

Difficulties in Learning Medical Terminology: The Public Authority for Applied Education and Training's Science Colleges

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Abstract: *Learning medical terminology is an essential part in any students' learning journey, as it is a crucial cornerstone in their future careers. However, the learning process of these medical terms is not always a pleasant experience that is free of difficulties. Learning medical terms, which are from Latin/Greek origin, are somewhat challenging to all students, particularly those whose first language is not English. This research aims to explore any difficulties that Kuwaiti students face when learning these terms. The participants were from PAAET's two science colleges, and data were collected from a sequential mixed-method design; the first phase involved a questionnaire where 185 students took part. The second phase involved semi-structured interviews with six students. The findings revealed that the majority of students had difficulties in learning medical terms, and these difficulties had several effects on their academic attainment and learning experiences. The findings also showed that students implement several strategies to help them overcome any obstacles they face when learning these terms.*

Keywords: English learning, terminology learning, education

INTRODUCTION

Vocabulary is an integral part of language learning, as it is not possible to speak without a variety of words (Zimmerman, 2006). Therefore, learning vocabulary is important for learners to master

the English language. As Nation (2006) states, if learning structure is the backbone of language, then vocabulary is considered the flesh and the vital organs. Vocabulary is crucial to the four language skills, listening, speaking, reading and writing. The difficulty of learning vocabulary relies on different aspects such as the learner's current level, the teaching methods, and the difficulty of the language (Suardi & Sakti, 2019).

Vocabulary is central to the development of learning a language, without it, learners are not capable of understanding and/or communicating with others. As the learners' language progresses, they will need to develop greater vocabulary fluency and find their own learning strategies to increase their vocabulary intake (Liando, Adam, & Londa, 2018). Acquiring vocabulary is a major step in learning a language; thus, it is essential for learners to acquire effective ways to increase their vocabulary intake, which ultimately eases their language learning journey.

Medical Terminology

Medicine, similar to other professions, requires a certain jargon in order for students to function properly in a professional setting. Increasing their medical terminology is a necessity as it is needed to communicate with other professionals, patients, and also for other related usage such as writing reports or reading related medical literature. However, learning medical terminology adds an extra burden on language learners, as it consists of many Greek and Latin word roots. Since students already have difficulty adjusting to the English language, they need now to understand words that have no relation to the original English terminology.

Medical terminology mainly consists of prefixes, suffixes, word roots and combining vowels (Chabner, 2022). The root of the words determines the meanings, whilst the prefixes and suffixes alter the meaning or define the part of speech. Teachers usually teach students these parts to help them understand the medical terms, but it remains a significant challenge for students to recognize the parts that build up these words (Dao & Nguyen, 2023).

Although learning the building structures of medical words can be helpful for students, it still poses several challenges. As Dao and Nguyen (2023) explain, some difficulties arise due to the nature of medical terms including a large number of low-frequency words and new created terms. Thus, it would be efficient to teach them new learning strategies rather than explaining every term they encounter. Furthermore, more difficulties face students as abbreviations in medical terms are not easily traceable from the English language.

Components of Medical Terms

As stated above, there are four components of any medical term (root, prefix, suffix, combining vowel), with a minimum of one-word root, with the root being the center block of most of the medical terms, and these roots stem from Greek or Latin origin. Furthermore, as Yang (2005) illustrates, typically Latin roots represent anatomical structures and Greek roots represent a

diagnostic, remedy, illness, or condition. Students need to understand these components to better understand medical terms and help them dissect and connect them.

As Alahmed (2024) explains further, the prefixes are located at the beginning of a word root to help modify it and provide additional information to the term by indicating a time, location, type, or quantity. Moreover, suffixes are at the end of a word root and serve to alter or provide a new meaning to the previous one. They typically represent an illness and/or its symptom, or a surgical diagnostic process. Finally, there is a combining form, which is a combination of a vowel (usually an 'o', or sometimes an 'I') and a word root. The combining vowel allows one or more-word parts to join together, either by adding a suffix or using one or more word roots.

Challenges in learning medical terms

Learning medical terms could result in several challenges and difficulties due to its unique structure, complicated words and its origin from Greek or Latin, which is not familiar to many students. The challenges and difficulties increase when students are not non-native speakers of English, which adds to the burden of trying to learn the language itself and the new difficult medical terms. Since medical terms are usually low-level frequency words, students need to develop suitable vocabulary learning strategies to enable them to learn them.

However, the difficulties and challenges that students face when learning these terms are different and varied, ranging from several disciplines, either being cognitive, linguistic, pedagogical, or psychological challenges.

Cognitive Challenges

1. Memory Load

Medical terminology often consists of lengthy and complex terms derived from Latin or Greek. The cognitive load required to memorize these terms, along with their meanings, pronunciations, and applications, can overwhelm students. Sweller's Cognitive Load Theory suggests that excessive information processing can hinder learning outcomes (Sweller, 1988). Studies have shown that the volume of new terms introduced in a short period contributes to difficulty in retention (Rohrer & Pashler, 2007).

2. Retention and Retrieval

Retaining medical terms requires consistent reinforcement. Research indicates that students struggle with long-term retention due to insufficient spaced repetition and practice (Brown, Roediger, & McDaniel, 2014). Additionally, the similarity between terms, such as "hypertension" and "hypotension," exacerbates confusion and retrieval difficulties (Larsen, Butler, & Roediger, 2009).

Linguistic Challenges

1. Complex Etymology

Many medical terms are derived from Latin and Greek, which are unfamiliar to most students. This unfamiliarity creates additional barriers to understanding and memorizing terms (González, Villalobos, & Jiménez, 2019). Moreover, the use of prefixes, roots, and suffixes in medical terminology often requires students to decode meanings, which can be daunting for those without prior linguistic training.

2. Pronunciation and Spelling

Pronouncing and spelling medical terms correctly are major hurdles. Mispronunciations can lead to misunderstandings in clinical settings, emphasizing the importance of mastering this skill. Research highlights the lack of systematic instruction in pronunciation as a key contributor to students' difficulties (Mayer & Moreno, 2003).

Pedagogical Challenges

1. Teaching Approaches

Traditional methods of teaching medical terminology often rely on rote memorization, which fails to engage students meaningfully. According to Wittwer and Renkl (2008), instructional methods that lack contextual or practical applications are less effective. Students often report difficulty in connecting abstract terms to real-world scenarios, reducing their motivation and engagement.

2. Limited Use of Technology

While digital tools and apps for learning medical terminology exist, they are underutilized in many educational settings. Studies show that interactive tools, such as flashcards and gamified learning platforms, improve engagement and retention (Mayer, 2002). However, the integration of such tools into curricula remains inconsistent.

Psychological and Emotional Challenges

1. Anxiety and Stress

The pressure to learn and apply medical terminology accurately contributes to anxiety among students. This anxiety can impede cognitive functioning, making it harder to focus and retain information (Thistlethwaite et al., 2012).

2. Self-Efficacy and Motivation

Low confidence in mastering medical terminology can demotivate students, particularly those with weaker language skills. Vygotsky's theory of the Zone of Proximal Development emphasizes the importance of supportive learning environments to build confidence and competence (Vygotsky, 1978).

METHODOLOGY

Research Questions

- 1) What are the difficulties that students face when learning medical terms in English?
- 2) Do these difficulties have any academic, psychological and/or other effects on students?
- 3) How do students cope with these difficulties?

Setting

Data were collected from students at the two science colleges at the Public Authority for Applied Education and Training, the College of Nursing and the College of Health Sciences. One of the objectives of these two colleges is to equip students with the necessary medical knowledge. Therefore, students at these colleges take a minimum of three English for Specific Purposes (ESP) courses so that they have more exposure to the medical terminology, and any related terms needed to help them in their professional settings.

Data Collection and Participants

This research used a sequential mixed-method design, by using a questionnaire in the first phase and followed by semi-structured interviews. This research design is in line with the exploratory nature of this research. The purpose of a mixed-method design is to provide a wider scope of the phenomenon (Bryman, 2012), and, as Mertens (2010) explains, this design is more valuable when the examining an issue that is embedded in a complex educational context.

The first phase involved 184 male and female participants from both science colleges at PAAET. Participants were chosen through a random sampling process. The second phase, semi-structured interviews, involved six participants, three females and three males from different years of study. The participants in the second phase were chosen through purposive sampling criteria, whereby they completed the questionnaire and were willing to participate in the interviews.

Both data collection tools were conducted in Arabic, so the participants were able to understand and express themselves better.

RESULTS

In this study, the questionnaire had three important segments: the difficulties that students faced when learning medical terms in English, what techniques or strategies did they implement when they faced such difficulties, and the effects of these difficulties on students learning experiences and outcomes. The semi-structured interviews involved similar segments.

Difficulties Students Face

The results showed that students faced several difficulties when learning new medical terms in English, as shown in Table 1.

Table 1. Difficulties Students Face

Item	Item Responses		
	Agree	Not Sure	Disagree
1. I find difficulty in understanding medical terminology in English	48%	8%	44%
2. I find difficulty in pronouncing medical terminology in English	65%	5%	30%
3. Learning medical terminology in English consumes a lot of my time	56%	10%	34%
4. I have to translate the medical terms into Arabic in order to understand them	71%	11%	18%
5. I have a hard time remembering and recalling medical terms	53%	10%	37%
6. The difficulty of medical terminology lies in its derivation from Latin and Greek	69%	21%	10%

Although the participants in item 1 were nearly exactly divided about whether they find difficulty in understanding new medical terms, there is a wider difference in item 2; 65% of the participants expressed that they find it difficult in pronouncing medical terms in English, 5% were not sure and 30% disagreed as they might have good previous knowledge/command of the English language or they could have focused on revising their correct pronunciation. Similarly, participants echoed the same difficulties in the interviews, as Aziz said:

Understanding the medical terms at the beginning is a tough task but it becomes easier with more practice and revision. However, I still have difficulties pronouncing medical terms as some of them are very long and in many cases the wording is difficult to guess the correct pronunciation.

Item 3 shows that the majority of students find that learning medical terminology consumes a lot of their time, although 34% disagree, which could be for the reason that they perceive it as part of their overall learning time. Similar findings were demonstrated in the interviews, as Sara explained:

Learning, memorizing and revising medical terminology is time consuming, and sometimes it takes time from my revision. For some of my friends it is a very long process that not only needs more time but also more effort.

Item 4 saw one of the largest agreements amongst the participants in this study, as 71% expressed their agreement that they tend to translate the medical terms into Arabic in order to understand them. However, 11% were not sure and 18% did not need to translate into Arabic and were able to learn the meanings of the words in English. The high agreement in this item could be a result of an easier learning process that students follow so as to learn words faster. As Sheikha illustrated in the interview:

I notice nearly all students write the medical word and its Arabic counterpart, this makes it easier to learn the terms and makes it easier to connect words that we already know to a new word in a new language. This makes the learning process a lot smoother.

Although the majority of students (53%) in item 5 agreed that they have a hard time remembering and recalling medical terms, there was a high percentage (37%) that did not agree to that item, and only 10% were not sure. This somewhat closeness between students agreeing and disagreeing with the statement could be the result of difference between students who put more time and effort to revise and understand those terms and those who do not. However, the findings still show that the majority of students have a hard time remembering and recalling medical terms.

Such findings in the questionnaire were also affirmed by the participants that were interviewed, as three of the participants expressed their view that they had difficulty recalling medical terms citing reasons such as long complex words and first-time encountered words. On the other hand, two interview participants did not have any issues remembering and recalling such terms, whilst one participant felt she was in middle of both views as she said the difficulty was intermediate.

The reason that could explain the participants' agreement with item 5 is reflected in item 6 whereas 69% of the participants agreed that the difficulty of medical terminology lies in its derivation from Latin and Greek, 21% were not sure and 10% disagreed. This was also affirmed in the interviews by five out of the six participants, as Ali stated:

The major difficulty of medical terms is their derivation from Latin and Greek, because they are new words, and they are nothing that we are familiar with. So, it needs time for us to familiarize ourselves with them then understand them.

Another student, Mariam, explained further:

Besides the terms being difficult, we need to understand the words in Latin/Greek, then translate and understand it in English, then do the same in Arabic so we completely understand the terms.

There seems to be a general consensus amongst students that medical terms are difficult to understand and one of the major reasons causing this difficulty in comprehension is the terms' Latin/Greek origin.

The Effects of these Difficulties

The results revealed that the difficulties students face have several effects on their academic attainment and other issues, as shown in Table 2:

Table 2. The Effects of these Difficulties

Item	Item Responses		
	Agree	Not Sure	Disagree
1. Because of the difficulty of understanding medical terminology in English, this affects my academic achievement	58%	21%	21%
2. Because of the difficulty of understanding medical terminology in English, this affects my final grades	57%	16%	27%
3. I feel frustrated when I don't understand medical terminology	68%	7%	25%

The items above show the effects of learning medical terminology on students, which could range from causing academic repercussions to psychological ones. Item 1 shows that the majority of students (58%) believe that the difficulty of medical terms effects their academic achievement, whilst 21% believe it does not and 21% are not sure. The high percentage in the latter finding could be the result of students not being sure whether the difficulty of medical terms is directly affecting their academic attainment or it could be other academic matters such as course context, and general learning process.

Some interview participants concurred with such findings, as Salem illustrated:

The time we consume in learning these medical terms could be invested in learning the whole content of our subjects, this does affect our academic achievement.

Item 2 had similar findings to item 1, whereby 57% of the participants agree that the difficulty of medical terminology affects their final grade, 16% were not sure and 27% disagreed. This was also affirmed in the interviews, as Sheikha said:

It surely affects our final grades, if I do not understand the keywords of my major then how am I supposed to understand, think, and answer exam/test questions correctly.

The findings in item 3 show that students experience some psychological effects when having difficulties learning medical terms, as 68% of the participants feel frustrated when they do not understand them. This was also reflected in the interviews, as Aziz demonstrated:

Learning is already frustrating and consumes time, so it becomes more difficult when you feel stuck with main words that are central to your major. This frustration causes more problems, as the more you are frustrated the likely we forgot the words because we feel down and disappointed.

Strategies Students Implement

The results showed the different strategies that students implemented to overcome any obstacles they might face when learning new difficult medical terms in English, as shown below in Table 3.

Table 3. Strategies Students Implement

Item	Item Responses		
	Agree	Not Sure	Disagree
1. To understand the term, I break it down into its four components (root, prefix, suffix, vowel)	78%	22%	10%
2. I read scientific articles in English to increase my understanding of medical terminology	48%	34%	18%
3. I use an English/English dictionary to understand medical terms	42%	30%	28%
4. I use an English/Arabic dictionary to understand medical terms	53%	26.5%	20.5%
5. I seek help from my colleagues to understand some medical terminology	50%	30%	20%
6. I ask the course professor about the meaning of the term if I do not understand it	82.5%	5%	12.5%

Participants in both the interviews and questionnaire discussed and revealed some of their strategies that they implemented to overcome the issue. One of the more popular ways amongst the participants was to break down the word into its four components to better understand the meaning, as the vast majority (78%) agreed. On the other hand, 22% were not sure whilst only 10% disagreed as they might follow other ways. Participants in the interviews also shared such findings, as Sara expressed:

We are taught from the beginning of our studies that we need to break down the words so it becomes easier for us to understand their meanings, and it does help. It makes it a lot easier to understand how the medical words are constructed.

Another participant, Mariam, explained further:

Such a strategy helps us to distinguish between similar words, such as tachycardia and bradycardia which makes it easier to understand the meaning and part of speech.

Another strategy that students apply is reading scientific journals to increase their understanding of medical terminology; 48% expressed their agreement with item 2, whilst 34% were not sure and 18% disagreed. The high percentage of participants not being sure could be for the reason that many do not follow such a strategy and have other ways to overcome any difficulties.

Items 3 and 4 have similar results, although item 4 has a higher percentage of agreement and a lesser percentage of disagreement. This shows that more students tend to resort to using English/Arabic dictionaries rather than English/English dictionaries. All in all, the findings show that many students resort to dictionaries to help understand the terminology.

Furthermore, in item 5, 50% agreed that they resort to their colleagues to help them understand the meaning of medical terms, 30% were not sure and 20% disagreed. Students find the help of their colleagues as a quick and more convenient way to ask freely, as Ali explained:

We discuss amongst ourselves the meaning of words, this helps us to ask freely without pressure and get different explanations from each other. Even during class we might ask quickly without interrupting our teachers.

Item 6 witnessed the largest agreement amongst the participants, as 82.5% agreed that they would ask their teachers about the meanings of words. This high percentage could be for the reason that students see their teachers as a credible and reliable source of information and also to make sure they get the proper meaning. This was also affirmed in the interviews, as Salim illustrated:

I never hesitate in asking my teachers about the terms that I do not understand, it is a reliable source and I get it straightforward from an experienced teacher.

DISCUSSION

The findings of this study have shown that students do face difficulties when learning medical terms in English, which could hinder their academic attainment and affect their learning journey. The study aimed at answering three research questions relating to the nature of the difficulties they face, what effects they have on them either academically or personally, and finally how do they cope with the difficulties they face.

In regard to the first research question, the findings have shown that the majority deal with several difficulties. The participants expressed that they had difficulties in understanding and pronouncing the medical terms, which are at the core of their studies. After graduation, they will enter their careers where these words will be a must in their communication and daily practices, so learning these words is a necessity for them to prosper. In order to master these words and build up their knowledge, one way is to use English/English and English/Arabic dictionaries not only to find meanings but also use the voice options to memorize the proper pronunciation, which is a crucial part to ensure proper understanding amongst their future colleagues and patients. As Harmer (2007) emphasized, it is important to teach students the proper phonics of words as that ultimately helps them pronounce them. Thus, it is important that teachers not only initially help students to pronounce the words properly but also to include tasks and exercises throughout the course that helps them fluently perfect the terms. Furthermore, the findings of this study are in accordance with Sari and Wardani's (2019) research at one of the universities in Indonesia, where they found that students had difficulties learning the medical terms and also pronouncing them correctly. Needless to say, memorization is important for vocabulary learning because if words cannot be remembered then they are less likely to be produced properly (Shen, 2003).

The findings also demonstrated that difficulty of these words stemmed from the fact that they are of Latin/Greek origin and they are unknown words to the students; this results in them having issues in memorization and retention. Therefore, as Najafi and Talebinezhad (2018) argue, it is important for teachers and educators to find more student-centered approaches that help students improve their usage and retention.

The final finding, related to the first research question, is students' resort to using Arabic in order to understand medical terms. Using L1 in learning English vocabulary is not a new topic, neither is it a lightly researched and discussed topic. It has been proven in many researches that students rely on incorporating their first language to ease their learning process (Othman & Abdullah, 2011). The findings of this study are in line with previous research, as Hanakova and Metruk (2017) found that students frequently asked their teachers to provide the L1 counterpart of the vocabulary they are learning, as it made them learn the words quicker and thus understand the content better and even improve their exam performance (Zulfikar, 2018).

The second research question focused on the effects of the difficulties that students faced on both the academic and personal level. It is crucial to understand that difficulties are not free of

consequences, as the effects of them could hinder students' learning journey and cause long-term negative effects such as depriving them from future opportunities, not attaining the aimed for GPA, and add more pressure to them. Ozdemir (2014) found in her study that students were frustrated by the extra pressure imposed on them from dealing with difficulties in learning words and perfecting the pronunciation of medical terms. This shift from focusing on mastering the medical content to trying to mastering the language leads to students' grades being affected.

Students ultimately strive for higher grades to open more prospects such as scholarships and getting better job opportunities. In this case, students deal with the difficulty of learning medical content in general and also the burden of learning the keywords that are the essence of this content, which is written in a language they are not highly familiar with. They feel that they add more time that goes to understanding the words (hence the language itself), rather than the content and this could lead them to underscoring in exams.

The third research question provided insights on how students dealt with these issues and what they did to help overcome any difficulties they faced whilst learning medical terms in English. One of the main strategies that students use is to break down the word to make it easier to understand, as Dao and Nguyen (2023) explain that medical vocabulary is constantly expanding, and it is not possible to teach students every single word. Therefore, it is more practical to teach students such strategies for them to infer these words and dissect them. As Nation (1994), suggests, teaching medical students these learning strategies is more effective especially when dealing with low-frequency words.

Reading scientific articles seems to have one of the lower agreements along students, although its importance must not be neglected. As Donesch-Jezo (2014) argues, reading scientific articles should be part of every ESP (English for specific purposes) course. This benefits students in increasing their exposure to scientific literature that will help them familiarize themselves with the language structures and lexis, and in return will ultimately enable students to participate in scientific discussions, deliver speeches, and write medical reports.

Another strategy that students implement was using dictionaries, as they seem to be a quick and easy option to find out the meaning of medical terms, either being English/English or English/Arabic dictionaries, according to the students' preference. Such a finding was echoed in the findings of Sari and Wardani (2019), whereby students resorted to dictionaries when trying to understand medical terms. These are beneficial because of their rich nature in information about words, their forms and meanings (Harmer, 2007).

The final finding and strategy in this research was students resorting to their colleagues and teachers for information about the medical terms. In regard to asking their colleagues, students follow this solution as it is more convenient for them to ask their peers, and they feel free to engage

in discussions if they do not understand correctly. However, asking teachers for the meaning had a much higher agreement, and this could be explained by understanding that students see that teachers will provide a more accurate meaning due to their better knowledge and experience.

Implications of the study

This study calls for better understanding of this phenomenon, as more research needs to be conducted to delve into the issue as it includes several intertwined topics that could lead to a positive learning outcome. For instance, there should, for example, be more academic focus on how to include a student's personal attempts and strategies to overcome learning difficulties of medical terminology in the curriculum. It would be best for researchers to thoroughly look into the other possible solutions that could ease students' learning experiences of medical terms, such as using more visual tools or increase class discussions regarding their meanings and attributes.

It is evident that many students have issues with learning these terms, and thus there should be more research to shed the light on what types of difficulties they face, especially in Kuwait. As the first step to fix an issue is to understand what problems are causing it. Other research should provide teachers perspectives on this phenomenon to reflect a more holistic idea of these difficulties.

CONCLUSION

This research explored the difficulties Kuwaiti students faced when learning medical terminology in PAAET's two science colleges. The findings clearly show that the majority of students are having difficulties when learning them, which also could affect their academic attainment and learning outcomes. The findings of this research should be considered as one of the early attempts to uncover this topic and more research needs to be conducted to provide more in-depth knowledge.

The findings of this research, and other similar research from around the world, seem to echo the same outcome, that students are having a hard time learning medical terminology in English. With this reoccurring confirmation of such difficulties, more research needs to be conducted in finding the best solutions to cater for students and provide them with better learning experiences.

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