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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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SOCIOCULTURAL IMPACT ON STUDENTS IN A STRESSFUL ENVIRONMENT: MEDICAL AND PSYCHOLOGICAL ASPECT

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Abstract.

In the context of increasing global academic mobility, international medical students face unique academic, cultural, and linguistic challenges that extend beyond general educational experiences. This study investigates how the language of instruction, sociocultural environment, and institutional context collectively affect learning outcomes, clinical communication skills, and well-being among mobile medical students. Through a comparative analysis of four distinct groups - based on the language of instruction and country type - this study identifies critical linguistic and psychological factors that shape educational success. Results indicate that students enrolled in English-taught programs in non-native English-speaking environments demonstrate high levels of professional comprehension and social adaptation. Conversely, students studying in unrelated national languages report lower integration and increased academic stress. Findings highlight the need for language support, intercultural training, and tailored pedagogical frameworks to ensure academic equity for future healthcare professionals.

Key words. Medicine, psychology, pharmacology, adaptation, medical education, clinical communication, stress.

Introduction.

Medical students are subjected to various stressors throughout their training, which has a considerable impact on their physical and mental health [1,2]. Given the high-stakes environment of medical education, understanding the interplay between these factors is crucial [3,4]. Globalization and academic mobility have transformed the landscape of medical education. A growing number of students pursue medical degrees abroad to gain clinical experience, access advanced technology, or improve future employability. However, for international medical students, the transition involves a complex interplay of language barriers, cultural differences, and unfamiliar academic expectations. Language of instruction, particularly in specialized fields such as medicine, plays a crucial role not only in knowledge acquisition but also in patient communication and the development of clinical competence [5,6]. Beyond linguistic and economic factors, several additional determinants influence students' academic mobility decisions such as: visa and immigration policies (countries with more transparent, student-friendly visa processes and post-study work opportunities are typically preferred); safety and quality of life (political stability, personal safety, cost of living, and access to healthcare significantly shape students' destination preferences); presence of diaspora communities (students are more inclined to choose countries where there is already a strong presence of people from their country of origin, which helps reduce social isolation and provides practical support); university internationalization strategies (institutions that actively promote international engagement through scholarships, mobility partnerships, and cross-cultural programming are more likely to attract global talent) [7,8].

According to UNESCO (2023), major sending countries include China, India, Vietnam, Nigeria, Saudi Arabia, and Ukraine [9]. The most popular host countries are the United States, the United Kingdom, Canada, Australia, Germany, France, Poland, and the Czech Republic. These data highlight not only the quantitative diversity of international student flows but also the urgent need to adapt educational systems to various linguistic and cultural contexts. The language of instruction significantly influences the quality of the learning process, affecting material comprehension, integration potential, and students' psychological well-being [10,11]. Ukrainian universities are affected due to war action, which is one of the reasons for the migration of Ukrainian students and foreign students who studied in Ukraine, transformation of medical service [12-14] with background of world pandemy [15,16].

For students from lower- and middle-income countries (including Ukraine), Central and Eastern European countries often serve as attractive destinations due to their relative affordability, geographical proximity, linguistic similarities in Slavic countries, and opportunities to study in the host country's national language. One of the most significant factors for academic success and integration is the language of instruction.

A key unresolved issue is determining which educational model best supports international students: studying in English in non-Anglophone countries or studying in the host country's national language. This question is central to understanding academic success, adaptation, and future professional integration. This study aims to examine how language of instruction and educational environments affect international medical students' academic and clinical learning outcomes. The focus is on how these factors support or hinder the development of professional competencies, especially in multilingual and multicultural classrooms. In that concerning, goals of our research were specific objectives include identifying language-related

barriers in medical content assimilation, assessing integration levels within clinical teams and academic cohorts, comparing professional preparedness across instructional settings.

Materials and Methods.

Data was collected through surveys and follow-up interviews with 412 international medical students from seven countries. The study received ethical clearance from the Ethical Review Board of Kharkiv International Medical University (Protocol No. 6/2023, dated March 2, 2023). All participants provided written informed consent. Participation was voluntary and fully anonymous.

A mixed-methods approach was used to evaluate academic performance, clinical communication confidence, and social integration. The survey was semi-structured and included both Likert-scale and open-ended items. It evaluated comprehension, linguistic barriers, communication confidence, and well-being. Example closed question: 'Rate your confidence in using medical terminology (1–5).' Example open-ended: 'Describe a challenge faced in adapting academically or culturally.' Follow-up interviews with 40 students enriched this data. The full questionnaire is provided in Supplemental File 1.

The study is based on a comparative analysis of learning outcomes among students grouped according to the language of instruction:

1. **Instruction in the Host Country's Official Language:**

Group I1: Students learning in a language related to their native tongue (e.g., Ukrainians in Poland, Czech Republic, Slovakia).

Group I2: Students learning in an unrelated national language (e.g., Ukrainians in Germany or Hungary).

2. **Instruction in English:**

Group F1: Students (from India, China, Ukraine, Egypt, Marocco etc.) enrolled in English-taught programs in non-English-speaking countries (e.g., Germany, Czech Republic).

Group A1: Students from non-English-speaking countries studying in English in Anglophone countries (e.g., the US, UK, Ireland).

Statistical analyses identified correlations between language of instruction and learning outcomes with using the Statistica for Windows 8.0 software package. Methods of descriptive statistics (determination of numerical characteristics of variables - arithmetic mean (M), mean sampling error (m), determination of the reliability of differences (p), which were tested via the Student-Fisher t-test in representative samples) were used. Correlation between indicators was assessed using Spearman's correlation coefficient (r). The difference in values between comparative indicators was considered significant at $p < 0.05$.

Results.

Findings indicate that students in English-taught programs in non-Anglophone countries (Group F1) report the highest levels of academic comprehension, confidence in medical terminology, and integration within peer and clinical settings. Students in unrelated national-language programs (Group I2) demonstrated lower performance in subject mastery and experienced higher levels of isolation and cognitive overload.

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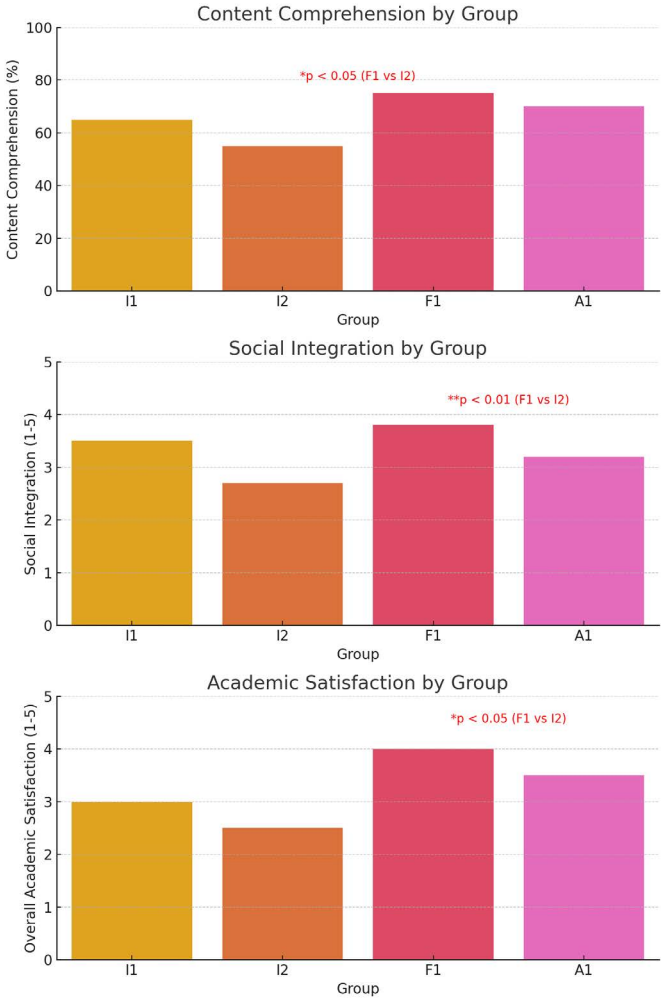

Figure 1. *Language of Instruction and Academic Integration.*

Group I1 (Related national language):

- **Learning Outcomes:** 65% reported a high level of content comprehension, with 33% achieving 91–100% assimilation. Linguistic proximity positively influenced understanding.
- **Linguistic Challenges:** Rated 2.3/5, suggesting moderate barriers, primarily due to differences in cultural and communicative norms.
- **Integration:** Scored 3.5/5, indicating some difficulty despite shared linguistic roots.
- **Conclusion:** Linguistic similarity facilitates learning, yet national cultural dominance may hinder full integration. Promoting intercultural dialogue is essential.

Group I2 (Unrelated national language):

- **Learning Outcomes:** Approximately 55% achieved satisfactory comprehension.
- **Linguistic Challenges:** Rated 1.9/5, indicating frequent barriers aggravated by unfamiliar cultural norms.
- **Integration:** Scored 2.7/5, reflecting difficulties in academic and social inclusion.

- **Conclusion:** The dual burden of linguistic and cultural distance calls for specialized language and integration programs.

Group F1 (English in non-Anglophone countries):

- **Learning Outcomes:** 75% demonstrated strong comprehension. English as a lingua franca created a neutral communicative space.
- **Linguistic Challenges:** Rated 3.2/5, suggesting minimal linguistic dominance.
- **Integration:** Scored 3.8/5, indicating successful adaptation.
- **Conclusion:** Group F1 performed best due to the balanced nature of international academic environments.

Group A1 (English in Anglophone countries):

- **Learning Outcomes:** 70% showed high comprehension, although idiomatic language posed challenges.
- **Linguistic Challenges:** Rated 3.0/5.
- **Integration:** Scored 3.2/5, pointing to cultural rather than linguistic obstacles.
- **Conclusion:** Immersion in native English contexts improves language fluency but may complicate cultural adaptation.

Discussion.

The assertion that cultural obstacles contribute to linguistic challenges is grounded in both quantitative results (e.g., Group I2's low integration scores) and qualitative student feedback citing cultural misunderstandings, communication norms, and academic expectations as compounding language difficulties.

In recent years, a growing body of research has examined the multifaceted relationship between academic mobility and the language of instruction, with particular emphasis on its implications for student integration, performance, and well-being. Scholars widely acknowledge that international students face a complex blend of linguistic, cultural, and institutional challenges when studying abroad. These challenges are shaped not only by language proficiency, but by deeper issues of identity, intercultural competence, and educational inclusivity. There is data [17] stresses the necessity of creating inclusive learning environments in multilingual university settings, arguing that diversity should be viewed as a resource rather than a barrier. This aligns with findings from Brooks and Waters [18], who investigate student motivations for choosing study destinations and underscore how perceptions of language accessibility and cultural compatibility inform these decisions. Wächter and Maiworm [19] explore the disparity between the growing demand for English-taught programs and their actual availability across European higher education, especially at the undergraduate level. Complementing these insights, De Wit [20] emphasizes the importance of culturally and linguistically responsive internationalization strategies that reflect the shifting demographics of global student populations.

International research has shown that international medical students face heightened academic and emotional strain due to the combined demands of technical content, clinical exposure, and cross-cultural adaptation [21]. The ability to master subject-specific language in anatomy, pharmacology, and diagnostics is closely linked to academic success and professional identity formation. Smit and Dafouz [22] argue that English-medium instruction in multicultural settings facilitates neutral communicative ground, allowing more equitable access for non-native speakers. Conversely, studying in national languages (particularly unrelated to a student's native tongue) imposes additional burdens in decoding clinical terminology and engaging with local medical practices [11,23].

Sawir et al. [24] emphasize the emotional consequences of language stress, particularly among medical students who must also establish patient rapport and handle clinical simulations in a second or third language. Beelen and Jones [25] advocate for inclusive curriculum design that balances cognitive demands with emotional well-being and sociocultural support structures.

Finally, Beelen and Jones [26] and Kreber [27] argue that instructional language should be viewed as a dynamic variable embedded within broader social, emotional, and pedagogical contexts. They call for a comprehensive, student-centered approach that integrates language training with intercultural development, inclusive teaching, and holistic student support. Taken together, this literature positions language not as a neutral medium but as a powerful agent of academic experience — one that interacts with identity, access, and belonging. The implications are clear: institutions must adopt integrated strategies that address both the cognitive and affective dimensions of international education [27,28].

When international students cross national borders to pursue education abroad, they are not merely entering a new academic system but immersing themselves in a multilayered linguistic and cultural context. Their capacity to adapt to this environment significantly influences how effectively they comprehend course content, perform academically, and maintain psychological well-being. Findings from the comparative analysis conducted in this study reveal several core tendencies that define the depth and success of educational integration.

A fundamental factor determining students' academic performance is their level of language preparedness prior to enrollment. Students who engage in structured language acquisition, attend preparatory courses, and actively practice the language in real-life interactions demonstrate markedly better academic results. This impact transcends grammatical competence or vocabulary knowledge; it encompasses the student's ability to participate in classroom dialogue, pose questions, produce academic writing, and navigate subject-specific terminology. In this regard, language functions not only as an instructional tool but as a channel for academic and social participation.

However, proficiency in the language of instruction alone does not guarantee successful adaptation. Social integration constitutes a parallel determinant that modulates academic success. Students who integrate into the peer environment — form supportive relationships, participate in co-curricular activities, and engage with the academic community – tend to report reduced psychological distress and greater educational engagement. Positive social interaction fosters language practice, strengthens motivation, and cultivates a sense of institutional belonging. Conversely, students who remain socially or culturally isolated — whether due to external constraints or internal hesitation — often exhibit diminished academic performance despite strong linguistic abilities.

Another salient aspect is the extent to which the academic environment accommodates linguistic and cultural diversity. In contexts where English serves as a lingua franca for instruction (e.g., Group F1 in this study), all participants — both students and instructors — share a non-native relationship with the language. This parity minimizes cultural dominance and fosters inclusivity. In contrast, when instruction is delivered in the host country's native language — especially in environments where the majority of students and faculty are native speakers — international students face compounded challenges. They must keep pace with native fluency, idiomatic expressions, and academic discourse styles, while simultaneously decoding implicit cultural norms embedded in communication and classroom behavior [29].

The psychological dimension of this adaptation process must also be acknowledged. Emotional states such as anxiety, loneliness, and self-doubt are frequently reported by students who do not feel socially or culturally included. Higher education institutions that implement systems of psychological support — including peer mentoring, intercultural clubs, and mental health services — can significantly improve students' emotional resilience and academic outcomes. Peer-based mentorship models, especially those grounded in the principle of "peer support" from senior students, have proven particularly effective in helping new international students navigate unfamiliar educational landscapes with modern technological achievement [30-32] which could be used in education. Unfortunately, famous on biological model stress factor could change mental and cerebral activity [33-35] with possible pharmacological correction [36,37].

Beyond the linguistic and academic challenges revealed in our comparative analysis, it is essential to contextualize students' initial decision-making processes regarding host countries and educational environments.

Recent research on international student decision-making reveals distinct motivations based on both national origin and the specific countries selected for study. Chinese students, for example, often choose to study in countries such as the United States, Switzerland, the United Kingdom, and Germany. These decisions are largely influenced by the perceived prestige of host institutions, high global university rankings, and the belief that such education will enhance employability prospects both internationally and within China. The promise of competitive labor market entry and long-term professional advancement remains a central factor.

In contrast, students from India report that their primary motivation for studying abroad lies in gaining access to high-quality education, often in prestigious institutions. However, financial considerations play a significant role in shaping the nature of their destination. While some opt for Western universities, many Indian students choose institutions in post-Soviet countries due to more affordable tuition fees. For these students, the financial infeasibility of obtaining a degree from elite domestic institutions prompts the pursuit of alternative international pathways that offer value without compromising educational standards.

When analysing international students' choices, it is essential to account not only for institutional reputation and affordability but also for linguistic and intercultural considerations. English-taught programs have become the most sought-after option among foreign students, particularly due to English's status as the dominant language of international communication. Nevertheless, challenges remain. Firstly, tuition fees for English-language instruction in non-Anglophone countries are often significantly higher than those for domestic-language programs. Secondly, a notable gap persists in English-language offerings at the undergraduate level, especially in Medicine. This trend can be attributed to state regulations favouring national languages, limited availability of qualified teaching staff, and lower demand due to tuition-free or low-cost programs in national languages and not high popularity of such programs due to their challenging character.

These considerations raise critical questions about the long-term effectiveness and accessibility of English-medium education in non-English-speaking environments. Although content may be standardized across programs and learning outcomes formally identical, the surrounding academic environment varies considerably. Students studying in the host country's official language often become part of the native educational ecosystem, where faculty and students predominantly share a common cultural and linguistic background. In contrast, those enrolled in English-taught programs typically belong to more internationalized and culturally diverse groups, in which neither students nor instructors are native speakers of English. Consequently, the learning environment itself is shaped by multicultural dynamics and the absence of a dominant linguistic or cultural code [29].

In both cases, foundational linguistic preparation is crucial for academic success. Students must develop language proficiency sufficient to engage with discipline-specific content and participate in academic discourse. Despite this shared requirement, the pathways of integration differ students in domestic-language programs must adapt to local cultural norms and native-speed communication, while English-taught program participants must navigate multilingual peer groups and culturally heterogeneous academic expectations. Institutional policies — such as grading criteria, assessment methods, and instructional standards — remain consistent across linguistic tracks, placing all students under equal academic scrutiny regardless of language.

As the internationalization of higher education expands, so most universities develop strategies to ensure that these diverse linguistic and cultural environments support learning equity. The provision of culturally responsive instruction, accessible academic resources, and linguistically inclusive pedagogy is key to mitigating the barriers identified in this study and fostering long-term academic and professional success for internationally mobile students.

These motivational patterns are reflected in the performance disparities observed across groups. For example, financial and linguistic considerations explain the larger presence of Indian students in English-taught programs in non-Anglophone countries (Group F1), which also performed best in terms of integration and learning outcomes.

Conclusion.

The academic and clinical success of international medical students in the context of mobility is shaped by the interplay of linguistic, sociocultural, and emotional dimensions. Each of these factors, while individually insufficient, collectively forms the foundation — or potential vulnerability – of a student's educational trajectory. Linguistic competence must be paired with structured opportunities for social inclusion and institutional sensitivity to students' emotional and intercultural needs. Without such integration, even the most academically rigorous programs may remain inaccessible — not because of the cognitive complexity of the material, but due to unseen cultural and communicative barriers that obstruct meaningful engagement. Focused language preparation, ongoing intercultural training, and mentorship are key to ensuring equity in global medical education.

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Supplemental File 1: Survey Instrument.

Section A: Demographics.

1. Age
2. Gender
3. Country of origin
4. Host country of study
5. Language of instruction
6. Program of study
7. Year of study

Section B: Likert Scale Items (1–5).

1. I understand the academic content delivered in the language of instruction.
2. I feel confident using medical terminology in class.
3. I can communicate effectively with instructors.
4. I feel integrated within my peer group.
5. I participate actively in clinical discussions.
6. The language of instruction creates a barrier for me.
7. I have access to language support services.
8. I feel emotionally supported in my academic environment.
9. I can express my thoughts clearly in academic writing.
10. I am satisfied with my overall academic experience.

Section C: Open-ended Questions.

1. What are the biggest challenges you have faced when studying in your current language of instruction?
2. Can you describe a time when language or culture affected your participation in class or clinical work?
3. What types of support (if any) have helped you adapt to your academic environment?
4. What recommendations would you offer to improve support for international students in your situation?

Section D: Consent.

By participating in this survey, I confirm that I have been informed about the purpose of the study. I understand that my participation is voluntary and that all responses will remain anonymous and confidential. I consent to the use of my responses for academic research purposes.