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Specialty choice and educational experiences among medical students in Lithuania: a cross-sectional study

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Abstract

Background Understanding medical students' perspectives is important for improving medical education and student well-being. This cross-sectional study examined medical education from the student perspective by describing motivations, concerns, perceived study difficulty, and satisfaction across Lithuania's medical schools.

Methods n anonymous online survey was distributed via university email to medical students in all study years (1–6) at Vilnius University and the Lithuanian University of Health Sciences, available in Lithuanian and English. The self-developed questionnaire covered demographics, motivations, and concerns related to studying medicine (rated on 5-point scales), single-item measures of perceived study difficulty and satisfaction (10-point scales), family medical background, and age at the decision to pursue medicine. Group differences were examined with independent-samples t-tests (Cohen's d) and associations among motivations, concerns, and the two outcomes were assessed with Pearson correlations.

Results A total of 864 students completed the survey (response rate ~ 9%; mean age 21.97 ± 2.73 years; 78.3% female). Most students (60.1%) reported being happy and satisfied with studying medicine; mean perceived difficulty was 7.32 ± 1.64 and mean satisfaction was 6.09 ± 2.21. Female students reported somewhat higher perceived difficulty than male students, while satisfaction did not differ by gender. Satisfaction was lower among students in years 4–6 than in years 1–3, and international students reported lower perceived difficulty and higher satisfaction than Lithuanian students. The desire to help others had the highest motivation score and showed a modest positive correlation with satisfaction, while concern about grades had the highest concern score and the strongest positive correlation with perceived difficulty; most other associations were weak.

Conclusions Intrinsic and prosocial motivations, especially the desire to help others, were associated with higher satisfaction with medical studies, whereas concerns about academic performance were associated with greater perceived study difficulty. Differences by study year and between domestic and international students suggest that medical education and support strategies should be tailored to diverse student groups and training stages. These exploratory, cross-sectional findings based on a self-developed questionnaire highlight areas for future research using validated measures and more advanced analytical designs.

Keywords Medical students · Career motivation · Medical education · Study satisfaction · Academic challenges

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Introduction

Medicine is a complex, multifaceted profession centered on helping others, and the path to becoming a physician — marked by long, demanding, and continually evolving training — carries a considerable risk of burnout [1]. This risk does not end at graduation: career regret among medical students [2], diminished well-being and intention to leave among academic physicians [3], and job dissatisfaction and turnover intention among practicing doctors [4] indicate that difficulties emerging during training may extend into professional life and ultimately contribute to physician attrition. Because health systems depend on retaining a motivated medical workforce, and because medical education varies widely in how it is delivered [5] and must continually adapt to society's needs, understanding how students experience their training is important both pedagogically and from a workforce perspective. Burnout and attrition, however, are distal outcomes that typically become visible only after considerable harm has accumulated. Educationally, the more actionable question is: which experiences during training signal, at an early, still modifiable stage, whether a student is moving toward engagement or toward dissatisfaction.

Perceived study difficulty and satisfaction with studies are two such early indicators. During the years of intensive medical studies, students face a rigorous academic workload, constant exposure to disease and death, and a limited sense of control [6], and they are more prone than students in other fields to depression, anxiety, and burnout [7]. About half of medical students lose interest in their studies and come to regret their choice, with academic difficulties among the main reasons [8]. Perceived study difficulty can therefore be understood as an indicator of academic strain: it has been linked with lower academic performance [9], lower self-efficacy and reduced situational interest [10], and stronger intentions to discontinue studies [11]. Study satisfaction, in contrast, reflects a positive educational experience, including a supportive learning environment and a sense of belonging [12], and is generally regarded as a marker of engagement and persistence. Together, the two indicators capture the balance between strain and engagement that, over time, plausibly feeds into the burnout and attrition outcomes described above — and, unlike those outcomes, they can be assessed and addressed while students are still in training.

What shapes whether students tilt toward strain or engagement? A substantial body of literature examines the motives that lead students to enter medicine and the concerns that accompany their studies. To organize these influences, the present study draws on Self-Determination Theory (SDT) [13, 14] as an interpretive framework. We state at the outset that our questionnaire was not designed as a standardized SDT instrument and does not directly measure the theory's core constructs; rather, SDT informed the selection of variables and the interpretation of their associations with the two educational outcomes. According to SDT, motivation and well-being are supported when three basic psychological needs are met: autonomy — the sense that one's actions flow from one's own values rather than external demands [15]; competence — the capacity to set and attain goals based on one's preferences and strengths [16]; and relatedness — feeling cared for and connected to others [17]. SDT further distinguishes intrinsic motivation, a drive from within [18] linked to well-being [19] and flourishing when the core needs are met [20], from extrinsic motivation driven by external rewards or pressures, and it holds that externally originating motives can become progressively internalized. In education specifically, the strength and quality of motivation have been linked to academic performance [21], need-supportive teaching has reduced stress and promoted motivation in clinical courses [22], and SDT-based strategies have been proposed to sustain motivation among health professionals [23].

Viewed through this lens, the motives and concerns assessed in the present study can be tentatively located within the SDT framework. Among the motives, the desire to help others may reflect a more autonomous, prosocial, and intrinsically anchored form of motivation, whereas expectations of a good salary and of honor and societal prestige are consistent with more extrinsic motives; family influence, peer influence, and exposure to a positive physician role model may operate through relatedness, although they may also function as external pressure. Among the study-related concerns, worries about grades, involvement in scientific research, and communication with patients may function as competence-related pressures; concern about finding friends may reflect challenges to relatedness; and financial, health, and safety concerns represent broader contextual pressures. These

mappings are interpretive rather than psychometric, but they generate directional expectations that can be examined with the present data: more autonomous and prosocial motives should be associated primarily with higher satisfaction, whereas concerns that threaten the need for competence — above all, concern about grades — should be associated primarily with higher perceived study difficulty. Examining motives, concerns, difficulty, and satisfaction within a single sample is what allows this pattern of differential associations to be evaluated; studies of any one construct in isolation cannot.

The quality of motivation that students bring to medical school does not arise at the moment of application; it develops over the years within the family and educational environment. For this reason, three background characteristics were included as potential developmental antecedents of motivational internalization, rather than as isolated demographic data. First, a family medical background may socialize students into medicine early, shaping the content of their motives, normalizing the profession's demands, and amplifying the role of family influence in the decision. Second, the age at which students decided to pursue medicine is treated as a proxy for how internalized the career choice is: in SDT terms, an early and sustained decision may reflect a choice that has become fully integrated into the student's identity and is experienced as autonomous, whereas a later or externally prompted decision may indicate motivation that is less fully internalized; relatedly, career maturity has been linked to academic achievement and the quality of educational decision-making [24]. Third, following Adlerian theory, birth order may influence personality development and career-related orientations through the distinct family niche each child occupies [25]; firstborns are often described as more achievement-oriented, which may both color their motives for choosing medicine and heighten their sensitivity to competence-related pressures such as concern about grades. What unites these three antecedents educationally is their visibility: unlike motivational quality itself, family background, birth order, and the timing of the career decision can be known at admission or within the first weeks of study. If they are associated with motives, concerns, or the two educational outcomes, they offer practically usable markers for identifying students who may benefit from targeted advising, mentoring, or support before academic strain develops. Given the measurement of these variables in the present study, their analysis is explicitly exploratory.

The contribution of the study therefore rests not on the mere co-occurrence of these variables but on what their joint examination makes possible, and on the setting in which it occurs. Previous studies have examined separate elements of this pathway, such as medical students' motivation [26], study satisfaction [27], or study-related difficulties [28], but to our knowledge none has evaluated the differential pattern of associations described above together with its developmental antecedents. Lithuania offers an unusually suitable setting for doing so: with exactly two medical schools training all of the country's future physicians, and with both schools, all six study years, and both domestic and international students represented in the sample, the study describes an entire national medical-training system rather than a single institution or convenience sample. This national scope also permits comparisons — by student type, study stage, and university — that are directly relevant to educational policy within the country and informative for other small European systems that train substantial international cohorts.

The descriptive objective of this study was to document motivations for choosing medicine, study-related concerns, perceived study difficulty, and satisfaction with studies among medical students across Lithuania's entire medical-training system, covering both medical schools, all six study years, and both domestic and international students.

The primary analytical objective was to test whether motivations and concerns show a differential pattern of association with the two educational outcomes — whether more autonomous and prosocial motives, such as the desire to help others, relate primarily to higher satisfaction, while competence-related concerns, such as concern about grades, relate primarily to higher perceived study difficulty.

The secondary analytical objectives were to compare perceived study difficulty and satisfaction across predefined student groups — by gender, university, study stage (years 1–3 vs. 4–6), student type (Lithuanian vs. international), family medical background, birth order (firstborn vs. non-firstborn), and age at the decision to

pursue medicine (≤16 vs. >16 years) — and to compare motivation and concern profiles by gender, student type, and family medical background.

To investigate the study objective more systematically, we formulated several hypotheses:

H1. More autonomous and prosocial motives for choosing medicine (the desire to help others and exposure to a positive physician role model) are primarily associated with higher satisfaction with studies rather than with perceived study difficulty.

H2. Competence-related concerns (such as concern about grades, followed by involvement in scientific research and communication with patients) are primarily associated with higher perceived study difficulty rather than satisfaction.

H3. Satisfaction with medical studies differs by gender, university, study stage (years 1–3 vs. 4–6), student type (Lithuanian vs. international), family medical background, birth order, and age at the decision to pursue medicine.

H4. Perceived difficulty of medical studies differs by gender, university, study stage (years 1–3 vs. 4–6), student type (Lithuanian vs. international), family medical background, birth order, and age at the decision to pursue medicine.

Finally, the scope of the design should be stated plainly. The study is cross-sectional and uses a self-developed exploratory questionnaire; the conceptual model organizes variable selection and interpretation, but is not a causal model under test. The SDT-informed expectations are directional rather than confirmatory hypotheses, and burnout and attrition serve as the rationale for studying the proximal indicators rather than as measured endpoints. Within these boundaries, the findings are educationally consequential for two reasons: the motivational and need-related mechanisms highlighted by SDT point to modifiable features of curricula, assessment, and learning environments, while the background characteristics may help identify groups of students — by study stage, student type, or developmental profile — who could benefit from targeted support before strain progresses toward burnout or attrition.

Materials and methods

Study design and setting

A cross-sectional online survey was conducted between 2021 and 2023 among medical students at both universities in Lithuania that provide medical education for future physicians: Vilnius University (VU) and the Lithuanian University of Health Sciences (LUHC). The study surveyed both Lithuanian-speaking students and international students—non-Lithuanian nationals who came from other countries to study medicine and are enrolled in Lithuania's medical schools.

Participants and recruitment

All students within these programs, including both Lithuanian-speaking domestic students (LUHC: 245–250; VU: 175–180 per course year) and English-speaking international students (LUHC: 157–160; VU: 100–105 per course year), received invitations to participate via their university email addresses between 2021 and 2023. Exact enrollment figures could not be obtained, as student numbers per course often decrease during the academic year due to withdrawals, transfers, or other factors. Across six course years at both universities and language groups, the total estimated sampling frame ranged from 9,264 to 9,840 students (midpoint: 9,552). The anonymous online survey yielded 864 complete responses (VU: 459 (53.1%); LUHC: 405 (46.9%)), corresponding to an overall response rate of approximately 8.8–9.3% (midpoint: 9.0%). This low response rate is typical for voluntary email-based student surveys, particularly on sensitive topics such as academic stress [29].

Questionnaire

The questionnaire included demographic questions (gender, age, university, and birth order) and questions about motives to choose medicine, satisfaction, difficulties with studies, and concerns. The authors developed the questionnaire used in this study based on their academic expertise. In particular, the instrument was suggested and designed by Professor Sigita Lesinskienė (VU) and Professor Virginija Adomaitienė (LSMU). The questions were selected for investigation based on their extensive experience in medical higher education, teaching, and research, to explore how students choose medical studies, what factors influence their choice, including family roles, and how they feel and function during medical studies. Questionnaires were developed in Lithuanian and English to accommodate language preferences. The questionnaire has been translated from Lithuanian into English language using a forward–back translation procedure to ensure conceptual equivalence between the language versions. The designed questionnaire was pre-tested with a small convenience sample of 3 Lithuanian- and 3 English-speaking volunteering students to check clarity, wording, and technical functionality; no changes or corrections were deemed necessary at that stage.

Measures

Motivations

Factors related to motivation for studying medicine were assessed using a 5-point Likert-type scale. Participants were asked to rate the extent to which various influences contributed to their decision to pursue medical studies, including family influence, peer influence, exposure to positive physician role models, expectations of a good salary, the perceived honor and societal prestige of the profession, and a desire to help others. In this context, "motivation" refers to the perceived impact of these factors on participants' choice to study medicine (1 = no impact, 5 = strong impact).

Concerns

Survey items assessing students' concerns regarding their studies were measured using a 5-point Likert-type scale. Participants were asked to rate their level of concern across several domains, including academic performance (grades), financial situation, social integration (finding friends), involvement in student scientific research, communication with patients, and personal health and safety. In this context, "concern" refers to students' subjective appraisal of difficulties or worries related to these aspects of their academic and personal experience (1 = no concern, 5 = high level of concern).

Difficulty and satisfaction

The perceived difficulty of medical studies was assessed with a single 10-point item asking students to rate how demanding their studies were overall (1 = very easy, 10 = very difficult). In this context, "difficulty" refers to students' subjective appraisal of the academic workload and the overall challenge posed by medical training. Study satisfaction was measured with a single 10-point item capturing students' overall satisfaction with their medical studies (1 = very low satisfaction, 10 = very high satisfaction), reflecting their general evaluation of the educational experience.

Other study variables

Other variables included gender, age, university, study year, student type (Lithuanian or international), and birth order. For analysis clarity, study years were grouped into two categories: years 1–3 and years 4–6. Birth order was coded as firstborn versus any later birth position and was analyzed as a dichotomous variable (firstborn vs.

non-firstborn). Students were also asked whether there were doctors in their family (yes or no), when they decided to become a doctor (3–6 years; 7–11 years; 12–15 years; 16–18 years; ≥19), whether they had already decided on a specialty (yes, no, or still thinking), and whether they were happy and satisfied with studying medicine (yes, no, or moderate). For **clarity in analysis**, the timing of the decision to become a doctor was further grouped into two categories: ≤16 years and > 16 years. The full questionnaire is included in Supplementary Material 1.

Statistical analysis

All statistical analyses were conducted using IBM SPSS Statistics version 29.0 (IBM Corp., Armonk, NY, USA). Continuous variables were summarized as means and standard deviations, and categorical variables as frequencies and percentages. For continuous outcomes, the normality of the distributions was evaluated using sample skewness and kurtosis rather than formal goodness-of-fit tests. Given the large sample size ($n = 864$), approximate normality was assumed when the absolute value of skewness was below 2 and the absolute value of kurtosis (proper) was below 7 for a given variable. In addition, skewness values between −1 and +1 were interpreted as indicating an essentially symmetric distribution, whereas values between −2 and +2 were considered acceptable but potentially mildly asymmetric. Because goodness-of-fit tests such as the Kolmogorov–Smirnov test are highly sensitive to large sample sizes and may flag trivial deviations from normality, these tests were not used to determine distributional assumptions. Means, standard deviations, skewness, and kurtosis of the study variables are shown in Supplementary Material 2.

Group differences in continuous variables were examined with independent-samples t-tests, and associations between continuous variables were assessed using Pearson correlation coefficients with 95% confidence intervals. To evaluate the practical and educational relevance of the findings, we interpreted Cohen's d and Pearson's r alongside p-values, using conventional benchmarks (approximately 0.20, 0.50, and 0.80 for small, medium, and large d, and approximately 0.10, 0.30, and 0.50 for small, medium, and large r). In line with these guidelines, we placed greater emphasis on findings with at least small-to-medium effect sizes when discussing educational implications, and treated statistically significant results with very small effect sizes or weak correlations as exploratory signals of limited practical impact. Two-sided p-values < 0.05 were considered statistically significant.

Ethical considerations

All study procedures complied with the ethical standards outlined in the Declaration of Helsinki and its later amendments. Participation in the survey was voluntary and based on informed consent, and no identifying personal information was collected. The obtained data were used solely for scientific purposes. The study protocol was approved by the Lithuanian Bioethics Committee on 26 October 2020 (approval numbers L-20-8/1 and L-20-8/2).

Results

Main characteristics of the sample

A total of 864 medical students participated (mean age 21.97±2.73 years), 78.3% female ($n = 673$). 53.1% ($n = 459$) studied at Vilnius University, and 35.3% were first-year students ($n = 305$), 79.5% were Lithuanian ($n = 687$). 60.1% ($n = 519$) were satisfied with their studies, 35.3% ($n = 305$) had chosen a future specialty, and 60.1% ($n = 519$) decided to pursue medicine after age 16. 40.6% ($n = 351$) had a doctor in the family, and 60.2% ($n = 520$) were firstborn. The main characteristics of the sample are presented in Table 1.

Table 1 Main characteristics of the sample

Background variable	M	SD
Age	21.97	2.73
	N	%
Gender		
Female	673	78.3
Male	186	21.7
University		
VU	459	53.1
LUHS	405	46.9
Courses		
1	305	35.3
2	126	14.6
3	119	13.8
4	104	12.0
5	91	10.5
6	119	13.8
Type of students		
Lithuanians	687	79.5
International students	177	20.5
Are You happy and satisfied that You are studying medicine?		
No	39	4.5
Moderate	306	35.4
Yes	519	60.1
Have you already decided what specialty you would like to choose in Medicine?		
No	249	28.8
Still thinking	310	35.9
Yes	305	35.3
How old were you when you decided to study medicine and become a doctor?		
3–15	345	39.9
>16	519	60.1
Are there doctors in Your family?		
No	513	59.4
Yes	351	40.6
Birth order		
Firstborn	520	60.2
Non-firstborn	344	39.8

Difficulty and satisfaction with medical studies were rated on 10-point scales (1 = very low, 10 = very high)

M mean, *SD* Standard deviation, *VU* Vilnius University, *LUHS* Lithuanian University of Health Sciences

Medical students' satisfaction and difficulties with their medical studies

Mean perceived difficulty was 7.32 ± 1.64 and satisfaction 6.09 ± 2.21. Female students reported higher perceived study difficulty than male students (7.42 vs. 7.01); the effect size was small (d = 0.25), indicating only modest practical differences at the group level; satisfaction did not differ between genders. Vilnius University students reported slightly higher difficulty than those at the Lithuanian University of Health Sciences (7.44 vs. 7.20), with a very small effect size (d = 0.15), indicating modest group-level differences; satisfaction did not differ between universities. Students in years 1–3 reported similar difficulty to those in years 4–6 (7.35 vs. 7.27, d = 0.05), while satisfaction was higher among years 1–3 (6.65 vs. 5.11), with a medium effect (d = 0.74), indicating a substantial difference at the group level. International students reported lower difficulty (6.55 vs. 7.52) than Lithuanian students, with a medium effect size (d = 0.61), and higher satisfaction (6.67 vs. 5.94), with a small effect size (d = 0.34), indicating substantial and modest differences at the group level. Birth order was not associated with differences in perceived study difficulty, while satisfaction was slightly higher among firstborn students than non-firstborn students (6.22 vs. 5.89), with a very small effect size (d = 0.15), indicating modest group-level differences. Having doctors in the family was not associated with differences in perceived difficulty (7.25 vs. 7.37)

or satisfaction (6.11 vs. 6.08). Detailed comparisons of perceived difficulty and satisfaction by gender, university, student type, family connections to the medical profession, and age when a student decided to study medicine are presented in Table 2.

Motivational factors for choosing medical studies and their associations with study difficulty and satisfaction

Desire to help others had the highest mean score among motivational factors (4.22 ± 1.03), followed by reputable social position (3.33 ± 1.20), role model as doctor (2.81 ± 1.43), family (2.75 ± 1.37), good salary (2.47 ± 1.31), and friends (1.79 ± 1.08). Male students reported a stronger influence of family (3.05 vs. 2.67), friends (2.00 vs. 1.73), and good salary (2.74 vs. 2.40) than female students, with small effect sizes (d = 0.25–0.28), while female students reported a slightly stronger desire to do good things for people (4.26 vs. 4.08, d = 0.18), indicating only modest practical differences at the group level. International students rated family, friends, a beautiful example of a doctor, a good salary, and a desire to do good things for people higher than Lithuanian students, with very small to small effect sizes (d = 0.19–0.30), indicating modest group-level differences. Students with doctors in the family reported a stronger influence of family (3.12 vs. 2.50), with a small effect size (d = 0.46), as well as friends and a beautiful example of a doctor, with very small and small effect sizes (d = 0.15 and d = 0.20, respectively). Detailed comparisons of motivational factors for choosing medical studies by gender, student type, and family connections to the medical profession are presented in Table 3.

In Table 4, data are presented on the correlations between motivational factors for choosing to study medicine and both perceived difficulty and satisfaction with medical studies. Perceived difficulty of medical studies showed weak positive correlations with family as a motivating factor ($r = 0.08$) and good salary ($r = 0.07$), and a weak negative correlation with having a doctor as a role model ($r = -0.10$), indicating that these motivations are only very modestly related to how difficult students perceive their studies to be, and that they explain only a small proportion of variance in perceived difficulty. Other motivational factors were not significantly associated with perceived difficulty. Satisfaction with medical studies was weakly associated with the desire to help others ($r = 0.19$), having a doctor as a role model ($r = 0.17$), a reputable social position ($r = 0.12$), and good salary ($r = 0.08$), indicating that students endorsing these motives tend to be somewhat more satisfied, although the magnitude of these associations remains small. Family and friends as motives were not associated with satisfaction.

Concerns faced during medical studies and their associations with study difficulty and satisfaction

Concern about good grades had the highest mean score (3.97 ± 1.06), followed by finances (3.42 ± 1.41), scientific research (3.41 ± 1.35), communication with patients (2.97 ± 1.33), health and safety (2.73 ± 1.36), and finding friends (2.29 ± 1.26). Female students reported greater concern about good grades (4.05 vs. 3.69), students' scientific research (3.51 vs. 3.06), and communication with patients (3.05 vs. 2.73) than male students, with small effect sizes (d = 0.22–0.35), indicating only modest practical differences at the group level. Lithuanian students reported greater concern about good grades (4.05 vs. 3.66, d = 0.38) and scientific research (3.53 vs. 2.92, d = 0.46) than international students, with small effect sizes, while international students reported greater concern about finances (3.61 vs. 3.37, d = 0.36), finding friends (2.53 vs. 2.22, d = 0.24), and communication with patients (3.16 vs. 2.92, d = 0.18), with very small to small effects, indicating modest group-level differences. Students without doctors in the family reported slightly greater concern about finances (3.51 vs. 3.28), scientific research (3.48 vs. 3.29), and communication with patients (3.06 vs. 2.85), with very small effect sizes (d = 0.14–0.16); concern about health and safety did not differ across any of the compared groups. Detailed comparisons of concerns during medical studies by gender, student type, and family connections to the medical profession are presented in Table 5.

In Table 6, data are presented on the correlations between concerns faced during medical studies and both perceived difficulty and satisfaction with medical studies. Perceived difficulty of medical studies showed a weak

Table 2 Differences in perceived difficulty and satisfaction with medical studies by gender, university, course year, student type, family medical background, and age at decision to study medicine

Background characteristic	*n*	M (SD)	Mean difference (95% CI)	*p*	d
Difficulty*					
Gender					
Female	673	7.42 (1.57)	0.41 (0.14–0.67)	0.005	0.25
Male	186	7.01 (1.77)			
University					
VU	459	7.44 (1.69)	0.24 (0.02 − 0.46)	0.031	0.15
LUHC	405	7.20 (1.57)			
Courses					
1–3	550	7.35 (1.63)	0.08 (-0.14 − 0.31)	0.227	0.05
4–6	314	7.27 (1.66)			
Student type					
Lithuanian students	687	7.52 (1.53)	0.97 (0.70 − 1.23)	< 0.001	0.61
International students	177	6.55 (1.82)			
Doctors in family					
No	513	7.37 (1.67)	0.12 (-0.11 − 0.34)	0.301	0.07
Yes	351	7.25 (1.60)			
Age at decision to study medicine					
3–15	345	7.12 (1.69)	-0.34 (-0.57 − -0.12)	0.002	0.21
> 16	519	7.46 (1.59)			
Birth order					
Firstborn	520	7.30 (1.67)	-0.06 (-0.29 − 0.16)	0.56	0.04
Non-firstborn	344	7.36 (1.60)			
Satisfaction*					
Gender					
Female	673	6.08 (2.31)	-0.10 (-0.25 − 0.46)	0.282	0.05
Male	186	6.18 (2.17)			
University					
VU	459	6.05 (2.20)	-0.09 (-0.39 − 0.20)	0.270	0.04
LUHC	405	6.14 (2.21)			
Courses					
1–3	550	6.65 (2.09)	1.54 (1.25 − 1.83)	< 0.001	0.74
4–6	314	5.11 (2.08)			
Student type					
Lithuanian students	687	5.94 (2.17)	-0.73 (-1.10 – -0.37)	< 0.001	0.34
International students	177	6.67 (2.27)			
Doctors in family					
No	513	6.08 (2.15)	-0.03 (-0.33 − 0.27)	0.833	0.02
Yes	351	6.11 (2.29)			
Age at decision to study medicine					
3–15	345	6.32 (2.25)	0.38 (0.09 − 0.68)	0.006	0.18
> 16	519	5.93 (2.17)			
Birth order					
Firstborn	520	6.22 (2.17)	0.33 (0.03 − 0.63)	0.033	0.15
Non-firstborn	344	5.89 (2.26)			

Mean difference represents the difference in mean scores between the first and second category listed for each background characteristic (reference group = second category)

M mean, *SD* Standard deviation

*Difficulty and satisfaction with medical studies were rated on 10-point scales (1 = very low, 10 = very high)

positive correlation with concern about good grades ($r = 0.34$), similarly weak positive associations were observed for concerns about student scientific research ($r = 0.20$), finding friends ($r = 0.17$), communication with patients ($r = 0.16$), health and safety ($r = 0.12$), and finances ($r = 0.10$), suggesting that each of these concerns contributes only modestly to how difficult students experience their studies.

Regarding satisfaction with medical studies, most concerns showed weak or non-significant associations. Concerns about finances were weakly negatively associated with satisfaction ($r = -0.11$), and concerns about communication with patients showed a weak positive association ($r = 0.09$), indicating that students who worry more

Table 3 Motivational factors for choosing medical studies by gender, student type and family medical background

Background characteristic	*n*	M (SD)	Mean difference (95% CI)	*p*	d
Family member(s)*					
Gender					
Female	673	2.67 (1.39)	-0.38 (-0.0.59 – -0.15)	<0.001	0.28
Male	186	3.05 (1.36)			
Type of students					
Lithuanian students	687	2.70 (1.34)	-0.25 (-0.48 – -0.03)	0.028	0.19
International students	177	2.95 (1.48)			
Doctors in family					
No	513	2.50 (1.32)	-0.62 (-0.78 – -0.43)	<0.001	0.46
Yes	351	3.12 (1.38)			
Friend(s)*					
Gender					
Female	673	1.73 (1.03)	-0.27 (-0.44 – -0.09)	0.003	0.25
Male	186	2.00 (1.19)			
Type of students					
Lithuanian students	687	1.75 (1.02)	-0.22 (-0.40 – -0.05)	0.013	0.21
International students	177	1.97 (1.25)			
Doctors in family					
No	513	1.73 (1.04)	-0.16 (-0.30 – -0.01)	0.034	0.15
Yes	351	1.89 (1.13)			
A beautiful example of a doctor*					
Gender					
Female	673	2.81 (1.44)	0.00 (-0.23–0.24)	0.984	0.01
Male	186	2.81 (1.38)			
Type of students					
Lithuanian students	687	2.74 (1.43)	-0.34 (-0.58 – -0.10)	0.004	0.24
International students	177	3.08 (1.43)			
Doctors in family					
No	513	2.69 (1.42)	-0.29 (-0.48 – -0.11)	0.004	0.20
Yes	351	2.98 (1.43)			
Good salary					
Gender					
Female	673	2.40 (1.28)	-0.34 (-0.55 – -0.12)	0.002	0.26
Male	186	2.74 (1.37)			
Type of students					
Lithuanian students	687	2.39 (1.29)	-0.40 (-0.61 – -0.18)	<0.001	0.30
International students	177	2.79 (1.35)			
Doctors in family					
No	513	2.45 (1.28)	-0.06 (-0.24–0.12)	0.534	0.04
Yes	351	2.51 (1.36)			
Honoured and reputable position in society*					
Gender					
Female	673	3.32 (1.25)	-0.05 (-0.25–0.17)	0.694	0.03
Male	186	3.37 (1.37)			
Type of students					
Lithuanian students	687	3.35 (1.25)	0.09 (-0.12–0.30)	0.423	0.07
International students	177	3.26 (1.36)			
Doctors in family					
No	513	3.34 (1.25)	0.03 (-0.14–0.21)	0.690	0.03
Yes	351	3.31 (1.32)			
Desire to do good things for people*					
Gender					
Female	673	4.26 (1.01)	0.18 (0.02–0.36)	0.028	0.18
Male	186	4.08 (1.08)			

Table 3 (continued)

Background characteristic	*n*	M (SD)	Mean difference (95% CI)	*p*	d
Type of students*					
Lithuanian students	687	4.17 (1.07)	-0.24 (-0.41 – -0.07)	0.006	0.23
International students	177	4.41 (0.85)			
Doctors in family*					
No	513	4.18 (1.04)	-0.10 (-0.24–0.05)	0.187	0.09
Yes	351	4.28 (1.03)			

Mean difference represents the difference in mean scores between the first and second category listed for each background characteristic (reference group = second category)

M mean, *SD* Standard deviation

*Motivations were assessed using a 5-point Likert scale (1 = no impact, 5 = strong impact)

Table 4 Correlations between motivational factors for choosing medicine and perceived difficulty and satisfaction with medical studies

Variable	Pearson *r* (95% CI)	*p*
Difficulty		
Family member(s)	0.08 (0.02–0.15)	0.014
Friend(s)	-0.01 (-0.07–0.06)	0.941
A beautiful example of a doctor	-0.10 (-0.18 – -0.04)	0.007
Good salary	0.07 (0.01–0.13)	0.047
Honored and reputable position in society	-0.04 (-0.10–0.24)	0.208
Desire to do good things for people	0.05 (-0.01–0.12)	0.103
Satisfaction		
Family member(s)	-0.01 (-0.07–0.07)	0.974
Friend(s)	-0.01 (-0.07–0.06)	0.944
A beautiful example of a doctor	0.17 (0.10–0.24)	< 0.001
Good salary	0.08 (0.01–0.14)	0.020
Honored and reputable position in society	0.12 (0.05–0.18)	< 0.001
Desire to do good things for people	0.19 (0.12–0.25)	< 0.001

CI Confidence interval, *pp* - value

Pearson's correlation coefficients represent the correlation between each motivational factor and perceived difficulty or satisfaction with medical studies

about finances tend to be slightly less satisfied, whereas those who are more concerned about patient communication tend to be slightly more satisfied; however, the magnitude of these associations is small, and other concerns were not significantly related to satisfaction, underscoring the limited practical impact of individual concerns on students' satisfaction.

Discussion

This cross-sectional study described medical students' motivations for choosing medicine, study-related concerns, perceived study difficulty, and satisfaction with studies across Lithuania's entire medical-training system, and examined whether motivations and concerns showed the hypothesized differential pattern of associations with the two educational outcomes (H1–H2) and whether difficulty and satisfaction differed across predefined student groups (H3–H4). Three results stand out. First, the differential pattern predicted by H1 and H2 was directionally supported: more autonomous and prosocial motives correlated with satisfaction but not with difficulty, whereas competence-related concerns — above all, concern about grades — correlated with difficulty but not with satisfaction; however, all of these correlations were small in absolute terms. Second, satisfaction was substantially lower in study years 4–6 than in years 1–3 (d = 0.74), the only difference of medium size. Third, international students reported lower perceived difficulty (d = 0.61) and modestly higher satisfaction (d = 0.34) than Lithuanian students. All remaining group differences were small or negligible. Because the study is cross-sectional, uses a self-developed instrument, and rests on a large number of unadjusted univariable comparisons,

Table 5 Concerns during medical studies by gender, student type and family medical background

Background characteristic	*n*	M (SD)	Mean difference (95% CI)	*p*	d
Good grades*					
Gender					
Female	673	4.05 (1.02)	0.36 (0.19–0.53)	<0.001	0.35
Male	186	3.69 (1.13)			
Type of students					
Lithuanian students	687	4.05 (1.03)	0.39 (0.22–0.57)	<0.001	0.38
International students	177	3.66 (1.08)			
Doctors in family					
No	513	3.99 (1.07)	0.05 (-0.09–0.19)	0.496	0.05
Yes	351	3.94 (1.03)			
Finances*					
Gender					
Female	673	3.45 (1.42)	0.11 (-0.12–0.34)	0.360	0.07
Male	186	3.34 (1.36)			
Type of students					
Lithuanian students	687	3.37 (1.44)	-0.24 (-0.47 – -0.01)	0.045	0.36
International students	177	3.61 (1.27)			
Doctors in family					
No	513	3.51 (1.42)	0.23 (0.036–0.42)	0.020	0.16
Yes	351	3.28 (1.39)			
Finding friends*					
Gender					
Female	673	2.31 (1.30)	0.10 (-0.10–0.31)	0.330	0.08
Male	186	2.21 (1.10)			
Type of students					
Lithuanian students	687	2.22 (1.26)	-0.31 (-0.51 – -0.10)	0.004	0.24
International students	177	2.53 (1.22)			
Doctors in family					
No	513	2.22 (1.25)	-0.16 (-0.34–0.01)	0.061	0.10
Yes	351	2.38 (1.27)			
Students scientific research*					
Gender					
Female	673	3.51 (1.35)	0.45 (0.24–0.67)	<0.001	0.34
Male	186	3.06 (1.25)			
Type of students					
Lithuanian students	687	3.53 (1.33)	0.61 (0.39–0.84)	<0.001	0.46
International students	177	2.92 (1.28)			
Doctors in family					
No	513	3.48 (1.37)	0.19 (0.01–0.38)	0.039	0.14
Yes	351	3.29 (1.30)			
Communication with patients*					
Gender					
Female	673	3.05 (1.33)	0.32 (0.11–0.54)	0.003	0.22
Male	186	2.73 (1.33)			
Type of students					
Lithuanian students	687	2.92 (1.34)	-0.24 (-0.46 – -0.02)	0.032	0.18
International students	177	3.16 (1.30)			
Doctors in family					
No	513	3.06 (1.33)	0.21 (0.03–0.39)	0.025	0.16
Yes	351	2.85 (1.33)			
My health and safety*					
Gender					
Female	673	2.76 (1.37)	0.15 (-0.07–0.38)	0.167	0.11
Male	186	2.61 (1.33)			

Table 5 (continued)

Background characteristic	*n*	M (SD)	Mean difference (95% CI)	*p*	d
Type of students*					
Lithuanian students	687	2.71 (1.36)	-0.09 (-0.32–0.13)	0.418	0.07
International students	177	2.80 (1.39)			
Doctors in family*					
No	513	2.80 (1.38)	0.18 (-0.01–0.37)	0.057	0.13
Yes	351	2.62 (1.33)			

Mean difference represents the difference in mean scores between the first and second category listed for each background characteristic (reference group = second category)

M mean, *SD* Standard deviation

*Concerns were assessed using a 5-point Likert scale (1 = no concerns, 5 = high level of concern)

Table 6 Correlations between concerns during medical studies and perceived difficulty and satisfaction with medical studies

Variable	Pearson *r* (95% CI)	*p*
Difficulty*		
Good grades	0.34 (0.28 − 0.39)	< 0.001
Finances	0.10 (0.03–0.16)	0.005
Finding friends	0.17 (0.10–0.23)	< 0.001
Students scientific research	0.20 (0.13–0.26)	< 0.001
Communication with patients	0.16 (0.07–0.19)	< 0.001
My health and safety	0.12 (0.05–0.19)	< 0.001
Satisfaction*		
Good grades	0.07 (0.01–0.14)	0.053
Finances	-0.11 (-0.17 – -0.04)	0.001
Finding friends	0.02 (-0.05–0.08)	0.645
Students scientific research	-0.04 (-0.10–0.03)	0.288
Communication with patients	0.09 (0.02–0.15)	0.012
My health and safety	-0.05 (-0.11–0.02)	0.188

Pearson's correlation coefficients represent the correlation between each concern factor and perceived difficulty or satisfaction with medical studies

CI Confidence interval, *p*-value

all interpretations offered below are associational; where possible mechanisms are proposed, they are explicitly labeled as tentative, and alternative explanations are considered alongside them.

Motivations, satisfaction, and perceived difficulty

Overall, most associations between motivational factors and students' perceived study difficulty and satisfaction were weak, indicating that no single motivational factor, taken alone, accounted for more than a small fraction of the variance in either outcome. This is consistent with the view that students' educational experiences are shaped by many interacting influences, but it also means that the motivational findings of this study should be read as weak signals rather than established educational relationships.

Regarding satisfaction with medical studies, the strongest positive association was observed for the desire to do good for people, followed by a beautiful example of a doctor and an honored, reputable position in society; none of these motives showed a positive association with perceived difficulty. This pattern is directionally consistent with H1 and with the SDT-informed expectation that more autonomous and prosocial motives relate primarily to the positive educational outcome [30]. As stated in the Introduction, our questionnaire measured the perceived impact of various influences on the original decision to study medicine, not the current quality of students' motivation as defined by SDT; the findings are therefore consistent with the theory but do not constitute a test of it. A weaker positive association was also observed for good salary, suggesting that financial motivations can coexist with positive educational experiences; however, this association is negligible in practical terms and may reflect chance, given the number of correlations examined. Neither family nor peer influence

was associated with satisfaction. These cross-sectional associations cannot show that fostering prosocial motivation would increase satisfaction; the direction of influence may equally run from satisfaction to the retrospective endorsement of prosocial motives, or both may reflect unmeasured third variables such as dispositional optimism. At most, the findings justify a hypothesis for future intervention research — namely, that learning environments offering opportunities for meaningful engagement in patient care are worth evaluating as potential contributors to satisfaction — rather than an implication that follows from the present data.

Family influence and salary motivation showed weak positive correlations with perceived difficulty, and a physician role model showed a weak negative correlation. These coefficients warrant no substantive educational interpretation: they are very weak, and with motivation–outcome correlations tested without adjustment for multiplicity, associations of this size are compatible with chance. Despite that, positive relationships with a clinician/educator may help students feel better during medical studies. A previous study showed that supportive relationships between students and educators are important for students' psychological well-being and academic adjustment [31]. Future research could further explore the relationship between clinicians/educators and medical students, particularly the impact of a good role model on students' perceived study burden and overall well-being during medical training.

Concerns, satisfaction, and perceived study difficulty

All concerns demonstrated weak positive correlations with study difficulty. The strongest association was observed for concerns about good grades. This correcaltion provides the clearest support for the differential pattern predicted by H2: the competence-related concern was linked specifically to the strain indicator, not to the engagement indicator. From the perspective of Self-Determination Theory, concern about grades may reflect pressure related to competence; we emphasize that this mapping is interpretive, as discussed in the Introduction, and that the cross-sectional design leaves the direction of the association open — students who worry about grades may perceive their studies as more difficult, students who find their studies difficult may come to worry more about grades, or both may reflect a common underlying factor such as anxiety, which we did not measure.

The broader literature offers relevant context. Previous research has shown that anxiety related to test performance is highly prevalent among medical students and is associated with depression, poor workload management, inadequate study preparation, mood instability, lower academic self-esteem, and poorer academic performance [32]. Qualitative work has also described strategies teachers can use to support students' sense of competence, such as re-explaining unclear content, creating opportunities for questions, setting appropriate challenge levels, and giving informative feedback [33], and some studies suggest that test anxiety may decrease when assessments are conducted in lower-stakes formats [34]. Whether such approaches would reduce perceived study difficulty in this population cannot be inferred from a cross-sectional correlation; this literature motivates intervention studies rather than our data licensing recommendations about assessment reform.

Satisfaction with medical studies showed limited associations with most concerns. Financial concerns were weakly and negatively associated with lower satisfaction. Given the size of this association and the study design, we describe it as an association only; the direction of influence cannot be established, and financial concerns may covary with other unmeasured factors. Previous research has indicated that higher levels of financial burden are associated with poorer mental well-being and less favorable academic outcomes and may also drive medical students towards higher-paying specialties [35], underscoring the need to revisit this small association with better measures of financial strain. Concerns regarding communication with patients showed a weak positive association with satisfaction. This result was unexpected, but the association is very small and, given the number of correlations tested without adjustment for multiplicity, may be a chance finding; we therefore refrain from proposing a substantive explanation.

Group differences in difficulty and satisfaction

Gender

Female students perceived medical studies as more difficult than male students (small effect) and reported greater concerns regarding good grades, scientific research, and communication with patients (small effect). Similar findings have been reported in previous studies showing that female medical students often experience higher levels of academic stress [36]. However, it should be taken into account that women are generally considered to be more neurotic than men [37]. At the same time, female students reported higher scores for altruistic motivation to study medicine, particularly the desire to help others, whereas male students more frequently emphasized external influences such as salary, family members, and friends, although all of these gender differences were small. Despite differences in perceived difficulty and concerns, satisfaction with studies did not differ significantly between genders, arguing against interpreting the difficulty difference as part of a more negative study experience among female students.

University

Students at Vilnius University reported marginally greater perceived difficulty than students at the Lithuanian University of Health Sciences, and satisfaction did not differ. A difference of this size is negligible in practice and may reflect chance or compositional differences between the two student bodies (for example, in the proportion of international students or in year-group composition) rather than differences in the programs themselves; our design does not permit further interpretation of institutional comparisons.

Study stage

The clearest group difference in the study concerned study stage. Although perceived study difficulty remained similar between junior and senior students, satisfaction was markedly lower among students in years 4–6 than in 1–3 years. Similar trends have been observed in longitudinal studies demonstrating decreases in life satisfaction and increases in psychological distress during medical education [38]. Because our comparison is cross-sectional, it does not demonstrate within-person decline. Selective attrition should also be considered — if dissatisfied students disproportionately leave before the senior years, the surviving senior cohort would be positively selected, in which case the true stage-related difference could be even larger than observed, although we cannot verify this. If the difference does reflect a genuine stage effect, several mechanisms are plausible. In SDT terms, the transition to clinical training may challenge autonomy, competence, or relatedness, and meta-analytic evidence suggests that competence may be a particularly strong antecedent of motivation [39]. We hypothesize — and explicitly label this a hypothesis rather than a finding — that in Lithuania, senior students' direct patient care and greater responsibilities may expose gaps between demands and perceived competence, which may weigh on satisfaction. Several educational approaches aimed at strengthening students' competencies have been described in the literature, ranging from early clinical exposure [40] to medical boot camps [41], Competency-Based Medical Education [42], and student-run free clinics [43]. The present findings do not establish that any of these approaches would raise senior students' satisfaction; they identify the senior years as the point in training where the need for such evaluation appears greatest. It is important for future research to investigate which specific difficulties senior medical students experience and which educational or psychological support strategies may best address their needs, ideally with longitudinal designs that can separate stage effects from cohort effects.

Domestic and international students

International students reported lower perceived study difficulty (medium effect) and higher satisfaction (small effect) compared with Lithuanian students. They also more frequently endorsed motivations related to helping others, positive physician role models, salary, family influence, and peer influence, with small effects. At the same time, international students expressed greater concerns about finances, communication with patients, and making friends, whereas Lithuanian students reported greater concerns about achieving good grades and conducting scientific research.

Student type is a marker for a bundle of demographic, socioeconomic, cultural, linguistic, academic, and procedural differences, and the observed contrasts should not be read as effects of being an international student per se. Several classes of alternative explanation deserve explicit consideration; the present data cannot adjudicate among them. First, international students who are dissatisfied may be more likely to discontinue or transfer than domestic students, so the international students who remained enrolled and responded may be a positively selected group [44]. Second, socioeconomic factors: the same funding structure that presupposes financial resources is also consistent with international students' greater financial concerns, and socioeconomic background may shape both expectations of the program and the experience [45]. Third, cultural factors: students may rate difficulty and satisfaction against different frames of reference — for instance, relative to admission systems, workloads, and grading norms in their home countries — and cross-cultural differences in response styles on Likert-type scales can shift group means independently of the underlying experience [46]. Fourth, academic and curricular factors: the English-language tracks are organized separately, and teaching arrangements, group sizes, and assessment climates may differ; moreover, the stakes attached to academic performance likely differ, since Lithuanian students' grades feed into competition for residency positions within the national system, which offers a plausible — though untested — account of their higher concern about grades and scientific research, while international students' concern profile (finances, finding friends, communication with patients) is consistent with the demands of adapting to a new country and, in clinical settings, communicating with Lithuanian-speaking patients. Fifth, demographic and sampling factors: the groups may differ in age, gender composition, and prior education, none of which our univariable analyses adjusted for, and group-specific response rates are unknown, so differential non-response cannot be excluded.

Family medical background, timing of career choice, and birth order

Students with doctors in their families reported higher scores for family influence and physician role models as motivations for choosing medicine. They were also slightly less concerned about finances, scientific research, and communication with patients. Nevertheless, family medical background was not associated with either perceived study difficulty or satisfaction. This suggests that professional familiarity alone may not translate into a more favorable experience of the academic and psychological demands of medical training, although the absence of a difference in these two single-item outcomes does not rule out more specific advantages or disadvantages that our measures did not capture.

Students who decided to pursue medicine at an earlier age reported slightly lower perceived study difficulty and greater satisfaction with medical studies, with small effects. From the perspective of Self-Determination Theory (SDT), an earlier and more sustained interest in studying medicine may reflect more autonomous and internalized motivation, which has been linked to greater persistence and well-being in academic contexts [18]. This interpretation, however, is one among several. The age at decision was reported retrospectively, and students who are currently satisfied may recall their commitment to medicine as having formed earlier than it did; the association may therefore partly or wholly reflect recall bias, and the cross-sectional design cannot exclude it. Given the small effect sizes, this variable is best regarded as a candidate marker worth examining prospectively rather than an established antecedent.

Birth order was included as an exploratory developmental antecedent on the basis of Adlerian theory [25], which describes firstborns as more achievement-oriented, an orientation that could, in principle, both motivate a choice of medicine and heighten sensitivity to competence-related pressures, such as concern about grades. The data provided little support for a meaningful role of birth order in the outcomes examined. Perceived difficulty did not differ between firstborn and non-firstborn students. Firstborn students reported slightly higher satisfaction, a difference that reached statistical significance but is very small, was not accompanied by any corresponding difference in difficulty or in the achievement-related concerns that the Adlerian account would most naturally predict, and — given the number of unadjusted comparisons in this study — may represent a chance finding. Two measurement considerations reinforce this caution: the dichotomous firstborn versus non-firstborn coding ignores family size, spacing, and only-child status, which Adlerian accounts treat as relevant to the family niche a child occupies [25], and birth order is itself associated with family-level characteristics that were not measured. If future studies pursue this question, finer-grained birth-order coding and adjustment for family characteristics would be needed.

Statistical versus practical significance

Although many associations were statistically significant, most effect sizes were small, indicating that the practical impact of individual motivational or concern factors on perceived study difficulty and satisfaction is modest at the individual level. This pattern suggests that medical students' experiences are shaped by multiple interacting influences, and that any future interventions should not focus on single factors in isolation but rather on broader educational and support environments — a suggestion that itself requires testing, since the present design cannot show that modifying any of these factors would change students' experiences.

Limitations

This study nevertheless has several limitations. First, the response rate was relatively low (approximately 9%), which increases the risk of non-response and self-selection bias and may limit the generalizability of the findings to all medical students in Lithuania. Students who chose to participate may differ systematically from non-responders in terms of motivation, study satisfaction, or perceived difficulty, so the observed associations should be interpreted with caution. The sample was also predominantly female (78.3%) and weighted toward first-year students (35.3%), and group-specific response rates (for example, by student type) are unknown, so differential non-response across the compared groups cannot be excluded. Second, the questionnaire was specifically developed for this study and underwent a pragmatic, experience-based development process rather than a formal, theory-driven scale construction and validation procedure. The items were generated by the authors based on their academic and clinical experience in medical education, and we did not conduct more extensive psychometric testing (e.g., exploratory or confirmatory factor analysis, test–retest reliability, or convergent validity with established instruments). As a result, the construct coverage and measurement precision of some domains (e.g. motivations and concerns) may be limited, and direct comparison with studies using validated scales is not possible. Perceived difficulty and satisfaction were each measured with a single item, which precludes internal-consistency estimation and may capture these constructs only coarsely. Furthermore, the questionnaire underwent only very limited pilot testing (six students), which is insufficient to fully evaluate item clarity, variability, and potential floor or ceiling effects. Consequently, some items may not have captured the full nuance of students' experiences, and subtle measurement problems cannot be ruled out. Moreover, some questions relied on predefined response options, which may have limited participants' ability to express more nuanced perspectives. Third, all analyses were univariable: no adjustment was made for the mutual associations among background characteristics (for example, student type, university, and study year), and no correction for multiple comparisons was applied, so some of the smaller significant differences may be spurious and some observed differences may be confounded by other characteristics. Fourth, all data were self-reported at a single time point, so common-method

variance may have inflated the correlations among self-rated constructs, and the age at the decision to study medicine was reported retrospectively and is subject to recall bias. Fifth, data were collected between 2021 and 2023, a period that overlapped with pandemic-related disruptions of teaching, which may have affected year groups differently and limits comparability with data collected under ordinary conditions. Furthermore, although multiple associations reached statistical significance, most observed effect sizes were small, which limits the practical significance of individual findings and underscores that statistical significance alone should not be over-interpreted. Finally, the cross-sectional design does not allow for causal conclusions or for the assessment of changes over time, and comparisons across study years conflate stage effects with cohort effects. Longitudinal studies using more extensively validated instruments, multivariable analyses, and formal invariance testing across language groups would help better understand how motivation, satisfaction, and perceived difficulty evolve throughout medical education.

Conclusions

This exploratory, cross-sectional study described medical students' motivations, concerns, perceived study difficulty, and satisfaction across Lithuania's entire medical-training system and examined whether motivations and concerns show differential patterns of association with these two outcomes. Prosocial and intrinsic motives — notably the desire to help others — were associated primarily with higher satisfaction, while concerns tied to academic performance, particularly about grades, were associated primarily with greater perceived difficulty. As these constructs were captured through self-rated impact ratings and single-item outcome measures, this pattern is best understood as a descriptive association rather than a demonstrated mechanism.

The study found that the stage of study and the type of student were the most significant factors affecting satisfaction levels. Specifically, students in years 4 to 6 reported substantially lower satisfaction than those in years 1 to 3. Additionally, international students reported lower perceived difficulty and higher satisfaction than their Lithuanian counterparts. These differences may point to the senior clinical years and the specific circumstances of international students as areas warranting closer attention in curriculum design and student support. Family medical background, birth order, and the age at which students decided to pursue medicine showed only small associations with difficulty or satisfaction and appear to play, at most, a modest role.

Given the exploratory, cross-sectional nature of the study, these findings should be viewed as an initial mapping of how motivations, concerns, and background characteristics relate to students' perceived difficulty and satisfaction, rather than as firm or generalizable conclusions. They nonetheless offer a useful starting point for future research — particularly longitudinal and more rigorously validated studies — and suggest that educational and support strategies may benefit from being tailored to students' training stage and background, with particular attention to sustaining engagement during the later years of study and supporting international or native students' distinct needs.

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Authors' contributions SL – conceptualized the study, obtained ethics approval, revised manuscript. VA – conceptualized the study, reviewed and provided scholarly feedback. JM – designed the questionnaires. MB – collected study data. RŠ – conducted formal data analysis, prepared the figures, wrote original draft. KP – wrote the original draft.

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Data availability The datasets used and/or analysed during the current study are available from the corresponding author

on reasonable request.

Declarations

Ethics approval and consent to participate Research ethics approval was obtained from the Lithuanian Bioethics Committee in October 26, 2020, under approval number L-20-8/1 and L-20-8/2. All procedures in the current study were in accordance with ethical standards with the 1964 Helsinki declaration and its later amendments.
Participation in the study was voluntary, and anonymity and confidentiality were guaranteed to all participants. Prior to participation in the study, students were presented with an informed consent form. After indicating their consent, they were directed to the research questionnaire.

Consent for publication Not applicable.

Competing interests The authors declare no competing interests.

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