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Medical Students' Perceptions of ChatGPT Integration in English Medium Instruction: A Study from Saudi Arabia

Omar Mansour Alqarni [1] **, *Samantha Curle*** [2,3] **, *Hassan Saleh Mahdi*** [4] **, *Jamal Kaid Mohammed Ali*** [1*]

[1] *Department of English Language and Literature, College of Arts and Letters, University of Bisha, Bisha, Saudi Arabia*

[2] *Department of Education, University of Bath, Bath, UK*

[3] *English Language and Literature Department, Khazar University, Baku, Azerbaijan*

[4] *Faculty of Language Studies, Arab Open University, Riyadh, Saudi Arabia*

ABSTRACT

ChatGPT has significantly impacted various educational sectors, including English-medium instruction (EMI). This study explores perceptions of Saudi medical students at the University of Bisha on integrating ChatGPT into their EMI coursework, focusing particularly on its influence on their comprehension and application of medical terminology in English. Employing a descriptive research design, this research collected data from 54 students using both quantitative and qualitative methods. Data collection was facilitated through a questionnaire administered via Google Forms, with responses analyzed statistically using SPSS and qualitatively through thematic analysis. Results indicate a positive student reception towards ChatGPT, particularly its role in enhancing their understanding of medical English. These findings suggest substantial pedagogical benefits, proposing that meticulous integration of ChatGPT could significantly improve EMI in medical education. The study highlights ChatGPT's capability to aid students in grasping complex medical terms and concepts, stressing the importance of strategic deployment to maximize educational outcomes. Furthermore, this research underscores the necessity for ethical guidance to enable students to critically evaluate the accuracy of information, thus mitigating dependence on potentially erroneous AI outputs. This study establishes a foundational framework for the future integration of ChatGPT in EMI, contributing innovatively to the field.

*CORRESPONDING AUTHOR:

Jamal Kaid Mohammed Ali, Department of English Language and Literature, College of Arts and Letters, University of Bisha, Bisha, Saudi Arabia; Email: jgmali@ub.edu.sa

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1. Introduction

ChatGPT, an AI-based tool powered by deep learning, simulates human-like text generation and analysis [1, 2]. It has been extensively integrated into educational and language learning research, where it is celebrated for its contextual understanding and capacity to deliver precise, actionable responses [3–6]. ChatGPT supports a range of educational functions, from enhancing teaching methodologies to aiding students in comprehension, research, and problem-solving [7].

Recent investigations into ChatGPT's application in English language teaching reveal its dual potential to both enhance and challenge the learning process. It is well-regarded for boosting language skills, providing immediate feedback, and supporting academic writing [3, 6, 7]. However, its impact varies with its implementation within educational frameworks.

Furthermore, studies evaluating ChatGPT's utility in non-English settings reveal limited scopes, such as analyses of responses to Chinese queries by Guo and Li [8] and Japanese medical exam preparation by Kasai et al. [9]. These studies indicate that comprehensive evaluations of ChatGPT's effectiveness across varied linguistic tasks are lacking.

The exploration of ChatGPT's role in English-medium instruction (EMI) marks a significant advancement, especially in regions where English is not the primary language [10–12]. Research conducted in Asian contexts has demonstrated ChatGPT's effectiveness in enhancing educational outcomes, as seen in Japan and Taiwan where it has improved student writing and facilitated teacher development [13, 14]. This research extends these insights to the Saudi context, addressing the increasing relevance of EMI in universities and the concurrent AI advancements [15]. It aims to fill the gaps observed in previous studies, which often relied on a single research approach or mere literature reviews [5, 16–21].

EMI's role in education, especially in sectors requiring precise language skills like medical education, is still contested, with ongoing debates about its effectiveness [22]. Prior studies have not fully addressed the unique needs and perceptions of medical students in EMI environments [10, 23]. This study is pioneering in its focus on how ChatGPT can alleviate the challenges Saudi students face in EMI settings, evaluating both the potential advantages and limitations of this AI tool in improving language comprehension and academic performance.

Research Questions

1. What is the perceived effectiveness, reliability, ease of use, preference, and frequency of ChatGPT integration as a tool for English-medium instruction (EMI) among Saudi ESP students?
2. How do Saudi ESP students perceive the use of ChatGPT for learning medical terminology?

2. Literature Review

ChatGPT, a large language model, has quickly become a focal point of discussion [4]. In the medical field, its application is still being discovered by many physicians who are assessing its benefits and risks [24]. Medical students generally have a positive perception of ChatGPT, while faculty members approach its integration with caution [16, 24]. Although ChatGPT faces challenges in contextualizing teaching and instructing interpersonal skills, it has been recognized as valuable for enhancing medical education [25]. Thus, the integration of ChatGPT into medical syllabi is advocated for its assistance in exam preparation, clinical problem solving, and research [25].

2.1. Theoretical Framework

The integration of ChatGPT into educational processes is supported by several studies [18, 26–29]. Hatmanto and Sari [26], and Zhang [29] discuss its foundation in learning theories such as Constructivism and the Communicative Approach, which promote learner autonomy and active engagement. Su and Yang [28] introduced the IDEE framework, which focuses on identifying desired outcomes, determining the appropriate level of automation, ensuring ethical considerations, and evaluating effectiveness. This framework emphasizes effective feedback and personalized learning

during the integration of ChatGPT into educational settings. Moreover, Bin-Hady et al.[18] developed the AIALL model, which advocates for flexible teaching roles, enjoyable learning experiences, increased learner autonomy, and the encouragement of future innovations. These theoretical frameworks support the integration of AI in English language teaching. Our research seeks to bridge the gap by proposing a model that specifically addresses the use of ChatGPT in EMI contexts.

2.2. ChatGPT and English Medium Instruction

ChatGPT is transforming educational practices by enhancing learning experiences and improving student outcomes. It supports personalized learning paths, adaptive assessments, and real-time feedback, which contribute to heightened student engagement and academic performance[30, 31]. In language learning, ChatGPT enables targeted practice opportunities and more efficient learning processes[32]. It also facilitates access to digital resources and provides personalized guidance for skill development. By automating administrative tasks, ChatGPT allows educators to concentrate on fostering students' critical thinking skills[30]. However, the challenges of data privacy and algorithmic bias need careful consideration[30].

Research on ChatGPT's integration into EMI has thoroughly examined its impact on English language teaching, learning, and assessment. Studies have highlighted its role in providing meaning-focused inputs, scaffolding during output production, offering feedback on language accuracy, and facilitating fluency through extensive practice[10–12]. ChatGPT is integrated into classroom lessons and intelligent adaptive learning models, providing personalized learning experiences and dynamic feedback. It also aids teachers in creating lesson plans, developing instructional materials, and offering immediate, individualized feedback[10, 33]. According to Shaikh et al.[12] and Park[11], ChatGPT effectively supports formal English language learning activities such as conversation, writing, grammar, and vocabulary, receiving positive feedback from diverse student groups. Mabuan[23] and Ali et al.[17] noted its motivational impact on students developing reading and writing skills, though its effect on listening and speaking skills varies.

While ChatGPT users often show higher motivation and performance than non-users[34], concerns about academic dishonesty and the accuracy of responses highlight potential negative impacts on learning outcomes[10, 24]. Thus, as AI technology evolves, continued research is crucial to fully understand its implications for language education and to develop best practices for its application[24, 34]. ChatGPT holds significant potential for language teaching and learning but necessitates digital competencies for ethical and effective usage[35]. Additionally, the challenge of language proficiency remains a significant barrier, emphasizing the need for robust language support systems within educational institutions[36].

2.3. ChatGPT and English Medium Instruction in Medicine

ChatGPT is utilized by medical students and is recognized for providing significant benefits such as personalized learning, customized feedback, and writing assistance[37]. This AI tool supports the development of language skills, fluency, and offers feedback and scaffolding[10, 18]. A notable benefit of ChatGPT is its role in enhancing and facilitating modeled dialogues[38, 39]. Although ChatGPT brings many advantages to medical education, challenges such as academic integrity, data accuracy, and general learning impacts remain concerns[37]. The benefits of ChatGPT are notably evident in its ability to elucidate medical terminologies and enhance dialogue and communication skills[8, 40, 41]. However, integrating ChatGPT into medical education demands careful consideration of emerging issues related to student evaluation, curriculum updates to align with AI advancements, and balancing the reliance on technology with the preservation of critical thinking and traditional teaching methods[39, 42–45].

2.4. English Medium Instruction in Saudi Arabia

The adoption of English Medium Instruction (EMI) for medical students in Saudi Arabia presents distinct advantages and challenges[19, 46–48]. Alrajhi et al.[49] noted that EMI affords medical students better access to English-written information and facilitates job acquisition. Conversely, Irham and Wahyudi[49] observed that transitioning from Arabic Medium Instruction (AMI) to EMI can confuse students, affecting their understanding of the content and leading to reliance on rote learning strategies[50]. Despite these challenges, many

Saudi medical students and their instructors prefer EMI for medical studies [48]. Opinions on EMI at higher education levels are mixed; some view it as essential for development while others see it as promoting linguistic dominance [51]. Researchers have proposed various strategies to alleviate the challenges faced by Saudi medical students in EMI, including enhancing their English proficiency before and during their medical education [52].

The discussion on EMI in medical education underscores its complexity and the multifaceted challenges of its implementation across different educational settings [48]. While EMI provides significant opportunities for accessing global knowledge [2, 38, 53], it also introduces challenges related to language proficiency, pedagogical methods, and the perspectives of different stakeholders [46, 54]. Prior research has demonstrated that ChatGPT could potentially enhance EMI by offering personalized educational experiences and supporting educators. Therefore, addressing the operational challenges and ethical considerations linked with these technologies is crucial to ensuring their effective and fair integration into educational practices.

3. Methods

3.1. Research Design

This study explores the perceptions of Saudi medical students regarding the integration of ChatGPT in English Medium Instruction (EMI). Operating as a descriptive study, it focuses on observing and describing the effects of ChatGPT in EMI settings without manipulating any variables. It combines qualitative and quantitative methodologies to provide a comprehensive understanding of the subject, thereby enhancing the study's robustness through methodological triangulation. This mixed approach aims to mitigate the limitations inherent in using a single research design [55]. Conducted at the Faculty of Medicine, University of Bisha during the 2023–2024 academic year, the research is positioned to yield insights that could significantly inform the effective integration of ChatGPT in medical education.

3.2. Participants

The study utilized a non-probability convenience sampling method, selecting 54 participants who voluntarily agreed to participate (see **Table 1**). This sampling strategy was chosen to facilitate easy access to a diverse group of participants across various locations [56]. The participants comprised 38 males and 16 females, enrolled in various departments: Basic Medical Sciences (N = 24), Family and Community Medicine (N = 11), Internal Medicine (N = 7), Surgery (N = 7), Microorganisms and Clinical Parasitology (N = 1), Anatomy (N = 1), Pharmacology (N = 1), Nursing (N = 1), and Obstetrics and Gynecology (N = 1). The distribution across academic years was as follows: first and second years (N = 6), third and fourth years (N = 7), fifth and sixth years (N = 5), and seventh year (N = 36). Concerning English proficiency, 15 students were categorized as advanced, 23 as intermediate, three as native speakers, and 13 had not taken a proficiency test. Experience with ChatGPT varied among the participants: 16 had moderate experience, 12 had limited experience, six had extensive experience, and 12 had no experience at all. The focus of the study was on students enrolled in content-specific medical courses, excluding first-year students who were primarily engaged in general English studies.

3.3. Ethical Procedures

Ethical considerations were rigorously maintained throughout the study to safeguard participants' rights and uphold the integrity of the research. Participants received a comprehensive explanation about the study's objectives, methods, potential benefits, and associated risks. They were informed that their involvement was entirely voluntary and could be terminated at any point without repercussions. Informed consent was obtained from all participants prior to their inclusion in the study. To protect confidentiality, no personal identifiers were collected, and all data were securely stored. Stringent data protection measures were implemented, including data encryption, to prevent unauthorized access. The research protocol received approval from the University of Bisha's ethics committee, ensuring adherence to prevailing ethical standards and regulations.

3.4. Instrument

A comprehensive questionnaire was developed to assess the affordances and challenges of using ChatGPT in educational contexts (see **Appendix A**). The questionnaire

Table 1. Background information about the participants.

Variable	Category	Frequency	%
Gender	Male	38	70.4
	Female	16	29.6
	Total	54	100.0
Department	Department of Microorganisms and Clinical Parasitology	1	1.9
	Basic Medical Sciences	24	44.4
	Surgery	7	13.0
	Department of Anatomy	1	1.9
	Pharmacology	1	1.9
	Internal Medicine	7	13.0
	Family and Community Medicine	11	20.4
	Nursing Department	1	1.9
	Obstetrics and Gynaecology	1	1.9
	Total	54	100.0
Years of Study in EMI	1–2	6	13.0
	3–4	7	9.3
	5–6	5	66.7
	7	36	11.1
	Total	54	100.0
English Proficiency Level (e.g., IELTS, TOEFL if applicable)	Advanced	15	27.8
	Not applicable/Not tested	13	24.1
	Intermediate	23	42.6
	Native Speaker	3	5.6
	Total	54	100.0
Previous Experience with AI Tools in Education	Moderate	16	29.6
	None	12	22.2
	Limited	20	37.0
	Extensive	6	11.1
	Total	54	100.0

design was informed by prior research findings[2, 37, 38, 54] and structured to capture both quantitative and qualitative data. It encompassed five dimensions to facilitate a thorough investigation of the topic: effectiveness in understanding medical terms (5 items), reliability and accuracy (5 items), preferences and suggested improvements (4 items), ease of use and assistance (6 items), and frequency of use (4 items). These dimensions were selected to align the study with extensive prior research in the field.

The questionnaire began with demographic questions capturing participants' gender, level of study, English proficiency, and previous experience with ChatGPT. It included 24 close-ended questions rated on a 6-point Likert scale, ranging from 'strongly agree' (6) to 'strongly disagree' (1). Additionally, it featured six open-ended questions, providing participants the opportunity to elaborate on their experiences and opinions regarding the use of ChatGPT for studying medical terminology. The design of the questionnaire allowed for an extensive assessment of the breadth (via close-ended questions) and depth (via open-ended questions) of the phenomenon under study.

Prior to deployment, the validity of the questionnaire was scrutinized by three Applied Linguistics professors, who evaluated the alignment of the items with the research questions. Feedback from these experts led to refinements in the questionnaire, including the modification and removal of certain items. The reliability of the questionnaire was determined using the Cronbach alpha coefficient, a method recommended by Brown[56] for evaluating consistency in language and literature assessments. The overall reliability score achieved was 0.95, indicating a very high level of consistency. The reliability scores for the individual dimensions ranged from 0.91 to 0.82, underscoring the instrument's robustness (see **Table 2**).

Prior to implementation, all participants received an introductory briefing about the study, which highlighted that their participation was entirely voluntary. To ensure the clarity and functionality of all items, the questionnaire un-

Table 2. Results of Cronbach's Alpha Reliability Test.

Dimensions	N	Cronbach's Alpha
ChatGPT's Effectiveness in Understanding Medical Terms	5	0.91
Reliability and Accuracy	5	0.88
Preference and Improvements	4	0.82
Ease of Use and Assistance	6	0.91
Frequency of Use	4	0.88
Total	24	0.95

derwent a pilot phase. Feedback from this pilot phase led to several modifications, culminating in the preparation of the final version on Google Forms. This final version was distributed to students at the University of Bisha, facilitated by their instructors. It was noted by some instructors that the questionnaire was also shared extensively within student WhatsApp groups, ensuring broad participation. In total, 54 medical students completed the questionnaire, providing a diverse range of responses that were instrumental for the research.

3.5. Data Analysis

Quantitative data were analyzed using statistical methods, which included calculating mean scores and standard deviations. The reliability of the scale was assessed using Cronbach's Alpha, revealing a high level of internal consistency. For the qualitative analysis, we employed thematic analysis to examine the responses to open-ended questions. Following the guidelines set by Curle and Pun [57] and Clarke and Braun [58], we adopted a systematic coding procedure to identify themes. The process began with multiple readings of the raw data, allowing researchers to become thoroughly familiar with its content. Frequently occurring themes were then pinpointed and assigned to each response in the initial dataset. These responses were systematically organized and coded into categories. To ensure the inclusion of comprehensive data and maintain reliability, the initial analysis was revisited after a week to confirm the accuracy and consistency of the thematic findings. This step was crucial to validate the reliability and precision of the thematic analysis.

4. Results

This section is structured to address the research questions directly, beginning with an analysis of learners' perceptions through statistical measures and followed by qualitative insights derived from thematic analysis. Collectively, these findings illuminate the impact of ChatGPT on medical education in Saudi Arabia, emphasizing its effectiveness, reliability, ease of use, and overall influence.

RQ1: To what extent do Saudi ESP students perceive the effectiveness, reliability, ease of use, preference, and frequency of integrating ChatGPT as a tool for English-medium instruction (EMI) education?

Saudi ESP students report a positive perception of ChatGPT's integration into their educational experience, as indicated by an average score of (M = 4.37, Std = 0.982). Specifically, students rated the effectiveness of ChatGPT in understanding medical terms highly (Mean score of 4.78, Std = 1.04). They also expressed a strong preference for and noted improvements in their knowledge with ChatGPT (M = 4.55, Std = 1.16). In terms of ease of use and assistance, ChatGPT was rated favorably (M = 4.72, Std = 1.10).

The frequency of use and perceived reliability and accuracy of ChatGPT garnered more moderate ratings (Mean scores of 3.51 and 4.30, respectively, with Std = 1.51 and 1.16). The overall average perception score of M = 4.37 suggests a robust recognition of ChatGPT's effectiveness and reliability in the learning process, as detailed in **Table 3**. The relatively low standard deviation indicates consistency in students' perceptions across the sample.

These findings are particularly relevant for educators, who might consider these preferences when preparing course materials and lectures, integrating ChatGPT as a teaching method or learning resource. It is important to note that these results are specific to medical students at the University of Bisha and may not necessarily be generalized to other institutions or departments.

RQ2: What are Saudi ESP students' perceptions of using ChatGPT for learning medical terminology?

The response to this question was derived from qual-

Table 3. Saudi students' perceptions on the dimension of ChatGPT in English.

Dimensions	N	Mean	Std. Deviation
ChatGPT's effectiveness in understanding medical terms	54	4.78	1.04
Reliability and accuracy	54	4.30	1.16
Preference and improvements	54	4.55	1.16
Ease of use and assistance	54	4.72	1.10
Frequency of use	54	3.51	1.51
Average	54	4.37	0.982

itative data obtained through open-ended questions in the questionnaire. Analysis revealed five distinct themes that encapsulate the integration of ChatGPT in learning medical terminology, as depicted in **Figure 1**. These themes delineate the multifaceted perceptions of ChatGPT's role within the context of English-medium instruction (EMI), showcasing both its strengths and potential areas for enhancement (refer to **Appendix B**).

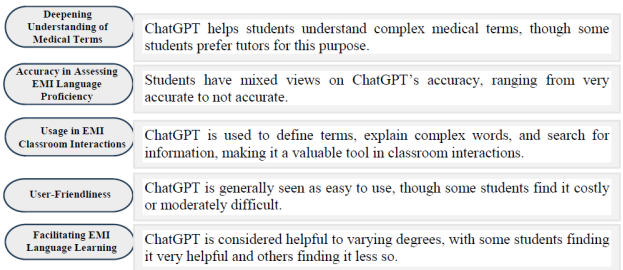

Figure 1. Thematic analysis of the open-ended questions.

4.1. Deepening Understanding of Medical Terms

Based on **Figure 1**, some students expressed that ChatGPT was less helpful for learning medical terms, pointing to a lack of trust or familiarity with the tool. This feedback indicates a need for improved integration and training to utilize ChatGPT effectively for medical terminology. Some students shared their experiences: "It did not, until now I deepen my understanding the tutors," and another commented, "I don't use it [ChatGPT] for medical terms."

On the other hand, students who found ChatGPT beneficial often described it as a powerful supplementary educational tool. These students noted its utility in breaking down complex ideas and enhancing their grasp and retention of medical terminology. Reports from these students included positive feedback on how ChatGPT aided their studies: one student noted, "It explains many anatomical terms to me in easy explanations," while another asked ChatGPT, "how the disease occurred from its beginning." Furthermore, one student used ChatGPT for obtaining definitions, stating, "If I want a definition of a medical term, ChatGPT helps me understand it." Another student highlighted its help with understanding abbreviations like "TWEAK" and "CAGE," adding, "it helped me."

4.2. Accuracy in Assessing EMI Language Proficiency

The perceptions of ChatGPT's accuracy in assessing language proficiency are mixed, reflecting its variable effectiveness. Some students regard it as highly accurate, with comments like, "Very accurate," as evidenced in four responses. Another student mentioned, "It [ChatGPT] is good for understanding abbreviations." Additionally, a third student described it as, "It's pretty good and clear to understand."

Conversely, other students questioned ChatGPT's validity. One student candidly remarked, "Not that accurate to be honest." This variation in views may stem from individual expectations, the complexity of the language tasks, or the nature of the assessments used. It indicates that while ChatGPT has potential as a supportive tool, it might require integration with other methods to fully assess and enhance language proficiency.

4.3. Usage in EMI Classroom Interactions

ChatGPT's utility in defining terms and providing examples underscores its role as a readily accessible resource for immediate clarification. One student highlighted its usefulness, stating, "asking and telling the meaning of a word with several examples." This availability is likened to having an expert on hand, as another student described, "it's like I'm asking an expert." ChatGPT's capability to elucidate complex medical terms demonstrates its potential as

an invaluable aid in comprehending intricate subject matter essential in medical education. One response illustrated this benefit: "using ChatGPT to explain complex anatomical words."

The efficiency with which ChatGPT delivers information is also highly valued by students, who appreciate the reduction in time spent searching for information. A student expressed satisfaction with the tool's performance, noting, "AI provides an excellent amount of information and examples in a short period of time."

4.4. User-Friendliness

Students generally report that ChatGPT possesses a user-friendly interface, which is vital for its adoption and regular utilization. Six students described their experience as "Very easy," underscoring its accessibility. Nonetheless, some concerns were raised regarding cost and the ease of use, suggesting that while the tool is approachable for many, there are still barriers that could hinder its broader accessibility and effectiveness. Comments from students included perceptions such as "easy but costly" and "moderate," with one noting it is "not that hard" to use.

4.5. Facilitating EMI Language Learning

Student feedback on ChatGPT's role in facilitating language learning highlights varying levels of effectiveness. Those who found it extremely beneficial praised its ability to simplify complex language constructs. One student remarked, "I think ChatGPT helps in facilitating English language learning." Conversely, students who reported it less helpful pointed out limitations in its accuracy and engagement. For instance, one student noted, "Helpful but in a limited way as medical terminology." These observations suggest that while ChatGPT can significantly aid language learning, its optimal use may require integration with other educational resources and strategies to overcome its inherent limitations.

5. Discussion

The findings offer a detailed perspective on Saudi medical students' views regarding the use of ChatGPT for English Medium Instruction (EMI) in their education. The results indicate that students highly value the integration of ChatGPT in EMI, with an average score of (M = 4.37). This high score underscores the strong recognition among students at the Faculty of Medicine of the benefits of using ChatGPT for enhancing their learning. These insights are consistent with previous research [23, 34, 35]. For instance, Mabuan [23] noted that ChatGPT enhances vocabulary expansion, writing practice, and language fluency, while Kohnke et al. [35] identified potential benefits of ChatGPT in language teaching and learning. Our study updates the current understanding of Saudi students' preferences regarding the use of ChatGPT in EMI, highlighting five advantages. This contribution is significant as it addresses questions about student perceptions at a Saudi university's medical department, offering insights for administrators and institutional stakeholders about integrating AI tools in EMI.

The thematic analysis of the qualitative data provided further insights: while some students did not find ChatGPT useful or did not employ it for learning medical terms, others valued its capability to demystify complex concepts. This contrast points to the necessity for enhanced training and integration strategies to optimize the tool's effectiveness.

Students who reported not using ChatGPT for learning medical terms may have been influenced by concerns that ChatGPT might foster inaccuracies and stifle human creativity. This observation aligns with findings from Dillon et al. [59], who reported difficulties for students transitioning from Arabic Medium Instruction (AMI) to EMI, particularly in adapting to new learning modalities. Similarly, other research [50] suggests that the abrupt switch from AMI to EMI can lead to a superficial understanding of content and reliance on rote learning strategies. The reluctance to use ChatGPT could also stem from existing concerns about its potential for academic dishonesty, inaccurate responses, and negative impacts on learning outcomes [10, 24].

Despite reports of general ease of use, concerns regarding cost and usability barriers for some users must be addressed to ensure broader and more equitable access. Students found ChatGPT helpful in deepening their understanding of medical terms. This observation is supported by Xu et al. [37], who noted that medical students find ChatGPT beneficial, offering personalized learning, customized feedback, and writing assistance. These findings resonate with those of Spero [14], who highlighted the significant role of ChatGPT in

assisting Japanese EMI students by enhancing their writing skills and aiding in various language-based tasks.

Another notable student perception is the accuracy of ChatGPT in assessing language proficiency within EMI settings. This view is echoed by Alrajhi et al.[48], who observed a preference among Saudi medical students and their teachers for studying medical content in English. Additionally, Bin-Hady et al.[18] and Meniado[10] reported that ChatGPT supports student learning by developing language skills, fluency, and providing feedback and scaffolding.

Students also expressed that ChatGPT enhances classroom interactions within EMI contexts, suggesting that it facilitates communication among students, allowing them to ask questions and receive feedback from peers and instructors. This utility aligns with findings by Meniado[10–12], who described ChatGPT as a scaffolding tool useful during output production, enhancing language accuracy, and promoting fluency through extensive practice.

The user-friendliness of ChatGPT was frequently highlighted, with students reporting easy interaction with the AI tool. This user-friendliness suggests that students are adept with technology, utilizing new tools for their lifelong learning. This aligns with findings from Sakirin and Said[60], who observed that students prefer the ease and friendliness of ChatGPT over traditional learning methods. Further, the integration of ChatGPT in EMI settings was seen to facilitate language learning, a benefit underscored by Javaid et al.[38] and Wu et al.[39], who both highlighted the substantial potential benefits of ChatGPT in enhancing learning processes.

Pedagogical Implications

The findings suggest significant implications for policy and educational practice. Policymakers in the medical education sector are encouraged to consider the integration of AI tools like ChatGPT into the curriculum, accompanied by the establishment of ethical guidelines and comprehensive training programs. These training programs are crucial to familiarize students with the effective use of ChatGPT for learning medical terms and to bridge the gap in trust and usage frequency. Educators are advised to utilize ChatGPT as a supplement to enhance learning rather than as a replacement for traditional methods. It is vital to train students to critically evaluate the information provided by AI tools and to confirm its accuracy. Such training will aid in developing critical thinking skills and help students avoid dependency on potentially inaccurate information.

Furthermore, ongoing professional development for educators on the effective integration of AI in teaching is essential to keep abreast of technological advancements. To ensure a thorough evaluation of language proficiency, ChatGPT should be used in conjunction with other assessment methods. Efforts should also focus on reducing cost barriers and improving the tool's usability to ensure wider access. Integrating ChatGPT as part of a comprehensive suite of learning resources will maximize its benefits and address its limitations effectively.

6. Conclusion

This study explored the perspectives of medical students at the University of Bisha on integrating ChatGPT into English-medium instruction (EMI) in Saudi Arabia. The results reveal that students perceive this integration positively, acknowledging its benefits for enhancing their understanding of medical English. Nonetheless, it is vital for educators to focus on ethical considerations and encourage students to use ChatGPT as a supplement to traditional learning methods rather than a replacement. Adequate training and critical evaluation of information provided by ChatGPT are crucial to optimizing its educational benefits. The key messages from this study are: (a) ChatGPT has potential to enhance EMI in medical education, and (b) its effective utilization requires careful consideration and strategic implementation.

7. Limitations and Further Research

The study acknowledges several limitations due to its methodology. Utilizing a convenience sample from a single university may limit the generalizability of the findings. Future research should aim to include a broader, more diverse sample from multiple institutions to enhance representativeness. Additionally, reliance on self-reported data may introduce bias. Despite these issues, our study highlights the preference of Saudi students for using ChatGPT for learning medical terms and facilitating classroom interactions, noting its user-friendliness. To gain a deeper understanding, future studies could employ mixed methods, incorporating interviews or focus groups with students, teachers, and policymakers. Further research could also expand to include

the perceptions of students from various specializations and explore the broader impact of ChatGPT across different educational contexts and among different stakeholders, such as educators and policymakers, to provide a more comprehensive view of its integration into EMI.

This study underscores the transformative potential of ChatGPT in medical education through English-medium instruction, highlighting the necessity for targeted strategies and robust frameworks to harness its capabilities fully, thereby enriching the learning experience and broadening the educational horizons for future medical professionals.

Author Contributions

Conceptualization, O.M.A. and H.S.M.; methodology, validation, J.K.M.A.; formal analysis, S.C.; investigation, O.M.A.; resources, H.S.M.; data curation, S.C.; writing—original draft preparation, J.K.M.A.; writing—review and editing, S.C.; visualization, H.S.M.; supervision, O.M.A.; project administration, S.C.; funding acquisition, O.M.A. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Information about data and materials used in the study is available.

Conflicts of Interest

The authors declare no conflict of interest.

Appendix A

Statement	N	Mean	Std. Deviation
1- ChatGPT clarifies confusing medical terms in my coursework.	54	4.7222	1.17227
2- ChatGPT helps me understand complex medical terminology.	54	4.8519	1.12279
3- ChatGPT assists in explaining abbreviations and technical terms used in medicine.	54	4.7593	1.34494
4- ChatGPT aids in understanding medical terms by providing contextual explanations.	54	4.8889	1.20794
5- The responses from ChatGPT meet my expectations for comprehending medical terminology.	54	4.6852	1.19471
6- I trust ChatGPT's explanations of medical terms.	54	4.4074	1.29613
7- I rely on ChatGPT for accurate translations of medical terms.	54	4.0000	1.47942
8- ChatGPT provides reliable information in the medical field.	54	4.0185	1.52329
9- I can easily interpret ChatGPT's responses to medical terminology queries.	54	4.4259	1.39544
10- ChatGPT offers instant answers about medical learning.	54	4.6667	1.31752
11- I prefer using ChatGPT over traditional dictionaries for understanding medical terminology.	54	4.5185	1.61059
12- Improvements in ChatGPT would enhance its effectiveness for medical terminology.	54	5.0370	1.11530
13- I feel confident using ChatGPT as my primary tool for understanding medical terminology in English.	54	4.3889	1.48472

Statement	N	Mean	Std. Deviation
14- I favour ChatGPT over other online dictionaries for understanding medical terminology.	54	4.2778	1.50993
15- ChatGPT's interface is user-friendly and easy to navigate.	54	5.0926	1.16988
16- ChatGPT effectively assists in exploring various medical terminologies.	54	4.7037	1.19163
17- ChatGPT is helpful in differentiating similar-sounding medical terms such as sore and sore.	54	4.5556	1.51305
18- ChatGPT provides ample examples to aid comprehension of medical terminology.	54	4.6296	1.33595
19- ChatGPT guides my understanding of complex medical terminology.	54	4.5000	1.37017
20- ChatGPT can be integrated into educational institutions' learning management systems to support students and educators.	54	4.8704	1.31818
21- I use ChatGPT as a medium of instruction during presentations.	54	3.3519	1.81355
22- I regularly use ChatGPT as a supplementary tool for explaining medical concepts in class.	54	3.3333	1.70460
23- I engage with ChatGPT for additional medical learning support outside regular class hours.	54	3.8148	1.78118
24- I use ChatGPT for discovering new learning methods.	54	3.5556	1.70091
Valid N (listwise)	54		

Appendix B

Themes, Categories of Students' Responses on Using ChatGPT in EMI		
Research Questions	**Codes**	**Initial Response**
1. ChatGPT helped deepen understanding of medical terms	1. No instance	1. No instance [7] 2. I don't use it for medical term 3. It did not, until now I deepen my understanding the tutors 4. It is nice, but most of the terms are not clear.
	2. Explain the meaning of complex ideas	1. There was a complicated 2 lines in one of my lectures and I had repeated it several time but I couldn't get it out, and then I searched by using ChatGPT and I asked with the words (explain it to me with examples) 2. ADH and pituitary gland 3. When this is an article that I don't understand I let ChatGPT to explain it 4. It explains the term accurately 5. It explains many anatomical terms to me in easy explanation 6. Meaning of blocking antibodies 7. When I want to translate, medical term into English explanation better than Arabic meaning, or explanation 8. As if asking ChatGPT about how the disease occurred from its beginning 9. If I want a definition of a medical term, GBT Chat helps me understand it 10. I tried to understand some abbreviations like (TWEAK, CAGE) and it help me
2. The accuracy of ChatGPT in assessing English EMI language proficiency	1. Very accurate	1. Very accurate [4]
	2. Accurate	1. It is accurate [4] 2. It is good for understanding abbreviations. 3. It's pretty good and clear to understand 4. Maximum of 80% specially in medical field
	3. Moderate	1. Moderate [2]
	4. Low	1. Not that accurate to be honest 2. Idk
3. Ways of using ChatGPT in EMI classroom interactions to master of medical terms	1. Giving meaning of terms	1. Asking and telling the meaning of a word with several examples 2. it's like I'm asking an expert 3. Description, interpretation, and exampling
	2. Explaining complex medical words	1. Using ChatGPT for explains the complex anatomical words. 2. Using ChatGPT for helping the students by give them a questions and tests about any subject Like (RNA Viruses).

Themes, Categories of Students' Responses on Using ChatGPT in EMI		
Research Questions	**Codes**	**Initial Response**
3. Ways of using ChatGPT in EMI classroom interactions to master of medical terms	3. Searching form information	1. AI provides an excellent amount of information and examples at short period of time 2. Saving time searching 3. Searching for information 4. Class challenge between students, like who's the first student translate this abbreviation and so on 5. Saving you time from getting into multiple websites and different sources to get any information
4. ChatGPT is a user-friendly in facilitating EMI language learning support	1. Very easy	1. Very easy [6] 2. Very easy, but not very accurate and reliable
	2. Easy	3. Easy but costly 4. Good for the most part 5. Easy [5] 6. I bet it's easy to use just 1 tried it
	3. Moderate	1. Moderate 2. not that hard 3. I think 50 out of 100.
	4. Difficult	1. Not easy to use it
5. ChatGPT is helpful in facilitating EMI language learning support	1. Very helpful	1. I think ChatGPT helping in facilitating English Language learning by explain any difficult word and sentence or Paragraph or text in a simple way and simple answer, either the basic language of the student or the English 2. It's very important cuz we can ask for any information about any question at any moment 3. Time saving method 4. It is helpful for quick access 5. Very helpful [6] 6. Very useful and trustworthy 7. Enormous
	2. Moderate	1. It might be helpful but I think (not that much because it is not that accurate and using it sometimes can be very boring) 2. Helpful but unlimited way as medical terminology is very difficult for GP chat to master it 3. Moderate [2] 4. Somewhat useful
	3. Little helpful	1. Little helpful 2. Not much helpful

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