

Should general anesthesiologists be certified to perform anesthesia for patients with morbid obesity undergoing bariatric surgery: A national web-based cross-sectional survey

ABSTRACT

Background: Bariatric surgery in Saudi Arabia has become one of the most performed surgical procedures for weight loss surgery (WLS). The aim of this survey is to highlight the importance of education and training in bariatric anesthesia (BA).

Methods: An Internet-based cross-sectional survey was conducted to examine the percentages of general anesthesiologists among respondents who supported the need for formal structured training in BA as the primary outcome. A 41 items questionnaire on different aspects of BA included in this survey. All anesthesiologists in KSA participated in this survey.

Results: 42% responded giving anesthesia for bariatric surgery/year between 25 and 50% of cases/year. 22% responded performing 25–50 cases/month, 21% from 10–25 cases, and 14% from 50–100 cases. Compared with how many elective bariatric surgical procedures performed in your center/month revealed significant differences ($P < 0.05$), 39% responded with no dedicated team in their center, 14% for <10 cases a month, 9% between 25 and 50 cases a month. Compared to the number of cases performed by non-bariatric anesthetists revealed non-significant differences ($P > 0.05$), upon asking on how many trained/skilled anesthesiologists in bariatric anesthesia in your center, 24% reported none, 4% only one, 21% 2–5 anesthesiologists, 12% 5–10 anesthesiologists, and 19% of the respondents reported more than 10 anesthesiologists specialized in BA.

Conclusion: We believe in education and training in bariatric anesthesia. Residents' rotation in BA should be included in their curriculum. A dedicated fellowship program to be developed at a national level as well as courses and workshops.

Key words: Anesthesia, bariatric surgery, survey

Introduction

Bariatric anesthesia is one of the growing sub-specialties in anesthesia. Bariatric surgery in Saudi Arabia has become one of the most performed surgical procedures for WLS.


Cooperation between anesthesia and surgical teams plays a determinant factor in the bariatric surgery patient's outcome. This level of collaboration requires the anesthetist to master

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How to cite this article: Ahmed AE, Alaqaili AF, Elbashary AS, Bin Muammar AF, AlQarni A, Yamani NT, *et al.* Should general anesthesiologists be certified to perform anesthesia for patients with morbid obesity undergoing bariatric surgery: A national web-based cross-sectional survey. Saudi J Anaesth 2024;18:395-401.

Access this article online

Website: https://journals.lww.com/sjan	Quick Response Code 
DOI: 10.4103/sja.sja_130_24	

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Submitted: 10-Mar-2024, **Revised:** 12-Mar-2024, **Accepted:** 14-Mar-2024, **Published:** 04-Jun-2024

the anesthetic techniques performed during the surgical procedures and to know in-depth respiratory physiology, pharmacology, and patients with morbid obesity pre-operative risk assessment and optimization of the patient condition as well as patient education pre-operatively. Understanding the mechanisms of obstructive sleep apnea (OSA) among those patients and starting the required pre-operative respiratory therapy are essential. For most procedures, a protective lung ventilation strategy is preferable, requiring knowledge of its technique, management, and complications. Bariatric anesthesia also permits the anesthesiologist to perform specific procedures, such as opioid-free anesthesia and ultrasound truncal blocks, namely, transversus abdominis plane (TAP) and erector spinae plane blocks (ESP). The early post-operative management of these patients can be complex, requiring complete knowledge of the possible complications, mainly ventilatory, circulatory, and acute pain management. Implementing enhanced recovery after surgery/anesthesia (ERAS/ERAA) guideline protocols is now mandatory for patients with obesity undergoing weight loss surgery. We had started thinking of establishing the “Bariatric Anesthesia Fellowship” (BAF) program in our setting in 2012. The reason was the increasing number of bariatric surgical cases for WLS under general anesthesia (GA).

The journey to establish the BAF program consisted of two phases. Phase I started in 2012 by developing clinical practice guidelines (CPG) in “Anesthesia for Patients with Obesity undergoing WLS.” Phase II began in 2015 to establish the BAF program. Though the journey took some time, ultimately, it ended with success and achieved the target.^[1] To expand the knowledge of different anesthetic challenges of BA, we have published a special issue on BA in the Saudi Journal of Anesthesia.^[2] Anesthesiologists are facing challenges in the peri-operative care of patients with obesity undergoing WLS. Bariatric surgery and anesthesia for treating subjects with obesity have evolved recently in terms of techniques, tools, and procedures. In the special issue of BA, many topics were addressed by eminent authors worldwide. The physiological and pharmacological aspects of patients with obesity were discussed in this issue. In modern BA practice, lung protective strategies were also covered in this issue. Optimizing the patient’s condition shortly before surgery and enhanced recovery after BA (ERABA) concerning fluid management were well documented in this particular issue. Also, pre-operative preparation and pre-medication of patients with obesity were well covered in this issue. The comprehensive pre-operative evaluation focused on co-morbidities, such as diabetes, coronary artery disease, and OSA syndrome, and appropriate equipment for positioning, anesthesia, and

surgery were well discussed in this issue. Besides airway management, high-flow nasal oxygenation has recently been introduced to improve the safe apnea period (SAP) during tracheal intubation. Novel techniques of pre-oxygenation and apneic oxygenation were well described in this issue. Pain relief following WLS was well covered, with particular reference to ultrasound techniques, besides other related subjects. This special issue was in collaboration with the International Society of Peri-operative Care of Patients with Obesity (ISPCOP).

An essential aspect of our BAF program is research. We published a few articles on anesthesia for patients with obesity who underwent WLS. We have studied the hemodynamic changes and respiratory mechanics of pneumoperitoneum in patients with obesity for bariatric surgery.^[3,4] Recently, together with members of ISPCOP, we have published a position statement on preventing post-operative nausea and vomiting (PONV) in bariatric surgery.^[5] We believe that more research is waiting for our fellows to launch. There are many areas of research interest in the peri-operative care of patients with obesity undergoing WLS. There is an excellent opportunity for the fellows to conduct novel research with all available supportive resources in our setting.

This cross-sectional survey aims to shed light on the importance of training anesthesiologists on the anesthetic challenges of patients with morbid obesity undergoing WLS, examine the acceptability of general anesthesiologists on having formal structured training in BA, and identify the potential obstacles to allow available anesthesiologists to have formal training in BA or BAF programs.

The results of this survey will help the contributing national societies and organizations on developing a consensus on the need to have short-term formal structured training in BA as a part of continuing medical education for all general anesthesiologists to improve the quality of caring for obese and patients with morbid obesity undergoing different varieties of surgical and interventional procedures.

Methods

An Internet-based cross-sectional survey was conducted to examine the percentages of general anesthesiologists among respondents who supported the need for formal structured training in BA as the primary outcome. Secondary outcomes included the respondents’ characteristics, perceived prevalence of patients with morbid obesity undergoing different varieties of procedures at the respondents’ centers, institutional facilities, experiences, presence of

trained and skilled anesthesiologists in caring for bariatric and patients with morbid obesity, and availability and limitations on having formal training in BA. The survey was in line with “CHERRIES” (Checklist for Reporting Results of Internet E-Surveys) guidelines. Institutional review board approval was obtained (NO E-23-8391/19th Dec 2023). The questionnaire was in English and conducted on the SurveyMonkey Internet platform. All submitted data will be encrypted. Ethics approval was obtained (E-23-8391) on 2nd February 2024.

A 41 items questionnaire included participants' characteristics, the number of procedures performed on patients with morbid obesity every year, their institutional infrastructure such as facilities for BA, monitoring, logistics, availability of skilled and experienced staff, and training opportunities. The questionnaire was designed in a consensus process by the study's steering committee and piloted by a selected group of experts for readability, practicability, presentation, acceptability, and generalizability. All anesthesiologists who provided peri-operative care for bariatric surgical patients undergoing different varieties of surgical interventions under general anesthesia in all centers in the Kingdom of Saudi Arabia were eligible for participation.

The URL link (<https://mobile.surveymonkey.com/web/home#>) to the questionnaire was distributed to the targeted anesthesiologists by email invitations sent out by professional societies participating in the study and personal and social networking platforms (Facebook, Instagram, LinkedIn, and Twitter). Additionally, a ‘snowballing’ sampling technique was used. Weekly reminders were sent until the planned minimum of 216 respondents required is reached or until the pre-determined completion date of the survey is reached. The duration of the survey was for 3 weeks.

Statistical analysis

The sample size was estimated using OpenEpi Info CDC version 3, open-source calculator-SSPropor. Assuming a population size (members of the Saudi Anesthesia Society 2024) of 500 anesthesiologists, the power is 90% with a confidence limit of 5%; a sample size of 176 was calculated. The number was increased to 216 participants to overcome any attritions. Statistical analysis was performed using StatsDirect statistical software (Version 2.7.9). Descriptive statistics (number, percentages) was performed according to the distribution of the data. Mann–Whitney test was used to compare continuous data, and Chi-square test was used to compare categorical data. $P < 0.05$ was considered statistically significant.

Results

Members of the Saudi Anesthesia Society (SAS) group participated in the survey from all over Kingdom of Saudi Arabia with 84% males and 14% females. The range of respondents age was from 35 to 45 years with (90%) with 95% working in the governmental health sector. 44% responded having experience from 10–20 years in anesthesia. 98% agreed on the statement that anesthetist giving anesthesia for bariatric surgical patients should know in depth the respiratory physiology, pharmacology of patients with morbid obesity as well as the pre-operative risk assessment, and optimization of the patient condition besides understanding the mechanisms of OSA and the required pre-operative respiratory therapy if required.

Daily practice target

80% responded giving anesthesia for bariatric surgical patients infrequently versus 9% with specialized bariatric anesthesia team.

Number of elective bariatric surgeries (BMI >35 kg/m²) performed/year

42% responded giving anesthesia for bariatric surgery/year between 25 and 50% of cases/year [Figure 1].

Number of bariatric surgeries performed/month

26% responded performing 10–25 cases/month and 23% performing 25–50 cases/month, while 17% performing >50 cases/month [Figure 2].

Number of bariatric surgical procedures performed/month by non-bariatric anesthetist

22% responded performing 25–50 cases/month, 21% from 10–25 cases, and 14% from 50–100 cases [Figure 3]. Comparison with elective bariatric surgical procedures performed in the center/month (Q11) revealed significant differences ($P < 0.05$).

Number of bariatric procedures performed by specialized bariatric anesthesia team/month

39% responded with no dedicated team in their center, 14% for <10 cases a month, and 9% between 25 and 50 cases a month [Figure 4]. Compared to number of cases performed by non-bariatric anesthetists (Q12) revealed non-significant differences ($P > 0.05$).

How often did you provide anesthesia for patients with morbid obesity during the last year (% of cases to total cases performed during the year)?

The majority of the participants (32%) replied that they gave anesthesia for those patients (10–25% of cases/year), 27% with 5–10% of their cases/year [Figure 5].

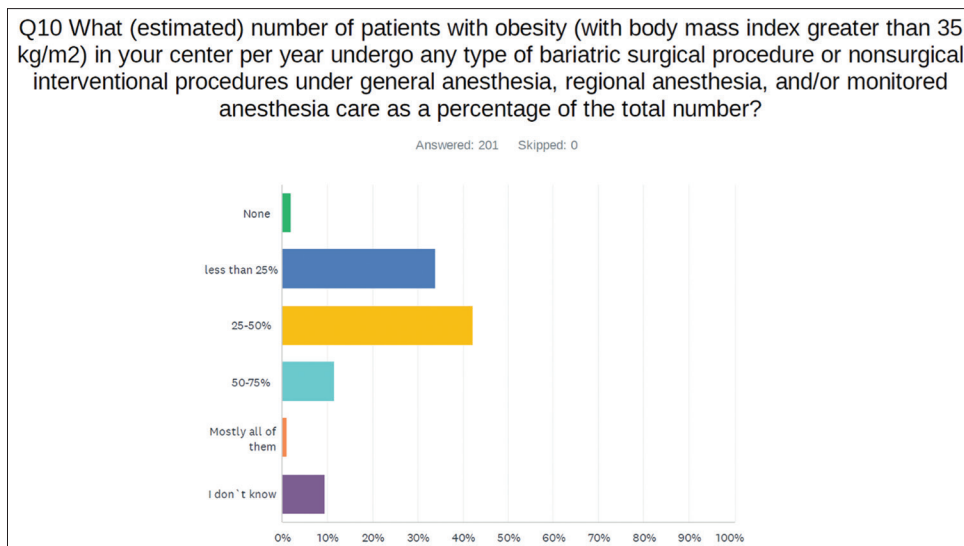


Figure 1: Number of patients with obesity undergoing surgery

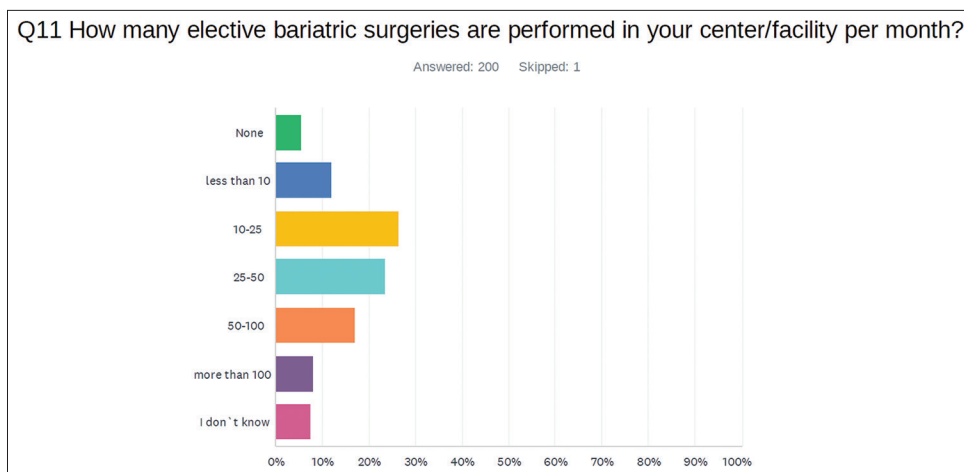


Figure 2: Number of elective bariatric surgeries/month

Anesthesia technique

Regarding the use of video laryngoscopes for tracheal intubation, 42% responded very often, 30% occasionally, and 26% always use it. The majority (73%) use the traditional curved blade video laryngoscope. Upon asking on the estimated number of patients with obesity who needed awake tracheal intubation, 132 participants (66%) responded using a flexible fiber-optic scope in less than 25% of their patients and 56 participants (28%) responded never did awake tracheal intubation. When asked whether practicing awake fiber-optic intubation or not, 77% responded with yes (<5 cases/year) and 22% with no. The majority 74% confirmed using the “single use” flexible bronchoscope in their center. When asked about the inhalation agent of choice in their facility for BA, 72% responded using sevoflurane. Regarding the muscle relaxant of choice used, 87% responded using rocuronium. Sugammadex was the reversal agent of choice with 72% of the respondents. Regarding intra-operative analgesia, 79% responded using

opioids as part of multimodal analgesia regimen. Regarding the opioid-free anesthetic technique, 52% responded using it and 48% not. 70% of the respondents mentioned ERAS concept in their center for bariatric surgical patients and only 33% mentioned they practice TIV/TCI in their facility.

Training and certification in bariatric anesthesia

Upon asking on how many trained/skilled anesthesiologists in BA in your center, 24% reported none, 4% only one, 21% 2-5 anesthesiologists, 12% 5-10 anesthesiologists and 19% of the respondents reported more than 10 anesthesiologists specialized in BA. When asked about the “dedicated training” in bariatric anesthesia, 31% reported having it during residency program and 36% reported having it as daily working experience with majority interested in having training in bariatric anesthesia. When asking whether your facility provide formal fellowship in BA, 68% of the respondents reported none [Figure 6].

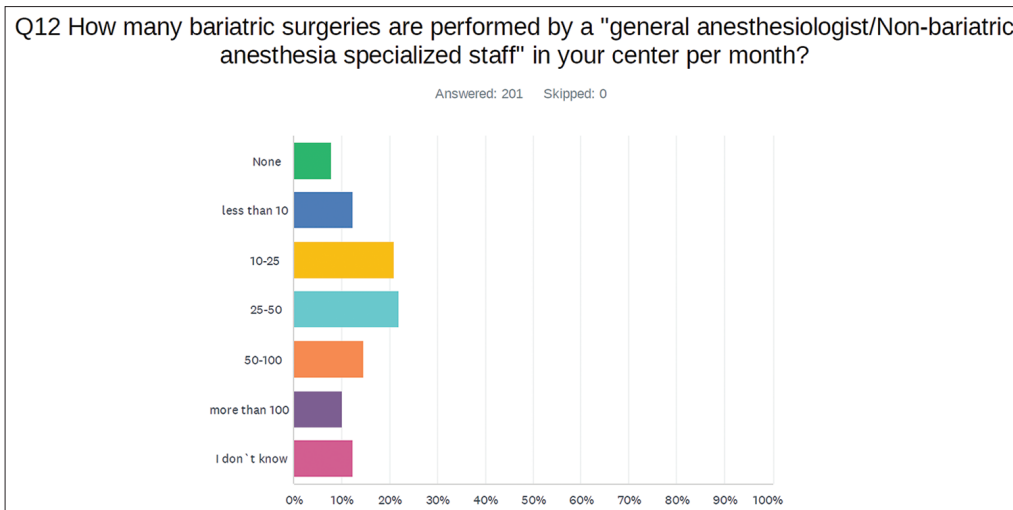


Figure 3: Number of bariatric surgeries anesthetized by non-bariatric anesthesia provider

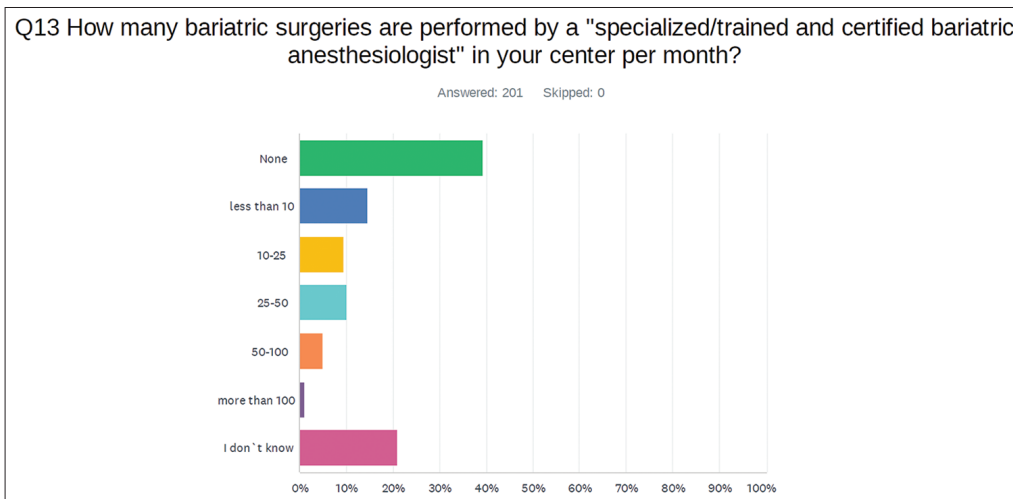


Figure 4: Number of bariatric surgeries anesthetized bariatric anesthesia fellow

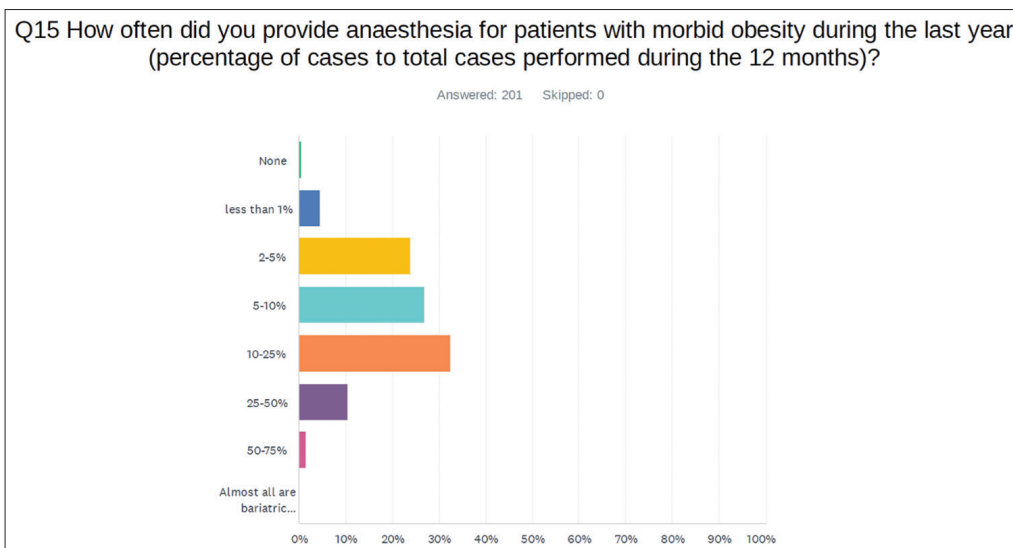


Figure 5: Percentage of patients with obesity/total number of patients/year

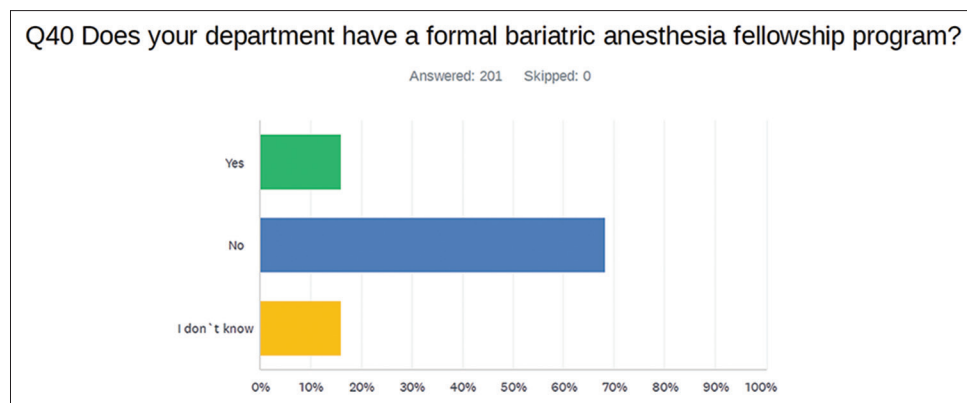


Figure 6: Do you have structured bariatric anesthesia fellow program in your center?

Discussion

In the current survey, most of the respondents reported giving anesthesia for bariatric surgical procedures with high percentages of the total amount of procedures/year. This reflects the challenges faced by anesthesiologists in this category of patients. Moreover, most of the respondents mentioned that anesthesia for those patients is conducted by non-specialized team in BA. The prevalence estimates of overweight and obesity have been steadily increasing in Saudi Arabia since 1975.^[6] Regarding the anesthetic technique, the majority of respondents favor the use of curved blade video laryngoscopes for tracheal intubation, and the majority responded using awake fiber-optic intubation in <5 cases/year. Regarding maintenance of anesthesia, the majority reported using sevoflurane, rocuronium for muscle relaxation, and sugammadex as the reversal agent and a few mentioned they practice TIVA/TCI in their facility. Regarding the opioid-free anesthetic technique, the majority responded using it and also the majority were in favor of ERAS concept in their center for bariatric surgical patients. Regarding intra-operative analgesia, the majority responded using opioids as part of multi-modal analgesia regimen. The ERAS Society published guidelines for bariatric surgery reviewing the evidence and providing specific care recommendations. These guidelines emphasize pre-operative nutrition, multi-modal analgesia, post-operative nausea and vomiting prophylaxis, anesthetic technique, nutrition, and mobilization. Several studies have since evaluated these pathways, showing them to be safe and effective at decreasing hospital length of stay and post-operative nausea and vomiting.^[7] In 2016, the Enhanced Recovery After Bariatric Surgery guidelines was published, and in 2022, an update to it was released. Grading of recommendations, assessment, development, and evaluations (GRADE), emphasizing the level of evidence (LoE) of both the guidelines, was performed. An overview of methodology was also performed, considering the following questions: how can research be improved,

what can be done in the future using data, and how to collaborate more? Both guidelines did not explain how the LoE conclusions were derived regarding the risk of bias. There is also potential for forming a global consortium that deals with bariatric research, which can serve as a repository for all relevant data. Ensuring that these data are FAIR (findability, accessibility, interoperability, reusability) compliant and using these data to formulate future guidelines will benefit clinicians and patients alike.^[8]

Regarding training in BA, the majority reported lack of specialized BA team. When asked about the “dedicated training” in BA, the majority reported having it during residency program with lack of formal courses/workshops/BAF program in their facility. Also, they mentioned some of the obstacles like lack of time and lack of structured training in BA. In our center, we have a fellowship program in bariatric anesthesia which was launched recently. There are opportunities for developing expertise in fast-track surgery, TIVA, and enhanced recovery programs, all of which we practice in bariatrics with special reference to high-risk cardiac patients undergoing bariatric surgery.^[9] The post-holder will gain wide experience in pre-operative assessment, and there are a multitude of possibilities for individual expertise to be developed as well as research, sleep studies, diabetes management, assessment of cardiac function in the morbidly obese, drug handling, and airway assessment. Our BAF program offers career development opportunities, provides experiential training, and can be used to recruit personnel to address specific challenges facing the public health workforce in the field of peri-operative care of patients with obesity undergoing WLS. Due to increasing number of subjects undergoing bariatric surgery, we must prepare our health specialists to master BA. We hope the BAF program paves the way toward achieving this goal for better patient outcome.

In conclusion, we believe in education and training in BA. Residents' rotation in BA should be included in their

curriculum during the residence program. Moreover, a dedicated fellowship program should be developed at a national level for better education and training since many patients nowadays undergoing WLS. We believe that courses and workshops on BA are necessary at a national level for better training and better patient outcome.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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