



A Focus Group Discussion Study Exploring General Surgery Trainees' Views on Evidence-Based Medicine Within Their Training Program in the United Kingdom

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INTRODUCTION: Evidence-based Medicine (EBM) is fundamental to modern healthcare and its integration into postgraduate curricula is strongly advocated. Despite its relevance, incorporating EBM in postgraduate training, specifically in general surgery, is fraught with challenges. This study aims to explore the perceptions of general surgical trainees regarding EBM, focusing on the process of achieving competency, assessment and its associated challenges.

METHODS: Four semi-structured focus group discussions were conducted, involving participants with varying experience in general surgery. Sessions were audio-recorded, de-identified and transcribed verbatim to facilitate data analysis. Thematic analysis was employed to identify recurring patterns and themes within the dataset, ensuring rigor and reliability in the findings. Saturation was achieved when no new themes or codes emerged from the data.

RESULTS: Eighteen trainees at different levels of training, academic experience and from different regions of the UK took part. The discussions were thematically analysed. Four key themes were identified: "Knowledge and understanding of EBM," "Developing EBM competencies," "Assessment in EBM," and "Barriers for EBM." Thematic saturation was achieved by the fourth focus group.

CONCLUSION: This study provides insights into the landscape of EBM in general surgery in the United Kingdom. Trainees demonstrated knowledge and understanding of EBM and the process of achieving relevant

competencies. EBM assessment was perceived to be part of their training. Nevertheless, systemic barriers and inherent challenges appear to hinder the development of EBM competencies within postgraduate general surgical training. Achieving this requires a participatory approach to engage stakeholders to further develop the existing competency-based curriculum. (J Surg Ed 82:103348. © 2024 The Author(s). Published by Elsevier Inc. on behalf of Association of Program Directors in Surgery. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>))

KEY WORDS: Evidence-Based Medicine, Evidence-Based Practice, General Surgery, Focus Group Discussion, Thematic analysis, Qualitative Research

INTRODUCTION

Evidence-based medicine (EBM)¹ aids clinicians in making informed decisions regarding patient care by integrating the best available research evidence with clinical expertise and patient values.² The lack of attention to EBM in surgical education and training is currently evident^{3,4} and has been demonstrated by a scoping review by the researchers.⁵ The consequences of inadequate education and training in EBM for surgeons are significant.⁴ Surgeons, like other doctors,^{3,4,6,7} make critical decisions regarding patient care, which in turn have a significant impact on their outcomes. The "apprenticeship model" of surgical training⁸ and additional challenges such as time constraints and lower prioritization of EBM concepts, obstruct the acceptance of EBM.⁹

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Within the field of surgery, regardless of subspecialty, in the United Kingdom (UK),¹⁰ there is currently no formal route of education towards competency in EBM.³ While there is evidence of the utility of undergraduate medical school EBM curricula¹¹ and advocacy for a specific competency framework in postgraduate training,¹²⁻¹⁴ surgery is not the focus of these studies.

It is essential to involve stakeholders in surgical education to develop a universally accepted curriculum, fostering a culture where the application of evidence-based medicine in clinical practice becomes standardized and actively promoted.

Following an initial interpretivist approach,¹⁵ this study aims to capture the diverse voices and experiences of general surgery trainees in the UK, with a particular focus on the process involved in achieving EBM competency, its assessment, and the barriers to integrating EBM principles into general surgical practice.

METHODS

Study Sample

Semi-structured focus group discussions were conducted between December 2023 and January 2024 involving trainees in general Surgical training in the UK. Candidates were invited to participate from closed groups via social media, WhatsApp and email circulation via all available deanery stakeholder communication portals. Responses of interest were received from 18 trainees in England. Participation in the discussions was incentivized with a free EBM course for trainees, provided by CRAMSURG.¹⁶

Ethics

Ethics approval for this study was granted by The University's Ethics Committee (Reference Number 056808). Participants signed an electronic consent form before participation. The training program directors (overseers of the trainees) were not informed of the focus group participation. Additionally, the transcripts were not made available to training program administrators or directors. Methods are reported based on the COREQ Guidelines.¹⁷

Data Collection and Analysis

Six key questions (Table 1) were part of the focus group topic guide and included additional prompting questions. All participants of each focus group were invited to discuss each of the key questions. The topic guide for the focus group was designed by ET and based on the scoping review recently performed by the researchers.⁵ The questions were reviewed and iteratively revised by

TABLE 1. Focus Group Questions

Focus Group Questions

What do you understand by EBM and why is it important to you as a surgeon?

- a) Do you feel it adds to your practice?
- b) If so, how?

What sources of information or resources have you found most helpful in your efforts to learn about EBM?

Are there specific areas or aspects of EBM that you feel confident in or areas where you would like more guidance?

Could you describe how EBM is currently integrated into your surgical training program?

- a) Are there specific courses, workshops, or methods used to teach you EBM?

EBM can sometimes be challenging to apply to daily practice.

- a) What barriers or obstacles have you encountered when trying to implement EBM principles in your clinical practice?

Should trainees be assessed on EBM knowledge and practice?

- a) What do you think of how trainees are currently assessed with regards to EBM knowledge and practice?
- b) What would be reasonable alternative ways to do this assessment?

other authors with qualitative (PVS), clinical (SPB), and under—and postgraduate medical education (PVS, SB) skillset. Training of the primary researcher (ET) in qualitative research methodology was obtained through university postgraduate education portals.

Focus group discussions (45 minutes per group) were conducted via Google Meet™ video conferencing system by ET (primary researcher) and supervised by PVS (supervisor). Researchers established their relationship with participants at the point of recruitment. Participants were made aware of the clinical and educational background of the interviewer (general surgery trainee, PhD student), and of their interests in the topic (EBM enthusiast). The focus group discussions were recorded, de-identified and transcribed. Field notes were taken during the discussions by ET. Transcripts were anonymised before analysis and the data was stored in a secure University cloud storage space.

Reflexivity ("the inherent bias carried by the conduct of the researcher in interviews or interpretation of transcripts")¹⁸ was acknowledged. The topic is focused and unique, therefore an enthusiast but less experienced researcher on the subject was considered suitable to design and moderate these discussions. To minimize bias, transparency was established with participants; the

lead author (ET) did the interviews and PVS (supervisor) sampled some of the interview process for quality and offered feedback. The data was subject to thematic analysis.^{19,20} This method provides a flexible, accessible, and efficient approach to qualitative research, suitable for early career researchers, that effectively highlights participant perspectives.²¹ Choosing this method allows for easier communication of the study's findings to researchers not necessarily familiar with qualitative research.²¹ For the analysis of the transcripts, NVivo software (Application, Copyright© 1999-2023 QSR International Pty Ltd)²² was used to read and generate codes from the different focus group transcripts. An initial code matrix was used,²³ and these further populated 4 major themes. Focus groups continued until saturation of themes occurred and new codes were no longer appearing in the discussions.²⁴

RESULTS

A total of 4 focus group discussions were held. The first group included 3 participants (2 from Yorkshire and 1 from London), the second group had 4 participants (3 from Yorkshire and 1 from the Southwest), the third group had 6 participants (3 from Yorkshire, 2 from the Southwest, and 1 from the Northwest), and the fourth group had 5 participants (3 from Yorkshire, 1 from the West Midlands, and 1 from the East Midlands). The demographics of the focus group discussion participants are summarized in Table 2. The major themes, subthemes and representative quotes are illustrated in Appendix A (supplementary material).

Knowledge and Understanding

Participants discussed "Knowledge and Understanding" extensively over the course of the 4 focus groups. Further sub-themes have been produced (definition/EBM resources). General surgical trainees' definitions of EBM varied. Trainees demonstrated a sense of intuition about defining EBM and their responses focused on the "critical appraisal" aspect of EBM. A contrast between evidence-based and practice-based medicine was illustrated. The concept of "guideline-based medicine" recurred with a trainee attempting to distinguish it from evidence-based medicine, trying to include individualised patient treatment into the definition which resembles the original definition of EBM from Sackett et al.¹ in the early 90s.

Trainees valued the EBM content of various resources such as guidelines, conference and surgical society meeting discussions; local meeting discussions such as journal clubs featured in this theme and recurred in all focus groups. Published scientific findings i.e. clinical trials and recent articles were mentioned, with trainees

TABLE 2. Participant Demographics

Participants	N=18
Gender	Male: 10 Female: 8
Training Level	ST3: 2 ST4: 2 ST5: 3 ST6: 2 ST7: 5 ST8: 4
Research degrees	PhD: 4 MD: 3
Research in progress UK Deaneries	Out of Program Research: 7 Yorkshire and the Humber: 1 Southwest: 3 London: 1 Northwest: 1 East Midlands: 1 West Midlands: 1
Subspecialty Focus	Colorectal: 10 Upper GI: 4 Hepatobiliary: 3 Undecided: 1

emphasizing the use of social media in their responses. Additionally, 2 trainees mentioned mobile phone applications for accessing evidence.

Developing EBM Competencies

This is the second of the 4 main themes generated from the discussions branching into 3 sub-themes. Participants generally agreed that EBM competence development starts at medical school and develops over the years in its more refined state near the completion of training. Additionally, preparing for specialty interviews was part of developing critical appraisal skills at an early stage. Throughout their training, the trainees have aids for EBM competence development; these can be extra-curricular as well as curricular adjuncts.

A single trainee mentioned that the emphasis in the curriculum is moving away from having to do extra-curricular activities such as a higher degree as a "tick box" exercise to demonstrate EBM activity. Nevertheless, most trainees (14/18) mentioned having or being in the process of obtaining a higher research degree (MD or a PhD) as a means for achieving and demonstrating EBM competence. This seemed to provide them with confidence in being competent in EBM or because their regulatory body (i.e. deanery) considered it appropriate to demonstrate EBM competence for certification. Additionally, trainees' perception was that this route provided them with access to academic resources, compared to colleagues not doing higher degrees.

Preparation for specialty exams (FRCS) was also universally considered to be a way of acquiring EBM competence.

Assessment of Competence in EBM

Trainees report that EBM competency is partly evaluated through various assessments such as the Annual Review of Competence Progression (ARCP), where EBM application may not be directly interrogated but is implied through assessments like audits. The significance of the FRCS exams was highlighted from the focus group data, indicating that a level of EBM competency is expected to achieve Certification of Completion of Training (CCT).¹⁰ Furthermore, the integration of EBM within the portfolio assessments²⁵ underscores its embeddedness within the certification pathway.

Extra-curricular activities are perceived as self-driven endeavors that augment trainees' EBM competence. Higher degrees such as an MD or PhD were seen as an informal yet rigorous form of assessment. Publications, while no longer a requirement in the new curriculum, previously served as an informal marker of EBM application and expertise.²⁶ On-the-job assessments, although informal, are an intrinsic part of daily medical practice²⁷ and play a role in EBM proficiency. Discussions with senior colleagues and consultants often revolve around evidence application in specific cases. These interactions, though not formally graded, seem to contribute to a culture of continuous learning and application of evidence-based medicine.

Barriers for EBM

Barriers for practicing EBM within general surgery were explored through the discussions. Several codes were generated that were combined into multiple sub-themes as shown on Appendix A ([supplementary material](#)). Trainees expressed a palpable sense of being overwhelmed by the complexity of statistical analysis necessary for interpreting research. This complexity acts as a barrier, necessitating support for those not specialized in research methodologies.

Trainees highlighted inconsistencies in access to training resources and literature necessary for EBM. Even within the same region, access can vary, affecting the ability to stay up to date. Economic and resource constraints and institutional capacity to provide appropriate equipment to implement the best evidence-based practices were also quoted as barriers. The type of hospital—whether it is a smaller, less academic center or a larger, research-oriented institution—influences the trainees' EBM competencies. Moreover, there is a noted ambivalence towards academia, with skepticism about academic surgeons' practical experience.

Established practices and “surgical dogma” heavily influence decision-making,²⁸ often at the expense of newer evidence-based approaches. However, the incorporation of EBM into clinical practice is not without challenge for the trainees. Several participants noted the varying levels of evidence application across different hospitals, which can be influenced by the consultants' engagement with current research and their willingness to update practice.

There are concerns about further burdening surgical portfolios with EBM requirements, which could add to the already substantial workload of trainees and trainers alike. Additionally, there was an acknowledgment of the role of hierarchy and seniority in surgical practice. Younger surgeons may be more inclined to adopt new evidence-based approaches, however there can be a reluctance among more senior surgeons to deviate from their longstanding practices.

Thematic Saturation and Meaning Saturation

New code generation has been decreasing gradually throughout the focus group discussions and no new codes were generated in group 4 ([Fig. 1](#)). This demonstrates thematic saturation by group 4 given that no more codes were generated. This meant that thematic saturation was achieved for all themes.

DISCUSSION

The focus group discussions provided insights into trainees' experiences with evidence-based medicine (EBM), demonstrated the critical role that EBM plays in surgical training and clinical practice^{3,4,6-8} and highlighted the barriers²⁹ that impede its integration into the curriculum.

Trainees acknowledged the importance of EBM in improving patient outcomes and the quality of healthcare.³⁰ They collectively defined EBM by the available literature.¹ There was a consensus that EBM principles were essential to modern surgical practice and decision-making. Participants' attitudes towards EBM were generally positive, suggesting a shift towards a more evidence-informed practice. However, there was an apparent dichotomy between the theoretical value placed on EBM and the practical difficulties in its application, reflecting the complexities of integrating EBM into a system with established practices and beliefs.³¹

Curricular and extra-curricular ways of developing EBM competencies were described, however, trainees' views varied as to the necessity of those. The role of possessing a higher academic degree was discussed in most focus groups, with the majority of higher degree holders feeling that it enhanced their EBM competence. Additionally, trainees underscored the importance of end-of-

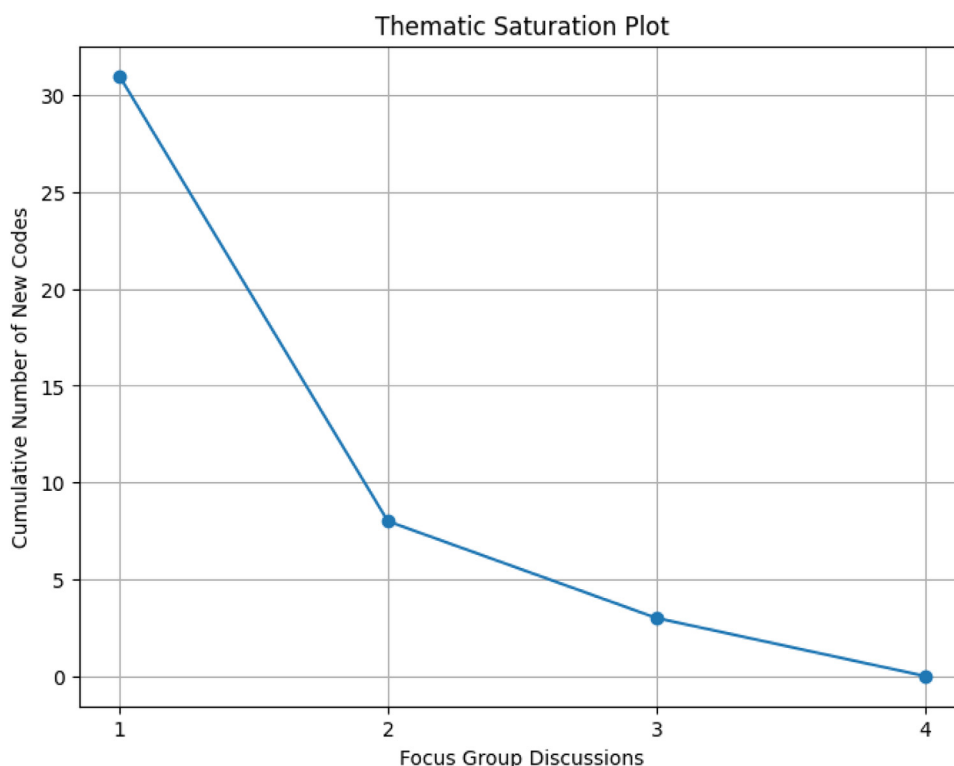


FIGURE 1. Chart demonstrating code saturation.

training exams (FRCS-Fellowship of the Royal College of Surgeons) in achieving EBM competencies.

The application of EBM is integral to clinical practice and intersects with daily surgical procedures and decision-making.^{32,33} Participants in the focus groups underscored the dynamic nature of surgical practice³⁴ and the need for continuous updates to align with evolving evidence, as captured by 2 trainees' reflections ("...medicine and surgery do not stay the same and we are continually making advances..."), ("...the evidence changes..."). This sentiment echoes the perception that evidence-based practice is not static,³⁵ emphasizing the importance of adaptability and ongoing education in surgery.³⁶ The application of EBM was further highlighted as crucial for patient safety and optimal care. Participants elaborated on the necessity of challenging institutional norms³⁷ when they diverge from evidence-based recommendations⁹ ("...it is ultimately about what is the best and safest thing for our patients and that is not always going to be what the done thing is in your institution..."). The discussions pointed towards the utility of EBM not only for passing exams but also as a foundational element in everyday clinical practice.

Nevertheless, the actual application of EBM in clinical settings was varied, with several barriers reported in its implementation. Complex statistical methodologies and the contrast between Evidence-based Surgery³⁶ (EBS)

and EBM were cited as substantial barriers. These issues could stem from the gap between the statistical literacy required to interpret surgical research and the training provided, however, there is no available evidence to support this. Additionally, surgery's distinct nature from medical specialties poses unique challenges,³⁸ potentially extending to EBM application within surgery.⁴

System barriers, particularly related to training resource accessibility, financial and managerial support, and the relationship with academia, were recurrent themes. Participants expressed that access to EBM resources was inconsistent, with disparities noted across different hospital settings and the level of engagement from their supervising consultants. This inconsistency was perceived to be exacerbated by financial constraints and bureaucratic barriers or organizational inertia in adopting new practices. These barriers, not specific to surgery, are well described in a recent systematic review on the topic²⁹ and have been investigated since the 1990s when McColl et al. introduced their attitude questionnaire on EBM for General Practitioners.³⁹

Surgery-specific barriers, such as the ingrained surgical dogma, time constraints due to the demanding nature of surgical training, and the perceived additional burdens of EBM-related portfolio requirements, were prevalent.³ These challenges reflect a culture within surgical training that at times prioritizes traditional methods and

experiential learning over the incorporation of new evidence into practice.^{9,40} The culture within surgical fields presents unique challenges, often characterised by varying degrees of acceptance of EBM. Surgeons may question the applicability of broader medical evidence to their specific field, citing methodological differences, surgical expertise, and individual patient demographics that may not align perfectly with the evidence presented.

Furthermore, the transition from evidence to clinical practice can be hindered by resistance to change, particularly from established practitioners. This highlights a generational paradigm in the acceptance and integration of new evidence into surgical practice.³ The time required to stay abreast of the latest research and integrate it into practice is a significant barrier, particularly given the demanding nature of surgical training and practice.²⁹ The apprenticeship model of surgical training,⁸ while valuable, sometimes hinders EBM practice.⁹ Identifying the equilibrium between valuing the experiential knowledge of surgical experience and embracing novel evidence-based practices that enhance patient care could be a future direction of EBM training in general surgery.

Given these findings, fostering an environment that supports the learning and application of EBM principles from the outset of surgical training, is of the essence. This may involve curricular reforms that integrate EBM more comprehensively, dedicated time for EBM activities, and a cultural shift that values ongoing education and adapts to evolving evidence. Furthermore, assessment strategies need to be refined to validate EBM competencies more effectively, always considering medical education interventions' complexity.

LIMITATIONS

This is a single-method study with a small number of participants, and the majority were from a single geographic location in the UK. However, the data reached saturation indicating the views captured were sufficiently comprehensive. Qualitative studies are not about generalizability but about building insight into a problem; this study achieves that. The plan is to build on this study by developing a survey to collect UK-wide data, informed by the focus group discussions. Selection bias is recognized given that a significant proportion of the participants are academically oriented. However, it was not possible to better understand the characteristics of nonresponders.

CONCLUSION

In conclusion, this study provides a snapshot of the current landscape of EBM within UK general surgery

training. Despite the limited number of participants, meaningful conclusions could be reached that echo emerging literature on the topic and highlight the need for future surgical education research in the field. While trainees recognize the importance of EBM, significant barriers remain that require systematic approaches to overcome. Efforts to enhance the integration of EBM into surgical training should be prioritized to ensure that future surgeons are equipped to deliver high-quality, evidence-based care. Future research should aim to understand the themes in depth, and we are currently developing additional work to do this.

CREDIT TAXONOMY

Conceptualisation, Project administration, Formal Analysis: E Tokidis. Investigation/Methodology: E Tokidis, P Vivekananda Schmidt. Validation/Visualisation: E Tokidis, P Vivekananda Schmidt, SP Balasubramanian. Supervision: P Vivekananda Schmidt, SP Balasubramanian. Writing—Original Draft: E Tokidis. Writing—Review and Editing: E Tokidis, P Vivekananda Schmidt, SP Balasubramanian. Software: NVivo.

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SUPPLEMENTARY INFORMATION

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.jsurg.2024.103348](https://doi.org/10.1016/j.jsurg.2024.103348).