

Challenges and Suggestions in the Education of Medical Terminology

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Abstract

The more proficient in English medical terminology, the more professional healthcare staff can become in more and more global working environment. They need medical terminology during their academic studies as well as in their professional settings to connect and collaborate with practitioners and researchers throughout the world. The study investigated the problems faced by doctors-to-be in learning and using medical terms at academic level in survey based research. The data was collected, analyzed and interpreted quantitatively by administering questionnaire among 97 mainstream medical students, in-service medical students and post grad students in ESP classes at University of Medicine and Pharmacy at Ho Chi Minh city, Vietnam. The findings revealed that the majority of the subjects had difficulties with Greek and Latin borrowing word parts, difficult term-structure and lack of opportunities to practice in medical context. Based on the findings, some strategies can be suggested to solve the problems by pursuing self-learning via online learning tools and peer learning.

Keywords: English medical terminology, word parts, online learning tools, peer learning

DOI: 10.7176/JLLL/96-03

Publication date: February 28th 2023

1. Introduction

No one can deny the role of English as the global communication tool to connect people from many different cultures and countries without identification of particular needs or specific people (EGP- English for general purposes). Furthermore, English has been also widely used as the instruction tool in various fields of sciences and technologies (ESP- English for Specific Purposes). ESP concentrates on a restricted use of language which is designed for specific needs of a particular group of learners and users. Medical English is a case in point. It is designed to meet the entire prerequisites of medical studies and profession. Medical lexicon which is the accepted international terminology of the discipline and the profession, is the prime need of the ESP learner and practitioner of medicine irrespective of whether his own language (Khan, 1986: 146). It's vital for all medical professionals to achieve a firm grasp of medical terminology in order to enhance their day-to-day job duties in clinical contexts. In other words, they can easily use medical terminology as a standardized language to understand what is being read, written or spoken to fulfill their healthcare roles as well as fully take part in staff communications and training. However, it seems to have a significant barrier for medical learners to acquire this essential competency. Medical terminology can be regarded as one of the most difficult language among all the other specialised languages in different fields because medical language includes very complicated long terms which seem difficult to sound, spell, remember and even understand (e.g. *encephalo-myeo-neuro-pathy*).

Studies have been undertaken to explore issues related to learning and teaching of medical vocabulary under the heads of ESP (Robinson, 1991; Salager, 1983). Medical vocabulary may raise a real obstacle even to those who are very good at English, and also to those who cannot understand the borrowings from Greek and Latin languages. Kenneth and Chuntana Methold (1975:6) argue "medical writing relies very heavily on a specialised vocabulary. most of these words cannot be usefully translated or even defined. Medical writing is often so difficult to understand, it is necessary to approach it from a variety of angles if one is to understand the ideas hidden in long words and even longer and complex terms." It has also been noticed that many medical doctors, teachers and working professionals also forget some useful words in due course of time if they don't practice a lot. And even practicing medical professional, teachers and hospital staff fail to retain what they learnt and memorized sometime earlier. (Khan, 2016).

The process of learning, mastering, and using medical terms involves several stages and ultimately leads to effective communication. Both new learners and refreshers face challenges in different aspects of medical vocabulary, such as prefixes, roots, and suffixes, and with Greek and Latin variables. All professional institutions, including medical colleges and hospitals, offer courses in medical terminology, but these courses can be difficult due to factors like vocabulary size and variation. These difficulties in using medical terms can be linked to various elements and skills in the English language, such as the sound system, spelling, grammar, structure, vocabulary, and meaning. The study aimed to identify challenges in using medical terms and the main factors contributing to these difficulties.

The present research paper is an attempt to investigate the issues preventing the learners of medicine at

UMP from understanding medical terms and then enable them to acquire the contents related to medical vocabulary. The study also helps, however to some extent, in directing the researchers and instructors to plan a better and feasible teaching strategy for medical terms.

This study aims to address the following research question:

1. Which troubles have students at UMP faced in learning medical lexicon?
2. What are the specific factors relevant to the level of difficulties of different groups of learners?

2. Literature Review

Medical terminology refers to the specialized language used by healthcare professionals to describe different aspects of the human body, diseases, and diagnoses. This terminology is used in various stages of the patient care process, from the initial visit to the discharge, and also during treatment team meetings, healthcare management meetings, nursing shift changes, and research presentations. The use of medical terminology is crucial for effective communication among healthcare professionals, for accurate diagnosis and treatment of patients, and for giving and following treatment instructions.

The success of an ESP (English for Specific Purposes) program is largely dependent on the materials used. It is important to take into account the learning needs of each individual learner, as noted by Nababan (1993), when designing the program. Munby (1978) emphasizes the close relationship between ESP materials, syllabus design, and the linguistic needs of learners. The teaching of ESP vocabulary is crucial as it serves as the foundation for the syllabus structure, according to Widdowson (2000). Vocabulary is seen as the main challenge in achieving the program's objectives, and a list of important vocabulary items has been provided as a guide for curriculum design and material production (Jones & Durrant, 2010). A well-designed course and textbook-based corpus, as suggested by Huang (2007), can improve reading comprehension in an ESP class. Flowerdew (2010) believes that multiple concordance outputs can help in understanding morphology, context, collocations, and semantics, leading to better comprehension.

Specific terms, which are not used in general English and mostly have Latin and Greek roots, are crucial for learning and using ESP (Robinson, 2009). Harding (2007) believes that a student cannot ignore these specific terms if they want to be successful in ESP.

It is understood that a better understanding of medical terminology in English can be achieved by considering the fact that many medical terms are composed of multiple parts: the root (which holds the core meaning), prefix (added before the root), suffix (added after the root), and combining vowels (placed between the roots, prefixes, and suffixes) (Rice, 2017). Some researchers believe that the most effective way to teach medical terms is through a combination of diagnostic methods, a generative model for acquiring medical vocabulary, using one's first language (L1) to teach a second language (L2), and other collective approaches (Gamal, 2013). Sinadinović (2013) argued that medical English vocabulary for academic purposes is often perceived as more challenging to learn and apply due to its specialized formation.

Medical terminology consists of various components, such as prefixes, word roots, suffixes, and combining forms. Prefixes are added to the beginning of a term to change its meaning, while the word root provides the basic meaning of the term. Suffixes are attached to the end of a medical term to modify its meaning. The combining form can be an "o" or sometimes other vowels like "e", "i", or "u". For example, a term could be just a root like "carcinoma" or "sarcoma," or have a prefix and a root like "neoplasm" or "dysfunction." Some terms have a prefix, a root, and a suffix, such as "hypoglycemia," "encephalitis," or "pericarditis."

2.1. Prefixes

A prefix is a word component borrowed from Latin that consists of two parts, "pre-" meaning "before" and "-fix" meaning "fasten." The combination of these two parts forms a component that is attached or added at the beginning of a word. For example, in the word "polyneuritis," the prefix "poly-" is added to "neuritis" to indicate "many." Not all medical terms have prefixes, but some of them do have elements added to the beginning of the word root. Prefixes are a common feature of medical terminology, and are used to alter the meaning of the term.

Pre- (before)

Post- (after)

Homo- (same)

Hypo- (under)

Hyper- (excessive)

Besides these prefixes, there are many other common prefixes that sometimes cause confusion because they have similar meanings, such as retro-peri, intra-endo, anti-contra, etc.

Other prefixes causing difficulties

Prefixes	Meanings	Words with prefixes
Intra	Within	Intravenous
Inter	Between	Intercostal

Retro-	Behind	Retro sterna
Peri	Behind	Perianal
Circum	Around	Circumcise
Sub	Below	Sub lingual
Endo	within, inside	Endoscopy
Trans	Through	Transplant
Anti	Against	Anti bacterial
Contra	Against	Contraceptic
Ab	Away, from	Abnormal
A- (an-)	Not, without, -less	Anemia
Ad	To, towards	Adrenal
Dys	Bad, not, ill, abnormal	Dysentery
Dis	Opposite	Disease
Hypo	Less, low, lack	Hypotension
Hyper	More, high, excessive	Hypertension
Micro	Small	Microscope
Macro	Large	Macrocyte
Mega	Large	Megacardia
Neo	New	Neo natal
Ante	Before	Antenatal
Pre	Before	Premature
Patho	Disease	Pathology
Post	After	Post mortem
Tox	Poison	Toxin
Re	Again	Relapse
Semi	Half	Semi coma
Di	Two, double	Diplegia
Hemi	Half	Hemisphere
Semi	Half	Semi coma
Poly	Many	Polyuria
Uni	One	Unilateral

2.2. Word roots

The root is the core or central part of a word, serving as the basis for its divisions and sub-divisions. Typically, ordinary English words only have one root. However, learners of medical terms often face difficulties in understanding words with multiple roots, such as "otorhinolaryngology," which has roots related to the ear, nose, and larynx. It is important for medical students to recognize the roots in a term and distinguish them from other word parts, as this helps in understanding the meaning of the term as a whole. Medical terms often have roots borrowed from Greek or Latin, which usually refer to body parts.

The following are some of the common roots:

Examples

Gastr (Stomach)

Cardi (Heart)

Arthr (Joint)

Cephal (Head)

Cyt (Cell)

Gyne (Woman)

Lingua (Tongue)

Thyr (Thyroid)

Dent (tooth)

Dermat (skin)

Cardi (heart)

Gastr (stomach)

Pancreat (pancreas)

The use of borrowed Greek and Latin words in medical terms can pose difficulties for learners in both retaining and using these terms in their professional work. This is especially challenging for those who are not strong in English or familiar with the derivation patterns used. The issue is not limited to the linguistic aspect of English, but also stems from the extensive use of words borrowed from two main languages, Greek and Latin.

The list of word elements from Greek and Latin origins includes a full explanation of their meanings.

However, the distinction between their origins can cause difficulties for users in selecting the appropriate one.

Table 1. *Terms having Greek and Latin origin*

Word elements	Origins		Examples
	Greek	Latin	
Stomach	Abodomin	Lapara	Laprascopy
Abdomen lapar(o)	Abodomin	Laparoscopy artery arteri(o)	Arteriosclerosis
Blood	Haemat (haem-, hem-)	Sangui	Hemorrhage
Brain	Encephal(o)	Cerebr(o)	Encephalitis
Breast	Mast(o)	Mamm(o)	Mastectomy
Heart	Cardi(o)	Cordi	Cardiograph
Kidney	Nephr(o)	Ren	Nephrology, renal
Lungs	Pneumon	Pulmon(i)	Pulmo
Tooth	Odont(o)	Dent	Dentist
Tongue	Gloss, glott	Lingu(a)	Glossitis
Urine, urinary system	Ur(o)-	Urin(o)	Urologist, urinalysis
Red	Erythr(o), rhod(o)	Rub, rubr	Erythrocyte, ruby

2.3. Suffixes

The suffix is made up of two parts, "suf-" and "-fix". The former means "after", "behind", or "beneath", while the latter means "fasten". This part of the word can be added to the end of the lexeme. For example, in the word "polyneuritis", the first part "poly-" is the prefix, the second part "neur-" is the root (nucleus) meaning nerves, and the last part "-itis" is the suffix meaning inflammation. The combination of these three elements refers to a medical condition where there is inflammation of many nerves. It is important to note that prefixes and suffixes can change the meaning of the root word, either adding, changing, or giving an opposite meaning. For example, in "useful" and "useless", "use-" is the root, and "-ful" and "-less" are the suffixes, making the two words have opposite meanings.

The meaning of a word root or combining form can be changed by attaching a suffix to its end. This results in the creation of a noun or adjective with a distinct meaning.

- itis
- osis
- oma
- uria
- emia

The following are suffixes that pose difficulties for various reasons:

Table 2. *Suffixes creating difficulties*

Suffixes	Origins	Meanings	Terms
-cyte	Greek	A hollow, a cell	Leukocyte
-ia	Greek	Diseased condition	Insomnia
-pathy	Greek	disease or disorder	neuropathy
-oma	Latin	A morbid condition, often a tumor	Carcinoma
-plasty	Greek	surgical repair	Rhinoplasty
-tomy	Greek	Surgical incision	Gastrotony
-ectomy	Greek	Surgical removal	Appendectomy
-ostomy	Greek	Surgical opening	Colostomy
-pexy	Greek	Surgical fixation	Colopexy
-algia	Greek	Pain	cephalgia
-dynia	Greek	Pain	Hepatodynia = Hepatalgia

2.4. Combining form "-o"

It is important to pay attention to spelling when breaking down medical terms. A vowel letter, usually "o," is used to separate the roots or from a suffix in the same term. However, there are rules and exceptions to consider when using this combining form with a vowel "o." When two roots or a root and a suffix come together, a vowel "o" must be used to link them.

For example:

Gastr**O**enterostomy

Cardiovascular = cardi- "root 1" + linker "-o-" + -vascular "root2"

Neurology = neur-"root" + linker "o" + -logy "suffix"

If the suffix begins with a different vowel or consonant, an "o" is required, for example in the word "Cardiology." However, if the suffix starts with the same vowel as the root word's final vowel, one of the vowels should be omitted, for example "carditis" instead of "cardiitis" or "cardioitis."

In conclusion, it is beneficial to use the connecting vowel "o" for two reasons. Firstly, it assists learners in distinguishing between the components of a term, facilitating understanding of its meaning. Secondly, it also makes it easier for foreign English students to pronounce complex medical vocabulary derived from foreign languages such as Greek and Latin.

2.5. Term pronunciation

The pronunciation of medical terms can vary and be different from what they look like, just like with general English words. For example, the word "febrile" is pronounced with a /f/ sound, despite starting with "f". There are also words that start with letters that produce the same phonetic sound, such as "physiology", which is pronounced with a /f/ sound despite starting with "ph". Some words sound like /j/ (such as "jejunum"), /k/ (such as "kyphosis"), /z/ (such as "zygomatic"), or /x/ (such as "xanthoma"). Some words like "pneumonia" and "knee" have silent letters. These variations can make it challenging for users of medical terms to correctly pronounce them.

2.6. Difficulties in learning a branch of medical study

Learning a branch of medical study can also pose some challenges, one such example is Gastroenterology, where learners face significant difficulties in learning the related terms. The following is an illustration of terms related this specific branch (Gastroenterology) that learners encounter significant difficulties in comprehending:

Table 3. *Difficulties in using Gastroenterology terms*

Gastroenterology	
Organs /Terms	Causes of difficulties
Teeth (Dent/o)	Learners are confused which one to choose
Teeth (Odont/o)	
Tongue (Gloss/o)	Confusion between the two
Tongue (Lingu/o)	
Gums (Gingiv/o)	Difficulties in pronunciation
Jejunum (Jejun/o)	
Rectum (Rect/o)	Difficult to choose
Anus and rectum (Proct/o)	
Gloss/itis	Confusion between "lingual" and "glossal"
Gloss/al	Why not /ic/ instead of /al/
Sub/lingu/al	Learners are confused which one to choose – "sub" or "hypo"
Hypo/gloss/al	
Gloss/o/plegic	Why not linguo-plegic
Esophag/eal	Why /e/ used before /al/ adjective suffix
Dys/enter/y	Why /y suffix
Col/o/pexy	Why /pexy/ and not /plasty/

From the previous terms, it is apparent that many of the challenges faced by learners or professionals are caused by borrowings from Greek and Latin languages. Moreover, a lack of proficiency in the target language, English, also adds to the difficulties. There are also difficulties in choosing between similar terms, and words with multiple roots can also be confusing. The use of adjectival suffixes such as /al/ or /ic/ also contributes to the confusion, which is also a common issue in English language.

In conclusion, studies have been conducted on the challenges faced in learning general English and medical English specifically, but there is a lack of research on the difficulties in using medical terms in the healthcare profession. This study is important because English is a crucial language in medicine.

3. Study Participants

Ninety seven mainstream and in-service medical freshmen and post grad students in three ESP classes at the University of Medicine and Pharmacy were invited to participate in the study. Among these students, sixty percent of them are from Ho Chi Minh City, the biggest city in the southern region and the other forty percent come from surrounding provinces such as Tien Giang, Binh Thuan, Cu Chi, Ben Tre, Long An, Binh Duong. Medical freshmen, aged from 18 to 20, have finished their high schools and have learnt English for about 6 years. These participants are required to successfully complete 75 hours of ESP training before graduation. "Basic

Reading in Anatomy and Physiology” is the main textbook used in their ESP classes. This book aims to provide students with basic medical terminology to explore the science of medicine. The medical terms that students gain from this book promote their comprehension and usage of English in medical contexts such as maintaining a healthy lifestyle, communicating with unwell patients, looking after the needy at home, in clinics or hospitals, and treating patients.

Whereas, post grad medical students, aged from 25 to 28, have finished their university education and have learnt English for about 8 years. These students are required to fulfil their training program for about 2 years. “A handbook for healthcare professionals” and “English for postgraduate” are the two learning materials which focus on body systems in terms of anatomy, physiology and pathology.

4. Data Collection

A self-developed questionnaire was constructed then employed to elicit the required data. The questionnaire was filled in by the subject who participated in a medical English class. The questionnaire includes five- scale (strongly agree, agree, neutral, strongly disagree, disagree) responses. The items were related to importance of medical terms, relevance of English for learning medical terms, difficulties caused by the elements: roots, prefixes and suffixes.

A total of 97 filled-in questionnaires were collected. Then the data were tabulated, graphically presented for each group and analyzed as per the need.

In order to make the questionnaire accessible to our students and to minimize the misunderstandings and confusion, we have translated the questionnaire into Vietnamese. Before the study participants were asked to complete the Vietnamese version of the questionnaire in class, an example of how to respond to the questionnaire was modelled. Frequency count and Percentage are calculated to analyze the questionnaire data.

5. Findings and Discussion

5.1 Learning difficulties faced by mainstream medical students

The data suggests that 81.3% of mainstream medical students believe that it is crucial to have a strong understanding of medical terminology in order to perform effectively in a hospital environment, particularly when communicating with specialists. 71.8% of the students also emphasized the significance of having a good command of English for managing medical terms. 37.5% of the students reported being content with the opportunities to apply their medical terminology knowledge. The results from item-8 of the questionnaire revealed that roots were identified as the most challenging aspect of learning medical vocabulary by 62.5% of the participants.

Table 4. Responses by mainstream medical students (N = 32)

No	Items of the Questionnaire	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	It is crucial to acquire knowledge of medical terms.	18 (56,3%)	8 (25%)	6 (18,6%)	-	-
2	It is important to have a good command of English in order to learn medical terms effectively.	14 (43,7%)	9 (28,1%)	4 (12,5%)	2 (6,3%)	3 (9,4%)
3	Working in hospitals requires knowledge of medical terminology.	11 (34,4%)	11 (34,4%)	4 (12,5%)	4 (12,5%)	2 (6,3%)
4	Acquiring knowledge of medical terminology is extremely challenging.	11 (34,4%)	10 (31,3%)	5 (15,6%)	3 (9,4%)	3 (9,4%)
5	Most medical terms are difficult because these are not English.	8 (25%)	8 (25%)	3 (9,4%)	7 (21,9%)	6 (18,8%)
6	A large number of terms have a Greek origin.	9 (28,1%)	8 (25%)	7 (21,9%)	4 (12,5%)	4 (12,5%)
7	There are a small number of terms with Latin roots.	10 (31,3%)	8 (25%)	9 (28,1%)	3 (9,4%)	2 (6,3%)
8	The roots are considered the most challenging aspect to learn.	13 (40,6%)	7 (21,9%)	7 (21,9%)	2 (6%)	3 (9,4%)
9	Prefixes are easier to learn than roots.	14 (43,8%)	8 (25%)	3 (9,4%)	4 (12,5%)	3 (9,4%)
10	There may be more than one suffix for the same disease or condition.	13 (40,6%)	7 (21,9%)	6 (18,8%)	3 (9,4%)	3 (9,4%)
11	A single medical term may consist of two roots and combining vowels.	13 (40,6%)	10 (31,3%)	6 (18,8%)	2 (6,3%)	1 (3,1%)

No	Items of the Questionnaire	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
12	Term practice can facilitate the learning of terms.	17 (53,1%)	10 (31,3%)	3 (9,4%)	1 (3,1%)	1 (3,1%)
13	I get enough opportunity to practice terms.	5 (15,6%)	7 (21,9%)	5 (15,6%)	10 (31,3%)	5 (15,6%)
14	Abbreviations also pose problems due to Greek connection.	13 (40,6%)	10 (31,3%)	3 (9,4%)	3 (9,4%)	3 (9,4%)
15	Medical textbooks should list the terms at the end of each lesson.	14 (43,8%)	10 (31,3%)	6 (18,8%)	1 (3,1%)	1 (3,1%)

5.2. Learning difficulties faced by in-service medical students

The data shows that a majority of in-service medical students believe that a strong understanding of medical terminology is crucial for effective work in hospitals. They acknowledge the importance of having proficient English skills for learning medical terms. A number of them expressed satisfaction with the opportunities for practicing their medical terminology knowledge. The questionnaire results indicated that roots were the most challenging aspect of learning medical vocabulary, while suffixes also caused confusion.

Table 5. Responses by in-service medical students (N = 31)

No	Items of the questionnaire	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	It is crucial to acquire knowledge of medical terms.	11 (35,5%)	10 (32,3%)	5 (16,1%)	3 (9,7%)	2 (6,5%)
2	It is important to have a good command of English in order to learn medical terms effectively.	8 (25,8%)	12 (38,7%)	4 (12,9%)	4 (12,9%)	3 (9,7%)
3	Working in hospitals requires knowledge of medical terminology.	12 (38,7%)	8 (25,8%)	7 (22,6%)	2 (6,5%)	2 (6,5%)
4	Acquiring knowledge of medical terminology is extremely challenging.	10 (32,3%)	12 (38,7%)	3 (9,7%)	3 (9,7%)	3 (9,7%)
5	Most medical terms are difficult because these are not English.	10 (32,3%)	8 (25,8%)	7 (22,6%)	4 (12,9%)	2 (6,5%)
6	A large number of terms have a Greek origin.	8 (25,8%)	9 (29%)	6 (19,4%)	5 (16,1%)	3 (9,7%)
7	There are a small number of terms with Latin roots.	9 (29%)	11 (35,5%)	4 (12,9%)	3 (9,7%)	4 (12,9%)
8	The roots are considered the most challenging aspect to learn.	11 (35,5%)	10 (32,3%)	4 (12,9%)	3 (9,7%)	3 (9,7%)
9	Prefixes are easier to learn than roots.	11 (35,5%)	12 (38,7%)	3 (9,7%)	4 (12,9%)	1 (3,2%)
10	There may be more than one suffix for the same disease or condition.	9 (29%)	12 (38,7%)	5 (16,1%)	2 (6,5%)	3 (9,7%)
11	A single medical term may consist of two roots and combining vowels.	10 (32,3%)	14 (45,2%)	4 (12,9%)	2 (6,5%)	1 (3,2%)
12	Term practice can facilitate the learning of terms.	8 (25,8%)	14 (45,2%)	5 (16,1%)	3 (9,7%)	1 (3,2%)
13	I get enough opportunity to practice terms.	8 (25,8%)	13 (41,9%)	4 (12,9%)	3 (9,7%)	3 (9,7%)
14	Abbreviations also pose problems due to Greek connection.	10 (32,3%)	10 (32,3%)	6 (19,4%)	3 (9,7%)	2 (6,5%)
15	Medical textbooks should list the terms at the end of each lesson.	9 (29%)	12 (38,7%)	5 (16,1%)	3 (9,7%)	2 (6,5%)

5.3 Learning difficulties faced by post grad students

The questionnaire data indicates that 85% of postgraduate students consider medical terms to be important to learn. 64.5% of them think that having a strong grasp of English is necessary for comprehending medical terms. 80% of the trainees believe that having a good command of English is important in a hospital setting. Only 67.7% of the employees reported having opportunities to practice medical terms in English.

Table 6. Responses by post grad medical students (N = 31)

No	Items of the questionnaire	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	It is crucial to acquire knowledge of medical terms.	15 (44,2%)	14 (41,2%)	2 (5,9%)	2 (5,9%)	1 (2,9%)
2	It is important to have a good command of English in order to learn medical terms effectively.	14 (41,2%)	11 (32,4%)	5 (14,7%)	3 (8,8%)	1 (2,9%)
3	Working in hospitals requires knowledge of medical terminology.	15 (44,2%)	12 (35,3%)	2 (5,9%)	3 (8,8%)	2 (5,9%)
4	Acquiring knowledge of medical terminology is extremely challenging.	12 (35,3%)	12 (35,3%)	4 (11,8%)	4 (11,8%)	2 (5,9%)
5	Most medical terms are difficult because these are not English.	10 (29,4%)	12 (35,3%)	7 (20,6%)	3 (8,8%)	2 (5,9%)
6	A large number of terms have a Greek origin.	14 (41,2%)	10 (29,4%)	5 (14,7%)	2 (5,9%)	3 (8,8%)
7	There are a small number of terms with Latin roots.	11 (32,4%)	14 (41,2%)	4 (11,8%)	4 (11,8%)	1 (2,9%)
8	The roots are considered the most challenging aspect to learn.	11 (32,4%)	13 (38,2%)	4 (11,8%)	3 (8,8%)	3 (8,8%)
9	Prefixes are easier to learn than roots.	13 (38,2%)	14 (41,2%)	4 (11,8%)	1 (2,9%)	2 (5,9%)
10	There may be more than one suffix for the same disease or condition.	10 (29,4%)	15 (44,2%)	5 (14,7%)	3 (8,8%)	1 (2,9%)
11	A single medical term may consist of two roots and combining vowels.	11 (32,4%)	11 (32,4%)	7 (20,6%)	2 (5,9%)	3 (8,8%)
12	Term practice can facilitate the learning of terms.	13 (38,2%)	12 (35,3%)	4 (11,8%)	4 (11,8%)	1 (2,9%)
13	I get enough opportunity to practice terms.	12 (35,3%)	10 (29,4%)	4 (11,8%)	4 (11,8%)	4 (11,8%)
14	Abbreviations also pose problems due to Greek connection.	10 (29,4%)	14 (41,2%)	5 (14,7%)	2 (5,9%)	3 (8,8%)
15	Medical textbooks should list the terms at the end of each lesson.	10 (29,4%)	19 (55,9%)	3 (8,8%)	1 (2,9%)	1 (2,9%)

5.4 Comparison of the responses

The data depict the comparative data elicited from three different groups. The following item-wise analysis shows the level of agreement on different items:

Item 1. A significant majority of mainstream medical students, 81.3%, believe that it is important to have a knowledge of medical terms in English. The importance of medical terms in the healthcare field is recognized by 67.8% of in-service medical students and 85.4% of postgraduate medical students.

Item 2. 65.6% of mainstream medical students believe that a good knowledge of English is necessary to learn medical terms, while 64.5% of in-service medical students and 73.6% of postgraduate medical students concur with this viewpoint.

Item 3. 68.8% of mainstream medical students think that knowing medical terms is necessary in a hospital, while 64.5% of in-service medical students and 79.5% of post-graduate students agree with the idea.

Item 4. According to the data, a majority of the medical students, including 65.7% of the mainstream students, 71% of the in-service students, and 70.6% of the post-grad students, believe that learning medical terms is a challenging task.

Item 5. Approximately half of the mainstream medical students, 58.1% of the in-service medical students, and 64.7% of the postgraduate medical students believe that medical terms are challenging because they are not originally in English but rather borrowed from other languages such as Greek and Latin.

Item 6. According to the survey results, approximately 53.1% of mainstream medical students and 54.8% of in-service medical students believe that a lot of medical terms have a Greek origin, and 70.6% of post-graduate medical students hold the same viewpoint.

Item 7. According to the data, approximately 56.3% of mainstream medical students, 64.5% of in-service medical students, and 73.6% of post grad students believe that there are a few Latin roots in medical terms.

Item 8. Approximately 62.5% of mainstream medical students, 67.8% of in-service medical students, and 73.6%

of post-grad medical students believe that roots are the most challenging aspect to learn.

Item 9. Around 68.8% of mainstream medical students, 74.2% of in-service medical students, and 79.5% of post grad students believe that prefixes are easier to learn than roots.

Item 10. A majority of the medical students, including 62.5% of the mainstream, 67.8% of the in-service, and 73.6% of the post grad students believe that there are multiple suffixes for similar diseases or conditions.

Item 11. Both mainstream medical students (71.9%), in-service medical students (77.5%) and post-grad students (64.7%) believe that one medical term can consist of two roots and connecting vowels.

Item 12. Approximately 84.4% of mainstream medical students, 71% of in-service medical students, and 73.6% of post-grad students believe that practicing can make the learning of medical terms easier.

Item 13. Only 37.5% of mainstream medical students, 67.8% of nutrition students, and 64.7% of postgrad students believe they have sufficient opportunities to practice medical terms.

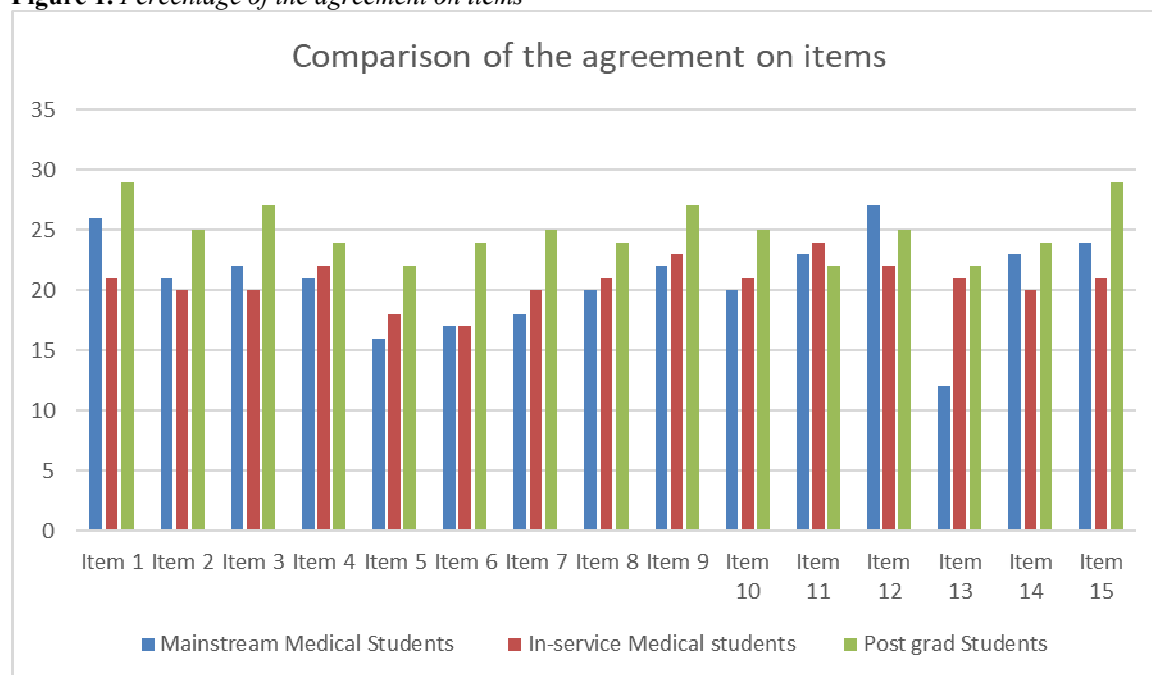
Item 14. 71.9% of midwifery students, 64.5% of nutrition students, and 70.6% of post-graduate students believe that abbreviations pose difficulties due to their connection to Greek.

Item 15. Three groups of students in different medical fields recommended that medical textbooks should contain special lessons on medical terms. 75.1% of mainstream medical students, 67.8% of nutrition students, and 85.3% of nursing students shared this opinion.

Table 7. Comparison of the agreement on items

No	Items of the questionnaire	Different groups (comparison of the agreement on items)		
		Mainstream students	In-service students	Post grad students
1	It is crucial to acquire knowledge of medical terms.	26 (81,3%)	21 (67,8%)	29 (85,4%)
2	It is important to have a good command of English in order to learn medical terms effectively.	21 (65,6%)	20 (64,5%)	25 (73,6%)
3	Working in hospitals requires knowledge of medical terminology.	22 (68,8%)	20 (64,5%)	27 (79,5%)
4	Acquiring knowledge of medical terminology is extremely challenging.	21 (65,7%)	22 (71%)	24 (70,6%)
5	Most medical terms are difficult because these are not English.	16 (50%)	18 (58,1%)	22 (64,7%)
6	A large number of terms have a Greek origin.	17 (53,1%)	17 (54,8%)	24 (70,6%)
7	There are a small number of terms with Latin roots.	18 (56,3%)	20 (64,5%)	25 (73,6%)
8	The roots are considered the most challenging aspect to learn.	20 (62,5%)	21 (67,8%)	24 (70,6%)
9	Prefixes are easier to learn than roots.	22 (68,8%)	23 (74,2%)	27 (79,5%)
10	There may be more than one suffix for the same disease or condition.	20 (62,5%)	21 (67,8%)	25 (73,6%)
11	A single medical term may consist of two roots and combining vowels.	23 (71,9%)	24 (77,5%)	22 (64,7%)
12	Term practice can facilitate the learning of terms.	27 (84,4%)	22 (71%)	25 (73,6%)
13	I get enough opportunity to practice terms.	12 (37,5%)	21 (67,8%)	22 (64,7%)
14	Abbreviations also pose problems due to Greek connection.	23 (71,9%)	20 (64,5%)	24 (70,6%)
15	Medical textbooks should list the terms at the end of each lesson.	24 (75,1%)	21 (67,8%)	29 (85,3%)

Figure 1. Percentage of the agreement on items



6. Conclusion and Implications

The findings from the data analysis showed that different groups of medical students and practitioners experience difficulties in mastering and utilizing medical terms in English. These difficulties stem from various aspects, such as the loan words from Greek and Latin, root words, and lack of opportunities for practicing the terms.

Medical terms are generally considered more difficult to learn compared to regular words, and the results showed that this difficulty stems from the roots and affixes of different types that make up the terms. Additionally, abbreviations used in the medical field were identified as difficult to understand, as they cannot be traced back to the English language.

Although there were some differences among the three groups in their responses to various items on the questionnaire, the differences were not significant enough to draw any specific conclusions. However, it was recommended that medical textbooks should include a comprehensive package of medical terms to aid students in their medical or paramedical studies.

It is worth noting that across all three groups, the lack of opportunities to practice medical terms was a common issue, although the extent of the problem varied among the groups. This highlights the importance of incorporating practical experiences into the medical education curriculum to help students effectively master and use medical terms.

There is a need to re-evaluate the approach to learning medical terminology to ensure that students can effectively learn, retain and apply it in their future careers. The most important step to be taken to improve the mastery and usage of medical terminology among different groups of people is to adjust the approach of learning this specialized language. A more effective teaching method can lead to better learning, retention, and practical application of the terms in the long run, which will benefit the students in their future careers as medical professionals. One way to improve the learning process is to utilize various online learning tools that can play a critical role in the students' study habits, and ultimately their success in the medical field. These tools assist in learning, revising, and practicing an extensive amount of medical words throughout the duration of a semester. Quizlet, for instance, is a valuable resource for students of all levels and disciplines that enables users to create digital flashcard sets that can be shared online. Another great reference tool is the Nurseslabs.com Medical Abbreviations Cheat Sheet, which can be used alongside class materials. This resource is especially useful when creating physical flashcards and includes a wealth of other study materials. The MedicineNet.com medical dictionary is an excellent reference material for when students come across an unfamiliar term that they cannot locate in their textbook. The MedTerm medical dictionary, with over 16,000 medical terms, may not be used as a study guide, but it can still serve as an excellent reference when used with other study resources.

Peer learning is another effective way of improving the knowledge of medical terminology. This method involves students learning from each other and is often facilitated through student-led workshops, study groups, peer-to-peer learning partnerships, and group work. Peer learning helps to develop students' collaboration and

communication skills, increases their confidence, and allows them to take control of their own learning process. Research has shown that students feel more comfortable working with their peers and are more likely to interact, reflect, and explore ideas more deeply than in a teacher-led environment (Ramsden, 1992; Biggs, 2003). Therefore, incorporating peer learning into the curriculum can have a positive impact on students' learning experiences and outcomes. Learners are expected to be more likely to engage in reflective discussions and explore ideas in depth compared to a teacher-led environment.

In brief, with a good command of medical terminology in English by the above approaches suggested, medical students and healthcare professionals can take advantage of the following key benefits:

Improved efficiency: Standardized terminology, including abbreviations and acronyms, can help to quickly deliver care and medications to patients, allowing healthcare facilities to increase patient volume and overall efficiency.

Enhanced communication: With doctors and other healthcare providers seeing a high number of patients each day, standardized medical terminology helps treatment teams communicate more effectively and efficiently.

Standardized documentation: Accurate and timely documentation is required by healthcare regulations and insurance policies. Using standardized medical terminology streamlines documentation and allows for smoother transitions between healthcare jobs.

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