are done either laparoscopically or abdominally in patients who may have otherwise undergone an uncomplicated VH.

The contraindications to VH mentioned above should not be an obstacle to removing the uterus vaginally, provided the uterine size does not exceed 12 weeks, the pathology is confined to the uterus

and there is adequate vaginal access. Many studies have shown that challenging these contraindications can lead to an increase in the numbers of VH performed.^[4-6] Recently, the International Society for Gynecologic Endoscopy (ISGE) released evidence-based guidelines, which include recommendations on the selection of women in whom VH can be safely performed.^[16]

The most significant reported barriers to performing LH were chiefly a lack of surgical experience due to inadequate training, followed by the risk of complications resulting in malpractice concerns. The operating time was also a source of unease among respondents. Regarding LH, the results of this survey were in agreement with those found among senior obstetrics and gynaecology residents by Einarsson *et al.*,^[17] which showed that residents are unable to attain proficiency in most advanced laparoscopic procedures, including LH, during their residency. In a survey performed in Canada, 93% of respondents selected the endoscopic approach as their preferred approach,^[18] but, 38.7% of the respondents felt that they had not received adequate training during their residency to perform endoscopy in general.

A preference for minimally invasive techniques was also evident in the present study, where respondents considered VH, followed by LH, as the most ideal mode of access when performing hysterectomy. These results were in agreement with other large surveys among practising gynaecologists.^[12,19,20] As such, a global trend can be seen, demonstrated in both the literature and by our own study, in which the attitude towards minimally invasive techniques to hysterectomy is positive, but a lack of proficiency due to inadequate training during registrar time deters gynaecologists from acting on their preferences.

While lowered VH rates may well reflect a switch to laparoscopic procedures,^[3,4,8] our data indicate that the major cause of the decline in VH rates is a lack of training during registrar time, and experience.

Respondents favoured LAVH as their ideal mode of access when performing a hysterectomy, whereas the vaginal route was considered the most ideal for hysterectomy. This preference for LAVH was also observed in a survey conducted to assess modes of access in performed hysterectomies in Germany.^[21] These results may suggest that the laparoscopic technique was considered an aid to VH rather than a replacement for it. This is in agreement with a 2001 postal survey conducted in England among consultant gynaecologists that demonstrated that gynaecologists who performed many LHs had the highest VH rates, and predicted that VH would be further emphasised in years to come.^[22] It may be that LAVH could serve as the vehicle for performing more VHs in the future.

It must be stated that our study had limitations as well as strengths. The first of its strengths lay in the fact that our survey took place among general gynaecologists, in the style of the majority of surveys published in the literature.^[12,17-20] Secondly, to the best of our knowledge, it is the first national survey conducted among SASOG members to evaluate barriers to performing MIH. However, our study was limited by its low response rate, as only 29.5% of potentially eligible doctors opted to complete the survey. This level of response is not unusual for electronic surveys, and in particular for surveys of doctors,^[23] for whom a lack of time and survey burden are well-documented impediments to participation.^[24] Furthermore, we acknowledge the potential for bias: it is possible that the respondents may not be representative of the overall population of minimally invasive gynaecological surgeons in practice in SA, which may have adversely affected our results.

Despite these possible limitations, we consider our hypothesis supported by the data collected through our survey. Insufficient training during registrar time and limited surgical experience were perceived as severe barriers when considering less invasive approaches to hysterectomy, thereby demonstrating that registrar training and experience indeed affect a surgeon's approach to hysterectomy. Furthermore, our data revealed that a positive attitude toward less invasive techniques does not necessarily reflect the surgeon's reality. VH and thereafter LH were considered ideal approaches to hysterectomy; however, TAH remained the surgeon's preferred practice. This, in conjunction with the sustained high number of TAH still performed worldwide, serves as a major indication that barriers to performing less invasive hysterectomies need to be addressed. Additional training opportunities to increase the numbers of VH and LH (namely TLH and LAVH) were suggested by the surgeons who answered the survey, and may be necessary to ensure that surgeons are capable of operating in accordance with their ideal method.

Conclusion

For the SASOG members who participated in our survey, preferences for the routes of hysterectomy compared with their actual practice appear inconsistent. The large discrepancy between practice and preference indicates that the route of surgery is more dependent on the clinical preference of the gynaecologist than the medical condition. Strategies should be initiated to increase training opportunities during registrar years in MIH, especially VH. Guidelines for performing MIH should be put in place to help our colleagues perform more MIH, including VH, in accordance with their ideal preferences.

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1. Clayton RD. Hysterectomy. *Best Pract Res Clin Obstet Gynaecol* 2006;20(1):73-87. <https://doi.org/10.1016/j.bpobgyn.2005.09.007>
2. Johnson N, Barlow D, Lethaby A, Travender E, Curr E, Garry R. Surgical approach to hysterectomy for benign gynaecological disease. *Cochrane Database Syst Rev* 2006;(2):CD003677. <https://doi.org/10.1002/14651858.CD003677.pub3>
3. Vessey MP, Villard-Mackintosh L, McPherson K, Coulter A, Yeates D. The epidemiology of hysterectomy: Findings in a large cohort study. *Br J Obstet Gynaecol* 1992;99(5):402-407. <https://doi.org/10.1111/j.1471-0528.1992.tb13758.x>
4. Raymond CD, Howard TS, Alder SC. Challenging generally accepted contraindications to vaginal hysterectomy. *Am J Obstet Gynecol* 2001;184:1386-1391. <https://doi.org/10.1067/mob.2001.115047>
5. McCracken G, Lefebvre GG. Vaginal hysterectomy: Dispelling the myths. *J Obstet Gynecol Can* 2007;29:424-428.
6. Kovac SR. Guidelines to determine the route of hysterectomy. *Obstet Gynecol* 1995;85(1):18-23. [https://doi.org/10.1016/0029-7844\(94\)00318-8](https://doi.org/10.1016/0029-7844(94)00318-8)
7. Moen MD, Richter HE. Vaginal hysterectomy: Past, present, and future. *Int Urogynecol J* 2014;25(9):1161-1165. <https://doi.org/10.1007/s00192-014-2459-x>
8. Wu JM, Wechter ME, Geller EJ, Nguyen TV, Visco AG. Hysterectomy rates in the United States, 2003. *Obstet Gynecol* 2007;110(5):1091-1095. <https://doi.org/10.1097/01.AOG.0000285997.38553.4b>
9. David-Montefiore E, Rouzier R, Chapron C, Daraï E, Collegiale d'Obstétrique et Gynécologie de Paris-Ile de France. Surgical routes and complications of hysterectomy for benign disorders: A prospective observation study in French university hospitals. *Hum Reprod* 2007;22(1):260-265. <https://doi.org/10.1093/humrep/del336>
10. McPherson K, Metcalfe MA, Herbert A, et al. Severe complications of hysterectomy: The VALUE study. *BJOG* 2004;111(7):688-694. <https://doi.org/10.1111/j.1471-0528.2004.00174.x>
11. Kovac SR. Hysterectomy outcomes in patients with similar indications. *Obstet Gynecol* 2000;95(6 Pt 1):787-793. [https://doi.org/10.1016/s0029-7844\(99\)00641-9](https://doi.org/10.1016/s0029-7844(99)00641-9)
12. Einarsson JI, Matteson KA, Schulkin J, Chavan NR, Sangi-Hagheykar H. Minimally invasive hysterectomies - a survey on attitudes and barriers among practicing gynaecologists. *J Minim Invasive Gynecol* 2010;17(2):167-175. <https://doi.org/10.1016/j.jmig.2009.12.017>

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13. Toma A, Hopman WM, Gorwill RH. Hysterectomy at a Canadian tertiary care facility: Results of a one-year retrospective review. *BMC Women's Health* 2004;4(1):10. <https://doi.org/10.1186/1472-6874-4-10>
14. Sheth SS. The scope of vaginal hysterectomy. *Eur J Obstet Gynecol Reprod Biol* 2004;115(2):224-230. <https://doi.org/10.1016/j.ejogrb.2004.02.016>
15. AAGL Advancing Minimally Invasive Gynecology Worldwide. AAGL position statement: Route of hysterectomy to treat benign uterine disease. *J Minim Invasive Gynecol* 2011;18(1):1-3. <https://doi.org/10.1016/j.jmig.2010.10.001>
16. Chrysostomou A, Djokovic D, Edridge W, van Herendaal BJ. Evidence-based guidelines for vaginal hysterectomy of the International Society for Gynecologic Endoscopy (ISGE). *Eur J Obstet Gynecol Reprod Biol* 2018;231:262-267. <https://doi.org/10.1016/j.ejogrb.2018.10.058>
17. Einarsson JA, Young A, Tsien L, Sangi-Haghpeykar H. Perceived proficiency in endoscopic techniques among senior obstetrics and gynecology residents. *J AM Assoc Gynecol Laparosc* 2002;9(2):158-164. [https://doi.org/10.1016/s1074-3804\(05\)60124-7](https://doi.org/10.1016/s1074-3804(05)60124-7)
18. Chen I, Bajzak KI, Guo Y, Singh SS. A national survey of endoscopic practice among gynaecologists in Canada. *J Obstet Gynaecol Can* 2012;34(2):257-263. [https://doi.org/10.1016/s1701-2163\(16\)35186-6](https://doi.org/10.1016/s1701-2163(16)35186-6)
19. Persson P, Helborg T, Brynhildsen J, Fredrikson M, Kjølhed P. Attitudes to mode of hysterectomy – a survey-based study amongst Swedish gynecologists. *Acta Obstet Gynecol Scand* 2009;88:267-274. <https://doi.org/10.1080/00016340802649824>
20. Janda M, Armfield NR, Kerr G, et al. Surgical approach to hysterectomy and barriers to using minimally invasive methods. *Aust NZ J Obstet Gynaecol* 2018;58(6):690-695. <https://doi.org/10.1111/ajo.12824>
21. David M, Wild D, Wernecke KD, Siedentopf F. Attitudes towards mode of hysterectomy: A survey-based study among German gynecologists. *Eur J Obstet Gynecol Reprod Biol* 2012;164(2):216-220. <https://doi.org/10.1016/j.ejogrb.2012.06.023>
22. Davies A, Magos A. The hysterectomy lottery. *J Obstet Gynaecol* 2001;21(2):166-170. <https://doi.org/10.1080/01443610020026119>
23. Nulty DD. The adequacy of response rates to online and paper surveys: What can be done? *Assess Eval High Educ* 2008;33(3):301-314. <https://doi.org/10.1080/02602930701293231>
24. Cunningham CT, Quan H, Hemmelgarn B, et al. Exploring physician specialist response rates to web-based surveys. *BMC Med Res Methodol* 2015;15(1):32. <https://doi.org/10.1186/s12874-015-0016-z>

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