Analysis of University Students' Errors in English for Medical Purposes

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Abstract

This study examines the linguistic errors made by first-year dental students at Al-Razi University, Yemen, in English for Medical Purposes (EMP) courses. It aims to identify and analyze common challenges in spelling, syntax, parts of speech, synonyms, and medical terminology.

Adopting a mixed-methods approach, the study collected data through mid-term exams and qualitative observations. Errors were categorized and analyzed to determine their frequency and underlying causes.

The study assessed the prevalence of different linguistic errors and students' difficulties in understanding and applying medical English terminology and grammar.

The findings indicate that spelling errors were the most common (27.81%), followed by syntactic errors (13.46%) and synonym-related errors (12.63%). Qualitative observations further highlighted students' struggles with medical vocabulary and

grammatical structures, impacting their overall language proficiency.

The study underscores the importance of a strong foundation in general English for successful EMP learning. It recommends targeted instructional strategies, including comprehensive grammar training, interactive exercises, and real-world language applications. The findings provide insights for improving EMP teaching methodologies to enhance students' academic performance and preparedness for medical professions. Future research should explore similar challenges in other medical disciplines to refine effective teaching approaches and contribute to better healthcare communication.

Keywords: Analysis, Llinguistic Errors, EMP, Syntax Spelling, Synonyms, Instructional Strategies.

Introduction

English has become a critical academic tool for university students worldwide, particularly in specialized fields such as medicine. As the prevailing universal language, English has transitioned from being a foreign language to the major instruction medium in higher education (Dearden, 2014). Such a shift has stressed the students' need to master English particularly those in scientific and technological fields such as medicine, pharmacy, engineering, and computer science. English for Specific Purposes (ESP) has emerged as a tailored approach to meet the unique linguistic requirements of these realms.

In medical instruction, English for Medical Purposes (EMP) gets a privileged position as a subclass of ESP designed for effective academic education. Teachers play an essential role in leveraging ESP as an effective educational medium by integrating subject-specific content with students' learning needs. The Analysis of students' errors and preferences permits teachers to make informed decisions on course goals, methodologies of teaching, and curriculum design to increase medical English instruction's effectiveness.

The importance of EMP consists in its function as a bridge between general English mastery and the specialized language necessary in medical settings. A firm basis in general English at an intermediate level is essential for students to actively engage in EMP classes and future professional settings. However, many students encounter difficulties in becoming proficient at medical English, particularly in grasping complex terminology, understanding specified texts, and producing scholarly work. Such linguistic obstacles deter their capability to fully get involved in academic and clinical situations, underlining the necessity for targeted EMP instruction.

Despite the growing emphasis on EMP, research about medical students' specific linguistic difficulties is still scarce, particularly in non-native English-speaking backgrounds. Previous studies have mostly centered on general ESP frameworks, with less emphasis on the medical students' specific needs. Moreover, there is little thorough analysis of the errors committed by EMP students, which could provide important insights for enhancing methodologies of teaching and curriculum design.

The current research paper intends to address these gaps by studying the Dentistry students' errors and linguistic challenges at Al-Razi University in Sana'a, Yemen. The study tries to identify common errors and analyze their potential causes, to bring in enhancing EMP instruction by improving teaching methods and tailoring appropriate learning materials. The research design includes direct teacher-student interactions and targeted assessments to provide a comprehensive knowledge and awareness of the linguistic needs for students.

The novelty of this research paper lies in its emphasis on a specific, under-researched context—Yemeni Dentistry students—and its focus on error analysis as a tool for refining EMP instruction. By studying these linguistic errors, the research aims to provide insights into enhancing EMP proficiency and instruction, addressing students' difficulties, and improving teaching methods and strategies to optimize medical English learning outcomes.

Previous Studies

Challenges in Academic Settings:

Several studies and researches have studied the academic challenges faced by first-year medical students, particularly those who are English as a Foreign Language (EFL) students in English-speaking countries. For example, in Australia and the United States, research reveals that EFL medical students compared to native English speakers, often struggle with both general and medical English, affecting their academic performance and demanding greater effort (Glew, 2013; Guhde, 2003; Salamonson et al., 2011; Sanner & Wilson, 2008; Sanner et al. (2002); Shakya & Horsfall, 2000). On the contrary, Kaliyadan et al. (2015) pinpoint an inconsistency between stakeholder expectations and students' real English proficiency, emphasizing the gap between present situations and desired language skills.

Unfortunately, there are few researches about the challenges encountered by EFL students studying dentistry in non-English-speaking countries, particularly in Arab states like Yemen. While some studies have explored challenges among students in fields other than dentistry, Almoallim et al. (2010) emphasized that in Saudi Arabia, female medical students ranked English as the most difficult subject, while their male counterparts ranked it second. Other researchers have noticed common difficulties faced by Arab students in writing skills, quoting insufficiencies in spelling and syntax rules (Abdul Haq, 1982); Mohammad & Hazarika, 2016). Influence from their mother tongue and an unwillingness to learn other languages form major challenges, multiplied by inadequate linguistic training of English language instructors and their use of out-of-date teaching methods. Alharby (2005) found that productive skills such as writing and speaking were deemed less important than receptive skills like listening and reading, and this indicated a misalignment between English courses and the language demands of hospital surroundings.

Further studies, such as Abu Shaikha et al. (2014) investigating Jordanian male nursing students, and Hamza (2015) examining medical students at Prince Sattam Bin Abdulaziz University, shed light on challenges in mastering English, underlining vocabulary, listening, and speaking skills as principal concerns.

The above-mentioned studies collectively emphasize the prevalent challenges faced by EFL medical students, particularly in non-English-speaking contexts and they call for improving EMP instruction designed to meet the medical students' linguistic needs in non-English-speaking surroundings. However, there is a lack in studies concentrating on dentistry students in Yemen, which is the aim of the current study.

Specific Studies on English for Medical Purposes (EMP):

Challenges faced by students in learning medical vocabulary have been addressed by many studies such as (Zaidi & Al Jadaan, 2022), trying to identify weak linguistic skills as a major problem and recommend collaborating activities to improve retention. Rinawati et al. (2021) conducted a needs analysis among first-year medical students at Sultan Agung Islamic University in Indonesia, stressing the importance of tailored language skills and preferred assessment types. Maharani et al. (2020) categorized pronunciation errors and analyzed their origins through teacher-student interactions in speaking activities. Rudy (2018) categorized lexical interference errors in medical students' writing, such as omissions, coinages, mis-selections, borrowings, and over-inclusions.

In South Africa, Swinfen et al. (2023) explored the training of medical students in error disclosure, finding deficiencies in teaching complex interpersonal skills necessary for effectively disclosing medical errors and proposing strategies for improvement. Fitriani (2018) analyzed syntactical and morphological errors in student nurses' written work, identifying a predominant focus on syntactical errors. Hekmati et al. (2020) used structured questionnaires to assess the language needs of

medical students at Birjand University of Medical Sciences, revealing discrepancies in perceptions of language needs among students, instructors, and practitioners, and highlighting specific requirements for medical English.

Previous studies discuss issues related to vocabulary acquisition, pronunciation, and communication skills. However, they focused on general medical students, and they did not deal with the specific linguistic challenges of dentistry students.

English for Specific Purposes (ESP) in Yemen:

English for Specific Purposes (ESP) addresses Yemeni students' academic and professional needs, especially in medical and technical fields. However, there are mismatches between students' focus on listening and reading and instructors' emphasis on writing and listening (Farea et al., 2024) and (Farea, & Singh, (2024) students' perceptions of English language skills. Speaking and listening remain common weaknesses (Al-Kadi, 2018), and courses should address grammar and communication skills as well (Ibrahim, 2020).

Studies highlight inefficiencies in ESP programs, recommending tailored curricula and improved teaching methods (Alselwi, 2011; Al-Tamimi, 2010). ESP is also essential in public health, such as the Electronic Integrated Disease Early Warning System (EIDEWS), and in humanitarian organizations, where challenges include report writing and terminology (Modhaffer & Humran, 2023).

Challenges such as outdated syllabi and limited instructor training hinder progress (Al-Kadi, 2018). Addressing these issues through needs analyses, curriculum revisions, and instructor development can align ESP with learners' specific needs (Ibrahim, 2020).

The researches above conclude that ESP programs in Yemen aim to address students' needs, but there are still some significant gaps in their effectiveness, particularly in

tackling the medical and dental students' linguistic difficulties. The present study aims to address these gaps by focusing on Al-Razi University dentistry students.

Similarities and Differences between Previous Studies and the Current Study:

Previous studies and the current study both focus on the academic challenges encountered by EFL students in medical and health-related fields (Glew, 2013; Guhde, 2003; Salamonson et al., 2011), emphasize the gap between actual English proficiency and the levels required for academic success, and utilize qualitative and quantitative methods to analyze linguistic errors and student perceptions (Kaliyadan et al., 2015; Fitriani, 2018).

However, the primary concern of many previous studies was on EFL students in countries other than Yemen, the current study' scope is specifically set in Yemen. Unlike previous studies that often include broader sets of medical or nursing students without specific emphasis on dentistry, the current study specifically targets first-year dental students at Al-Razi University.

Furthermore, while prior studies often focus on specific areas such as medical vocabulary (Zaidi & Al Jadaan, 2022) or pronunciation (Maharani et al., 2020), the current study offers a detailed examination of various linguistic aspects, including spelling, syntax, tenses, and multiple-choice questions. It also incorporates tests, interactive methods, and personal teacher observations, offering a more hands-on qualitative approach, but many of the previous studies are heavily based on surveys and structured questionnaires (e.g. Hekmati et al., 2020).

After comparing these elements, it can be said that while there is a common thread in addressing EFL challenges in academic settings, a focus of the current study is specifically on Yemeni dental students and a comprehensive methodology is employed to address a broad range of linguistic issues.

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The current study has similarities in addressing EFL challenges in academic settings, but it stands out for its specific focus on Yemeni dental students and its comprehensive methodology, which addresses a broad range of linguistic issues.

Methodology

Research Design:

This study employed a mixed-methods approach, where quantitative and qualitative methods are integrated to analyze the linguistic errors and challenges encountered by first-year dental students in learning medical English at Al-Razi University. The quantitative component involved the analysis of students' linguistic errors obtained from a mid-term exam, while the qualitative one was based on teacher observations, student reflections, and interactive discussions to offer a full understanding of students' challenges.

Participants:

104 first-year dental students were involved in the study from the Faculty of Dentistry at Al-Razi University. The following criteria were observed in the recruitment of the participants:

1. **Enrollment Status**: Participants must be officially registered in the first year of the dentistry program.

2. **Language Background**: the mother tongue of the students is Arabic and English is a foreign language for them.

3. **Course Participation**: To ensure familiarity with the course content, the students must have attended at least 75% of the medical English classes during the academic year.

4. **Voluntary Participation**: Students gave their consent about participating voluntarily after they were told about the study's purpose.

Data Collection

Two primary methods were used in Data collection: a mid-term exam and teacher observations as well as student reflections, and interactive discussions.

Quantitative Data Collection:

Mid-Term Exam:

- The **mid-term** exam was conducted during the second term of the academic year and was planned to assess various aspects of medical English, as follows:

  - Spelling

  - Parts of speech

  - Incorrect forms

  - Tenses

  - Syntactic structure

  - Passive voice

  - Wrong information

  - Lack of answers

  - Inappropriate synonyms

  - Word combinations

  - Multiple-choice questions

  - Use of Arabic

  - Incomprehensible words

The exam was administered in English, with three different versions to minimize the possibility of cheating. level of Difficulty for Each version was equivalent. For completing the test, students were given 60 minutes. Their papers were collected, their answers are checked and corrected, and later statistically analyzed to identify patterns and frequencies of errors.

Qualitative Data Collection:

Teacher Observations and Interactions:

- The teacher/researcher conducted **personal observations** of students' difficulties during regular class sessions and consultations.

- **Direct conversations** and **interactive sessions** were arranged with students to gain qualitative insights into their linguistic difficulties.

- After two terms of studying, students were requested to **reflect on the mid-term exam**, identify the most difficult sections, and discuss other linguistic aspects not covered in the exam.

Data Analysis

Quantitative Analysis:

The data collected from **exam results** were quantitatively analyzed using **SPSS (Statistical Package for the Social Sciences)** to classify linguistic errors and determine their frequencies. The steps of analysis are as follows:

1. **Data Entry** –Coding and inputting students' answers into SPSS.

2. **Error Categorization** – categorizing the linguistic errors into specific types (e.g., spelling, grammar, vocabulary, syntax) etc.

3. **Descriptive Statistics** – to find out the most common error patterns, the frequency distributions, percentages, and means of errors types were calculated.

4. **Inferential Statistics** – Where applicable, statistical tests (e.g., **chi-square tests**) were performed to determine significant differences between error types.

Qualitative Analysis:

The **qualitative data** obtained from observations, discussions, and reflections were analyzed thematically as follows:

1. **Data Transcription** – Notes recorded during teacher observations and student discussions were transcribed.

2. **Thematic Coding** – Recurrent themes (e.g., difficulty with pronunciation, reliance on Arabic, lack of confidence in speaking) were identified.

3. **Interpretation** – The qualitative results served to contextualize the quantitative findings, emphasizing **the causes of** certain errors prevalence.

Because this methodology incorporates **statistical analysis** with **student perceptions and teacher insights**, it provides a well-rounded understanding of the linguistic challenges faced by first-year dental students in medical English proficiency.

Disclosure Statement

No potential competing interest was reported by the author(s).

Results

The following section includes a breakdown of various error types committed by students during the test. Here are an overview of the errors and their totals. The total number of errors by all students is 1751 in all types of errors as is seen in the following tables.

The detailed breakdown of error types and their frequencies is presented in Table (1).

Error Type	Total	Frequency
Spelling Errors	487	27.81%
Syntactic errors	136	13.46%
Parts of Speech	138	7.88%
Incorrect Forms	129	13.07%
Tenses	107	6.11%
Passive Voice errors	117	6.68%
wrong information	107	11.80
No answer	117	12.37
Synonyms	121	12.63%
Word Combinations	82	10.39
Wrong choice	90	10.82
Use of Arabic	48	8.45%
Incomprehensible Words	72	9.81%
total	1751	100

In terms of errors related to spelling, the total number was 487 errors by all students. The frequency distribution shows varying counts from 0 to 12 errors per student. Only 15 students had not any errors in spelling with (14.4%) out of the total number of students.

As for syntactic errors, the total number was 136 errors committed by the students. Most students made between 0 and 5 errors, with a significant number of students about 33 students (31.7%). having 0 errors

The total number of errors related to the parts of speech was 138 errors committed by students. The frequency varies from 0 to 5 errors per student, with about one third of students (30) (28.8%) having 0 errors.

The students committed 129 errors of using incorrect forms of the words. The distribution of this type of errors ranges from 0 to 4 errors per student, and 35 students with 33.7% having 0 errors.

Tenses based errors committed by students were 107 errors. Most students had between 0 and 3 errors, while 42 students (40.4%) had no errors in tenses.

The total number of errors related to passive voice was 117 errors. Majority of the students had either 0 or 2 errors, and 43 students (41.3%) did not have any errors related to passive voice.

On the other hand, the students might not answer wrongly in terms of linguistic aspects, but they provided wrong information. This category of errors is classified in this paper as "Wrong Information Errors". The total number of this type of errors was 107 errors. It is found that 50% of students did not make any error of this kind.

The students sometimes may not provide any answer and leave it blank. This type of errors is called here "No Answer Errors". The students had 117 errors of this type. Majority of students (67.3%) did not leave any questions unanswered.

The synonyms errors collected from the students' answer papers were 121 errors. The frequency ranges from 0 to 5 errors per student, with 47 students (45.2%) having no errors of this nature.

Matching the words and making appropriate word combinations made a difficulty for students. They had committed 82-word combination errors, but most students - 74 (71.2%) - made 0 errors.

Correct choice errors were also committed by the students. The total number of errors related to choice was 90 errors. 54 students (51.9%) made no errors in this category.

Some students resorted to Arabic in answering some questions. This is considered an error in this paper with 48 errors. Fortunately, most of them about 86 students (82.7%) did not make any errors related to this type of errors.

The last type of errors noticed in the students' answer papers was writing illegibly. The total number of errors related to illegibility was 72 errors. But this was not common among students since 88 of them (84.6%) had no illegible errors.

In terms of students' gender, it is observed that male students have a slightly higher

mean for committing errors, indicating their tendency to make more mistakes than female students as presented in the following table (4). This could be due to differences in attention to detail, spelling proficiency, or exposure to written language. This result is in contradiction to Almoallim et al. (2010).

Group Statistics Table (2)

	gender	N	Mean	Std. Deviation	Std. Error Mean
Spelling errors	male	52	4.8462	3.43788	.47675
	female	52	4.5192	2.86624	.39748
Syntactic errors	male	52	1.3846	1.34535	.18657
	female	52	1.2308	1.07768	.14945
parts of speech	male	52	1.58	1.334	.185
	female	52	1.08	.926	.128
incorrect forms	male	52	1.3077	1.19703	.16600
	female	52	1.1731	1.04264	.14459
tenses	male	52	1.0577	1.07400	.14894
	female	52	1.0000	1.00976	.14003
Passive Voice errors	male	52	1.13	.991	.137
	female	52	1.12	.963	.134
wrong information	male	52	1.10	1.404	.195
	female	52	.96	1.371	.190
no answer	male	52	1.7885	2.69594	.37386
	female	52	.4615	1.21206	.16808
synonyms	male	52	1.3462	1.44011	.19971
	female	52	.9808	1.29085	.17901
word combinations	male	52	.88	1.491	.207
	female	52	.69	1.181	.164
Wrong choice	male	52	.98	1.075	.149
	female	52	.75	1.135	.157
Use of Arabic	male	52	.37	.864	.120
	female	52	.56	1.883	.261
Incomprehensible Words	male	52	.96	3.372	.468
	female	52	.42	1.289	.179

From the data, the distribution of errors across different categories shows varying degrees of difficulty for the students. The highest number of errors occurred in spelling, followed by synonyms and incorrect form errors. The categories with the

least errors were related to using Arabic language and incomprehensible answers.

Discussion

The findings indicated several key conclusions regarding the linguistic challenges facing first-year dental students at Al-Razi University in medical English mastery. The most frequent errors were associated to spelling, with (27.81%) of all errors, followed by syntactic errors (13.46%) and incorrect forms (13.07%). Other remarkable error types encompassed synonyms (12.63%), tenses (6.11%), and passive voice (6.68%). In addition, students struggled with word combinations, parts of speech, and multiple-choice questions, though these errors were less common.

Qualitative data from teacher observations and student interactions further stressed students' challenges in understanding medical terminology, understanding professional texts, and using grammatical rules. Students reported difficulties with tenses, sentence structure, and vocabulary, which often caused misunderstandings and incorrect answers. The resort to Arabic in answers and incomprehensible or illegible responses were also observed, though less common.

Regarding the gender factor, there were some gender differences noticed, with slightly more errors committed by male students on average than those by female students, particularly errors related to spelling, syntactic errors, and parts of speech. This result contradicts previous studies, as in Almoallim et al. (2010), which claimed that female students frequently encounter greater challenges in mastering English.

Comparison with Related Studies

The results of this study agree with and disagree with previous research in many aspects. For example, the high frequency distribution of spelling errors is consistent with Abdul Haq's (1982) conclusions, which recognized spelling as a key challenge for Arab students. In the same way, the difficulties with tenses and sentence structure

confirm Fitriani's (2018) examination of syntactical errors between nursing students.

However, this study contrasts to Almoallim et al. (2010), who found out that English was rated as the most difficult subject for female medical students in Saudi Arabia, but it was rated second for male students. In the contrary, the present study concluded that male students committed slightly more errors than female students, proposing potential differences in attention to detail or exposure to written language.

The difficulties with vocabulary and medical terminology align with Zaidi et al. (2022), who found that medical students' major barrier was weak linguistic skills. Similarly, the challenges with word combinations and collocations echo Hamza's (2015) conclusions, which emphasized vocabulary limitations as a major problem.

The qualitative insights from this study also echo Maharani et al. (2020), who claimed that memorizing the pronunciation of difficult words doesn't make an obstacle for students but they often struggle with spelling, particularly for multisyllabic words. This study also highlights the effect of limited vocabulary on students' capability in understanding exam questions and providing accurate responses.

Significance of the Comparison:

The comparison with previous studies emphasizes the universality of certain linguistic difficulties faced by EFL medical students, such as spelling, grammar, and vocabulary. Nevertheless, the unique setting of this study—focusing on Yemeni dental students—shows specific challenges that may not be fully examined in broader studies. For instance, the high frequency of synonym errors and incorrect forms implies that instruction should be more directed particularly in medical terminology and word usage, which may be more marked in this population because of inadequate exposure to English in non-academic environments.

The gender differences found in this study also urge the necessity for designed

teaching strategies. The focus of previous studies was on female students' challenges, but this study suggests the need for more additional emphasis and support for male students particularly spelling and syntax aspects. The implications of this finding are significant for designing curriculum, as it calls for gender-sensitive methodologies to language teaching.

Moreover, the qualitative insights stress that addressing both tested and untested linguistic barriers is very important. For example, although the exam identified specific types of error, students reported additional difficulties, such as inability to understand complex syntactic structures and apply grammatical rules in real-world situations. This calls for the importance of using a more holistic approach to EMP instruction, in which grammar, vocabulary, and practical language use are integrated.

Implications for EMP Instruction

To improve EMP instruction, several implications can be inferred from this study:

1. **Targeted Grammar Instruction**: Concentrated lessons on spelling, tenses, parts of speech, and syntactic structures should be incorporated to tackle the most common errors.

2. **Vocabulary Building**: Exercises, tasks and activities should be designed to improve students' familiarity with medical terminology and word combinations, and context-based learning methods should be used.

3. **Interactive Learning**: more opportunities should be increased for spoken communication and practical language use using role-playing, group discussions, and case studies.

4. **Gender-Sensitive Approaches**: Instructional strategies should be developed to address the male and female students' specific needs, according to their observed challenges.

5. **Comprehensive Assessments**: exams should be designed to imitate real-world

medical situations, and students should be provided with opportunities that enable them to practice their language skills in practical situations.

By examining these areas, students can be helped overcome linguistic challenges, enhance their academic performance, and equip them for successful jobs in English-based medical situations.

Conclusion

Research Findings:

This study explored the linguistic challenges encountered by at Al-Razi University in Yemen, with reference to their errors in medical English. The analysis showed that students struggle significantly with **spelling**, which accounted for **27.81%** of all errors, followed by syntactic errors (13.46%) and incorrect forms (13.07%). Other remarkable error types encompassed synonyms (12.63%), tenses (6.11%), and passive voice (6.68%). In addition, students struggled with word combinations, parts of speech, and multiple-choice questions. Qualitative insights from teacher observations and student interactions also underscored difficulties in understanding medical terminology, applying grammatical rules, and interpreting professional texts.

The study also pointed out that there are differences in gender, where male students commit slightly more errors than female students do, particularly in spelling and syntax. This finding is in contrasts to some previous studies, calling for gender-sensitive instructional strategies. Overall, the findings assert addressing both general and specialized linguistic skills is so important that to students' proficiency in medical English can be enhanced.

Research Limitations:

Although this study presents many valuable insights related to the linguistic

challenges facing Yemeni dental students, it has several limitations. First, the exclusive focus on one Yemeni university first-year dental students limits the possibility of generalizing of the conclusions to other medical specialties or educational settings. Second, the data collection was conducted mainly through a mid-term exam and teacher observations, and this may not completely cover the range of linguistic challenges faced by students in real-world medical contexts.

Furthermore, reliance of the study on self-reported data from students during interactive meetings may be subject to bias or inaccuracies. Though the sample size was adequate for this study, it was relatively small, and future research could need larger and more diverse participant groups. Finally, the study explored one year impact but not the long-term impact of linguistic challenges on students' academic performance or professional outcomes, which could bring about in deeper insights into the effectiveness of EMP instruction.

Future Research Directions:

Based on the findings of this study, future research should study linguistic challenges in other medical disciplines, such as nursing, pharmacy, and general medicine, to gain a more comprehensive understanding of the difficulties encountered by EFL students in medical instruction. To provide valuable insights into the role of cultural and institutional factors in determining students' language proficiency, more comparative studies either between different universities or countries should be conducted.

In addressing the specific linguistic needs of medical students, further research should explore the effectiveness of targeted interventions, such as vocabulary-building exercises, enhanced grammar instruction, and interactive learning methods. Longitudinal studies could be useful to assess the long-term impact of these interventions on students' academic performance and professional proficiencies.

Finally, future studies should investigate the use of technology in EMP education, such as the use of language-learning apps, online resources, AI, and virtual simulations, so that students can be provided with more flexible and engaging learning opportunities. If these research gaps are addressed, more effective strategies can be developed by instructors and policymakers to support the linguistic and academic success of medical students worldwide.

Implications for Practice:

The study's findings provide important implications for EMP instruction, targeted grammar instruction, vocabulary-building exercises, and interactive learning methods should be prioritized by instructors to address the specific linguistic challenges recognized. Students' proficiency in medical English can be also enhanced by extending lecture durations, increasing practice opportunities, and fostering supportive learning environments.

By addressing these issues, educational institutions can better qualify students to meet the demands of the medical profession, ensuring they have the language skills required to be successful in their studies and future jobs. This, in turn, can improve healthcare outcomes, as future medical professionals will be better prepared to communicate effectively with colleagues and patients in English.

A List of Abbreviations

EFL: English as a Foreign Language

EIDEWS: Electronic Integrated Disease Early Warning System – A digital system used for monitoring and detecting disease outbreaks early, often implemented in public health surveillance.

EMP: English for Medical Purposes.

ESP: English for specific purposes.

SPSS: Statistical Package for the Social Sciences – A software widely used for statistical analysis in social sciences, business, health sciences, and other fields.

Declarations

Funding: The authors declare no competing interests.

Human Ethics and Consent to Participate declarations:

This study is part of a curriculum development initiative aimed at improving English for Medical Purposes (EMP) instruction within a formal educational setting. It is purely linguistic in nature and does not involve any medical interventions or sensitive personal data. Therefore, formal approval from an ethics committee was not required. However, the research was conducted in line with institutional academic policies and ethical best practices in linguistics and education.

Consent: Students gave their oral consent after they were told about the study's purpose.

Data availability

The data that support the findings of this study are available from the authors upon reasonable request.

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Table Legends:

Table 1. Error Types and Their Frequencies:

A detailed breakdown of error types, their totals, and frequencies as a percentage of the total errors (1751).

Table 2. Group Statistics by Gender:

A comparison of error means between male and female students across various error categories, including spelling, syntactic errors, parts of speech, and others.