

Beyond the Formal Curriculum: Members' Perceptions of Educational Value and Career-Exploration Opportunities in a Malaysian Student-Led Surgical Society

Yan Naing Soe¹, Theingi Maung Maung², Hnin Pwint Phyu³, Low Yi Xuan⁴,
Soh Joe⁵ & Su Yunn Myat Soe⁶

Corresponding Author: Yan Naing Soe

ORCID: 0000-0002-8983-3142

Abstract

Background: Student-led surgical societies may complement formal undergraduate medical education by providing early clinical exposure, practical skills training, peer-assisted learning, mentorship, and opportunities for career exploration. Evidence regarding their educational contribution in Malaysian medical schools remains limited. This study examined members' perceptions of the educational and career-exploration value of a faculty-supported, student-led surgical society. **Methods:** A cross-sectional online questionnaire study used a census approach among eligible society members at a Malaysian medical school. Of 150 active members, 149 met the eligibility criteria and completed the survey. The researcher-developed questionnaire assessed motivations for joining, participation, perceived learning and confidence, mentorship exposure, career influence, experiences with peer trainers, and barriers to participation. Ten perception items used five-point Likert scales and demonstrated high preliminary internal consistency during pilot testing (Cronbach's $\alpha = .902$). Data were analysed descriptively, with exploratory continuity-corrected chi-square tests, Cramér's V, odds ratios, and 95% confidence intervals. **Results:** Early clinical exposure was the most frequently reported motivation for joining (75.8%), while workshops were the most attended activity (85.1%). Most respondents reported perceived acquisition of a specific skill (82.6%), and 67.8% perceived a positive contribution to academic performance or clinical readiness. More than half (57.0%) reported that participation had influenced their career goals, and 75.8% reported opportunities to connect with mentors or surgical professionals. Between 78.5% and 81.9% agreed or strongly agreed that peer trainers were knowledgeable, clear, approachable, supportive, and constructive. Respondents with mentorship or networking exposure had higher odds of reporting perceived career influence than those with non-affirmative exposure responses (66.4% vs 27.8%; OR = 5.13, 95% CI 2.24–11.74; $p < .001$) and higher odds of confidence in performing practised skills (89.4% vs 58.3%; OR = 6.01, 95% CI 2.46–14.68; $p < .001$). Stage of training was not significantly associated with perceived career influence ($p = .158$). The main barriers were time constraints, timetable conflicts, and limited clinical-shadowing opportunities. **Conclusion:** Members perceived the student-led surgical society as a valuable complement to formal undergraduate education, particularly for early surgical exposure, practical engagement, peer-assisted learning, mentorship, confidence-building, and career exploration. However, the single-institution, cross-sectional, self-reported design, absence of a comparison group, and high prevalence of pre-existing surgical interest preclude causal inference. Multicentre prospective studies incorporating validated measures, objective performance assessment, comparison groups, and longitudinal follow-up are warranted.

Keywords: student-led surgical society; undergraduate medical education; peer-assisted learning; mentorship; surgical skills; career exploration

Introduction

Student-led surgical societies provide extracurricular opportunities for practical exposure, networking, mentorship, and engagement with surgical specialties beyond the formal curriculum (Collins et al., 2008; Song et al., 2019; Wells et al., 2019). Their activities may include skills workshops, case discussions, conferences, clinical exposure, and links with wider student surgical networks, thereby supplementing opportunities that may be variably represented in routine undergraduate teaching (Asif et al., 2014; Booth et al., 2017; Tariq et al., 2017).

Early exposure to surgery and surgeons may influence students' interest in surgical careers and support more informed specialty decision-making (Kirkham et al., 2006; Marshall et al., 2015). Students' perceptions of surgical culture and whether they can envisage themselves fitting within it may also shape their consideration of a surgical career (Hill et al., 2014; Peel et al., 2018). Positive practical experiences, supportive role models, and structured extracurricular initiatives have been associated with stronger interest in surgery and, in some settings, increased entry into surgical specialties (Grover et al., 2016; Marshall et al., 2015). Student-led initiatives may therefore function as complementary educational spaces for exploration, repeated exposure, and access to mentorship.

Peer-assisted learning is increasingly used in clinical and procedural skills education. When appropriately structured and supervised, near-peer teaching can be a feasible and educationally useful approach to basic surgical skills training, particularly where faculty teaching capacity is limited (Bennett et al., 2018). Surgical interest groups may also provide comfortable environments for skills practice and interaction with senior students, residents, and faculty members (Song et al., 2019). Cognitive and social congruence may enable peer tutors to communicate at an accessible level and create a psychologically safer environment for questions and feedback (Loda et al., 2019). Structured near-peer surgical skills teaching may be feasible and educationally valuable, with cognitive and social congruence potentially facilitating accessible communication, learner comfort, and constructive feedback (Bennett et al., 2018; Loda et al., 2019).

Participation may also provide experiences relevant to professional identity formation, a complex and non-linear process shaped by socialisation, role models, mentoring, reflection, and the learning environment (Sarraf-Yazdi et al., 2021). A student-led surgical society may provide an identity-relevant setting in which learners encounter surgical practices, peer and senior role models, mentorship, and specialty-related norms outside the formal timetable. Participation in a student-led surgical society may provide experiences relevant to professional identity formation through role modelling, mentorship, and engagement with a surgical community. However, this outcome was not directly assessed in the present study (Sarraf-Yazdi et al., 2021).

The society evaluated in this study was established in 2023 as an extracurricular, student-led initiative with faculty advisory support and partial institutional funding.

Its activities included workshops, case discussions, conferences, outreach, research-related opportunities, and peer-assisted basic surgical skills training. Evidence on such initiatives in Malaysian medical education remains limited, despite their potential relevance in settings where access to early surgical exposure, mentorship, and structured practical learning varies.

This study therefore examined members' perceptions of the educational value and career-exploration opportunities provided by a student-led surgical society, focusing on motivations for joining, participation, peer-assisted training, perceived learning and confidence, mentorship exposure, career influence, and barriers to participation.

Methods

Study design and setting. A cross-sectional online questionnaire study was conducted among eligible members of a student-led surgical society at Universiti Tunku Abdul Rahman, Malaysia. The society was organised primarily by medical students with faculty advisory support and was intended to complement, rather than replace, formal curricular teaching.

Participants and sampling. A census approach was adopted. The active membership register included 150 eligible members, all of whom were invited to participate. Of these, 149 completed the questionnaire, while one declined to participate, yielding a response rate of 99.3%. Eligible participants were society members aged 18–30 years, including medical students and recent graduates who remained affiliated with the society. No incomplete questionnaires were received or excluded.

Questionnaire development and variables. The research team developed the questionnaire in accordance with the study objectives and literature on surgical societies, peer-assisted learning, mentorship, and undergraduate surgical education. It comprised five demographic items and 19 study items across five areas: motivations and participation, perceived career influence, barriers and areas for improvement, experience with peer-assisted trainers, and perceived learning outcomes and confidence. Ten perception items used a five-point Likert scale from strongly disagree to strongly agree: six items concerning peer-assisted trainers and four concerning learning outcomes and confidence. The remaining items used categorical single-response or multiple-response formats.

Pilot testing, data collection, and ethics. The researcher-developed questionnaire was pilot-tested with 20 students who were excluded from the main analysis to assess item clarity, comprehensibility, and usability. Preliminary internal consistency was assessed in the pilot sample for the combined 10-item Likert-scale measure, yielding a Cronbach's alpha of 0.902. Categorical and multiple-response items were excluded from the reliability analysis because they did not constitute multi-item scales. Data were collected anonymously through Google Forms between October and November 2025. Participation was voluntary, and electronic informed consent was obtained before questionnaire completion. Ethical approval was granted by the institutional ethics review board (approval no. U/SERC/56(A)-692/2025).

Data analysis. Data were analysed using IBM SPSS Statistics (IBM Corp., Armonk, NY, USA). Categorical responses are reported as n (%), using 149 as the denominator unless stated otherwise. For descriptive presentation, Likert responses were collapsed into agree/strongly agree, neutral, and disagree/strongly disagree; all three categories are reported. Multiple-response items are identified, and their percentages may exceed 100%. For exploratory 2×2 analyses, stage of training was grouped as junior (Years 1–2) or senior (Years 3–5, house officer or medical officer). Perceived career influence and mentorship exposure were each dichotomised as affirmative (yes) versus non-affirmative (no/not sure), while confidence was dichotomised as agree/strongly agree versus all other responses. Continuity-corrected chi-square tests were used because all expected cell counts exceeded five. Cramér's V and odds ratios (ORs) with 95% confidence intervals (CIs) are reported. Tests were two-sided, with $p < 0.05$ considered statistically significant. The inferential analyses were exploratory and unadjusted.

Results

Participant characteristics and response flow

Of the 150 active members on the society register, 149 met the eligibility criteria, were invited, and completed the questionnaire, yielding a 100.0% response rate among eligible members. Most respondents were aged 18–24 years (129/149, 86.6%) and female (96/149, 64.4%). Year 3, Year 1, and Year 5 participants represented 25.5%, 22.8%, and 20.8% of respondents, respectively. Most respondents (120/149, 80.5%) reported an interest in surgery before joining the society, whereas 29 (19.5%) reported that their interest developed after joining (Table 1).

Characteristic	n	%
Response flow		
Active members on register	150	—
Eligible and invited	149	99.3*
Completed questionnaire	149	100.0†
Participant characteristics		
Age 18–24 years	129	86.6
Age 25–30 years	20	13.4
Female	96	64.4
Male	53	35.6
Year 1	34	22.8
Year 3	38	25.5
Year 5	31	20.8

Characteristic	n	%
Other training stages (Year 2, Year 4, and early graduates combined)	46	30.9
Interested in surgery before joining	120	80.5
Interest developed after joining	29	19.5

Table 1. Respondent characteristics and response flow

Percentages for participant characteristics are based on $N = 149$. *Percentage of active members.

Motivations, activities, and continued participation

Early clinical exposure was the most frequently selected motivation for joining (75.8%), followed by interest in a surgical career (56.4%), academic or professional development (53.7%), and curiosity or exploration (51.7%) (Figure 1).

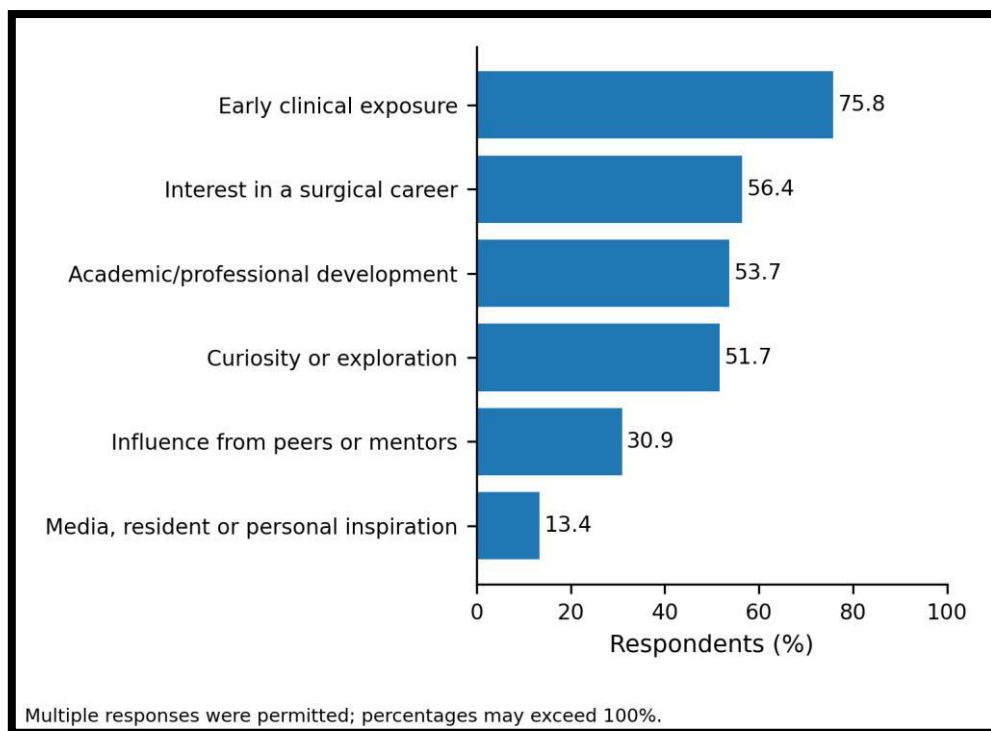


Figure 1. Motivations for joining the student-led surgical society

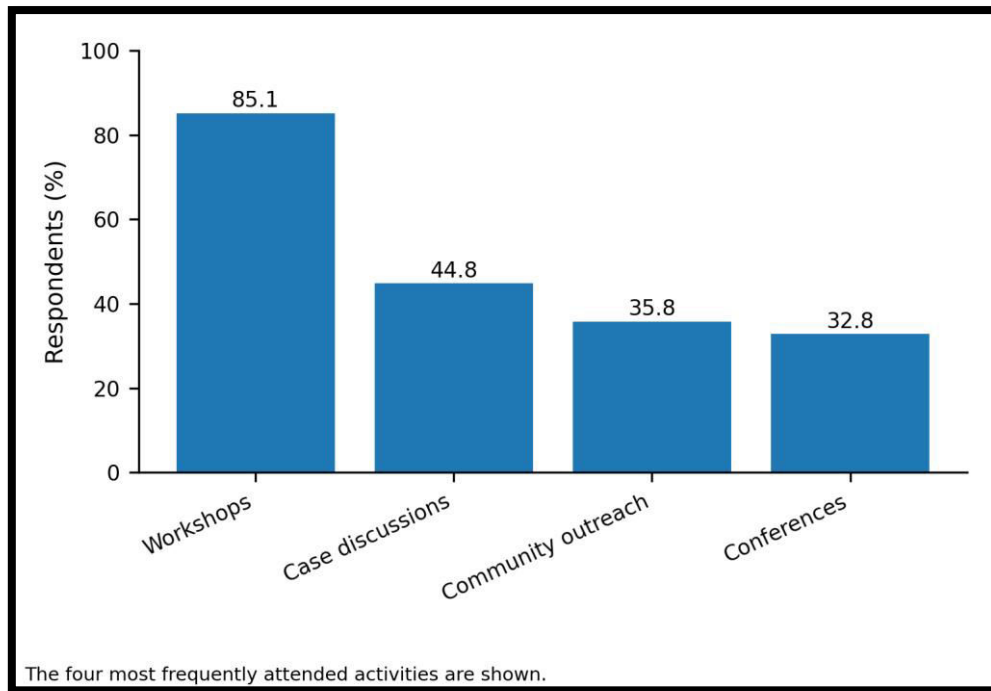


Figure 2. Most frequently attended society activities

Workshops were the most frequently attended activity (85.1%), followed by case discussions (44.8%), community outreach (35.8%), and conferences (32.8%) (Figure 2). Most respondents reported perceived acquisition of a specific skill (123/149, 82.6%), and continued skill development was the most selected factor sustaining involvement (108/149, 72.5%). Attendance was therefore concentrated primarily in workshop-based activities. (Figure 2).

Perceived career influence, mentorship exposure, and educational contributions

Society participation was perceived to have influenced career goals by 85 respondents (57.0%); 55 (36.9%) were unsure, and nine (6.0%) reported no influence. Opportunities to connect with mentors or surgical professionals were reported by 113 respondents (75.8%). A positive contribution to academic performance or clinical readiness was reported by 101 respondents (67.8%); 41 (27.5%) were unsure, and seven (4.7%) reported no contribution. Events and activities were most frequently identified as the strongest contribution of membership (98/149, 65.8%) (Table 2).

Variable	Response	n	%
Perceived acquisition of a specific skill	Yes	123	82.6
	Not sure	22	14.8
	No	4	2.7
Main factor sustaining involvement	Continued skill development	108	72.5

Variable	Response	n	%
	Career motivation	14	9.4
	CV or portfolio building	11	7.4
	Supportive peer group	9	6.0
	Access to mentors and role models	4	2.7
	Leadership opportunities	3	2.0
Perceived influence on career goals	Yes	85	57.0
	Not sure	55	36.9
	No	9	6.0
Opportunity to connect with mentors or surgical professionals	Yes	113	75.8
	Not sure	30	20.1
	No	6	4.0
Perceived contribution to academic performance or clinical readiness	Yes	101	67.8
	Not sure	41	27.5
	No	7	4.7
Strongest perceived contribution of membership	Events and activities	98	65.8
	Learning resources and support	36	24.2
	Mentors and networking	15	10.1

Table 2. Participation, career, mentorship, and perceived contribution outcomes

Percentages are based on N = 149. Percentages may not total 100.0 because of rounding.

Peer-assisted training and perceived learning outcomes

Responses concerning peer-assisted trainers were consistently favourable. Between 78.5% and 81.9% of respondents agreed or strongly agreed that peer trainers demonstrated good knowledge, explained procedures clearly, were approachable, encouraged questions, and provided constructive feedback. A total of 117 respondents (78.6%) perceived peer-led teaching to be as effective as faculty-led teaching. For the four learning and confidence items, between 81.9% and 85.2% agreed or strongly agreed that workshops supported understanding, confidence, and perceived skill

retention. These findings reflect respondents' perceptions and do not demonstrate equivalence with faculty-led teaching or objectively assessed competence (Table 3).

Item	Agree or strongly agree, n (%)	Neutral, n (%)	Disagree or strongly disagree, n (%)
Peer trainer demonstrated good knowledge	122 (81.9)	23 (15.4)	4 (2.7)
Peer trainer explained procedures clearly	120 (80.5)	25 (16.8)	4 (2.7)
Peer trainer was approachable and encouraged questions	119 (79.9)	26 (17.4)	4 (2.7)
Comfortable asking questions to peer trainer	118 (79.2)	26 (17.4)	5 (3.4)
Peer trainer provided constructive feedback	117 (78.5)	27 (18.1)	5 (3.4)
Peer-led teaching perceived as effective as faculty-led teaching	117 (78.6)	26 (17.4)	6 (4.0)
Workshop improved understanding of basic surgical skills	123 (82.6)	22 (14.8)	4 (2.7)
Felt more confident performing practised skills	122 (81.9)	21 (14.1)	6 (4.0)
Peer-assisted training improved perceived skill retention	122 (81.9)	22 (14.8)	5 (3.4)
Peer-assisted learning should be a regular part of skills training	127 (85.2)	17 (11.4)	5 (3.4)

Table 3. Peer-assisted trainer and perceived learning outcomes

Exploratory associations

Perceived career influence did not differ significantly between junior and senior participants (24/50, 48.0% vs 61/99, 61.6%; continuity-corrected $\chi^2(1, N = 149) = 1.99, p = .158$, Cramér's $V = .13$; OR for junior versus senior participants = 0.58, 95% CI [0.29, 1.14]). Respondents reporting mentorship or networking exposure were more likely to report perceived career influence than those with non-affirmative exposure responses (75/113, 66.4% vs 10/36, 27.8%; continuity-corrected $\chi^2(1, N = 149) = 15.06, p < .001$, Cramér's $V = .33$; OR = 5.13, 95% CI [2.24, 11.74]). They were also more likely to agree that they felt more confident performing practiced skills (101/113, 89.4% vs 21/36, 58.3%; continuity-corrected $\chi^2(1, N = 149) = 15.71, p < .001$, Cramér's $V = .35$; OR = 6.01, 95% CI [2.46, 14.68]). These exploratory, unadjusted associations should not be interpreted causally, and the dichotomisation of uncertain responses should be considered when interpreting the estimates (Table 4).

Association	Group results	χ^2 (df)	<i>p</i>	Cramér's V	OR (95%CI)
Stage of training and perceived career influence	Junior: 24/50 (48.0%); senior: 61/99 (61.6%)	1.99 (1)	.158	.13	0.58 (0.29–1.14)
Mentorship exposure and perceived career influence	Exposed: 75/113 (66.4%); non-affirmative: 10/36 (27.8%)	15.06 (1)	< .001	.33	5.13 (2.24–11.74)
Mentorship exposure and confidence performing practised skills	Exposed: 101/113 (89.4%); non-affirmative: 21/36 (58.3%)	15.71 (1)	< .001	.35	6.01 (2.46–14.68)

Table 4. Exploratory associations

Junior participants comprised Years 1–2, whereas senior participants comprised Years 3–5 and recent graduates. Non-affirmative responses combined “no” and “not sure”. The χ^2 values shown are continuity corrected. Odds ratios compare junior with senior participants in the first analysis and mentorship-exposed with non-affirmative participants in the second and third analyses. Cramér's V was calculated from the uncorrected Pearson χ^2 statistic. CI = confidence interval; OR = odds ratio.

Barriers and areas for improvement

Time constraints were the most frequently reported primary barrier to joining (47.0%), followed by uncertainty about career goals (16.8%) and lack of awareness (13.4%) (Figure 3).

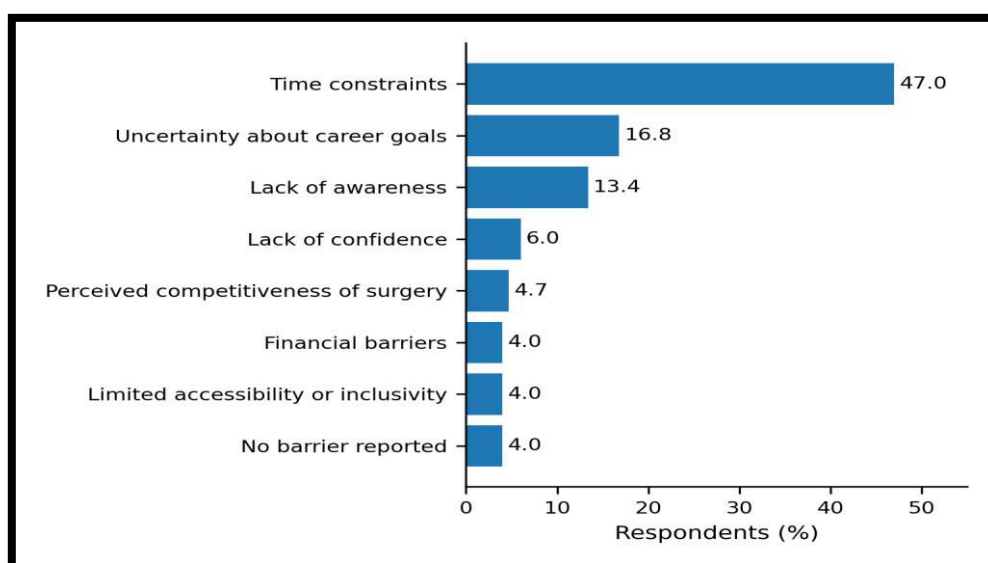


Figure 3. Primary barriers to joining the surgical society

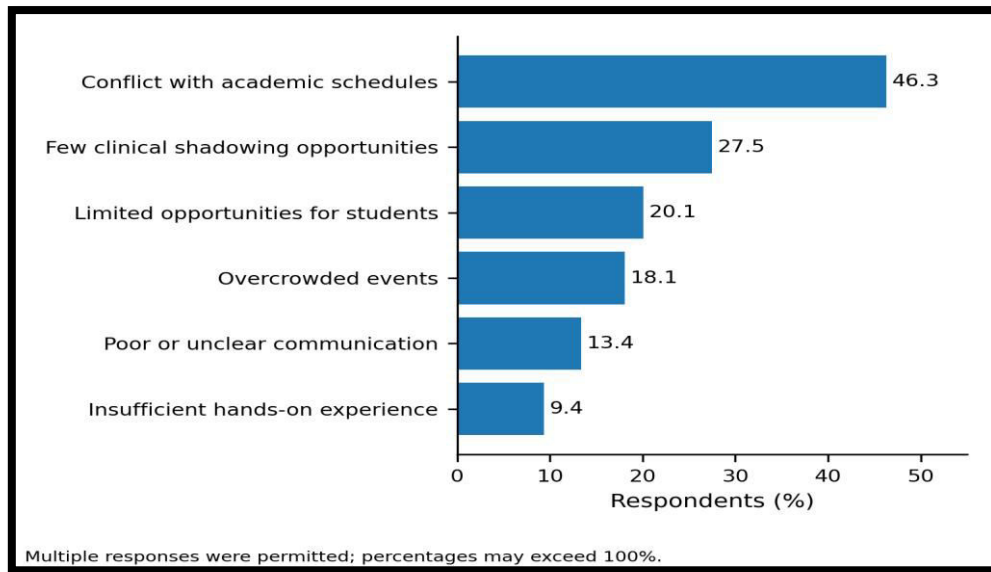


Figure 4. Areas in which the surgical society was perceived to require improvement

Areas perceived to require improvement were assessed separately. Conflicts with academic schedules were the most frequently selected concern (46.3%), followed by few clinical shadowing opportunities (27.5%), limited opportunities for students (20.1%), and overcrowded events (18.1%). Overall, timetable-related constraints and limited clinical exposure predominated among the reported areas for improvement. (Figure 4).

Discussion

Members generally perceived the student-led surgical society as a useful complement to undergraduate education, particularly for early exposure, practical engagement, peer-assisted learning, mentorship access, confidence-building, and career exploration. These findings are consistent with previous descriptions and evaluations of surgical societies as extracurricular platforms offering opportunities that may not be consistently available through routine curricular delivery (Asif et al., 2014; Collins et al., 2008; Song et al., 2019). The present study, however, assessed members' perceptions rather than educational effectiveness or actual career outcomes.

Early clinical exposure was the strongest motivation for joining, and workshops were the most frequently attended activities. Undergraduate surgical skills teaching has been associated with improvements in learner confidence, skills acquisition, and attitudes towards surgical careers (Glossop et al., 2023; McAnena et al., 2018). The high proportion of respondents reporting perceived skill acquisition suggests that hands-on formats were valued. Nevertheless, no objective technical assessment or delayed retention assessment was undertaken; therefore, these findings should not be interpreted as evidence of demonstrated competence or sustained skill retention.

Glossop et al. also emphasised limitations in the existing evidence, particularly the lack of medium- and long-term follow-up.

Peer-assisted learning was viewed positively. Respondents perceived peer trainers as knowledgeable, clear, approachable, and constructive, and many perceived peer-led teaching as comparable with faculty-led teaching. This is consistent with evidence that structured near-peer surgical skills teaching can be feasible and can improve learners' confidence (Bennett et al., 2018). Cognitive and social congruence may help explain why learners feel comfortable asking questions and receiving feedback from near peers (Loda et al., 2019). However, the present survey did not directly compare objective learning outcomes between peer- and faculty-led teaching; perceived comparability should therefore not be described as demonstrated equivalence.

Mentorship exposure showed the strongest exploratory associations. Members who reported connecting with mentors or surgical professionals had higher odds of reporting perceived career influence and confidence in performing practised skills. Mentorship, role modelling, and authentic surgical exposure are recognised influences on surgical interest and career exploration (Kerdegari et al., 2024; Marshall et al., 2015; Peel et al., 2018). Kerdegari et al. (2024) similarly reported improvements in students' surgical exposure, career insight, professional contacts, and attitudes towards surgery. However, most respondents in the present study already had an interest in surgery before joining, and more motivated or engaged members may have been more likely to seek mentorship. The cross-sectional, unadjusted analysis cannot establish whether mentorship produced the reported differences.

The findings may also be interpreted cautiously through the lens of professional identity formation. Participation in workshops, interaction with peers and surgeons, exposure to surgical role models, and engagement with the practices of a surgical community may provide opportunities for learners to explore professional belonging and possible future roles (Sarraf-Yazdi et al., 2021). The society may therefore function as a relatively low-stakes setting for identity exploration. However, professional identity formation was not measured directly; this interpretation should be regarded as theory-informed rather than as an observed study outcome.

Implications for learning and teaching practice

The findings suggest several practical design principles for student-led educational initiatives:

- Use a faculty-supported student leadership model in which peer trainers expand access while faculty provide supervision, legitimacy, calibration, and patient-safety oversight.
- Prepare and calibrate peer trainers before workshops, including structured teaching plans, skills checklists, feedback guidance, and clear escalation to faculty.

- Repeat high-demand workshops in smaller groups to reduce overcrowding and increase deliberate practice and feedback.
- Align events with academic timetables and provide transparent registration, waitlist, and communication systems to improve equitable access.
- Develop structured mentorship and shadowing pathways that are accessible to students with and without pre-existing surgical interest.

For programme evaluation, future delivery should combine participation data with objective indicators such as checklist-based skills performance, delayed retention assessment, mentor engagement and equitable access across training stages. Monitoring attendance frequency and prior surgical interest would also help distinguish the contribution of the society from self-selection among already motivated students. These measures would support continuous quality improvement while preserving the flexible, student-led character of the initiative.

The barriers also raise an equity concern: extracurricular opportunities may disproportionately benefit learners with more time, confidence, prior interest, or access to professional networks. Programme design should therefore prioritise transparent access, repeated opportunities, and outreach to students who are still exploring career options.

Limitations and future research

This single-institution study included society members only and lacked a non-member comparison group, limiting generalisability and introducing potential selection bias. The cross-sectional, self-reported design, absence of baseline data and high prevalence of pre-existing surgical interest limit causal interpretation and may introduce recall and social desirability bias. The researcher-developed questionnaire was pilot tested for clarity and demonstrated preliminary internal consistency; however, comprehensive psychometric validation was not undertaken. The exploratory analyses were unadjusted, and combining “no” with “not sure” as non-affirmative responses may have obscured differences between disagreement and uncertainty. Perceived outcomes were not verified through objective assessment or comparison groups.

Future multicentre prospective studies should use validated measures, non-member or comparison groups, objective technical assessments, and delayed follow-up to determine whether participation is associated with sustained career interest, preparedness for clinical practice, or entry into surgical training after accounting for pre-existing interest and level of engagement.

Conclusion

Members perceived the student-led surgical society to provide valuable opportunities for early surgical exposure, practical engagement, peer-assisted learning, mentorship access, confidence-building, and career exploration. Workshops and peer-assisted

training were particularly well regarded, while timetable conflicts, time constraints, and limited clinical-shadowing opportunities remained important barriers.

These findings support the role of a faculty-supported student-led surgical society as a complementary educational platform within undergraduate medical education. However, objective, comparative, and longitudinal research is required before effects on technical competence, clinical preparedness, or career outcomes can be established.

Ethical approval

Ethical approval was obtained from the institutional ethics review board (approval no. U/SERC/56(A)-692/2025).

Informed consent

Electronic informed consent was obtained from all respondents before questionnaire completion.

Data availability

The anonymised data supporting the findings are available from the corresponding author upon reasonable request, subject to institutional ethical and privacy requirements.

Author contributions

Yan Naing Soe conceptualised and supervised the study, interpreted the findings, and critically revised the manuscript. Theingi Maung Maung contributed to study design, interpretation, and manuscript revision. Hnin Pwint Phyu and Low Yi Xuan contributed to data collection, analysis, literature review, and drafting. Soh Joe and Su Yunn Myat Soe contributed to data collection, interpretation, and critical revision. All authors approved the final manuscript.

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Declaration of interest

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Author Address:

¹ Clinical Associate Professor, Department of Surgery, M. Kandiah Faculty of Medicine and Health Sciences, Universiti Tunku Abdul Rahman, Selangor, Malaysia

² Associate Professor, Community-based Department, Faculty of Medicine, Universiti Kuala Lumpur Royal College of Medicine Perak, Malaysia

³ Senior Lecturer, Department of Preclinical Science, M. Kandiah Faculty of Medicine and Health Sciences, Universiti Tunku Abdul Rahman, Selangor, Malaysia

⁴ Tutor, Department of Surgery, M. Kandiah Faculty of Medicine and Health Sciences, Universiti Tunku Abdul Rahman, Selangor, Malaysia

⁵ Medical officer, Department of Surgery, M. Kandiah Faculty of Medicine and Health Sciences, Universiti Tunku Abdul Rahman, Selangor, Malaysia

⁶ School of Medicine, University of Aberdeen, Scotland, United Kingdom

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