

# BMJ Open Do structured career counselling initiatives influence specialty preferences in medical students? A longitudinal observational survey study

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## ABSTRACT

**Objective** This longitudinal study aimed to document shifts in specialty preferences, career pathways and intended practice locations among medical students following the implementation of structured career initiatives during the 2023–2024 academic year.

**Design** A longitudinal observational survey study.

**Setting** A private, not-for-profit institution, VinUniversity in Hanoi, Vietnam during the 2023–2024 academic year.

**Participants** All year 2, year 3 and year 4 medical students (n=144 eligible), of whom 105 (73%) completed both baseline and follow-up surveys.

**Interventions** Structured career counselling initiatives introduced at the start of the academic year, including academic mentoring, clinical mentoring, hands-on clinical exposure in year 4 and multiple career counselling activities.

**Primary and secondary outcome measures** The primary outcome was change in specialty preference over time, measured by students' self-reported first-choice specialty at baseline and follow-up. Secondary outcomes included shifts in factors influencing career decisions (eg, personal interest, income and family expectations), intended practice location (domestic or international) and preferred career pathways (residency, Specialist Level I, master's degree or direct workforce entry).

**Results** Personal interest remained the strongest influence on specialty choice from baseline to follow-up (mean scores 4.27 vs 4.36 on a 5-point scale). A notable decrease occurred in the importance of income (3.82 to 3.22;  $p<0.001$ ). Students showed increased openness to both domestic and international practice, while the number of undecided students dropped (17.1% to 1.9%). Internal medicine nearly doubled in popularity (12.4% to 24.8%), and surgery maintained the highest stability in specialty preference over the 1-year period (66.7%). Students also shifted towards advanced training pathways, with more pursuing specialist qualifications or master's degrees instead of immediate workforce entry.

**Conclusion** Noticeable shifts in specialty preferences and career pathways were observed after a series of career initiatives were implemented. Although these trends coincided with the new programmes, further qualitative research is needed to elucidate how and why these career initiatives may have influenced decision-making. Informed by these findings, medical educators can refine

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Longitudinal design: follows students over one academic year, rather than relying on cross-sectional snapshots.
- ⇒ Multicohort involvement: captures differences among year 2, year 3 and year 4 students who may have varying levels of clinical exposure.
- ⇒ Integrated intervention: examines the effect of multiple career counselling approaches, including mentoring and immersive clinical rotations.
- ⇒ Single-institution setting: results may not be generalisable to other institutions or countries with different educational structures or resources.
- ⇒ Lack of control group: limits definitive conclusions about the direct causal impact of interventions on specialty choice.

interventions to support students' evolving preferences and ultimately strengthen healthcare workforce distribution.

## BACKGROUND

### Study context and rationale

Developing a motivated and evenly distributed medical workforce is a key objective of health systems worldwide.<sup>1</sup> Studies have long noted that medical students' specialty preferences are not static; they are influenced by a multitude of factors, including intrinsic motivations (eg, personal interest and perceived calling), extrinsic factors (eg, financial prospects and family expectations) and institutional or societal pressures (eg, cultural norms).<sup>2–4</sup> These preferences may evolve substantially throughout medical school as students gain clinical exposure, expand professional networks and refine career aspirations.<sup>5 6</sup>

In many low- and middle-income countries, career decisions can be further complicated by limited financial resources and cultural expectations regarding family

obligations.<sup>7 8</sup> Vietnam exemplifies such a rapidly developing environment, where both traditional and newly established medical programmes offer multiple pathways (residency, Specialist Level I and master's degree).<sup>9–11</sup> Historically, Vietnamese medical graduates often gravitated towards a few higher-prestige specialties—such as surgery, cardiology or internal medicine—potentially leaving other clinical areas understaffed.<sup>12</sup> Although earlier cross-sectional surveys highlighted personal interest as the strongest predictor of choice, they also found a sizeable proportion of students felt ill-prepared to navigate the complexities of their postgraduate options.<sup>13</sup>

### Career pathways in Vietnam

Vietnam's medical graduates typically choose among:

1. Residency (4 years): involves rigorous, hands-on training at teaching hospitals, often leading to board certification and potential leadership roles. This route is highly prestigious but can demand significant personal investment.
2. Specialist Level I (Chuyen khoa I) (2–3 years): focuses on refining clinical skills in a specific field; appeals to students seeking a shorter, less competitive track but may offer fewer career advancement opportunities.
3. Master's degree in a clinical specialty (2–3 years): emphasises research methodologies and academic inquiry over direct patient care, potentially serving students interested in teaching or research pursuits.

Despite the variety of options, national surveys indicate that many students struggle to make well-informed decisions, often citing insufficient mentorship and inadequate career guidance.<sup>12 14</sup>

### Introducing structured career initiatives

VinUniversity, a not-for-profit institution in Hanoi, Vietnam, was established in 2020 and identified a pressing need for more comprehensive, longitudinal career support. Our goal explicitly aims to cultivate a diverse, well-trained medical workforce aligned with Vietnam's evolving healthcare needs. Our career initiatives are expected to support this goal by producing physicians who are clinically competent and aware of specialty distribution, healthcare equity and societal needs. In prior internal analyses, over 70% of students indicated they lacked sufficient guidance, echoing broader findings from Asian medical schools.<sup>15–17</sup> Thus, starting in the 2023–2024 academic year, we launched several coordinated efforts, including four main components: academic mentoring, clinical mentoring, hands-on clinical exposure and career counselling activities. These initiatives were developed based on best practices from the medical education literature, adapted to our local context.<sup>7 18</sup>

### Academic mentoring (years 1–2)

Each student was assigned to a faculty mentor, meeting regularly approximately once per month throughout the academic year. These meetings typically lasted 30–45 min each and covered discussions on academic progress,

personal development, extracurricular activities, preliminary career exploration and early identification of students' interests and strengths. Mentors also guided students in setting achievable short-term and long-term academic and professional goals.

### Clinical mentoring (years 3 and above)

In the clinical mentoring phase, students received structured guidance from mentors representing various clinical specialties, including internal medicine, surgery, general practice, paediatrics, obstetrics and gynaecology, psychiatry and emergency medicine, among others. Clinical mentoring involved regular one-on-one and small-group meetings held at least monthly. During these meetings, mentors shared practical insights about clinical routines, challenges and rewards of their specialty, pathways for career progression and strategies for successful postgraduate training. Additionally, mentors provided individualised advice based on each student's expressed interests and strengths.

### Hands-on clinical exposure (year 4)

Fourth year students participated in structured, immersive clinical rotations designed specifically to enhance specialty awareness. These rotations were adapted from an established team-based clinical model and involved small student groups (4–6 students) rotating through different departments (eg, surgery, internal medicine and paediatrics) for 2–4 weeks per department. Students were actively involved in patient care rounds, supervised clinical activities, interactive case discussions, departmental meetings and reflective sessions facilitated by senior residents and faculty mentors. This exposure was intended to provide firsthand experience and realistic insights into daily practice within various specialties.

### Career counselling activities

Two key career events were held during the academic year:

- Career Day: a full-day event held mid-academic year featuring representatives from various medical specialties. Experts presented case discussions, practical scenarios, typical patient management routines, research opportunities and career trajectories within their fields. Interactive Q&A panels allowed students to directly engage with specialty representatives.
- Career Guidance Talks resemble TED (Technology, Entertainment & Design) style: these interactive sessions took place quarterly, each lasting approximately 2 hours, featuring experienced clinicians and academic leaders. Speakers shared personal experiences, career paths, lifestyle considerations, challenges and opportunities in their respective specialties. Students were actively encouraged to participate through moderated discussions and informal networking following each session.
- These structured initiatives aimed collectively to support medical students in making informed

specialty choices, aligning their interests and aspirations with Vietnam's healthcare workforce needs.

### Objectives of the study

To determine whether these structured, multifaceted career initiatives correlate with changes in medical students' specialty preferences and associated factors over one academic year, we conducted a longitudinal observational study. Specifically, we sought to:

1. Document any shifts in first-choice specialty, key influencing factors (eg, personal interest and income) and practice location plans.
2. Assess whether new pathways (master's degrees and specialist qualifications) gained traction at the expense of immediate workforce entry.

Ultimately, this research aims to expand the understanding of how longitudinal mentoring, immersive clinical exposure and targeted career activities intersect with students' evolving career aspirations, providing an evidence base for enhancing medical curricula and student guidance.

## METHOD

### Research design

This study employed a longitudinal observational study design to explore the changes in medical students' specialty preferences and the factors influencing these shifts during the 2023–2024 academic year at VinUniversity. The study aimed to capture trends over time and infer potential implications of career guidance interventions. Surveys were administered at two time points

1. Baseline survey (August 2023): conducted at the beginning of the academic year prior to the implementation of career counselling activities.
2. Follow-up survey (June 2024): conducted at the end of the academic year after the career initiatives had been completed.

The survey instrument included three sections:

1. Demographics and academic information: captured participants' age, gender, cohort (academic year), Grade Point Average (GPA), high school type, hometown and family income.
2. Specialty preferences, career pathways and practice location:
  - Specialty preferences: students selected their primary, secondary and tertiary specialty choices, with an option to input unique preferences.
  - Career pathways: students identified their intended career pathways (eg, clinical practice, research, teaching, administration or entrepreneurship) and postgraduation plans (eg, residency, specialisation and direct employment).
  - Practice location: students indicated their preference for practising domestically, overseas or undecided.
3. Influential factors: measured the impact of various factors (eg, personal interest, income, job availability,

working schedule, research/teaching opportunities and family expectations) on career decisions using a 5-point Likert scale.

### Study participants

This study employed a total population sampling technique. Since our medical institution, VinUniversity, was established in 2020, only three cohorts of undergraduate medical students were eligible for participation. All students from these cohorts were invited to take part in the survey, ensuring comprehensive representation of eligible participants. Specifically, the study included:

- ▶ Cohort 1: year 4 students (class of 2020–2026).
- ▶ Cohort 2: year 3 students (class of 2021–2027).
- ▶ Cohort 3: year 2 students (class of 2022–2028).

Out of 144 eligible students, 105 completed both surveys, yielding a response rate of 73%. By including students from multiple academic years, the study aimed to enhance the reliability of the findings and capture diverse perspectives across different stages of medical education.

### Interventions

The newly introduced initiatives, detailed above, included academic mentoring, clinical mentoring, hands-on exposure for fourth year students and events such as Career Day and TED-style talks.

### Data collection

Data collection was conducted in August 2023 and June 2024 using a specially designed questionnaire developed specifically for this study (see online supplemental appendix 1—Career Choice Questionnaire). The questionnaire was administered via an electronic survey on Microsoft Forms, and the link was disseminated electronically by research assistants to all three cohorts of students. To maximise participation, reminders were sent via email, and the survey ensured anonymity and confidentiality for participants.

### Survey instrument and validation

The survey instrument was designed to align with the local context and culture, drawing extensively from similar studies in the literature.<sup>2–4</sup> Its development and validation involved several key steps. A comprehensive literature review ensured the inclusion of all relevant factors influencing career decisions. An expert panel, comprising medical educators, career counsellors and clinical mentors, reviewed the questionnaire for relevance, comprehensiveness and cultural appropriateness. Cognitive pretesting was conducted by administering the self-designed questionnaire to 10 randomly selected university students, whose feedback was used to refine ambiguous items and enhance clarity. To establish reliability, Cronbach's alpha was calculated for Likert scale items at both survey time points, with a threshold of 0.7 set for acceptable internal consistency.

## Primary and secondary outcomes

Primary outcome: change in first-choice specialty from baseline to follow-up. Secondary outcomes:

- ▶ Shifts in rated importance of decision-making factors (personal interest, expected income, research/teaching opportunities, etc).
- ▶ Changes in intended practice location (domestic, international and undecided).
- ▶ Variations in immediate postgraduation plans (residency, Specialist Level 1 training, master's degree and direct employment).

## Statistical analysis

Data were analysed in R Statistical Software (V.4.4.0). Descriptive statistics (means, SDs and percentages) summarises key variables. Paired t-tests or Wilcoxon signed-rank tests evaluated pre-post changes in continuous variables (eg, factor importance), whereas categorical data (eg, specialty choice) were compared using  $\chi^2$  or Fisher's exact tests. The bootstrap method (1000 iterations) generated CIs for the retention of specialty

preferences. Repeated-measures ANOVA and mixed-effects models explored longitudinal patterns, with  $p < 0.05$  considered significant.

## RESULT

### Participant characteristics

Table 1 highlights significant differences in the demographic and academic characteristics of three cohorts of medical students. Cumulative GPA distribution varied significantly across cohorts ( $p = 0.002$ ), with cohort 3 having a higher proportion of students in the lowest GPA category ( $< 3.20$ ) compared with the other cohorts. No significant differences were found in gender, hometown, high school type or family income among the cohorts.

### Factors influencing career decisions

Table 2 highlights notable shifts in factors influencing career choices between 2023 and 2024. Personal interest in the specialty remained the most influential factor,

**Table 1** Demographic and academic characteristics of three cohorts of medical students

Variable	Cohort 1, n=29*	Cohort 2, n=36*	Cohort 3, n=40*	Overall, n=105*	P value†
Age	22.62 ( $\pm$ 1.29)	21.50 ( $\pm$ 1.28)	20.83 ( $\pm$ 2.90)	21.55 ( $\pm$ 2.16)	<0.001
Gender					0.8
Female	16 (55%)	17 (47%)	19 (48%)	52 (50%)	
Male	13 (45%)	19 (53%)	21 (53%)	53 (50%)	
Home town					0.6
Rural city	5 (17%)	3 (8.3%)	5 (13%)	13 (12%)	
Urban city	24 (83%)	32 (89%)	35 (88%)	91 (87%)	
Undisclosed	0 (0%)	1 (2.8%)	0 (0%)	1 (1.0%)	
High school					0.3
High school for the gifted	19 (66%)	18 (50%)	20 (50%)	57 (54%)	
Private/international high school	6 (21%)	14 (39%)	10 (25%)	30 (29%)	
Public high school	4 (14%)	4 (11%)	10 (25%)	18 (17%)	
Cumulative GPA					<b>0.002</b>
<3.20	9 (31%)	7 (19%)	24 (60%)	40 (38%)	
3.20 to 3.59	15 (52%)	17 (47%)	6 (15%)	38 (36%)	
3.60 to 4.00	2 (6.9%)	8 (22%)	6 (15%)	16 (15%)	
Undisclosed	3 (10%)	4 (11%)	4 (10%)	11 (10%)	
Family annual income (in USD)					0.3
<4800	3 (10%)	1 (2.8%)	0 (0%)	4 (3.8%)	
4800–9600	2 (6.9%)	4 (11%)	4 (10%)	10 (9.5%)	
9600–14 400	4 (14%)	7 (19%)	2 (5.0%)	13 (12%)	
14 400–24 000	4 (14%)	3 (8.3%)	10 (25%)	17 (16%)	
>24 000	11 (38%)	15 (42%)	18 (45%)	44 (42%)	
Undisclosed	5 (17%)	6 (17%)	6 (15%)	17 (16%)	

\*Mean ( $\pm$  SD); n (%).

†Kruskal-Wallis rank sum test; Pearson's  $\chi^2$  test; Fisher's exact test.



**Table 2** Changes in factors influencing career choices between 2023 and 2024

Characteristic	2023 (mean±SD)	2024 (mean±SD)	P value
Personal interest in the specialty	4.27 (±1.01)	4.36 (±1.15)	0.13
Income	3.82 (±1.01)	3.22 (±1.31)	<0.001
Working schedule	3.73 (±1.03)	3.54 (±1.26)	0.5
Job availability	3.57 (±1.07)	3.52 (±1.26)	>0.9
Research or teaching opportunities	3.45 (±1.05)	2.74 (±1.37)	<0.001
Family members or relatives	2.88 (±1.30)	2.74 (±1.43)	0.5

maintaining consistently high scores across both years. In contrast, family members or relatives had a minimal impact, with low and stable scores throughout. Significant declines were observed in the importance of income and research/teaching opportunities, with income dropping from 3.82 (±1.01) to 3.22 (±1.31) and research/teaching opportunities falling from 3.45 (±1.05) to 2.74 (±1.37) (both  $p<0.001$ ). These changes suggest a shift in student priorities, with less emphasis on financial and academic factors and a potential focus on clinical practice.

### Intended practice location

**Table 3** and **figure 1** highlight significant changes in students' intended working locations between 2023 and 2024. In both 2023 and 2024, significant differences were observed among cohorts in the proportion of students intending to work domestically ( $p=0.019$  and  $p=0.011$ , respectively). In 2024, there was also a notable increase in the proportion of students considering both domestic and overseas work, rising to 24%, 42% and 35% in cohorts 1, 2 and 3, respectively. Simultaneously, the proportion intending to work solely overseas decreased in most cohorts, while those who were undecided declined substantially in cohort 1 (from 41% to 0%). These shifts suggest a growing interest in flexible working locations and a decline in uncertainty about future work plans.

**Figure 2** showed that over 1 year, surgery remained the most stable specialty choice, with no change in the number of students selecting it (34.3%). Internal medicine saw the largest increase, doubling from 12.4% to 24.8%, while obstetrics and gynaecology also grew moderately from 4.8% to 9.5%. Radiology showed notable growth, increasing from 1% to 4.8%. Conversely, paediatrics and psychiatry experienced slight declines, while dermatology dropped significantly from 6.7% to 1.9%. The number of undecided students decreased dramatically from 17.1% to 1.9%, indicating more defined career preferences. Forensic medicine, pathology and rehabilitation medicine showed little change, maintaining low interest levels.

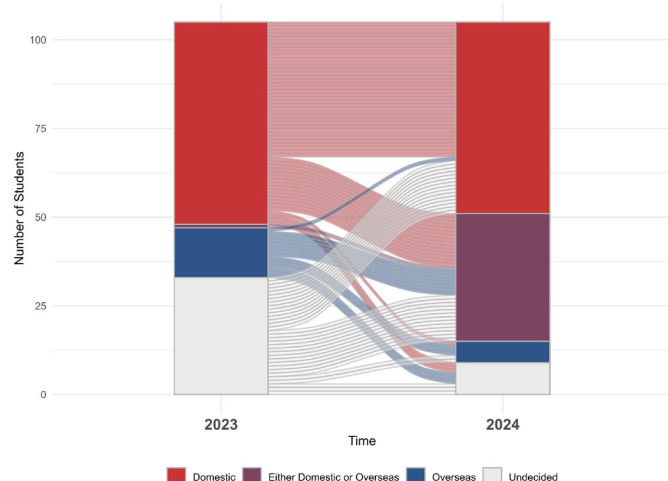
**Table 4**, bootstrap analysis, reveals that surgery is the most stable specialty, with 66.7% of students retaining their choice after 1 year, supported by a relatively narrow CI (47.8%–85.6%) and a larger sample size, enhancing the reliability of this finding. Internal medicine, paediatrics and psychiatry demonstrate moderate stability, with retention rates of 61.5%, 63.6% and 62.5%, respectively, but wider CIs reflect greater variability due to smaller sample sizes. Obstetrics and gynaecology shows a 60% retention rate but high variability, indicating limited precision. Dermatology had the lowest stability, with only 28.6% retention, further highlighting the challenges of

**Table 3** Changes in intended practice location among medical students by cohort and survey year

Survey year	Working location	Cohort 1 (n=29*)	Cohort 2 (n=36*)	Cohort 3 (n=40*)	P value†
2023	Domestic	16 (55%)	24 (67%)	17 (43%)	0.019
	Overseas	1 (3.4%)	2 (5.6%)	11 (28%)	0.007
	Either domestic or overseas	0 (0%)	0 (0%)	1 (2.5%)	0.99
	Undecided	12 (41%)	10 (28%)	11 (28%)	0.71
2024	Domestic	21 (72%)	17 (47%)	16 (40%)	0.011
	Overseas	1 (3.4%)	0 (0%)	5 (13%)	0.120
	Either domestic or overseas	7 (24%)	15 (42%)	14 (35%)	0.183
	Undecided	0 (0%)	4 (11%)	5 (13%)	0.152

\*n (%).

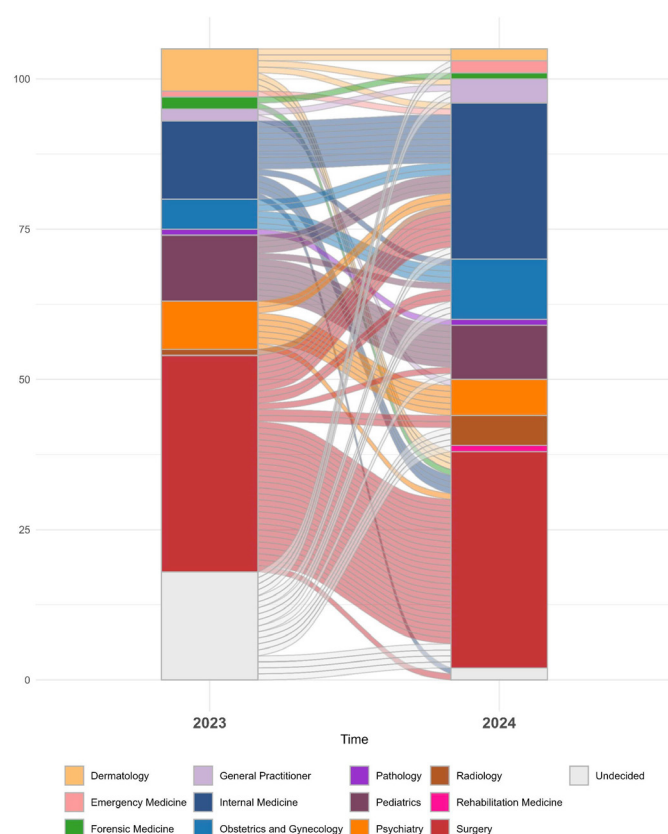
†P values represent the statistical significance of the differences in intended working location between the three cohorts (cohort 1, cohort 2 and cohort 3) at each specific survey year (2023 and 2024) for each working location option (domestic, overseas, either domestic or overseas and undecided) using Fisher's exact test.



**Figure 1** Changes in intended working location of medical students.

interpreting results from smaller and heterogeneous groups (table 4).

Figure 3 illustrates a shift in medical students' career choices within the field of surgery, moving from a general preference for 'Surgery' in 2023 to more specific surgical subspecialties in 2024, such as orthopaedic surgery, paediatric surgery and oncologic surgery.



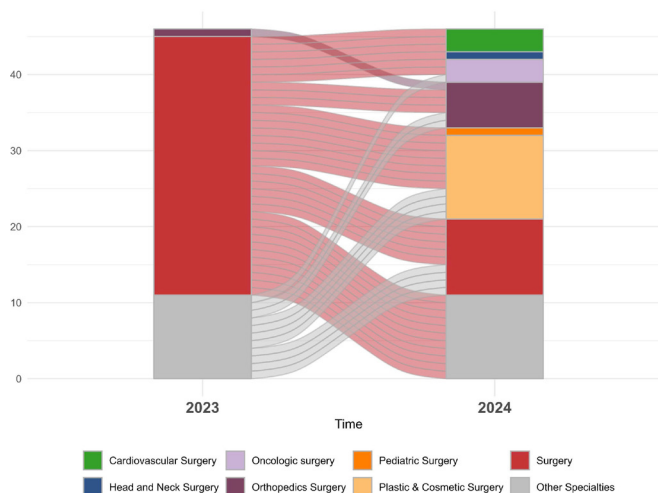
**Figure 2** Changes in medical students' specialty choices.

**Table 4** Stability comparison among choice of specialty

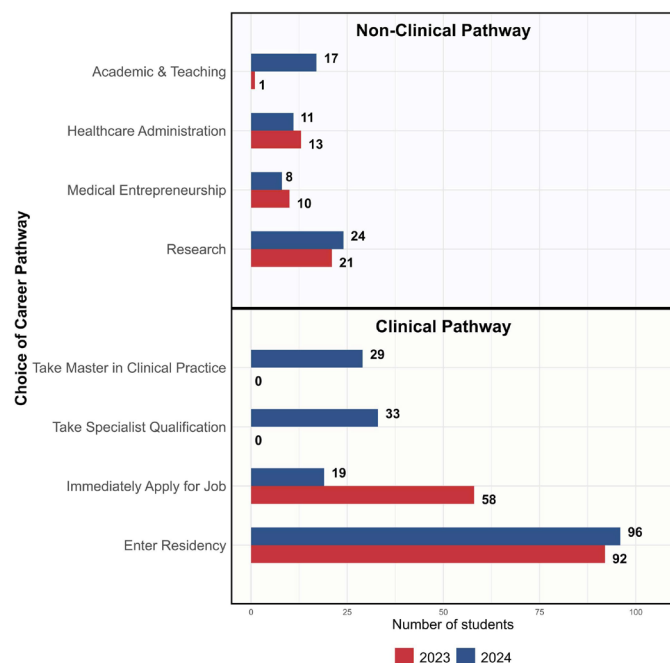
Choice of specialty in 2023	Changes in 2024	Count	Per cent (bootstrapped 95% CI)
Surgery	Different	12	33.3% (6.6 to 60)
	Same	24	66.7% (47.8 to 85.6)
Internal Medicine	Different	5	38.5% (0 to 81.2)
	Same	8	61.5% (27.8 to 95.2)
Paediatrics	Different	4	36.4% (0 to 83.6)
	Same	7	63.6% (28 to 99.2)
Psychiatry	Different	3	37.5% (0 to 92.3)
	Same	5	62.5% (20.1 to 100)
Obstetrics and gynaecology	Different	2	40% (0 to 100)
	Same	3	60% (4.6 to 100)
Dermatology	Different	5	71.4% (31.8 to 100)
	Same	2	28.6% (0 to 91.2)
Forensic medicine	Different	1	50% (0 to 100)
	Same	1	50% (0 to 100)
General practitioner	Different	1	50% (0 to 100)
	Same	1	50% (0 to 100)
Pathology	Different	0	0% (NA to NA)
	Same	1	100% (100 to 100)
Emergency medicine	Different	1	100% (100 to 100)
	Same	0	0% (NA to NA)
Radiology	Different	1	100% (100 to 100)
	Same	0	0% (NA to NA)
Undecided	Different	18	100% (100 to 100)
	Same	0	0% (NA to NA)

### Career pathways postgraduation

Figure 4 highlights significant changes in postgraduation career pathway choices, divided into non-clinical and clinical pathways.



**Figure 3** Transition from general surgery to specialised surgical fields postcareer initiatives.



**Figure 4** Changes in career pathway choices postgraduation.

In the non-clinical pathway, the number of students choosing academic and teaching roles increased dramatically, rising from just one student in 2023 to 17 in 2024, reflecting a growing interest in educational careers. Meanwhile, healthcare administration saw a minor increase, medical entrepreneurship remained stable and research experienced a slight decline, all representing relatively insignificant changes.

In the clinical pathway, a striking shift towards advanced training emerged. The proportion of students opting for a master's degree in clinical practice rose from 0% to 29% and specialist qualifications from 0% to 33%, while those planning immediate workforce entry dropped from 58 to 19. Residency remained the most common path but increased only slightly (from 92 to 96). These trends underscore an increased focus on advanced training and specialisation among medical students, suggesting a movement toward long-term career development over immediate employment.

## DISCUSSION

This longitudinal observational study documents significant shifts in students' specialty preferences, practice intentions and career pathways after 1 year of structured career initiatives. Although the design cannot prove direct causation, the timing of the interventions and the noticeable changes in preference patterns suggest potential synergy between the programmes and evolving student interests. Specifically, the decline in students who were undecided and the move towards advanced training routes indicate a stronger orientation towards well-planned, specialised careers.

Prior studies underscore the role of mentorship in shaping career commitments.<sup>5 7</sup> In our setting, academic mentoring in the early years and clinical mentoring in the later years likely served different but complementary purposes, analogous to a developmental approach observed in Western institutions.<sup>19 20</sup> The notable decrease in the importance of income aligns with research suggesting that as students gain clinical exposure, intrinsic motivations, including professional fulfilment, begin to override purely financial considerations.<sup>21 22</sup>

The surge in interest in internal medicine resonates with findings from other Asian medical schools that have reported increased appeal for broad, foundational specialties when backed by strong institutional support and mentorship.<sup>23 24</sup> Meanwhile, the stability of surgical interest parallels patterns observed globally, where structured surgical clerkships and departmental mentorship help maintain students' commitment to operative fields.<sup>25</sup> In contrast, limited exposure or fewer role models may have contributed to lower retention in specialties like dermatology, echoing observations in similar resource-limited contexts.<sup>26</sup>

Our results also mirror global studies that emphasise the importance of well-designed career fairs and role-model-driven talks. Students repeatedly report that firsthand insights into day-to-day practice, lifestyle implications and professional trajectories help clarify career pathways.<sup>27</sup> The decline in undecided students, from 17.1% to 1.9%, suggests these interactions were effective in providing concrete information and dispelling misconceptions about specific fields.

## The role of career initiatives in shaping pathways

The shift away from immediate workforce entry in favour of master's degrees or specialist training underscores how well-structured career counselling can elevate awareness of diverse postgraduate routes. Such developments could bolster the research capacity of the institution and support an academic healthcare model.<sup>28 29</sup> In practice, these additional qualifications may be particularly advantageous in low and middle income countries where advanced training can bridge knowledge gaps, enhance clinical skills and potentially redress workforce imbalances.<sup>30</sup>

Fourth year students' increased exposure to multiple specialties through immersive rotation models may have particularly influenced their readiness to commit to advanced programmes. The direct observation of varied clinical scenarios, coupled with interactive mentorship, likely helped them envision long-term career sustainability in their chosen fields.<sup>17</sup>

## Implications for policy and practice

Our findings hold relevance for educational policy makers, curriculum committees and administrators in LMICs' settings. The clear association between structured career guidance and reduced indecision suggests that investment in academic and clinical mentoring, supplemented

by interactive career events, can play an essential role in aligning student interests with local and global healthcare needs. Fostering collaborations with experienced specialists, both domestically and internationally, may broaden students' understanding of emerging fields that could help meet future demands.<sup>29</sup>

Moreover, the significant uptick in advanced training choices suggests that medical institutions could benefit from formal partnerships with hospitals and universities capable of offering robust postgraduate programmes. Ensuring these opportunities are well-publicised and integrated into the curriculum earlier may smooth students' transition from undergraduate to postgraduate education.<sup>9</sup>

One important consideration arising from this study is the limited student interest in general practice or primary care, despite its critical role in ensuring health system equity and sustainability. While many countries face workforce maldistribution, with shortages in both rural areas and primary care specialties, the situation in Vietnam is nuanced. The national physician density remains low, 14 doctors per 10 000 population, below the global average of 17, indicating an across-the-board shortage of doctors in most specialties, not solely in general practice.<sup>31 32</sup>

Furthermore, despite strategic efforts by the Ministry of Health to implement family medicine models between 2016 and 2020, progress has been slow. As of late 2021, only 340 family doctor clinics had been established nationwide, and the model has encountered systemic barriers to scale-up.<sup>33</sup> These include the lack of a legal and financial framework to support family physicians, absence of insurance reimbursement mechanisms for family medicine services, shortages of trained personnel and lack of a standardised certification process.<sup>34</sup> Additionally, care coordination between family doctors and hospitals remains fragmented. Compounding these structural issues are cultural norms, where patients often bypass primary care to seek direct access to tertiary care, a practice facilitated by policies allowing referral-free treatment.<sup>33</sup>

Parliamentary and policy discourse in recent years has explicitly acknowledged these challenges, with health system leaders calling for renewed efforts to define, regulate and incentivise family medicine practice. Yet despite its importance, family medicine has not been fully embedded into undergraduate education or postgraduate training pathways, limiting its visibility and perceived viability among medical students.

Given these structural limitations, our career counselling initiatives prioritised specialties with stronger institutional infrastructure and available mentorship, such as internal medicine, surgery, paediatrics, obstetrics and gynaecology, psychiatry, emergency medicine and public health. While the absence of general practice as a prominent student choice may be concerning from a public health perspective, it also reflects the current realities of medical education and workforce planning in Vietnam. Addressing this disconnect will likely require systemic reforms, including financial incentives, certification

schemes, curricular integration and insurance reimbursement policies. A dedicated study exploring the alignment (or misalignment) between student preferences and primary care workforce needs would be a valuable next step.

### Strengths and limitations

A key strength of this study is its longitudinal design, capturing how students' preferences evolved over an academic year rather than relying on a single time point. Including multiple cohorts (years 2, 3 and 4) adds nuance to the interpretation, illustrating how different stages of medical education respond to career interventions.

However, several limitations should be acknowledged. First, this study was conducted at a single institution located in a rapidly modernising part of Vietnam, which may limit the broader generalisability of our findings to other settings. Second, the absence of a control group restricts our ability to definitively attribute observed shifts in specialty preferences and career decisions directly to the structured career initiatives. Future studies employing controlled or comparative designs would be valuable to confirm and strengthen these associations. Third, the follow-up period was limited to one academic year, which may not capture longer-term trends or the sustainability of observed changes. Longer follow-up periods, extending into residency matching and early professional stages, would provide deeper insight into the stability of these career preferences. Lastly, the reliance on self-reported data introduces the potential for social desirability bias or inaccuracies in students' responses. Incorporating qualitative methods or triangulating data sources in future research could help mitigate these limitations.

### Future directions

To explore the mechanisms behind these observed shifts, a qualitative follow-up study is planned. Through focus groups or in-depth interviews, researchers aim to capture the lived experiences of students, clarify which aspects of mentoring or exposure proved most influential and identify any persistent barriers. Additionally, measuring actual residency match outcomes and career satisfaction rates in subsequent years could provide stronger evidence of how well students' choices endure and translate into professional fulfilment and healthcare workforce distribution.

### CONCLUSION

This longitudinal observational study identified significant alterations in medical students' specialty preferences, practice intentions and postgraduation pathways after one academic year of newly implemented career counselling initiatives. The notable decline in undecided students and shift towards advanced training routes suggest that structured mentorship, hands-on clinical exposure and interactive career events may foster more confident, values-driven career decisions. Although causality cannot be conclusively established without a



control group or longer-term follow-up, the alignment between these interventions and observed changes points to the potential benefits of comprehensive career guidance in medical education. Broader integration of such programmes, especially in LMIC contexts, could help cultivate a well-distributed, motivated and future-ready healthcare workforce.

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## REFERENCES

- Goel S, Angeli F, Dhirar N, *et al*. What motivates medical students to select medical studies: a systematic literature review. *BMC Med Educ* 2018;18:16.
- Pfarrwaller E, Voirol L, Karemera M, *et al*. Dynamics of career intentions in a medical student cohort: a four-year longitudinal study. *BMC Med Educ* 2023;23:131.
- Scott I, Gowans M, Wright B, *et al*. Stability of medical student career interest: a prospective study. *Acad Med* 2012;87:1260–7.
- Yang Y, Li J, Wu X, *et al*. Factors influencing subspecialty choice among medical students: a systematic review and meta-analysis. *BMJ Open* 2019;9:e022097.
- Arshad S, McCombe G, Carberry C, *et al*. What factors influence medical students to enter a career in general practice? A scoping review. *Ir J Med Sci* 2021;190:657–65.
- Pianosi K, Bethune C, Hurley KF. Medical student career choice: a qualitative study of fourth-year medical students at Memorial University, Newfoundland. *CMAJ Open* 2016;4:E147–52.
- Sarikhani Y, Ghahramani S, Bayati M, *et al*. A thematic network for factors affecting the choice of specialty education by medical students: a scoping study in low-and middle-income countries. *BMC Med Educ* 2021;21:99.
- Syakurah RA, Rosyila R. Medical student career choice's determinants in Asia: a systematic review. *IJPHS* 2020;9:57.
- Ha MT, Dao HC, Nguyen THH, *et al*. Examining dimensions of career intentions: insights from medical and nursing students at a private not-for profit university in Vietnam. *BMC Med Educ* 2024;24:1303.
- Fan AP, Tran DT, Kosik RO, *et al*. Medical education in Vietnam. *Med Teach* 2012;34:103–7.
- Duong DB, Phan T, Trung NQ, *et al*. Innovations in medical education in Vietnam. *BMJ Innov* 2021;7:s23–9.
- Minh NN. Preferred career choice of medical students at a medical university in Vietnam. *Ann Clin Anal Med* 2021;12:5–9.
- Ha TM, Hoang D, Huynh CD, *et al*. Integrated Educational Technology in Teaching Anatomy Using the ASIC Framework: A Case Study from VinUniversity. *Adv Med Educ Pract* 2023;14:669–81.
- Zayabalaradjane Z, Abhishekh B, Ponnusamy M, *et al*. Factors influencing medical students in choosing medicine as a career. *Online J Health Allied Scs* 2018;17:5.
- El Naggar MA, Mohamed RA, Almaeen AH. The effect of career guidance on undergraduate medical students' specialty preferences. *J Pak Med Assoc* 2021;71:1808–13.
- Thakur A, Fedorka P, Ko C, *et al*. Impact of mentor guidance in surgical career selection. *J Pediatr Surg* 2001;36:1802–4.
- Kiolbassa K, Miksch A, Hermann K, *et al*. Becoming a general practitioner—which factors have most impact on career choice of medical students? *BMC Fam Pract* 2011;12:25.
- Duong DB, Nguyen TA, Goodell K, *et al*. Undergraduate Medical Education Reform in Viet Nam for a Primary Health Care Workforce. *Ann Glob Health* 2022;88:100.
- Hauer KE, Durning SJ, Kernan WN, *et al*. Factors associated with medical students' career choices regarding internal medicine. *JAMA* 2008;300:1154–64.
- Campwala I, Aranda-Michel E, Watson GA, *et al*. Impact of a Surgical Subspecialty Roundtable on Career Perception for Preclerkship Medical Students. *J Surg Res* 2021;259:493–9.
- Obadeji A, Olo T, ntoye ntoye, *et al*. Career in medicine: what factors influence medical students? *J Contemp Med Edu* 2014;2:218.
- Mehmood SI, Kumar A, Al-Binali A, *et al*. Specialty preferences: trends and perceptions among Saudi undergraduate medical students. *Med Teach* 2012;34 Suppl 1:S51–60.
- Salawati E, Ghamri R, Amir A, *et al*. The magnitude of influence of personal and professional factors on the career choices of medical students. *J Med Life* 2024;17:449–56.
- Guraya SY, Almarahmy HH. Mapping the factors that influence the career specialty preferences by the undergraduate medical students. *Saudi J Biol Sci* 2018;25:1096–101.
- Reed CE, Vaporciyan AA, Erikson C, *et al*. Factors dominating choice of surgical specialty. *J Am Coll Surg* 2010;210:319–24.
- Vo A, McLean L, McInnes MDF. Medical specialty preferences in early medical school training in Canada. *Int J Med Educ* 2017;8:400–7.
- McCord JH, McDonald R, Sippel RS, *et al*. Surgical career choices: the vital impact of mentoring. *J Surg Res* 2009;155:136–41.
- Chen HC, Wamsley MA, Azzam A, *et al*. The Health Professions Education Pathway: Preparing Students, Residents, and Fellows to Become Future Educators. *Teach Learn Med* 2017;29:216–27.
- Teherani A, Uwaezuoke K, Kenny J, *et al*. Aspiring physicians program: description and characterization of the support processes for an undergraduate pathway program to medicine. *Med Educ Online* 2023;28:2178368.
- Kraemer RR, Wakelee JF, Hites L, *et al*. Moving Career Development Upstream: Evaluation of a Course for Internal Medicine Trainees Contemplating Career Pathways in Academic Medicine. *South Med J* 2018;111:471–5.
- World Health Organization. Density of physicians (per 10 000 population). Datadot. 2024. Available: <https://data.who.int/indicators/i/CCCEBB2/217795A>

- 32 Le TTH, Nhan LC, Tran HB, *et al.* Healthcare human resource shortfall in Vietnam compared to select countries in Asean. *Arch Sci* 2024;74:258–64.
- 33 Hoa NT, Derese A, Peersman W, *et al.* Primary care quality in Vietnam: Perceptions and opinions of primary care physicians in commune health centers - a mixed-methods study. *PLoS One* 2020;15:e0241311.
- 34 Hoang T, Viet T. Mô Hình Bác Sĩ Gia Đình Chứa Thành Công vì Thiếu Cơ Chế. *VnExpress* 2022. Available: <https://vnexpress.net/mo-hinh-bac-si-gia-dinh-chua-thanh-cong-vi-thieu-co-che-4475593.html>