

The learning preferences, perception of control, coping strategies and self-efficacy of medical doctors commencing the national specialist anaesthesiology training programme in the Republic of Ireland: A cross-sectional descriptive study

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Abstract

Background

Anaesthesiology is a high-acuity specialty characterised by significant pressure, yet the psychological characteristics of doctors entering anaesthesiology training are not well characterised. Better insight into these traits could help evaluate training, optimise programmes to improve resilience and retention:

Objectives

To describe the psychological profile of doctors at entry to anaesthesiology training, focusing on learning preferences, perceived control of internal states, self-efficacy and coping strategies[CB1] .

Design and setting

Cross-sectional descriptive study involving the Specialist Anaesthesiology Training (SAT) programme of the College of Anaesthesiologists of Ireland (CAI).

Main outcome measures

Established self-report measures were administered to assess learning preferences (VARK: Visual, Aural, Read/Write, and Kinaesthetic), perceived control of internal states (PCOISS), general self-efficacy (GSE) and coping strategies (Brief COPE).

Results

Of the cohort of 40 doctors appointed to the SAT programme in 2019, responses were obtained from 34, thus a response rate of 85%.

VARK learning preferences demonstrated diverse modality scores amongst respondents (n=33), with no single dominant modality. Read/Write learning preferences demonstrated the highest mean score (7.00, SD 3.34), followed by Visual (5.45; SD 3.01), Kinaesthetic (5.39; SD 2.68), and Aural (4.91; SD 2.72). Among participants who reported their learning preference style, (n=31), 14 (45.2%) were classified as unimodal, 13 (41.9%) as bimodal, and 4 (12.9%) as multimodal.

Participants reported mean self-efficacy and perceived-control scores of 31.47 (SD 3.32) and 58.57 (SD 5.50), respectively. Alongside a pattern of coping characterised by active-coping (mean 3.10; SD 0.54) and emotion-focused coping (mean 2.27; SD 0.26), and problem-focused strategies (mean 2.97; SD 0.38) were also popular. Avoidant coping strategies were less frequently endorsed (mean 1.56; SD 0.41).

The cohort reported greater use of problem-focused than avoidant coping strategies, although individual variation was evident.

Conclusion

Doctors entering specialist anaesthesiology training demonstrate psychological characteristics that may support functioning in high-pressure clinical settings. However, in the absence of a comparator group, it is not possible to determine whether these levels differ from other trainee or professional populations. The findings provide a useful baseline for future longitudinal research examining how psychological characteristics evolve during training and relate to performance, wellbeing, and retention.

Background

Selection into and progression through medical training are among the most highly regulated and competitive processes in education. Medical school admission often involves rigorous academic assessment with evaluation of aptitude, interpersonal skills and broader societal contribution [1]. Achieving specialist status as a medical practitioner requires demonstration of clinical competence, professional development, and success in high-stakes examinations within structured postgraduate training programmes [2]. While these processes are designed to ensure high standards of care, considerably less attention has been paid to the psychological characteristics of individuals at the point of entry to specialty training and how these may influence adaptation to the demanding clinical environment.

Anaesthesiology is a particularly demanding medical specialty. It requires integration of technical expertise, rapid decision making under pressure, and effective teamwork in unpredictable and often time-critical situations. Practitioners are routinely involved in the management of acutely unwell patients, in perioperative care and in end-of-life scenarios. The specialty is also associated with high levels of occupational stress, burnout and mental health risk, including substance misuse and suicide [3–6]. Despite this, there remains limited empirical evidence describing the baseline psychological profiles of doctors entering anaesthesiology training, or how these characteristics relate to performance, resilience and longer-term career sustainability. The Theory of Planned Behaviour has direct relevance to medical training programmes, given that learning takes place in a setting that is immersive, social, complex and dynamic [7]. The selection of psychological parameters for study derives from these features with a view to future examination of interactions that could improve the programmes and optimise the training environment for each doctor.

Existing research in medical education has largely focused on outcomes such as academic performance, burnout, and wellbeing during or after training. Studies which examine resilience, coping strategies and self-efficacy have demonstrated associations with effective stress management and with clinical performance [5, 8, 9], while research on learning styles has informed the design of educational interventions [8, 10]. However, these strands of educational literature have rarely been integrated, and few studies have examined these constructs collectively at the point of entry to specialty training. As a result, there is a limited understanding of whether individuals entering high- intensity specialties such as anaesthesiology share common psychological characteristics, or how variation in these characteristics should guide programme design, trainee support or selection processes.

The Irish context offers a unique opportunity to explore such questions. Specialist Anaesthesiology Training (SAT) is delivered through a single, nationally coordinated programme managed by the College of Anaesthesiologists of Ireland (CAI). This structured six-year programme, accredited by the Medical Council of Ireland provides a consistent training pathway across multiple accredited clinical sites in partnership with Ireland's Health Service Executive. The programme employs standardised selection processes, curricula and assessment frameworks. Such a system allows for the examination of a clearly defined national cohort at a uniform point of entry into specialist training.

This study seeks to characterise certain psychological features of doctors commencing specialist anaesthesiology training in Ireland. Specifically, it examines four key domains, including learning preferences, perception of control, general self-efficacy and coping strategies, using established self-report instruments [9–14]. Furthermore, it explores the relationships between these variables within this cohort.

By establishing a baseline profile of trainees at the outset of specialist anaesthesiology training, we aim to contribute to a more nuanced understanding of psychological readiness or suitability for high-risk medical specialties. The findings may have implications for the design of training programmes, the provision of targeted supports for trainees and, even theoretically, the consideration of psychological factors for candidate selection. Furthermore, this work provides a foundation for planned future longitudinal research, aimed at examining how these characteristics evolve over time at individual, cohort and programme levels, and whether they are associated with training outcomes, including performance, wellbeing and retention within medicine and the specialty of anaesthesiology. This work aligns with intentional efforts to enhance healthcare through targeted efforts at workforce optimisation [15]. Furthermore, stakeholders in medical specialist training include taxpayers, patients and society at large [16]. Therefore, studies of this type have potential value even at a macroeconomic scale.

Methods

Aim, Design and Setting

This study employed a cross-sectional design to characterise the psychological attributes of doctors at the point of entry into specialist anaesthesiology training in Ireland. The study was conducted within the SAT programme, nationally coordinated by the CAI.

Participants and Recruitment

All doctors who completed the SAT programme in 2025 were invited to participate at their entrance point 5 years earlier. With the support of the CAI Council and Training Committee, invitations were distributed via email from CAI. A reminder email was issued one month following the initial invitation. The email included an information sheet outlining the purpose of the study and a link to Qualtrics online survey platform. Respondents provided informed consent prior to completing the survey. Participants

completed the questionnaire at a single time point early in their training. Responses were anonymised prior to analysis.

Outcome Measures

Demographic data

Participants provided demographic information including age and gender.

Psychological characteristics

Participants completed a battery of established self-report instruments assessing four psychological domains: learning preferences, perceived control, self-efficacy, and coping strategies.

Learning preferences were assessed using the Visual, Aural, Read/Write and Kinaesthetic (VARK) questionnaire [10, 11, 12]. The VARK identifies preferences for receiving and processing information across four learning modalities: Visual (V), Aural (A), Read/Write (R), and Kinaesthetic (K). In addition, participants were categorised as having unimodal, bimodal, or multimodal learning preferences. Participants could endorse single or multiple modalities.

Perceived control over thoughts, emotions and internal experiences was assessed using the Perceived Control of Internal States Scale (PCOISS) [9]. PCOISS is an 18-item scale with a possible total score range of 18–90. Higher scores indicate greater perceived control of internal states.

Self-efficacy was assessed using the 10-item General Self-Efficacy Scale (GSE) [13] is a widely used measure of an individual's confidence in their ability to manage challenging situations. Items are rated on a 4-point Likert scale, with higher scores indicating greater perceived self-efficacy

Coping strategies were assessed using the Brief COPE inventory [14]. Composite scores were calculated for problem-focused coping, emotion-focused coping and avoidant coping.

Statistical Analysis

Descriptive statistics were calculated for demographic variables and questionnaire scores. Continuous variables are presented as means and standard deviations (SD), while categorical variables are presented as frequencies and percentages.

Some respondents did not complete all questionnaire items, resulting in varying sample sizes across analyses, which are noted below. Analyses were conducted using all available data.

Spearman rank correlation coefficients r_s were calculated to examine associations between perceived control, self-efficacy and coping strategies. Statistical significance was set at $p < .05$. Analyses were

conducted using IBM SPSS Statistics Version 29.

Results

Of the cohort of 40 doctors appointed to the SAT programme, responses were obtained from 34 participants, thus a response rate of 85%.

Demographic data were available for 26 participants (Table 1). Participants had a mean age of 30.4 years (SD 5.4; range 25–49 years). Of the 26 participants who reported gender, 18 (69.2%) were male and 8 (30.8%) were female.

Table 1
Participant characteristics (n = 26)

Variable	Value
Age, mean (SD)	30.4 (5.4)
Age range	25–49
Male, n (%)	18 (69.2)
Female, n (%)	8 (30.8)

SD, standard deviation. n, number of participants

Learning Preferences

VARK modality scores were available for 33 participants (Table 2a). Read/Write learning preferences demonstrated the highest mean score (7.00; SD 3.34), followed by Visual (5.45; SD 3.01), Kinaesthetic (5.39; SD 2.68). and Aural (4.91; SD 2.72). Preference-type classification was available for 31 participants (Table 2b), of whom 14 (45.2%) were classified as unimodal, 13 (41.9%) as bimodal, and 4 (12.9%) as multimodal.

Table 2
a. VARK modality scores (n = 33)

Learning modality	Mean	SD
Visual	5.45	3.01
Aural	4.91	2.72
Read/Write	7.00	3.34
Kinaesthetic	5.39	2.68

Table 2
b VARK preference-type
classifications (n=31)

Preference type	n	%
Unimodal	14	45.2
Bimodal	13	41.9
Multimodal	4	12.9

VARK, Visual, Aural, Read/Write, and Kinaesthetic; SD, standard deviation. Scores represent the total number of responses corresponding to each learning preference: Visual (V), Aural (A), Read/Write (R), and Kinaesthetic (K) as derived from the VARK Questionnaire. Higher scores indicate stronger preference towards that modality.

Self-Efficacy, Perceived Control and Coping

Internal consistency was moderate for PCOISS (Cronbach's $\alpha = .663$) and good for self-efficacy (Cronbach's $\alpha = .834$), whilst internal consistency for the overall Brief COPE was Cronbach's $\alpha = 0.669$.

Participants (n = 34) reported relatively high levels of self-efficacy (mean 31.47; SD 3.32) and perceived control of internal states (mean 58.57; SD = 5.50; Table 3)

Problem-focused coping demonstrated the highest score (mean 2.97; SD 0.38), followed by emotion-focused coping (mean 2.27; SD 0.26). Avoidant coping demonstrated the lowest mean score (mean 1.56; SD 0.41). Among the problem-focused coping subscales, planning (mean 3.14; SD 0.60) and active coping (mean 3.10; SD = 0.54) were most frequently endorsed (Table 3).

Table 3
Self-efficacy, perceived control and coping scores

Measure	n	Mean	Score Range	SD
PCOISS total	28	58.57	18–90	5.50
GSE total	34	31.47	10–40	3.32
Problem-focused coping	31	2.97	1–4	0.38
Emotion-focused coping	31	2.27	1–4	0.26
Avoidant coping	31	1.56	1–4	0.41
Active coping	25	3.10	1–4	0.54
Information support	25	2.72	1–4	0.66
Planning	25	3.14	1–4	0.60

PCOISS, Perceived Control of Internal States Scale; GSE, General Self-Efficacy; SD, standard deviation.

PCOISS (Perceived control of Internal States Scale) is an 18-item scale with a possible total score range of 18–90. Higher scores indicate higher levels of perceived control of internal states. Self-efficacy measured using the Generalised Self-Efficacy Scale (GSE) is a 10-item, 4-point Likert scale (1 = Not true at all, 4 = Exactly true). Higher scores represent stronger self-efficacy. The Brief COPE Inventory is a 28-item measure with sub-scale domains of Active-coping, Emotion-focused, Avoidant Focused and Problem Focused. Higher scores indicate greater use of the corresponding coping strategies.

Correlation among psychological variables

Spearman correlation analysis identified a positive association between problem-focused and emotion-focused coping ($r_s = .40$, $p = .026$; Table 4) Exploratory analysis of individual coping subscales found that higher perceived control was associated with greater endorsement of planning coping ($r_s = .496$, $p = .012$); however, this finding requires replication in a larger sample.

Table 4
Significant correlations among psychological variables

Variables	r_s	p
Problem-focused coping – Emotion-focused coping	0.400	0.026
PCOISS – Planning coping	0.496	0.012
Problem-focused coping – Active coping	0.690	< 0.001
Problem-focused coping – Information support	0.684	< 0.001
Problem-focused coping – Planning	0.822	< 0.001
Active coping – Planning	0.498	0.011
Information support – Planning	0.414	0.040

r_s , Spearman rank correlation coefficient; PCOISS, Perceived Control of Internal States Scale. P values are two-tailed.

Perceived control of internal states was positively associated with planning coping ($r_s = .50$, $p = .012$), suggesting that individuals reporting greater control over their internal experiences were more likely to engage in proactive planning behaviours.

Several additional relationships approached statistical significance. Self-efficacy demonstrated a moderate negative association with avoidant coping ($r_s = -.34$, $p = .062$) and positive associations with active coping ($r_s = .38$, $p = .061$) and problem-focused coping ($r_s = .32$, $p = .076$).

No significant associations were observed between perceived control and avoidant coping, emotion-focused coping, or problem-focused coping.

Discussion

The present study explored learning preferences, perceived control of internal states, self-efficacy, and coping strategies among doctors commencing SAT in Ireland. While learning preferences varied across participants, the most notable findings concerned the psychological profile of trainees entering specialist training.

Self-efficacy scores were relatively high, suggesting that trainees generally felt confident in their ability to manage challenges, solve problems, and achieve desired outcomes. This finding is perhaps unsurprising given the competitive nature of entry into specialist anaesthesiology training. Previous research has consistently demonstrated that self-efficacy is associated with enhanced performance, persistence in the face of difficulty, and resilience when encountering professional challenges [17, 18]. This was observed in other groups of medical trainees, particularly in procedural or high-intensity specialties [3, 6, 19].

Participants also reported relatively high levels of perceived control over their internal states. Perceived control has been linked to emotional regulation, stress management, and adaptive functioning in both healthcare and non-healthcare populations. Anaesthesiology requires clinicians to function effectively under conditions of uncertainty, time pressure, and high responsibility. The ability to regulate emotional responses while maintaining cognitive performance may therefore represent an important psychological resource for trainees entering the specialty.

A particularly encouraging finding was the predominance of problem-focused coping strategies. Participants reported greater use of problem-focused coping than either emotion-focused or avoidant coping strategies. Within the problem-focused domain, planning and active coping were among the most highly endorsed behaviours. This pattern suggests a tendency towards proactive engagement with stressors, characterised by information gathering, preparation, and direct action. Such strategies are consistent with the cognitive and procedural demands of anaesthesiology, where anticipation, planning, and systematic problem-solving are central to clinical practice.

In contrast, avoidant coping demonstrated the lowest mean score among the coping dimensions assessed. Avoidant coping has been associated with poorer psychological adjustment, increased burnout, and reduced wellbeing among healthcare professionals [18]. Although caution is warranted in interpreting cross-sectional findings, the low levels of avoidant coping observed in the present study suggest that trainees may enter specialist training with a relatively adaptive repertoire of coping strategies. This finding is particularly relevant given increasing concerns regarding burnout and psychological distress within the medical workforce [6].

The correlational analyses further support this interpretation. Problem-focused coping was positively associated with emotion-focused coping, suggesting that adaptive coping strategies are not mutually exclusive. Rather than relying solely on practical problem-solving, trainees who engaged in active management of stressors also reported greater use of emotional regulation strategies. This finding

aligns with contemporary conceptualisations of resilience, which emphasise flexibility in coping rather than reliance on any single strategy. Effective adaptation may therefore involve the capacity to combine practical problem-solving with emotional self-regulation depending on situational demands.

One of the most theoretically meaningful findings was the positive association between perceived control of internal states and planning coping. Trainees who reported greater control over their thoughts, emotions, and internal experiences were more likely to engage in planning behaviours when confronted with challenges.

Strengths and limitations

This study has several strengths. It examines a substantial proportion of a national cohort within a single, standardised training programme, providing a clearly defined, relatively homogeneous sample at point of entry into specialist training. The use of established self-report instruments across multiple psychological domains allows for a structured and multidimensional assessment of trainee characteristics.

Several limitations should be considered when interpreting these findings. First, the study involved a relatively small cohort of doctors commencing Structured Anaesthesiology Training within a single national training programme. Although this reflects the size of the annual intake and achieved a high response rate, the modest sample size reduced statistical power and may have limited the detection of some meaningful associations. Several correlations approached statistical significance and may warrant further investigation in larger cohorts.

All measures relied on self-report questionnaires and are therefore subject to response bias, including social desirability and self-perception biases. Although established self-report instruments were used, self-report measures capture perceived rather than objectively observed behaviours or performance. Also, the fact that the questionnaire was seen as originating with the CAI may have influenced responses towards reporting “superior” characteristics. One might also conjecture that non-respondents chose not to participate because they believed truthful responses might portray them negatively.

The cross-sectional design precludes conclusions regarding causality or the stability of these psychological characteristics over time. It remains unclear whether the observed profile reflects characteristics of doctors entering specialist training or whether these psychological resources change as trainees progress through increasingly demanding stages of training. Longitudinal studies are needed to examine how self-efficacy, perceived control and coping strategies evolve throughout postgraduate training and whether they predict educational, clinical or wellbeing outcomes.

Finally, learning preferences were assessed using the VARK questionnaire. While the VARK remains widely used within health professions education, there is ongoing debate regarding the validity of learning style frameworks and limited evidence that matching educational approaches to learning preferences improves learning outcomes. [20] Accordingly, the VARK findings should be interpreted

descriptively rather than prescriptively. The diversity of reported preferences illustrates heterogeneity within the cohort. Educational variety may be valuable on broader pedagogical grounds, but the present findings do not demonstrate that matching instruction to reported learning preferences improves outcomes.

Implications for CAI SAT programme

These findings have several potential implications. Firstly, in relation to training design, the identification of multimodal learning preferences, including strong kinaesthetic components, reinforces the importance of simulation and experiential learning in anaesthesiology education. Training programmes should continue to invest in high-fidelity simulation and structured reflective practice to align with these preferences and support skill acquisition in complex clinical environments.

Second, the psychological profile observed in this cohort raises important considerations for trainee support. While high levels of perceived control and self-efficacy are advantageous, they may also mask vulnerability, particularly if individuals fail to seek help or acknowledge difficulty. Training programmes should therefore ensure that support structures are proactive, accessible, and normalised within the culture of training.

Third, there are potential, albeit cautious, implications for selection processes. While it would be premature to advocate for the formal incorporation of psychological testing into selection, the findings suggest that psychological characteristics may play a role in adaptation to specialty training. Further research is required to determine whether these traits are predictive of outcomes such as examination performance, progression, or attrition before any changes to selection processes could be considered.

Finally, at a workforce level, understanding the baseline characteristics of trainees may inform broader strategies aimed at improving retention and sustainability within high-demand specialties and quality improvement of the training programmes. Given ongoing concerns regarding burnout and workforce shortages in anaesthesiology, the identification of factors associated with resilience and adaptation is of increasing importance.

Conclusions & Future research

Taken together, our findings suggest that doctors entering specialist anaesthesiology training demonstrate a psychological profile characterised by relatively high self-efficacy, perceived control, and adaptive coping strategies. While longitudinal research is needed to determine how these characteristics evolve throughout training, the results provide an encouraging picture of trainees at the commencement of their specialist careers and highlight the potential importance of fostering perceived control, self-efficacy, and adaptive coping within postgraduate medical education.

This study provides a descriptive baseline of perceived control, self-efficacy, coping strategies and learning preferences among doctors entering a national specialist anaesthesiology training programme. The cohort reported greater use of problem-focused than avoidant coping, and perceived control was

positively associated with planning. These exploratory findings require replication in larger comparative samples. Planned longitudinal follow-up will examine whether these characteristics change during training and whether they are associated with performance, wellbeing, progression and retention. Ultimately, these findings may help inform the future development and evolution of the CAI training programme.

Abbreviations

CAI

College of Anaesthesiologists of Ireland

GSE

General Self-Efficacy

PCOISS

Perceived Control of Internal States Scale

SAT

Specialist Anaesthesiology Training

VARK

Visual, Aural, Read/Write and Kinaesthetic

Declarations

Ethics approval and consent to participate

Ethical approval for the study was obtained from the Social Research Ethics Committee at University College Cork, Ireland, Log number: 2019-083 on 27th May 2019. The study was reported in accordance with the STROBE guidelines. All participants provided informed consent to participate prior to completing survey.

Consent for publication

All participants consented to publication of their de-identified data.

Competing interests

BOB formerly served as Chair of CAI Training Committee; ChigB currently serves as Chair of CAI Training Committee; MM serves as CAI Chief Executive Officer; GS formerly served as CAI President.

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No funding source was assigned to this project.

Author Contribution

BOB, GS, MM and ADG conceptualised and designed the study. ADG conducted data analysis and statistical interpretation. MCG and CB contributed to the writing, editing and preparation for submission. All authors contributed to the writing and reviewing of the manuscript and approved the final version.

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Data Availability

The datasets used and/or analysed during the study are not publicly available due to ethical and confidentiality considerations in accordance with the conditions of the study's ethics approval.

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