ARABIC MORPHOLOGICAL PRODUCTIVITY IN THE TRANSLATION OF MEDICAL TERMINOLOGY

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ARABIC MORPHOLOGICAL PRODUCTIVITY IN THE TRANSLATION OF MEDICAL TERMINOLOGY

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LIST OF ABBREVIATIONS

ALAs	Arabic Language Academies
ALESCO	the Arabic League, Educational, Cultural, and Scientific Organization
ASEAN	Association of Southeast Asian Nations
CA	Classical Arabic
EU	European Union
MSA	Modern Standard Arabic
MSA	Modern Standard Arabic
NATO	North Atlantic Treaty Organization
OPEC	Organization of Petroleum Exporting Countries
PBA	The Permanent Bureau of Coordination and Arabicization
SL	Source Language
TL	Target Language
TPs	Translation Procedures
UMD	Unified Medical Dictionary
WFM	Word Formation Methods
WHO	World Health Organization

PRODUKTIVITI MORFOLOGI ARAB DALAM TERJAMAHAN ISTILAH PERUBATAN

ABSTRAK

Kekayaan istilah sesuatu bahasatertentu menunjukkan perkembangannya dalam penyelidikan saintifik dan teknikal dan, dengan itu keupayaannya untuk menggunakan potensi linguistiknya untuk menjadi bahasa sains. Sehubungan itu, kajian produktiviti morfologi dalam terjemahan istilah dalam bidang tertentu adalah amat penting. Perkembangan yang semakin meningkat dalam bidang perubatan di dunia hari ini, dan penguasaan bahasa Inggeris dalam bidang itu, menyebabkan bahasa Arab perlu menyesuaikan dirinya untuk berubah dengan menggunakan sepenuhnya potensi produktiviti morfologinya untuk mencipta persamaan terjemahan yang sesuai untuk bahasa Inggeris. istilah perubatan untuk menghadapi perkembangan yang berterusan. Tujuan utama kajian semasa adalah untuk menganalisis produktiviti morfologi Arab dan peranannya dalam memberikan istilah perubatan. Untuk mencapai matlamat tersebut, pengkaji menganalisis sampel terjemahan bahasa Arab yang setara yang digunakan dalam Kamus Perubatan Bersepadu (UMD) untuk mengenal pasti kaedah pembentukan istilah bahasa Arab di mana perkataan perubatan dibentuk, prosedur terjemahan yang digunakan untuk menjadikannya, menentukan produktiviti mereka, dan memeriksa. kekerapan penggunaan mereka dalam bidang perubatan. Walaupun kajian menggunakan terutamanya kaedah kualitatif, kaedah kuantitatif juga digunakan untuk meneliti jadual dan carta dan mengkaji nisbah produktiviti, kekerapan, dan penggunaan prosedur terjemahan. Mengenai kerangka teori, pendekatan eklektik yang terdiri daripada empat teori telah diterima pakai. Ia termasuk Teori Terminologi Komunikatif (CTT) Cabré (2002), Stem-based Theory (SBT), oleh

Aronoff (1976), Morpheme-based Theory (MBT) oleh Cantineau (1950) dan McCarthy (1981), dan teori prosedur terjemahan (TTP) yang dicadangkan oleh Newmark (1988b). Kajian ini dibahagikan kepada lima bab. Bab pertama membentangkan pengenalan umum kepada kajian ini dan secara amnya membincangkan aspek dan latar belakangnya yang berbeza. Bab kedua membentangkan ringkasan tinjauan literatur dan kajian yang berkaitan dengan topik tersebut. Bab tiga membentangkan kaedah kajian yang digunakan untuk mengumpul bahan kajian untuk kajian ini, bab empat membentangkan analisis data korpus kajian manakala bab lima memaparkan hasil kajian, rumusan, cadangan dan cadangan untuk kajian lanjutan. Kajian mendapati bahasa Arab mempunyai produktiviti morfologi yang tinggi yang membolehkannya menjadi tuan rumah terminologi perubatan asing yang semakin berkembang. Ia juga mendedahkan bahawa walaupun bahasa Arab menggunakan sumber asli dan bukan asli untuk mencipta istilah perubatan baharu, ia mempunyai kecenderungan untuk memihak kepada penggunaan sumber asli. Kajian itu telah mencapai kesimpulan bahawa bahasa Arab boleh menghadapi kemasukan baru istilah perubatan apabila proses morfologi yang produktif dan prosedur terjemahan yang betul digunakan dengan sewajarnya untuk membentuk persamaan istilah perubatan Inggeris.

ARABIC MORPHOLOGICAL PRODUCTIVITY IN THE TRANSLATION OF MEDICAL TERMINOLOGY

ABSTRACT

The terminology wealth of a given language indicates its development in the scientific and technical research and, hence its ability to use its linguistic potentials to be a language of science. Accordingly, the study of the morphological productivity in the translation of terminology in a given field is crucially important. The ever-increasing developments in the field of medicine in today's world, and the English dominance in that field, made it necessary for the Arabic language to adjust itself to change by making full use of its morphological productivity potentials to create appropriate translation equivalents for English medical terms to cope with ongoing developments. The main purpose of the current study is to analyse the Arabic morphological productivity and its role in rendering medical terminology. To achieve such a goal, the researcher analyzes samples of Arabic translation equivalents used in the Unified Medical Dictionary (UMD) to identify Arabic term formation methods by which medical words are formed, the translation procedures used to render them, determine their productivity, and examine their frequency of usage in the medical field. Although the study uses mainly the qualitative method, the quantitative method is also used to examine tables and charts and study the ratio of productivity, frequency, and translation procedures used. Regarding the theoretical framework, an eclectic approach that comprises four theories was adopted. It includes Cabré's (2002) Communicative Theory of Terminology (CTT), Stem-based Theory (SBT), by Aronoff (1976), Morpheme- based Theory (MBT) by Cantineau (1950) and McCarthy (1981), and the theory of translation procedures (TTP) proposed by Newmark (1988b).

The study is divided into five chapters. The first chapter presents a general introduction to this study and generally discusses its different aspects and backgrounds. The second chapter presents a summary of the literature review and studies related to the topic. Chapter three presents the research methods used for gathering research materials for this study, chapter four presents the data analysis of the study corpus while chapter five displays the study results, conclusions, recommendations and suggestions for further research. The study found that Arabic possesses high morphological productivity which enables it to host the ever-expanding foreign medical terminology. It also revealed that although Arabic uses native and non-native resources to create new medical terms, it has a tendency to favor the use of native resources. The study has reached a conclusion that Arabic can cope with the new influx of medical terms when its productive morphological processes and the right translation procedures are appropriately used to form the equivalents of the English medical terms.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Translation of scientific and technical terminology has become a linguistic necessity in the age of information explosion worldwide. The terminology wealth of a given language is an indicator of its progress in the field of scientific research and, hence its ability to use its linguistic potentials to be a language of science. The rapid progress and the development of science and technology require the naming of new concepts and words introduced in different spheres of knowledge. Hence, the study of the morphologically productive mechanisms such as term formation processes and the translation procedures used to render them are crucially important. They represent the means of extending a language's resources to accommodate scientific and technical language requirements. Due to the ever-increasing developments in the field of medicine in today's world, and the English dominance in that field, it has become urgently required from the Arabic language to adjust itself to change by making full use of its morphological productivity to create appropriate translation equivalents for English medical terms to cope with ongoing developments. This translational, terminological, and morphological process, which takes place first, through specialized English-Arabic medical dictionary constitutes a specialized corpus that presents the real reservoir of Arabic language in the medical domain and identifies the potentially wide range of possible language meanings of medical terms. Arabic language academies (مجامع اللغة العربية) (majami'u aluqati al Arabiya) have always endeavored to create new native terms to localize scientific and technical terminology. To achieve such a goal, word formation methods such as derivation, borrowing,

Arabicization, coinage, compounding, translation, revival and eponym have been employed by these academies (Awang & Salman, 2017). Thus, through this process, Arab academicians, translators, and terminologists are trying to prove that Arabic is still a language of science as it was before; and at the same time, respond to the questions raised now and then about the inability of Arabic to accommodate medical terminology produced by other nations in different languages. Besides choosing the suitable word formation methods to name new objects and concepts, translation, mainly scientific and technical translation, is crucially important to render these new terms from one language into the other. According to Pinchuck (1977: p.13), "Scientific and technical translation is part of the process of disseminating information on an international scale, which is indispensable for the functioning of our modern society".

Translation has always been a major factor in promoting scientific progress during the different stages of the history of humankind despite linguistic and cultural barriers. This role profoundly impacts the development and evolution of human societies (Salama et al., 1995). Jumpelt (1961) and Pinchuck (1977), as cited in Salama-Carr et al. (1995), argue that waves of translation activities have always accompanied the knowledge journey between the major world cultural and intellectual centers. Translation was a precondition for the export and import of scientific ideas from Asia to Greece, from Greece to the Middle East, and from there to Europe, the Americas, and the world

The whole intellectual history of humanity could be structured in terms of what Kruger (2014) describes metaphorically as translation waves. The next section elaborates on this “wave metaphor” since it provides a useful background for illustrating the historical significance of scientific and technical translation.

According to Störig, as cited in Kruger (2014), for the translation activity to happen, three prerequisites are necessary:

a) A disparity in the intellectual standard of two the cultures that host the languages.

b) The intellectual and societal development in the culture or language community that possesses a lower intellectual standard must have reached a point in which a natural demand arises for the reception of external knowledge;

c) The two communities and cultures must contact each other, as this contact provides a vital spark that ignites a large-scale exchange of knowledge between them.

According to Salama-Carr et al. (1995), the movement of the scientific and philosophical works of Ancient Greece into the Muslim-Arab Empire and its re-export from the Muslim-Arab world to medieval Europe is considered as one of the most famous and crucial examples of such translation waves that had accompanied the proliferation of knowledge between different cultures.

Around the 9th century, Ancient Greece imported into the Arab-Muslim culture their major scientific works. The Arab and Muslim translators of بيت الحكمة "House of Wisdom" in Baghdad, also known as "Baghdad school," translated great philosophical scientific and philosophical works such as the whole medical works of Euclid's Elements, Hippocrates and Galen and Ptolemy's Almagest Plato's dialogues and The Republic, Aristotle's Organon (Salama-Carr et al. (1995). The efforts of the translators of the Baghdad school were crucial in setting the foundations of the development and consolidation of Arabic as a scientific language and in establishing a new system of thought in Arabic-Islamic culture. Describing this historical stage of the knowledge

movement, Störig (2007: p.150 cited in Kruger, 2014: p.37) points out that "the intellectual stimuli induced by this inflow of knowledge were among the most important factors for the intellectual superiority that the Muslim-Arab culture gained over medieval Europe before another wave of translation activity would restore the balance between the cultures again, eventually tipping it in favor of Europe." This stage began by the European invasion of Toledo in Spain in 1085, which marked the end of Arab-Muslim's rule over the city and lead to the fall of all Spain in 1492. A prominent figure in the “reimport” of the Ancient Greek knowledge into Europe was Gerard of Cremona (1114-1187), was one of the European scholar pioneers who profited from the access to the wealth of Arabic-Islamic that stored in Toledo and who dedicated his life to translating the Arabic versions of the Ancient Greek works into Latin (Störig 2007 cited in Kruger, 2014). This was the beginning of a process of retranslating scientific and philosophical knowledge to Greek again before being translated into Latin. Thus, through this new wave of translation, the torch of knowledge had passed on again from The Arab-Muslim world to Europe (Salama-Carr, 1995: p.102).

The Ancient Greek knowledge movement between Europe and the Muslim-Arab world shows that scientific and technical translation had played an important role in the development of societies and cultures throughout the different stages of human history (Byrne, 2012). Kelly (2009) points out that the beginning of the 17th century witnessed a decline of Latin as a scientific lingua franca and the rise of European vernacular languages with a growing number of scientists who started to write in their local languages. In the 20th century, the scientific revolution that led to the industrial revolution yielded further scientific knowledge and the publication of scientific and technical works. For example, in the field of radiology and medical diagnostics, Conrad Röntgen and Wilhelm in German and Pierre and Marie Curie published in French (Byrne, 2012). The European vernacular languages continued to dominate the

scientific and technical scene interrupted by a brief period of French rise until the middle of the 20th century when English became the dominant lingua franca of science. Since then, the demand for scientific and technical translation from English into other international languages is on the rise (Brekke 2004 cited in Kruger, 2014: p.40). This historical significance of translation in the dissemination and propagation of scientific and technical knowledge is the one that gave Fischbach (1993) a sound reason to say that translators are the "great pollinators of science" (Salama-Carr et al., 1995: p.101).

The above-mentioned evolution of scientific and technical translation would not have happened without simultaneous development in terminology and morphological studies. Understanding scientific and technical issues requires a solid knowledge of terminological and morphological productivity tools through which words can be built and concepts can be expressed. Thus, comes the significance of corpus-oriented text typology. Kittredge (1987) suggests that specialized languages, such as medical language, have their own sets of vocabulary items and syntax rules; therefore, he suggests deriving them from the analysis of a corpus. This means that one has to collect a corpus, as a preliminary step, before making any decision.

According to Puchala (2011), the translator has to take into consideration the text type due to its significant role in producing a successful translation. He argues that text type is the basic factor that helps the translator to identify the function and the purpose of the text to be translated. Depending on such identification, the translator selects the appropriate procedure. This importance becomes more urgent when it comes to the medical language, which has an increasing number of specialized jargon that needs to be dealt with.

Ten Hacken and Panocová (2015) argued that due to the rapid progress in medical research and the occurrence of new medical conditions, medicine is a field where new concepts have to be named more frequently than in many other fields. Thus, the importance of naming these concepts is crucial in activating word-formation, not only in English but also in other international languages). Whenever the need to name a new concept arises, productive word formation rules and processes have to be activated. Word formation processes become more significant when rendering a morphologically wealthy language such as Arabic. Thus, come the challenges related to the different nature of English and Arabic, the need to use Arabic native potential resources in forming new words as well as identifying the suitable translation procedures to achieve such a goal (Elmgrab, 2011).

The current study discusses the Arabic morphological productivity in the translation of medical terminology. It analyses the morphological processes and word-formation methods used by different scholars such Ali (1987), Emry (1989), Darwish (2009), Elmgrab (2011), Ghazala (2012) , and Aljarf (2016) ; including derivation (الاشتقاق al ishtiqaaq), compounding (التركيب at-tarkiib), coinage (blending) (النحت an-naht), borrowing (*الاقتراض* al iqtirad), Arabicization (التعريب at-ta‘riib), revival (الإحياء, al ihya’) eponym , translation (الترجمة, at-tarjemah), and finally muliple processes, not mentinoed by those scholars according to the best of the researcher’s knowledge. Furthermore, during the reseacher’s investigation of the thesis subject, he has not come across any study that focuses on the use of these processes in productively creating medical words in Arabic neither by the above mentioned scholars nor by other scholars.

It is worth noting here that every linguistic system has its means of forming its words, enlarging its resources, and enriching its lexical repertoire; Arabic is no exception. According to Alesawy (2002), most languages use almost the same word formation methods. The differences occur only in the frequency and dependence each system lays on one or other of these methods. Some languages use only some methods; others choose entirely different ones, whereas a third group would employ the same processes with different preferences. The issue mostly depends on the adaptability of the morphological system of a given language to some processes rather than others. Arabic, as an example, takes advantage of its highly productive morphological rules to derive a variety of semantically related word forms from verb entries. Besides studying the word-formation methods, the study examines the translation strategies used in rendering the English medical terms into Arabic according to the translation approach suggested by Newmark (1988b).

This study falls within the area of terminology translation in the medical field. It is about exploring one side of Modern Standard Arabic (MSA), namely morphology; how far MSA has developed its terminology morphologically and the processes used in enlarging its lexical repertoire in the scientific and technical domain; especially medical field, and what are the translation procedures it opts for to achieve such a goal. The study chose the medical terms translated from English into Arabic as its corpus.

Undoubtedly, terminology and translation are inextricably interrelated and interdependent, especially scientific and technical translation. Thus, Rouleau (2003) argues that asking about the importance of terminology to the language activity of a specialized translator is similar to wondering if a living being breathes. The question

does notarise, as the terminology is part of his/her professional life. The translator's work's quality depends mainly on his/her ability to do proper research terminology.

Emphasizing the relationship between translation and word formation methods, Prysiazhniuk (2016) postulates that correct translation depends on the neologism's structure. Thus, it cannot be possible without careful analysis of methods of word-formation. This research also raises the argument that while specific term formation methods (compounding, coinage and derivation, borrowing, Arabicization…etc.) can be productive in providing translation equivalents in Arabic. Furthermore, it examines whether there are other word-formation methods not mentioned in previous studies, which have tackled this topic.

It is an established fact that language is an adaptable sociological organism. That is to say, it undergoes processes of growth and development in the same way as does the nation or society where it is spoken (Davis, 2014).

The judgments heard now and then that language X is primitive or language Y is advanced are often intended to imply that in both cases, the degree of the evolution of the language concerned has witnessed is proportional to that undergone by its environment. It remains to be said that languages may somehow vary in the way they adapt themselves to the new needs. This situation is often determined by a variety of factors such as the potential resources of the language, its place, and role in the various aspects of culture it represents, the attitude of the speakers toward their language as a cultural heritage…etc. (Fathi, 2015). Taking Arabic as an example, Al Khory (1988) points out that in a given time, it was self-evident that Arabic could be a language of science that was able to expand to absorb more terms and meanings better than any other language existed at that time. Its vocabulary richness has enabled it to create

thousands of terms in many scientific fields such as medicine, mathematics, astronomy, chemistry, embryology, anatomy, botany, …etc. The lack of some Arabic equivalents of some English scientific terms is not a problem in Arabic itself, but in language speakers and practitioners who fail to study and use their language potentials to the maximum and benefit from its ability to create neologisms related to science and technology (Benkharafa, 2013). Thus, one should differentiate between Arabic as a rich and flexible language, as some argue, and the Arab linguists or translators' failure to use the language productivity potentials to create or translate scientific and technical materials into Arabic. The fact that Arabic has continued to live for fifteen centuries despite all adverse circumstances is mainly attributable to religious and social factors. It is also due to the nature and merits of the system of language itself that it has succeeded in preserving its essential characteristics and continued to be capable of growth and expansion.

1.2 Research Rationale

Although the considerable number of publications have been devoted to the analysis of the word formation methods in studies of Arabic morphology, the role of productivity in the medical field and its terminological and translational aspects have been largely disregarded. To the best of the researcher's knowledge no study has been conducted on the Arabic morphological productivity in the medical field. Consequently, the lack of specialized studies in this domain left gaps that need to be bridged. Thus, comes the importance of this study to fill these knowledge gaps.

For that reason, this study focuses on one of the essential Arabic language potentials, mainly its morphological productivity, and on one of the vital areas of science, i.e., medicine. Such an objective can not be achieved without exploreing the

translation of one aspect of MSA, namely lexicon, how far MSA has productively developed its lexicon in the medical field, studying the process employed in enlarging its lexical repertoire, and studying the translation procedures adopted to render it from English. There is also a need to fill the gap related to searching for patterns of morphological development in MSA and probing into how far patterns of morphological growth have been productive and which of these patterns gave rise to the largest number of medical vocabulary creations in Arabic.

Even though Arabic is the language of one of the greatest civilizations (Arabic-Islamic civilization), it has recently been viewed by many as incapable of coping with modern science and technology regarding accommodating modern scientific and technological concepts produced by other languages; especially English. What is described by some as “the underdevelopment” of Arabic is now used as an excuse for not using it as a medium of instruction in schools and universities. Thus, comes the need to highlight the Arabic morphological productivity for hosting and creating new terms in one of the most important scientific and technical field namely the medical field as an example of Arabic capabilities in generating terms.

Benkharafa (2013) points out that today there are claims that question Arabic's ability to cope with modern science and technology. The proponents of these claims argue that Arabic is inherently incapable of expressing their speakers’ needs and unable to contribute to modern science and technology. For example, Al Mazroui (2014) claims that term formation's capacity is a unique characteristic and relates to the language's morphological faculty and its derivational capabilities. He adds that the ability to use prefixes and suffixes in English has endowed it with almost infinite possibilities of term formation, whereas Arabic lacks this faculty. Although some research carried by some scholars such as Al-Hamzawi (2004) contradicts that of Al

Mazroui statement, the results of their studies need to be specified and deepened, especially in the medical field. Al-Hamzawi (2004) points out that one of the characteristics of modern Arabic today is that it tends to accept and internalize the scientific and technical terminology expressed in other languages through translation. Thus, the morphological and derivational productive potentials of the Arabic language in a crucial scientific field such as medicine need to be researched and highlighted.

Related literature, as shown in chapter two, showed that a little has been done about this subject. As an example, the English-Arabic Unified Medical Dictionary (UMD) described by Yasseen (2013) as the closest official Arabic medical resource to everyday medical practices, has not as not studied from word formation perspective, according to the researcher's best of knowledge.That is why the researcher this dictionary as a source of the data or sample frame to investigate the translation of Arabic morphological processes such as inflectability and derivability principles as well as other word-formation methods through which Arabic creates words to keep pace with the continually progressing terminology of the medical field.

The World Health Organization has estimated that several thousand new medical terms are created annually and that most of them are in English (Zeinali & Awang, 2009). Thus, the current study seeks to fill the gap in the domain for the benefit of language specialists, terminologists, professional translators, medical staff, students and researchers in the fields of translation, scientific terminology, and morphology. As for language specialists, terminologists and researchers, this reasearch helps to open new avenues in morphological productivity and its relation to translation studies and conduct research related to that domain. Regarding translation students, professional translators and medical staff, such types of studies contibute to enhancing their

understanding of Arabic medical terminology to be able to express medical concepts concisely, accurately and clearly.

As the study focuses on the principles and methods of morphological productivity in term formation in Arabic as well as translation procedures to render medical terms, it adopts an eclectic approach that touches upon different aspects of the study, i.e., translation, terminological and morphological theories. In translation, the study adopts Newmark's (1988b) approach. Concerning the terminological theory, the study chose the Communicative Theory of Terminology (CTT) by Cabré (1992, 1999, 2002). The study followed morpheme-based morphology by Cantineau (1950) and McCarthy (1981) and the stem-based theory by Aronoff (1976) to cover the morphological aspect. As for translational aspect, the study addopted Newmark's (1988) translation procedures theory. These theories present a more realistic view of translation, terminology, and morphology since they base their description on how terms are created, translated, standardized, documented, and used in communicative contexts. They provide the guidelines for analyzing word formation methods and translation procedures used in rendering medical terms in the corpus of the study. Such theories are explained in detail in chapter three.

1.3 Research Objectives

This study aims at achieving the following objectives:

1. To identify word-formation methods used to create medical terms in Arabic.

2. To determine how Arabic word-formation methods are productive in providing English-Arabic translation equivalents for medical terms based on a descriptive analysis of samples of medical terminology.

3. To examine the role of Arabic morphological processes in medical translation

4. To identify the range and frequency of usage of Arabic word formation methods in the medical field.

1.4 Research Questions

The contribution of this study lies in its attempt to answer the following research questions:

1. What are the word-formation methods that Arabic possesses to create equivalents for new medical words?

2. To what extent have the methods of morphological growth in Arabic been productive in creating medical terms?

3. What is the role of Arabic morphological processes in medical translation?

4. What is the range and frequency of usage of Arabic word formation methods in the medical field?

1.5 Significance of the study

The significance of the study stems from its attempt to fill the gap in the literature concerning the Arabic morphological productivity in terms of word formation methods used in creating medical terms, the degree of their productivity, their frequency of occurrence as well as the role of translation procedures used in rendering them from English into Arabic. Thus, the study looks for more word formation methods and morphological processes used in forming medical words other than the eight ones used by Ali (1987), EL Emry (1989), Abulsad (2008), Darwish

(2009), Elmgrab (2011), and Ghazala (2012). Aljarf (2016). The eight methods are: derivation, Arabicization, borrowing, coinage, compounding, eponym, revival and translation. The significant role of scientific and technical translation, the importance of Arabic morphology in language development, the significance of medical terminology, and the need to localize the increasing scientific input all these factors make it indispensable to study the means through which Arabic can use its morphological productivity in the medical field. The study of scientific and technical translation and its relation with the Arabic morphological field in the medical field have not received the attention they deserve. Moreover, using productivity and frequency as measurement tools to assess Arabic translational and morphological capabilities also has a great significance in Arabic translational and terminological input. It adds more credibility to the study results.

Besides studying the actual position of the study of the role of morphology with regard to scientific translation and its valuability in creating medical terminology, the findings of this study will open new avenues for research in the fields of English-Arabic scientific and technical translation, terminology development, and management in Arabic. Thus, comes its importance in the contribution to filling a research gap related to scientific and technical translation and the morphological capabilities of Arabic to be a language of science in general and medicine in particular. The present study will be beneficial for professional translators, language specialists, terminologists, scientific language researchers and medical staff. Furthermore, one of the most significant implications of this study lies in the fact that it may bridge the gap between the Arabic morphology, a significant branch of language, and medical translation. It is also meant to make a useful contribution to the dictionary-based medical terminology use. Finally, it is hoped that this thesis contributes to enriching

Arabic language studies and helps to build enough literature for scholars interested in Arabic morphology and English –Arabic scientific and technical translation.

1.6 Limitation of the study

Due to the wide range of scientific and technical translation and terminology, this study limits itself to the investigation of Arabic morphological productivity and term formation methods used in translating medical terminology from English into Arabic.

Considering the broad nature of morphology and word formation, the focus of the study will be mainly limited on analysing medical terminology in the chosen corpus, examining word formation process productively used to create Arabic medical terms through various translation procedures such as derivation, compounding, Arabicization, coinage, revival, translation, borrowing and eponym. If the analysis of the corpus shows that other word-formation methods, apart from those mentioned by other researchers, are used in creating new medical terminolgy, they will be taken into consideration.

Being a descriptive study and due to time constraints and the impossibility to consider all the medical terms, only the first one hundred words of each English alphabet and their Arabic counterparts have been selected for this study. The study limits itself to two thousand six hundred English- Arabic translation equivalents for medical terms extracted from the Unified Medical Dictionary (UMD). Such a number of entries or equivalents yield 4285 words. These terms are meant to be a reflective sample and cover different medicine areas, the different term formation methods, and patterns used to form Arabic medical terms and the various translation procedures employed to render them into Arabic. The way the sample was chosen and how it is

considered is explained in the methodology chapter. The examined sample is classified according to the most common word formation methods classification used by Ali (1987), Ghazala (1995), Abdulsad (2008), Darwish (2009), and Elmgrab (2011). Those methods are derivation, coinage (blending), compounding, borrowing, and Arabicization; in addition to other less commonly used processes such as translation, eponym and revival.

Regarding translation procedures, the study limits itself to the translation procedures of Newmark's (1988b) taxonomy of direct (literal) versus oblique (free) translation strategies. The direct translation strategy covers borrowing, calque, and literal translation. The oblique translation strategy includes transposition, modulation, equivalence, and adaptation. Newmark's translation procedures also include reduction and expansion, couplets, and naturalization. Finally, this study limits itself to two languages: English as a source language (SL) and Arabic as a target language (TL). The variety of Arabic described and analyzed in this study is Modern Standard Arabic (MSA).

As English and Arabic constitute the two languages on which this study is based, it seems necessary to highlight different aspects related to them, with a focus on Arabic as the main language of the study.

1.7 Definition of Key Terms

Morphology: is the study of morphemes and their arrangements in forming words (Nida, 1963: p.1).

Productivity: in general, can be defined as the frequency with which a particular morpheme, pattern or root is involved in word-formation processes (Baayen et al., 1997). Meanwhile, morphological productivity refers to the property of word formation methods in a given language to be used to produce new words in a systetematic way (Nasser, 2008).

Translation procedure: According to Delisle (1984), translation procedures can be defined as methods used by translators when they formulate an equivalence in order to transfer elements of meaning from a source text to a target text.

Scientific and technical translation: Ghazala (1995) defines scientific translation as the process mainly concerned about translating terms in the science and technology fields such as medicine, mathematics, physics, computer sciences, chemistry, …etc., from one the source language to the target language. Similarly, as described by Wright and Wright (1993), technical translation refers to the translation of special language texts. It includes besides medical and engineering other types of texts such as psychology, economics, and law.

Medical terminology: Medical terminology refers to the system of words that are used to describe specific medical aspects. Medical terms include all categories of the terminology used in all branches of the medical field, such as human body parts, diseases, diagnoses, instruments, protocols, and medications (Duclos et al., 2014).

Word formation: Nasser (2008: p.71) refers to word formation processes as "the bases upon which words are formed in a language."

Frequency: Johnson (1999: p.45) defines frequency as "a term used in statistics to express the number of times individuals occurred in an experiment or study."

Terminology: According to Rask (2008: p.68), terminology is the process of naming concepts and objects belonging to a special subject or field.

1.8 Corpus of the Study

Kennedy (2014: p.1) defines a corpus in language sciences as “a body of written text or transcribed speech which serves as a basis for linguistic analysis and description.” He argues that a corpus constitutes an empirical basis for identifying the elements and structural patterns that make up the systems used in language and mapping up the use of these systems. According to Shen (2010), recent years had witnessed a significant growth of corpus-based translation studies that appeared at the beginning of the 1990s when the translation scholar Mona Baker started applying it to explain translation phenomena.

Based on the above statements regarding corpus and corpus-based translation studies, the present study uses the medical corpus due to its scientific and technical nature as well as its suitability to be reflective of the scientific and technical corpus in general.

An English-Arabic authentic medical corpus is used to investigate the morphological productivity of the Arabic language in the medical field and the methods it adopts to develop its scientific and technical terminology. This thesis's data is based chiefly on medical terms drawn from the fourth online edition of Unified Medical Dictionary (UMD) (2006).

As the language used as corpus material for the study has to be of particular characteristics, mainly well-used, modern, standard variety, Modern Standard Arabic is taken as a model because this language variety is the far more standardized and conventionalized variety officially used in all Arab countries.

The UMD, chosen as a corpus of the study, is the result of a joint effort between the Arabic Language Academies, World Health Organization, Regional Office for the Eastern Mediterranean, and the Librairie du Liban Publishers. According to Larbi (2016), this accredited dictionary, compiled by a team of medical and linguistic professionals from all the Arab World countries and supervised by official and specialized bodies, helps a lot in the work of translators to find the accurate and appropriate Arabic equivalents of the English medical terms. More than that, it represents a significant contribution to enhancing the quality of translation products, which is undoubtedly one of the primary goals of scientific translation. UMD is characterized by preciseness as it gives one meaning of the term in most cases.

UMD is a bilingual (and multilingual in some versions) standard medical dictionary. The first edition of this dictionary was issued in the 1960s by the Arab Medical Union of Baghdad, Iraq, in response to the Arab Medical Union's recommendation to meet the urgent need for a unified medical terminology in the Arab World. With its third edition in (1973), the World Health Organization (WHO) has taken the lead in maintaining and developing it, with a valuable contribution from the Arab Health Ministers' Council, Arab Medical Union, and Arab League Educational, Cultural and Scientific Organization (ALECSO). A specialized editorial committee of experts from Lebanon, Morocco, Algeria, Iraq, Tunisia, Syria, and Egypt was set up to further verify and enrich the UMD regularly. This specialized committee has endeavored to form, collect, verify, standardize, and add new medical terms to the

dictionary to cover the most comprehensive range possible of medical terminology to be made available for users. It received comments, feedback, and information from linguistic and medical experts and professionals from all over the Arab world, as well as medical terms approved and issued by the different Arabic academies in Cairo, Amman, Baghdad, and Damascus. In 1996, a digital version of UMD was produced, and in 2000 a computerized version and a hard copy version were produced. Since 2006, the online English-Arabic Unified Medical Dictionary (UMD) has been available on the WHO website (Argeg, 2015).

Hard work was carried out over many years to produce the final material for the fourth edition, and particular attention was paid to the medical terms approved by the Arabic Academies in Cairo and Damascus. The dictionary committee also made sure that the Arabic terms were selected carefully in accordance with a rigorous, precise, simplified, and user-friendly methodology (Al-Jalabi, 1984). Yasseen (2013) assesses the validity of this dictionary and emphasizes its usefulness as the closest official Arabic medical resource to everyday medical practices.

As it has been early mentioned, the main contributors to the Unified Medical Dictionary were:

- The Council of Arab Ministries of Health
- The World Health Organization (WHO)
- The Arab Medical Union – Committee for Unification of Terminology
- The Arabic League, Educational, Cultural, and Scientific Organization (ALESCO).

Although Arab scholars undertook much effort in the compilation of this dictionary, Argeg (2015) postulate that it has been challenging to update it continuously and keep up with the enormous rapid developments in science and technology general, and in the medical area in particular.

Besides the number of terms chosen as a corpus, other materials might opt for examples and illustrations such as Arabic- Arabic dictionaries, English – Arabic, and Arabic English dictionaries. As for the Arabic terms, the etymology and development of the chosen terms, as well as the analysis of meanings of their different forms were drawn from (لسان العرب Lisan Al Arab)," the Arab tongue" by Ibn Mandhur (1994), an Arabic-Arabic dictionary and (قاموس المعاني Qamous al ma'any), "the dictionary of meanings" Arabic- Arabic, and English-Arabic and Arabic English online dictionary (2016). The former dictionary represents a relatively old version of Arabic, while the latter is an example of the new generation of Arabic dictionaries. The reason behind choosing these two dictionaries is to determine how medical Arabic has developed and created neologisms using Arabic Arabic morphological productivity and translation procedures. Selecting a dictionary as a corpus did not occur arbitrarily. Medical dictionaries provide a detailed insight into the vast scope of the medical term that covers all aspects of medical terminology. As Mascott, (2007) states, dictionary helps to identify a potentially wide range of meanings of a term. He argues that choosing dictionaries as a corpus provides an invaluable textured understanding of a term. It provides an extremely useful insight into how a particular word is used in relation to terms throughout a given language. Despite the potential shortcomings of dictionary definitions used as out of context, their use a specialized corpus may be beneficial to traditional corpus linguistics research. Using one, or even multiple, dictionaries as a specialized corpus could help ensure no relevant usage of a term is missed. Talking

about newly coined terms, Newmark (1988a: p.140) states that "since they usually arise first in response to a particular need, a majority of them have a single meaning and can, therefore, be translated out of context." The dictionary used as a corpus of this study is freely available on the internet, and readers can easily access the cited corpus. Another reason that urges the researcher to opt for the English-Arabic dictionary is the scarcity of Arabic materials that can cover many medical branches; with both English and Arabic versions. This requires many books, journals and other materials.

1.9 Organization of the study

This study is divided into five chapters, organized as follows:

Chapter 1: Introduction

This chapter presents a general introduction to this study. It provides a statement of the research issue, research objectives, questions, significance, and scope of the study as well as the historical background of Arabic and English and related materials such as the scientific and technical translation, term morphology, and word-formation. Finally, the key term definitions and the theoretical framework adopted for it are examined.

Chapter 2: Literature review

This chapter presents a summary of the literature on the topic. It deals with the literature that lays the foundation for subsequent data analysis and evaluation of Arabic morphological productivity and its significance in scientific and technical term formation processes, scientific and technical translation. It analyses scientific and technical translation procedures and uses the word-formation methods in creating

Arabic equivalents for medical terms. To achieve such a goal, the researcherreviews samples of Arabic translation equivalents used by Arabic translators and terminologists in the Unified Medical Dictionary (UMD) for specific medical terms. The purpose is to identify Arabic term formation methods by which medical words are formed, the translation procedures used to render them, determine their productivity, and examine their frequency of usage in the medical field.

Chapter 3: Research Methodology and Theoretical Framework

This chapter presents the research methods used for gathering research materials for this study, mainly the qualitative approach. However, the quantitative method is used to examine tables and charts and study the ratio of productivity, frequency, and translation procedures use. An eclectic approach that comprises four theories was adopted as a theoretical framework to investigate the Arabic term formation processes involved in translating medical terms. It includes Cabré Communicative Theory of Terminology (CTT), the Stem-based Theory, and Morpheme-based Theory for the morphological aspect as well as Newmark translation theory for the translational side of the study.

Chapter 4: presents the data analysis and discussions of the study corpus.

Chapter 5: Conclusion, which presents the study findings and gives some recommendations and suggestions for further research related to the research topic.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the literature that laid the foundation for subsequent data analysis and evaluation of Arabic's morphological productivity as a language of science. It reviewed the literature that explains the Arabic morphological system, term formation methods adopted by Arabic to express medical terms. The literature related to productivity and frequency as tools of morphology measurement and medical terminology and its characteristics. As the study examines the formation of medical words translated from English into Arabic, it might be useful at the beginning to have a historical background of both languages, grammatical and morphological structures, their scientific and technical linguistic, terminological aspects.

2.2 Historical background of Arabic and English

2.2.1 Arabic Language

It is beyond the scope of the current research to present a detailed history of the Arabic language. Instead, a short overview would be able to highlight the history of such a language, its morphological structure, and its past and present, among other languages. Before embarking on such an overview, it would be relevant to start with three testimonies by famous scholars cited by Fitouri (1975) regarding Arabic's prominent position. The first of these testimonies is the one expressed by Ernest Renan (1950), who points out that it is indisputable that Arabic has invaded a wide range of countries. Besides Greek and Latin, it has had the honor of becoming a universal language. It won a high position which permitted it to become an organ of religious