

# Multiple Arabic Equivalents to English Medical Terms: Translation Issues

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## Abstract

Translation of medical texts poses several challenges to undergraduate student-translators due to multiple Arabic equivalents to English medical terms. For medical terms such as *clinical*, *intensive care*, *polyp*, and *osteoporosis* several Arabic equivalents exist. A sample of English medical terms with multiple Arabic equivalents was collected from several English-Arabic medical dictionaries to find out the types of multiple Arabic equivalents given, the shortcomings of Arabic equivalents, and the difficulties that students have with multiple Arabic equivalents. Two lists of categories with definitions and examples were developed and used in classifying and evaluating the equivalents. In addition, students answered an Arabic medical terminology test and responded to a questionnaire-survey to find out their difficulties. Results of the analysis and evaluation of the Arabic equivalents, medical terminology test, and responses to the questionnaire-survey are reported in detail. Recommendations for translation instruction are also given.

**Keywords:** English medical terminology, English-Arabic medical dictionaries, multiple Arabic equivalents, translation students, terminology problems, Arabic terminology shortcomings

## 1. Introduction

The last few decades have witnessed a plethora of newly coined terms in almost every language and every subject area. Latest developments in information and communications technology have accelerated the spread, adoption and/or translation of new technical terms and concepts, in general, and new medical terms, in particular, across countries and languages. Like other languages, Arabic tries to keep abreast of latest developments in terminology through the Arabization of new terminology coined in English, French and other languages.

In each subject area such as medicine, a plethora of English-Arabic medical dictionaries and glossaries exist such as *The Unified Medical Dictionary (UMD)*, *Babylon's Medical Dictionary*, *Hitti's Medical Dictionary*, KudoZ open glossaries (KOG), Medical Dictionaries of the Arabic Language Academy, Medical Dictionaries of the Arabization Center in Morocco, Tbeeb.net, *free online medical dictionary*, *BEIKS English-Arabic Medical Dictionary for Mobile*, *English-Kurdish -Arabic Medical Dictionary*. *The Lexicool* website has 45 dictionaries in 45 medical specialties, AlMaany and others.

However, medical terminology, as Huang (2013) indicated, presents problems which are different from other specialized domains, particularly the problems of determining the right medical terminology.

Difficulties in medical translation have been the subject of research for a very long time. A review of the literature has shown a number of studies that investigated the problems encountered in translating medical terminology. For example, Ricart Vayá and Candel Mora (2009) analyzed a corpus of 311 medical conclusion sections of Spanish articles in cardiology, pediatrics and psychology. They found that researchers use different ways to introduce neologisms into the Spanish medical language such as: Words borrowed from other languages with slight modifications, words borrowed from other languages added with or without morphological changes, the addition of suffixes and/or prefixes, and using "false friends".

In translating medical terminology from English to Persian, Zeinali (2009) evaluated and compared 408 English medical terms and their Persian equivalents referring to diseases and procedures selected from ICD-9-CM. The researcher found that Persian applies a variety of translation processes: Substitution which constituted 62% of the terms, and borrowing which constituted 60%, of which 40% are borrowings from Arabic. Persian equivalents in

the dictionary appeared as phrases, whereas English words appeared as single words. In some cases, no appropriate Persian equivalents for English medical terms were given.

In another study, Hlongwani (2012) identified several challenges that translators face when translating documents from English into Xitsonga (a South African language). Those included inconsistency in equivalents, excessive transliteration, word-for-word translation, i.e., translating words from English to Xitsonga without changing the syntax from English to Xitsonga, words which have zero equivalence, in addition to excessive borrowing.

In Sweden, Nyström, Merkel, Ahrenberg, Zweigenbaum, Petersson and Åhlfeldt (2006) reported on a parallel collection of rubrics from the medical terminology systems ICD-10, ICF, MeSH, NCSP and KSH97-P and its use in the semi-automatic creation of an English-Swedish medical dictionary. The dictionary consisted of 31,000 English and Swedish medical entries collected in electronic format. Rubrics were extracted in parallel language pairs. At first, interactive word alignment was utilized to create training data from the dictionary. Then the training data were used in automatic word alignment to help generate candidate term pairs. The researchers found 40 different translation problems in the terminology systems, mainly: Translating the English prefix '*allo*' into the Swedish prefix '*homo*' in the rubrics dealing with transplantations; the word '*partial*' was sometimes absent in the Swedish translation. Sometimes an English word is translated into several Swedish. For examples the word '*operation*' has 6 different Swedish equivalents and the Swedish word '*operation*' has 9 different English equivalents.

In Arabic, Yaseen (2013) collected and compared a sample of medical terms from seven Arabic translated medical books, two medical dictionaries and 35 drug package inserts to find out the best translation equivalents in specialized vs. nonspecialized texts and to identify inconsistencies in assigning different Arabic equivalents to English terms within a text and across different texts. In addition, she conducted interviews with doctors and pharmaceutical companies, and administered a questionnaire to doctors in order to identify the different types of Arabic equivalents that doctors and medical students use when they communicate with each other and when they communicate with patients. The researcher found inconsistencies in selecting and assigning Arabic equivalents to the same English terms within a text or across different texts in both Arabic medical books and drug package inserts. Results also showed that transliterated equivalents were the most commonly used in specialized contexts among doctors and medical students, whereas descriptive translations were more common in non-specialized contexts such as doctor-patient communication. Arabic or translated medical books depend on Arabic dictionaries and tend to use Arabized and descriptive translations a lot more than transliteration. Arabized equivalents were the least used in both specialized and non-specialized contexts. Couplets were extensively employed to avoid the use of one-to-many equivalents.

In a study by Argeg (2015), Ph.D. students majoring in translation and professional translators in Libya responded to a questionnaire test consisting of a set of English medical terms that are key components of medical texts. The results revealed several problems in translating English medical terms into Arabic such as: use of literal translation of the prefixes, suffixes and roots in an English medical term or words in an English compound, heavy use of transliteration, and inconsistency. The problems were due to students' lack of experience and practice in medical translation, and to lack of up-to-date English-Arabic medical dictionaries.

An-Nayef (2002) reported results of a survey by the American International Health Council (AIHC) which showed that the majority of Arab Syrian medical doctors had no difficulty in understanding Arabized medical terms. But the problem lied in the 'accuracy and simplicity of the translated material'. Some translated medical materials used at schools of medicine were found to be ambiguous due to literal translation, use of old, uncommon Arabic medical terms and translation by authors who are not qualified translators.

In Saudi Arabia, undergraduate students majoring in translation at the College of Languages and Translation (COLT), King Saud University (KSU), Riyadh, Saudi Arabia, take 18 translation courses in 18 subject areas including medicine. Although they have access to many English-Arabic paper and online medical dictionaries, which provide them with a variety of Arabic equivalents within a dictionary and across several dictionaries, translation of medical texts from English into Arabic poses several challenges to them, one of which is the availability of multiple Arabic equivalents to some English medical terms. For medical terms such as *clinical*, *intensive care*, *polyp*, and *osteoporosis* several Arabic equivalents exist. Students have difficulty understanding some equivalents and they do not know which equivalent fits a particular context in the text under translation. Therefore, the present study aims to analyze the Arabic multiple equivalents given to a sample of English medical terms selected from a variety of English-Arabic medical dictionaries and glossaries to find out the types of equivalents given to English medical terms and the problems they pose for undergraduate student-translators based on a content analysis of those Arabic multiple equivalents and as revealed by an Arabic medical terminology test

given to the students, and students' responses to a questionnaire-survey about the problems they face with Arabic medical terminology provided by English-Arabic dictionaries.

Unlike prior studies, the present study is based on a content analysis of the multiple Arabic equivalents of a sample of medical terminology in a sample of online English-Arabic medical dictionaries to show the types of equivalents given and the shortcomings of multiple Arabic equivalents in those dictionaries.

Understanding of and selecting the appropriate Arabic equivalent to medical terms is essential for translation accuracy. It is also a necessary requirement for translation students, as it reflects translation competence.

Since translation students at COLT take a medical translation course, results of the present study will shed light on aspects of English and Arabic medical terms that need to be acquired by translation students at COLT, those with which they have difficulty, and aspects that need to receive more attention in the medical translation instruction.

## 2. Study Samples

### 2.1 Sample of Medical Terminology

A sample of 369 English medical terms with two or more Arabic equivalents was collected from several online medical dictionaries: *The Unified Medical Dictionary (UMD)*; *Babylon's Medical Dictionary*; KudoZ Open Glossaries (KOG); Medical Dictionaries of the Arabic Language Academy; *the Free Online Medical Dictionary*; *The Lexicool English-Arabic Medical Dictionaries* which consist of 45 dictionaries in 45 medical specialties. All of the equivalents provided by a dictionary were listed. No comparison was made among the dictionaries as per the equivalents given to each English term. The sample covered single terms, compound terms, acronyms and hyponyms.

### 2.2 Student Sample

A total of 63 undergraduate students majoring in translation at COLT, KSU, Riyadh, Saudi Arabia participated in the study. The students were enrolled in a medical translation course (2 hours per week). They have completed 2 specialized translation courses in physical sciences and the humanities (2 hours each), in addition to listening, speaking, reading, writing, vocabulary and grammar courses in English, courses in Arabic morphology and syntax, and courses in linguistics, semantics, stylistics and text linguistics.

## 3. Data Collection and Analysis

### 3.1 Analyzing the Arabic Multiple Equivalents

Arabic equivalents were examined by the author who taught medical translation to students at COLT and were compared with the English source term in the sample and with each other to find out the types of equivalents given (translation processes used) and problems with and shortcomings of those equivalents. The following categories were developed by the author and used to classify the Arabic equivalents:

- **Borrowing, loan word or transliteration:** Here the Arabic equivalent is the same as the English term. It is just transliterated in Arabic letters as in: *malaria* مَلاَريَا; *cholera* كُوليرا; *hemoglobin* هِموغلوبين.
- **Arabized term:** where the borrowed term is modified phonologically and morphologically as in: *aorta* الأورطي; *acetylation* أستلَّة; *allergy* أَرَجِيَّة - أَلِيرَجِيَّة; *bacillus* باسيل; *bacilli* باسيلات; *beta* البيتاني; *biological* بيولوجي; *fluoroscopically* التفلور; *interesterified* مؤستر أسترة; *coding* تكويد; *encapsulate* كبسلة; *pasteurization* بسترة.
- **Synonym:** these are words or phrases that mean nearly the same as another Arabic word or phrase. Synonyms can be: (i) single terms (*congenital* وُلادِي - خَلْقِي); (ii) compound terms (*blood count* تَعْدَاد دَمَوِي - إحصاء دموي - عد دموي - الصيغة الدموية); (iii) a word within a phrase as in: *Antiretroviral* مضاد للفيروسات الرجعية - مضاد للفيروسات القهقرية مضاد للفيروسات الانقلابية - مضاد لفيروسات النسخ العكسي.
- **Eponym:** A term adopted from names of famous scientists or doctors such as: *Parkinson's disease*; *Alzheimer*; *Down Syndrome*.
- **Names** of the same disease or term as: in *whooping cough* السعال الشهاق - الديكي السعال.
- **Regional variety:** Here different varieties of the Arabic term used in different Arab countries are given such as: *intensive care* العناية المركزة - العناية المشددة - العناية الحثيثة - العناية الفائقة - الرعاية الفائقة; *medical body* الجسم الطبي - الهيئة الطبية.
- **Derived forms:** Equivalents with different derived forms are given (*breast-feeding* إرضاع - رضاعة; *dilatation* توسع - توسع; *fermentation* تخمر - تخمير).

- **Descriptive equivalent:** Here an explanation or definition of the Arabic term is given as in: *alkalaise* وقف الرجفان: إيقاف الارتعاش الخيطي في الأذنين والبطين; علاج قلوبيا قلوبون: عالج قلوبيا قلوبون.
- **Equivalents of a polyseme:** The English source term has several meanings used in different contexts, therefore an Arabic equivalent is given to each meaning as in: *medicine* طب - نواء; *convulsion* إختلاج - إختلاجة - إرتجاج - إبتفاضة - إهتزاز - تشنج - ثقفل خضن - خصنة - رج - رجة - رعشة - زلزال - قلقة - هر - هرّة
- **Technical and common equivalents:** Terms used by specialist and by non-specialists or in common speech as in: *eschar* تقشر الجلد; *peristalsis* الحركة الودية; *suppository* قمع - فرزجة
- **Old and modern equivalents** such as: *edema* خرب - وذمة - وذبة - تجمع سوائل - استسقاء - تورم مائي; *trachea* القصبة الهوائية - الرغامى
- A **calque:** This is a loan translation in which the Arabic equivalent is an imitation of the English term in structure or manner of expression. It can be literal translation (*Eye-poking* وخر العين), word-for-word translation as in compounds (*physical therapy* العلاج الفيزيائي), or names of organizations (*HMO* منظّمة), root-for-root translation (*bovine spongiform encephalopathy* اعتلال دماغي بقري إسفنجي (الشكل)).
- **Re-wording** of phrases and compounds, i.e., equivalent phrases show different word orders such as: *Wellness plans* برامج الوقاية الصحي; *endocrine system* الغدد الصماء - البرامج الصحية الوقائية - البرامج الوقائية الصحي; *Dental sealants* عقاقير مهلوسة; *groupthink* التفكير الجمعي - الفكر الجماعي; *hallucinogenic drugs* عقاقير الهلوسة - عقاقير الهلوسة

The author went through each English medical term in the sample and its multiple Arabic equivalents, and classified each equivalent according to the above categories. The percentage of Arabic equivalents in each category was calculated.

### 3.2 Evaluating the Arabic Medical Equivalents

To evaluate the Arabic multiple medical equivalents provided by English-Arabic dictionaries and find out the sources of difficulties they might pose for students, the following categories were developed by the author:

- **Acceptable equivalents** in which the Arabic equivalents are **accepted synonyms** of each other or the English terms have more than one meaning (*medicine* طب - دواء; *acalcerosis* نقص الكالسيوم - فاقدة الكالسيوم).
- **Unnecessary equivalents** where the Arabic equivalents are synonyms, but that one of them is better than the others, and one or more terms is unnecessary (*medulla oblongata* النخاع المستطيل).
- **Incorrect (inaccurate) equivalents:** Here one of the Arabic equivalent is an incorrect translation of the English source term which requires correction (*influenza* النزلة الوافدة). Inaccurate equivalents can also include spelling errors, faulty derived forms, faulty use of definite and indefinite forms, equivalents that do not match the source term in part of speech such as given an equivalent that is a noun for a source term that is an adjective.
- **Missing equivalents:** A more accurate Arabic equivalent or the Arabic equivalent that is commonly used is not provided: (*reflux* الارتجاع المريئي; *suppository* تحميلة; hydrotherapy العلاج المائي).
- **Unfamiliar equivalents** that are not commonly used or *familiar* (*pancreas* المعثكلة; *prostate* المؤتة; *suppository* فرزجة).
- **Ambiguous equivalents** where one or more Arabic terms have multiple meanings and the user might understand different meanings. 'insular' جزائري - جزائري can be confused with 'island'; 'suppository' قمع might be confused for 'thimble' or 'dropping funnel' rather than the medical denotation.

The author went through each English medical term in the sample and its multiple Arabic equivalents and classified each according to the above categories. The percentage of Arabic equivalents in each category was calculated.

### 3.3 The Arabic Medical Terminology Test

To find out the sources of difficulties that students have with multiple Arabic equivalents to medical terms, the students were given two versions of a test each consisting of 30 Arabic medical terms that were randomly selected from the Arabic translations of the 369 English term sample. The Arabic equivalents were presented in isolation, as presenting them in context would help the students infer the meaning. The test instructions specified what the items were. The students were asked to explain or define each Arabic medical term (in Arabic). They were not allowed to use a dictionary. No time limit was imposed on the test session. The two test versions were as follows:

*Test version (A):* أسْتَلَّةٌ - اسْتِضْبَاب - قَلُون - أَرْجِيَّة - الوَتِين - اختلاج - اندحاس - مثنائي - إكليلي - الارتعاش الخيطي - العفج - الزحار - حثل - وَذْبَةٌ - الايض - النظام الصمي - الذيفان - التادم - كظرين - الملتحمة طلانية - خُشَارَةٌ - ليفياني - مبتسرين - مُخِطَّةٌ - البرداء - الشنف - خَزْب - الكزاز خدج - استكباب - احتشاء عضلة القلب - أبخس - الخضاب - تكون الحزيمات

*Test version (B):* اليعمور - الدمة - تنكزز - جنبية مانية - موه الصدر - هيد - قمانع - التقشع - النفاثة - الركبة الفحجاء - النقرس - مهلسات - الشتر - الرغامي - الكظر - المهاد - الوطاء - الاتحشار - اخزب - السحاي - الاستقلاب - المعتكلة - تمعج - فرزجة - علاج مموه - الفوئ - الربلة - الجوجو - الشرى - دسامات - الدريقة الحلأ المنطقي - تناذر - التروية - الكفافي - الاحليل

The subjects' written responses were marked by the author. To be marked as correct, each explanation (paraphrase) had to be correct, either by a single equivalent Arabic term or by an explanation. The average percentage of correct responses for the total number of students was computed.

### 3.4 The Arabic Medical Terminology Survey

To find out the difficulties that undergraduate translation students have with multiple Arabic equivalents to English medical terms, they responded to a questionnaire survey with an open-ended question that asked them to state their difficulties with multiple Arabic equivalents while translating a medical text from English into Arabic and give examples. Students' responses were qualitatively analyzed by the author.

## 4. Reliability And Validity

### 4.1 Reliability and Validity of the Analysis and Evaluation of Arabic Equivalents

The categories and their definitions in sections 4.1 and 4.2 were validated by having 2 colleagues who are professors of English-Arabic translation and linguistics take a look at the categories and make comments. Amendments were made accordingly. The two professors used the same categories in sections 4.1 and 4.2 in classifying a sample of Arabic multiple equivalents. Their classifications were compared those of with the author and discrepancies were solved by discussion. The percentages of agreement between each professor and the author in classifying the Arabic equivalents were 93% and 95%.

### 4.2 Reliability and Validity of the Arabic Medical Terminology Test

Since it was not possible to use parallel forms, split-halves, or re-test the students two weeks after the first administration of the test, reliability of the test scores was calculated using the Kuder-Richardson 21' formula as it estimates the internal-consistency of the test items from a single administration of the test. The reliability coefficient of the Arabic medical terminology test scores was .86. Inter-scorer reliability was also calculated by having a colleague who taught translation mark a sample of answer sheets and by comparing her scores with those of the author's. There was a 97% agreement between the two scorers as most items were left blank. Disagreements were solved by discussion.

## 5. Results

Data analysis has shown that 2-word equivalents were given to 67% of the English medical terms; 3-word equivalents were given to 23%; 4-word equivalents were given to 6%, 5-word equivalents were given to 2%, and 8-, 9-, and 16-word equivalents were given to 2% of the English medical terms in the sample.

### 5.1 Types of Arabic Equivalents Given in the Medical Dictionaries:

Data analysis showed the following types of Arabic equivalents given in the English-Arabic medical dictionaries:

- When two equivalents are given, one of them is a **loan word** (borrowed as it is) such as disease names and some eponyms, the other is Arabic as in:
  - thermometer - ميزان حرارة
  - leukemia - سرطان الدم
  - Parkinson disease - داء الشلل الرعاش
- When two or three equivalents are given, one of them is an Arabized term (6%), the other(s) is an Arabic term or an explanation:
  - melanoma - ورم ميلانيني، ورم اسود، ميلانوما
  - clinical - إكلينيكية سريرية عيادي
- When there are 3 or more equivalents, one is a **loan word**, an Arabized word, synonyms, an explanatory compound and/or an explanation:
  - polyp - بوليب، سليلية (مخاطية)، نامية غير سرطانية
  - edema - ادِيمَا - تورم مائي - استسقاء - تجمع سوائل

- Equivalentents are derived forms expressing different shades of meaning and used in different contexts as in:
  - *stenosis* ضيق تضيق
  - *abrasion* سحج تسحج
  - *palpitation* خفق خفقان
  - *dejection* غائط تغوط
- Equivalentents are regional varieties used in different countries as in:
  - *Medical body* الهيئة الطبي - الجسم الطبي
  - *intensive care* العناية المركزة - العناية الفائقة - العناية المشددة
  - *osteoporosis* مسامية العظام - هشاشة - تخلخل العظام
- The English term is a polyseme which has several meanings used in different contexts, each of which has an Arabic equivalent as in:
  - *rupture* انفجار ، تمزق
  - *sepsis* تقيح ، تعفن ، تسمم
  - *medicine*: طب ، نواء
  - *peristalsis* الحركة الدودية - تمعج
- Equivalentents are synonyms, a descriptive (explanatory) word or phrase, an eponym, 2 or more names used for the same disease, an old term and a modern one, a technical term and the others are common as in the following examples:
  - *necrosis* نخر موتي - تنكروز ، تنخر
  - *palpitation* تسارع لضربات القلب - خفقان-خفق
  - *pathogen* عامل ( او كائن ) مرضي ، مسبب للمرض ممرض
  - *peristalsis* تمعج ، الحركة الدودية
  - *placebo* علاج مموه ، علاج ارضائي (تمويهي)
  - *prolapsed* هبوط ، سقوط ، تدلي ، تهدل
  - *ataxia* ترنج ، اختلاج الحركة
- Some equivalentents are **calques** (a loan translations):
  - *Eye-poking* وخز العين
  - *physical therapy* العلاج الفيزيائي
  - *HMO* منظمة الحفاظ على الصحة
  - *bovine spongiform encephalopathy* اعتلال دماغي بقري اسفنجي الشكل
- **Some equivalent** phrases and compounds **are a re-wording** of each other:
  - *Wellness plans*: البرامج الصحية الوقائية - برامج الوقاية الصحي
  - *Dental sealants*: ختامات الأسنان - ختامات سنية
  - *endocrine system*: الغدد الصم - الغدد الصماء
  - *groupthink*: التفكير الجمعي-الفكر الجماعي
  - *hallucinogenic drugs*: عقاقير مُهلِسة - عقاقير الهلوس

Overall, Arabic equivalentents that are synonyms were given to 39.5% of the English terms and eponyms were used in 2% of the entries. Descriptive (explanatory) equivalentents were given to 23% of the medical terms. There were more equivalentents used by both specialists and non-specialists than technical equivalentents used by specialists only. The latter were used 22% in of the entries. Loan (transliterated) words were given to 20% of the medical terms. In 14.5%, the English source term is a polyseme, therefore several Arabic equivalentents were given to cover the different meanings and contexts. Calques were given to 15% of the English terms in the sample, different derived forms were given to 10%, and two or 3 names for the same disease or medical terms were given to 8%. In 8% of the entries, the same Arabic phrase was worded differently (different word order). Arabized terms were used in 6% of the entries only.

These results are partially consistent with findings of a study by Yaseen (2013) who identified five types of Arabic equivalents to medical terms used in translated medical books, and drug package inserts: (a) Arabization versus descriptive translation; (b) Arabization versus transliteration; (c) Transliteration versus descriptive translation; (d) transliteration versus Arabization vs descriptive translation; and (e) inconsistency in target language equivalence. As in Yaseen's study, Arabized equivalents were the least used Arabic equivalents to English medical terms in English-Arabic dictionaries. Unlike Yaseen's study, use of synonyms was the most common (39.5%) English-Arabic dictionaries examined in the present study, descriptive equivalents constituted 23%, loan words constituted 20%, and calque constituted 15%. In Yaseen's study transliterated equivalents, i.e. loan words, were the most common in specialized contexts among doctors and medical students, descriptive translations were more common in non-specialized contexts such as doctor-patient interaction and couplets were extensively employed to avoid the use of one-to-many equivalents.

Similarly, findings of the present study are in agreement with findings of Zeinali (2009), who found that substitution constituted 62% of the terms, and borrowing constituted 60%, of which 40% were borrowings from Arabic. Unlike the English-Persian medical dictionary in which Persian equivalents appeared as phrases, compare to English words that appear as single words, in English-Arabic medical dictionaries, more Arabic medical terms appear as single words than phrases.

### 5.2 Evaluation of Arabic Medical Equivalents Given

Results of evaluating the multiple Arabic equivalents given revealed that: (i) Twenty seven percent (27%) of the Arabic equivalents were unfamiliar as in (*pancreas* المعثكلة; *prostate* الديفان - وذمة - وذبة - والموتة - هيضة - الموتة - وذبة - وذمة - الديفان; *أرجية بيتاني* - هيضة - الموتة - وذبة - وذمة - الديفان; *المعثكلة*; *pancreas* - ذكاك). Some of those are old medical terms. (ii) Eighteen percent (18%) of the multiple Arabic equivalents were unnecessary equivalents such as loan words or synonyms. Unnecessary use of some synonyms, Arabized and loan words. (iii) Thirteen percent (13%) of the equivalents given to of the English terms are incorrect as in (*radiologist* الشعاعي; *soft palate* الحنك; *Influenza* الوافدة النزلة; *sulfate* سلفاتات). Incorrect derived form, incorrect spelling, incorrect use of definite/indefinite forms; incorrect morphology. No punctuation marks are used within the entries to separate the synonyms, definition and defined word. (iv) Ten percent (10%) of the equivalents were ambiguous as in (*endotoxin* الديفان; *epidermopoiesis* التادم; *epithelium* ظهارة - ظلانية). (v) In 9% of the sample of English terms, the exact Arabic equivalent or the Arabic equivalent that is commonly used by common unspecialized people is missing, i.e. not listed such as in: (*reflux* الارتجاع المريني; *defervescent* خافض الحرارة).

The above findings are partially consistent with findings of An-Nayef's (2015) study in which he reported that some translated medical materials used at schools of medicine were ambiguous due to literal translation, and use of old, uncommon Arabic medical terms.

### 5.3 Students' Responses to the Arabic Medical Terminology Test

Results of the Arabic medical equivalent test results showed that the undergraduate translation students in the present study were not familiar with most Arabic medical terms on the test. They could only recognize and give correct explanations to fewer than 10% of the terms on the test such as: *مهلسات* - *الخصاب* - *النقرس* - *خدج* - *الأبيض* - *اختلاج*. They gave faulty responses and left many many items blank (with no response).

This finding is consistent with Argeg's (2015) findings which indicated that translation of medical terms was problematic for inexperienced translators and postgraduate translation students. Inexperienced translators and postgraduate students have a clear and obvious weakness in finding accurate translations and appropriate explanations for the terms that cannot be found in English-Arabic medical dictionaries.

The difficulties that undergraduate students have with Arabic medical equivalents are also consistent with findings of a study by An-Nayef's (2002) study in which reported that the majority of students do not know the exact meaning of many of the key medical terms in a medical text, which negatively affected their understanding of the medical text and thus translating it properly into Arabic.

### 5.4 Student-translators' Views of Multiple Arabic Equivalents

Qualitative analysis of the students' responses to the questionnaire-survey showed that multiple Arabic equivalents to English medical terms in English-Arabic dictionaries have several advantages. Descriptive (explanatory) equivalents help clarify the meaning of Arabic terms especially when they are unfamiliar. In the case of acronyms, and English acronym is translated by several words in Arabic, as Arabic has very few acronyms. Some English acronyms are borrowed in Arabic (*AIDS* الإيدز), others are translated (*TB* السل - الدرر). When dictionaries provide several derived forms, this helps the students choose the form which suites the way the term is used in a particular text morphologically and syntactically. Sara added:

*"Sometimes I do not know how to modify the equivalent to fit the context morphologically and syntactically. Providing different wordings of the same English medical phrase help me to choose the one that fits the syntactic context of translated sentence.*

On the other hand, the students reported that they are more familiar with the loan word than the Arabic equivalent, in which case they do not know whether to use the loan word or its Arabic equivalent. They also find some Arabized equivalent such as "البييتاني" meaningless. In the case of polysemes, the students do not know all the meanings of the source word and which equivalent is used in medicine. Maha stated:

*I am not familiar with the Arabic equivalent given by the dictionary... I do not know how to pronounce it, and it is difficult for me to remember it.*

Maha responded:

*Sometimes, when I encounter an English term in a text, I do not know which Arabic equivalent to choose.*

Ghada indicated:

*Sometimes, there are different synonyms and I do not know which one to use in the sentence I am translating.*

Regional varieties seem to be difficult for students. Hanoof, Asma and Lateefa wrote:

*In equivalents that vary from country to country, I do not know which one is used in Jordan, which one is used in Lebanon, Saudi Arabia or Morocco. The dictionaries do not tell which equivalent is used in which country.*

Many students find that some equivalents are easier to understand than others. For example the terms 'necrosis' and 'apoptosis' denote how cells die, but the Arabic equivalent to 'apoptosis' الموت المبرمج is easier to understand than 'necrosis' النخر. In the latter case the student has to check its definition in an English-English dictionary or check other English-Arabic dictionaries for a more comprehensible equivalent or for an explanation of the Arabic equivalent 'نخر'.

Another problem reported by the students is that sometimes, the same Arabic equivalent يتخناق is used for two or more English terms such as: diphtheria and angina and the same multiple Arabic equivalents exist for "imaging and x-ray" "صورة أشعة - أشعة - صورة شعاعية".

When an English term consists of a root and several prefixes, suffixes such as: Bovine spongiform encephalopathy اعتلال دماغي بقرى إسفنجي الشكل, the Arabic equivalent is usually several words rather than a single term, as the English terms consists of a root, prefixes and suffixes, whereas Arabic is a derivational language and the word formation process using prefixation and suffixation is non-existent in Arabic.

Other problems were mentioned by Aisha, Nada and Dalal:

*.. the equivalent that is commonly used in daily life is not listed.*

*.. English-Arabic dictionaries may not contain the terms that the translators need.*

*.. most entries have no punctuation marks to separate synonyms and definitions and term. Missing punctuation marks make it difficult for me to tell which word is a synonym of which word, especially in the case of equivalents are phrases.*

The difficulties that students in the present study have with multiple Arabic equivalent are similar to some of the problems that a medical translator face which were listed by Huand (2013). Some of the problems medical translators might face are: (i) translation of eponyms because they are usually synonyms for other terms; (ii) whether adopt British or American medical terms; (iii) unfamiliarity with hospital jargons used by inpatient and outpatient, and the fact that medical practitioners do not agree on the terms; (iv) automatically translating a drug name into the target language equivalent without including the trade name and International Non-proprietary Name, i.e., a name designated by the World Health Organization; and (v) translating medical metaphors or euphemisms for unpleasant topics, such as using "to expire" for "to die" (Huang, 2013).

## 6. Conclusion

Based on the variations in the translation of English medical terms to Arabic and the difficulties that undergraduate students have in understanding and using Arabic medical terms when they translate English medical texts into Arabic, the study recommends that medical translation instructors raise translation students' awareness of multiple Arabic equivalents to English medical terms by collecting medical terms with multiple equivalents, examining Arabic multiple equivalents and evaluating them in terms of ease of use, popularity, accuracy, context and country



where a term is used. Medical translation instructors should also raise students' awareness of the English and Arabic word-formation processes used in coining medical terminology in both languages.

Before translating an English medical text into Arabic, the students should read the text, understand it, look up the Arabic equivalents of unknown medical terms, then translate it. The students need to examine the semantic, morphological, and syntactic context in which a term is used, which equivalent is popular and common in a particular country; sub-field in which a term is common. Preference is for using single terms rather than compounds or multiple-word phrases. Whether the target audience is a specialist or non-specialist should be also taken into consideration. In this respect, Huang (2013) indicated that the first criteria that a medical translator has to his/her target audience. The target audience will determine whether the text is translated into common, layperson terms or technical medical terms, or both.

While translating a medical text, an unfamiliar Arabic equivalent can be briefly defined or explained in a footnote. If a loan word is more common than an Arabic equivalent, the Arabic equivalent can be used in the translation, with reference to the loan word made in a footnote. Reference to regional varieties can be also made in a footnote.

To solve students' difficulties in understanding Arabic medical terms and evaluating the different Arabic equivalents given by a dictionary, Huang (2013) recommends providing the students with adequate background knowledge through reading medical texts in both English and Arabic and/or research skills, to be able to check reliable websites and a variety of monolingual medical dictionaries as well as English-Arabic medical dictionaries.

Finally, the present study recommends that an English- Arabic online database of English-Arabic medical terms be created where all the terminology covered in all English-Arabic medical dictionaries can be store. Equivalents to a single term can be compiled from all the dictionaries, the different equivalents evaluated, and the best selected. The context in which each is used can be specified and then publicized. Linguists, medical translators, medical doctors, Arabic Language Academies, the Arabization Center in Morocco and other stakeholders can contribute to the establishment of the database, maintaining and updating its content, checking the equivalents orthographically, semantically and morphologically. This way the students can have access to all the dictionaries, terms and equivalents. This will save their time and efforts and provide them with more reliable, accurate and comprehensive equivalents.

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