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Morphological Analysis of Some Medical Terms and their Translations from English into Arabic

Wegdan R. Sayed

Khalifa

English Department,

Faculty of Arts, Sohag

University

Abstract

Although medical translation shares some features with other types of translation, it has some distinctive features that distinguish it from all other types. This paper is intended to analyze the morphological features of selected medical terms and their translations from English into Arabic. These medical terms are extracted from the 'Health Information Translations' website which contains a lot of health topics and their translations into different languages. The analysis of these morphological features is based on Vinay and Darbelnet's model (1958, 2000). The current research paper is based on a qualitative approach using a contrastive analysis to analyze the data. The findings of this study suggest that most of Vinay and Darbelnet's translation procedures are applicable and frequently used in analyzing these morphological features of medical terms and their translations (from English into Arabic).

Keywords: medical translation, morphological features, word formation, translation procedures, Vinay and Darbelnet's model (1958, 2000)

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التحليل الصرفي لبعض المصطلحات الطبية وترجمتها من الانجليزية إلى العربية

وجدان ربيع سيد خليفة

قسم اللغة الإنجليزية - كلية الآداب - جامعة سوهاج

المستخلص

بالرغم من التشابهات التي قد تتشاركها الترجمة الطبية مع أنماط الترجمة الأخرى، إلا أنها تتفرد بسمات خاصة تجعلها متميزة، مما يُضفي عليها طابعاً خاصاً واستثنائياً. يهدف هذا البحث إلى تحليل السمات الشكلية في مصطلحات طبية مختارة وترجماتها من الإنجليزية إلى العربية. وقد جرى انتقاء هذه المصطلحات الطبية من موقع "Health Information Translations"، الذي يُعنى بتوفير مواضيع صحية متعددة مترجمة إلى لغات شتى (تركز هذه الدراسة تحديدًا على المصطلحات الطبية المكتوبة بالإنجليزية وكيفية صقلها وترجمتها إلى اللغة العربية). ويرتكز التحليل على نموذج فيناي وداربلنيت (١٩٥٨-٢٠٠٠)، الذي يوفر إطارًا منهجيًا لتحليل الترجمة. تعتمد ورقة البحث الحالية على النهج النوعي باستخدام التحليل المقارن لتحليل البيانات.حيث تشير النتائج المستخلصة إلى أن معظم إجراءات الترجمة وفق فيناي وداربلنيت قابلة للتطبيق، كما أنها تُستخدم بتواتر في عملية تحليل السمات الشكلية للمصطلحات الطبية وترجماتها (من الإنجليزية إلى العربية).

الكلمات الرئيسة: الترجمة الطبية، السمات الشكلية، تكوين المصطلحات، إجراءات الترجمة، نموذج فيناي وداربلنيت (١٩٥٨-٢٠٠٠).

1. Introduction

Translation is the process of transferring texts from one language and hence culture into another. Elewa (2016) noted that "scientific and medical translation is not totally different from other types of translation since one can spot common vocabulary and grammatical structures that are required for communication within the scientific community" (p. 9). It is a highly specialized translation that depends on some basics that a translator must be familiarized with in order to properly translate a medical text from one language into another. Consequently, a medical or scientific translator must be fully aware of the strategies and linguistic features of medical texts before working on translation and must be familiar with medical terminology, its components, and the ways of its formulation; otherwise, he will face many challenges in translating these texts.

The challenges that the medical translator may encounter include the existence of multiple Arabic equivalents to English medical terms, the use of uncommon or complex medical terms, the extensive use of abbreviations and acronyms, complexity of the sentence structure, and the unavailability of medical terms in some specialized dictionaries. Consequently, medical translation is not an easy task and it can present a number of problems that can hinder understanding of medical research, reports, handouts, prescriptions, and other medical texts. Let us first highlight the most prominent linguistic features of medical texts.

Features of Scientific Translation

Elewa (2016) divided the main features of scientific translation into four main categories: **morphological, lexical, syntactic**, and **semantic**.

First, the **morphological** features are basically related to word formation. They include the use of affixes, compounds, abbreviations, acronyms, and eponyms. Affixation is a process in which prefixes and suffixes are added to a root word to create a new word with a different meaning. Compounding is a word formation process where two or more words are combined

to create a new word with a different meaning from its components (compounds are words that are formed by combining two or more words to create a new word with a specific meaning). Abbreviations are shortened forms of words; acronyms are a type of abbreviation formed from the initial letters of a multi-word phrase or noun. Eponyms are words that are derived from proper names of people, places, or things.

Second, the **lexical** features of scientific translation include the taxonomy of lexical items in the scientific domain and are divided into three types: purely technical vocabulary, common vocabulary, and semi-technical vocabulary (Elewa, 2016). Purely technical terms are unfamiliar to the lay translator because they are only used in technical contexts; common terms are familiar to the lay translator because they are only used in non-technical contexts; and semi-technical terms are used in both technical contexts and non-technical contexts, so they are familiar to the lay translator (Elewa, 2016). The most challenging of these types is the semi-technical terms because the translator cannot always recognize whether they are technical or not, while the purely technical and common terms can be easily understood by looking them up in specialized dictionaries. However, such jargon constitutes a great problem for even native speakers of the English language as most technical words are derived mostly from Latin and Greek roots and to solve this problem we can simplify the jargon into non-technical English language after consulting a specialized dictionary. For example, the suffix "-itis" can be simplified into "inflammation" which is non-technical.

Third, the **syntactic** features deal with sentence structure and the most common syntactic features in the scientific domain are nominalization, passivization, use of general and impersonal pronouns, and ellipses (Elewa, 2016). Nominalization (i.e. change of a verb or adjective into a noun) is used in scientific language because it is an abstract, impersonal, and objective style of writing (it also conceals agency and modality) while the use of the passive voice is helpful in focusing on the effect or result rather than the agent (it also hides agency,

enhances impersonality and objectivity). Furthermore, the use of impersonal pronouns is commonly used in science such as the use of the personal plural pronoun "we" to refer to only one person and to also enhance impersonality and objectivity.

Fourth, the **semantic** features include the ambiguity resulting from the use of words with connotative meanings, hyponyms, and synonyms. For instance, a medical translator who is not fully aware of the difference between terms such as 'pain' and 'ache' or 'sick' and 'ill' can render them incorrectly in the target language causing intricacies and ambiguities. So, semantic and communicative translations are more accurate than literal or word-for-word translation of scientific texts.

2. Review of the Literature

El-Wifati (2017) published a research paper that aimed to discuss derivational morphemes in the field of medical terminology and the process of translating them into Arabic. Because of the complexity of these morphemes, the understanding of what derivation morphemes are is important. So, that paper sheds light on neologisms, hyphenated medical compounds, and the process of translating them with reference to the theory of Meaning-Based Translation.

Mayyas, et al. (2020) conducted a contrastive analysis of English medical texts (ST) and Arabic medical texts (TT). They adopted the translation strategies proposed by Vinay and Darbelnet's Model (1958). The strategies have been listed and exemplified by providing examples which thoroughly explain and describe the way every strategy is employed in translating medical texts. Then, every single translation strategy has been discussed and analyzed in terms of its definition and specific details. The findings of that study, as the conclusion shows, indicate that these translation strategies are applicable, though quite challenging, to translating highly specialized medical texts from English into Arabic.

Alasbahy and Shamsi (2022) conducted a study to identify some difficulties

encountered when translating medical terms. It examines how current translators translate complex medical terms. The data used in that study consisted of 24 English medical terms and their Arabic equivalences. Also, different types of medical terms were considered. The findings of that study showed that translation of medical terms poses difficulties for medical students and researchers and these difficulties were tabulated and discussed to provide suggestions that can solve these problems when working on medical terms.

Mohammed (2022) conducted a research paper that focused on identifying the challenges of translating variants of medical documents that include abbreviations and acronyms. The study adopts the descriptive approach to investigate the inconsistency of medical abbreviations in English that include multiple medical meanings/versions of acronyms and abbreviations to be translated into Arabic. The samples used in that paper are frequently used in the medical context in hospitals. The documents included 18 medical abbreviations and acronyms to be translated from English into Arabic. The findings of that paper showed the main challenges encountered when translating abbreviations and acronyms from English into Arabic and the consequentiality of training for the medical translators to overcome these challenges.

3. **Methodology**

3.1. Data Collection

The current research paper is based on a qualitative approach using a contrastive analysis to analyze the data. The data have been collected from the “Health Information Translations” website which contains a huge number of translated health topics written in English (and their Arabic translations) to promote health and wellness among populations who may not speak English as a primary language. This paper limits itself to the morphological features included in these English medical terms and their translations such as affixations, compounds, abbreviations, acronyms, and eponyms.

3.2. Data Processing

The features are extracted from different medical texts. The selection of these texts is based on choosing terms in medical texts that include the morphological features of scientific translation. This **contrastive** analysis aims to compare the morphological features in the English source language terms and how they have been rendered into Arabic. The researcher uses the model of Vinay and Darbelnet (1958) to see which translation procedures were adopted in rendering these features into Arabic.

4. **Theoretical Framework**

Vinay and Darbelnet (1958) proposed two main types of translation strategies which are direct translation and oblique translation. The two strategies comprise seven procedures, of which direct translation covers three:

(1) Borrowing: a foreign word that is taken directly from the source language into the target language. This procedure is heavily used in technical fields such as translating "computer" as كمبيوتر. In languages which have different scripts, borrowing requires transcription like, for instance, the borrowings of mathematical, scientific, and other terms from Arabic into Latin or English such as rendering "الجبر" [al-jabr] to "algebra".

(2) Claque: a kind of borrowing where a source language expression or structure is transferred into a literal translation such as translating "cold war" as حرب باردة. Vinay and Darbelnet (1958) noted that both borrowings and calques often become fully integrated into the TL, although sometimes with some semantic changes, which can turn them into 'false friends'.

(3) Literal translation: a word-for-word translation which Vinay and Darbelnet (1958) described as being the most common between languages of the same family (though Arabic and English belong to different language families, Arabic to Semitic Languages with Hebrew and English to European Languages, West German). They also note that in cases where literal translation is not applicable, the strategy of **oblique translation** must be used.

The strategy of oblique translation covers four procedures, which are:

(1) Transposition: (sometimes known as 'class shift' if it only consists of a change of one part of speech) the change of one part of speech to another or a change of a certain structure into another without changing the sense (but a change of focus) such as translating the verb 'cheat' into the noun 'غِش' or changing a whole clause consisting of 'NP+VP' like "the program was a success" into كان البرنامج ناجحًا (consisting of NP+NP) or active into passive or vice versa. Transposition can be obligatory or optional. Vinay and Darbelnet (1958) see that transposition is the mostly used structural change by translators and they list at least ten categories like, for instance, the verb to the noun as in converting (they have pioneered) to (they have been the first) or active into passive like (They killed five children) into (Five children were killed), etc.

(2) Modulation: changing the meaning of the source language item or the point of view (e.g. words that have negative connotations into words that have positive connotations such as translating "liar" into" غير صادق" instead of "كاذب" or "infidel" into "غير مؤمن" instead of "كافر". Modulation can also be optional or obligatory. Vinay and Darbelnet (1958) subdivided modulation into: (1) abstract for concrete, (2) cause for effect, (3) a part for the whole, (4) a part for another part, (5) reversal of terms, (6) negation of the opposite, (7) active to passive and vice versa, (8) rethinking of intervals and limits in space and time, and (9) change of symbol.

(3) Equivalence (also referred to as idiomatic translation): languages describe the same situation by different stylistic or structural means. Equivalence or idiomatic translation is particularly useful in translating idioms and proverbs such as translating رجع بخفي حنين as "He returned empty-handed".

(4) Adaptation: changing the cultural reference when a situation in the source culture does not exist in the target culture. It refers to the process of modifying a text to make it suitable for the target audience or to fit the cultural context of the target language. An

example of adaptation is rendering “Romeo and Juliet” as "قيس وليلى" in Arabic.

5. Analysis and Discussion

5.1 Affixation

Most medical terms can be broken down into one or more parts. These parts are (1) roots (combining forms like ‘tonsil/o’ or ‘gastr/o’), (2) prefixes (e.g. peri-, anti-, hypo-), (2) suffixes (-itis, -scope, -logy), and (4) linking or combining vowels (o). The root is the core element that contains the essential meaning of the word. The suffix is a word element added to the end of a word root modifying the meaning. The prefix is a word element that is added to the beginning of a word changing its meaning. The linking vowel is a vowel that links the root to the suffix or the root to another root. An example of a word with these parts is the medical term "pericarditis" which can be divided into three parts: ‘peri-’ (prefix that means surrounding or around) – cardi/o (root that means ‘heart’) and ‘-itis’ (suffix that means inflammation): the whole word means inflammation of the area surrounding the heart. Thus, affixation plays a significant role in forming and coining scientific terms in English, and being aware of the common affixes used in the medical field can help in understanding and rendering many terms from English into Arabic or any other language.

1. *Table of Analysis (Affixation)*

No.	English Medical Term	Arabic Translation	Translation Procedure
1	gastroparesis	خزل المعدة	literal translation
2	paralysis	شلل	equivalence
3	hypothyroidism	قصور الغدة الدرقية	literal translation
4	bulimia	الشره المرضي	modulation
5	anorexia	فقدان الشهية	modulation
6	autoimmune	المناعة الذاتية	literal translation
7	triglycerides	الدهون الثلاثية	literal translation + modulation

Discussion

In examples (1), (3), and (6), the translator adopted the procedure of literal translation. The term ‘gastroparesis’ consists of the word root (gastr-) which means stomach, the linking vowel (o), and the suffix (-paresis) which describes weakness or partial paralysis. So, this term refers to a disorder in which the stomach muscles do not function properly causing slow emptying of food from the stomach into the small intestines. Both the root (gastr-) and the suffix (-paresis) have been rendered literally into خزل المعدة.

“Hypothyroidism” refers to a condition where the thyroid gland does not produce enough thyroid hormones and it consists of the prefix (hypo-) which means ‘below normal’, the root (thyroid) which refers to the thyroid gland, and the suffix (-ism) which denotes a condition. Each part of this word has been rendered literally into its Arabic equivalent. “Autoimmune” refers to a condition where the body's immune system mistakenly attacks its own cells. It consists of the suffix (auto-) which is commonly used in English to indicate something related to oneself and the root (immune) which relates to the immune system. When rendering this term into Arabic as المناعة الذاتية, both the prefix and the root have been translated literally.

In example (2), the translator adopted the procedure of equivalence. The medical term ‘paralysis’ is derived from Greek and it means “disabling of (or inability to move) the nerves or one or more muscles in the body”; (para-) means ‘beside or by’ and (lysis) means ‘making loose’. This term has been translated into Arabic by using the equivalence procedure, which means the same situation but different stylistic or structural means, into شلل.

In examples (4) and (5), the translator adopted the procedure of modulation. The term ‘bulimia’ (known also as ‘bulimia nervosa’, the prefix (buli-), the combining form (mia), and the suffix (-nervosa) refers to an eating disorder characterized by eating large amounts of food at one time followed by vomiting, excessive exercise, or the use of laxatives to

prevent weight gain. In the Unified Medical Dictionary, the direct Arabic equivalent of 'bulimia' is نهام. However, 'bulimia' has been translated into الشره المرضي by using the modulation procedure. Also, in the term 'anorexia,' the prefix (an-) indicates the absence of appetite, the combining form (orex-) relates to appetite, and the suffix (-ia) denotes condition or state of lacking appetite. The term refers to an eating disorder characterized by an abnormally low body weight. As explained in example (4), the direct Arabic equivalent of 'anorexia' in the Unified Medical Dictionary is قهم, but 'anorexia' has been translated into فقدان الشهية by using the modulation procedure.

In example (7), the translator adopted both the procedures of literal translation and modulation. In the term 'triglycerides,' the prefix (tri-) means three, the root (glycer-) means the sweet compound glycerol, and the suffix (-ide) denotes a particular quality. The term refers to a type of lipid found in the blood. The literal Arabic translation of this term is غلسريدات ثلاثية. Instead, in the above translation, the prefix (tri-) that indicates "three" has been translated literally as "الثلاثية", while the procedure of modulation was adopted in rendering (glycerides) as الدهون where the translator used a more general term instead of specifying what type of lipid it is.

5.2. Compounds

Compounding is heavily used in the scientific domain and it is classified into three types: connected (e.g. photograph), hyphenated (e.g. ill-mannered), and spaced (e.g. black bird). There is also a group of compounds called 'new classical compounds', mostly coming from Latin origin, mostly technical like 'photograph', 'biology', 'astronomy', etc., each consisting of a bound root, combining vowel and a suffix. Elewa (2016) stated that the translator can simplify the compound into a noun phrase as in the following example: "sodium free": خال من الصوديوم

2. *Table of Analysis (Compounds)*

No.	Compound	Type of the Compound	Arabic Translation	Translation Procedure
1	Heartburn	Connected	حرقة في فم المعدة	Modulation
2	X-ray	Hyphenated	أشعة سينية	Adaptation
3	Radioactive	Connected	مشعة	Equivalence
4	Calcium-fortified	Hyphenated	تحتوي على كميات كبيرة من الكالسيوم	Borrowing + Transposition
5	Heartbeat	Connected	ضربات قلب	Modulation + Literal translation
6	Airways	Connected	المجاري الهوائية	Literal translation

Discussion

In example (1), “heartburn” is a connected compound that consists of two words appearing as one: heart and burn. The direct Arabic equivalent of this term is حموضة المعدة. Here, the translator adopted the modulation procedure and rendered it into حرقة في المعدة. There is a change of the point of view in which the translator mentioned the effect of the heartburn, which is حرقة في المعدة.

In example (2), “x-ray” was discovered by the German physician “Wilhelm Conrad Roentgen”, and because he did not know what exactly it was, he called it X-ray and this is because the letter ‘X’ is used to denote an unknown variable in English. In Arabic, the letter (س) is used to signify the unknown. So, the term "سينية" is derived from the letter (س) which helps in retaining Roentgen’s discovery, just as “X” does in English.

In example (3), “radioactive” is a connected compound that consists of radio and active (referring to radiation) which means نشط in Arabic. Instead of rendering each part of the compound literally as نشط إشعاعيًا, the translator opted for an Arabic equivalent of one word

which has the same meaning (مشعة).

In example (4), “calcium-fortified” is a hyphenated compound which literally means مدعم بالكالسيوم in Arabic. In the above example, the translator adopted the procedure of borrowing in transcribing the word “Calcium” as كالسيوم. Second, he adopted the procedure of transposition in translating the adjective “fortified” into Arabic. He changed the grammatical structure without altering the meaning.

In example (5), “heartbeat” is a connected compound that consists of two words: (heart) and (beat). In this example, the procedure of modulation has been used in translating the component (beat). The translator used the plural form "ضربات" instead of the singular form used in the original compound in order to match the Arabic norms. But the other component which is “heart” has been translated literally as "القلب".

In example (6), “airways” is a connected compound that consists of two words: “air” and “ways” to refer to the passages through which the air flows. This compound has been translated literally where the two components “air” and “ways” have been rendered as "ممرات هوائية".

5.3. Abbreviations and Acronyms

Abbreviations and acronyms are among the most problematic features for the medical translator and they are common in medical reports, referral letters, and prescriptions. Abbreviations are shortened forms of words or phrases and they are pronounced by saying each letter individually (i.e. spelling letters out), while acronyms are also regarded as shortened forms but the difference is that acronyms are formed by taking the initial letters of a multi-word phrase and using them to form a new word. Unlike abbreviations, acronyms are pronounced as words themselves.

3. Table of Analysis (Acronyms and Abbreviations)

No.	Medical Abbreviation or Acronym	Arabic Translation	Translation Procedure
1	IV	الحقن الوريدي	equivalence
2	ECG	رسم قلب	Equivalence
3	TB	السل	Equivalence
4	EGD	تنظير المعدة والأمعاء	Literal translation + Modulation
5	EEG	مخطط كهربية الدماغ	Literal translation
6	MRI	التصوير بالرنين المغناطيسي	Literal translation
7	COPD	مرض الانسداد الرئوي المزمن	Literal translation + Transposition
8	MSG	الغلوتامات أحادية الصوديوم	Literal translation + Adaptation
9	UTI	التهاب الجهاز البولي	Modulation + Literal translation
10	SPF	معامل حماية من الشمس	Literal translation

Discussion

In examples (1), (2), and (3), the translator adopted the procedure of equivalence. “IV” is a medical abbreviation that stands for ‘intravenous’. ‘Intravenous’ consists of the prefix (intra-) which means inside and the root (venous) which is derived from “vein”. If this term was rendered literally into Arabic, it would be داخل الوريد. Instead, the translator opted for an Arabic equivalence to ensure the same concept is understood in both languages. ‘ECG’ stands for ‘electrocardiogram’. ‘Electrocardiogram’ consists of three components: the first root (electro) means electricity, the second root (cardio) means the heart, and the suffix (-gram) means recording. If each component of this term was translated literally, the Arabic translation of this abbreviation would be مخطط كهربية القلب. Instead, the translator opted for an Arabic equivalent term (رسم قلب) which is also used to record both the heartbeat and the electrical activity of the

heart. ‘TB’ is a medical abbreviation that stands for ‘tuberculosis’. The equivalence procedure has been used to render such a medical term into Arabic as السل. Both terms refer to the same infectious disease that affects the lungs.

In example (4), “EGD” stands for “eophagogastroduodenoscopy” which is a diagnostic procedure. This term consists of four components: the first combining form or the first root (esophago-) which refers to the esophagus, the second combining form or second root (gastro) which refers to the stomach, the third combining form or third root (duodeno-) which refers to the duodenum, and the suffix (-scopy) which refers to the process of examining. The literal translation of this abbreviation is تنظير المريء والمعدة والاثنى عشر. Here, the translator adopted the procedure of modulation in replacing both “esophagus and duodenum” with "الأمعاء". Also, he translated the combining form (gastro-) and the suffix (-scopy) literally as تنظير المعدة.

In example (5), “EEG” stands for “electroencephalogram”. This term consists of two combining forms or roots and a suffix. The combining forms are (electro-) which refers to the electrical activity and (encephalo-) which refers to the brain. The suffix (-gram) refers to something recorded. Each part of these has been translated literally into Arabic as مخطط كهربية الدماغ.

In examples (6) and (10), the translator adopted the procedure of literal translation. MRI is an abbreviation that stands for “magnetic resonance imaging”. Each component of this abbreviation has been translated directly into its literal Arabic equivalent as التصوير بالرنين المغناطيسي in addition to maintaining the meaning and the original structure. SPF stands for “sun protection factor”. The translation "معامل حماية من الشمس" closely follows the procedure of literal translation as each component of the abbreviation has been translated literally: factor "معامل", protection "حماية من", and sun "الشمس". The original structure and meaning of the abbreviation have been retained while converting each component into the target language.

In example (7), COPD is a medical acronym that stands for chronic obstructive pulmonary

disease. Every component of this acronym has been rendered literally into Arabic except the adjective “obstructive”. It has been translated into Arabic by adopting the procedure of transposition. It has been changed from the adjective “obstructive” into the noun “انسداد”.

In example (8), MSG stands of monosodium glutamate. In translating “monosodium glutamate” into Arabic, the translator adopted two different procedures. First, he used literal translation in rendering “monosodium”. It consists of two components: the prefix (mono-) which means “one” and the root “sodium”. Each component of these has been translated literally as أحادية الصوديوم. Second, the term “glutamate” has been borrowed from English and adapted to fit the phonetic and morphological rules of Arabic as الغلوتامات.

In example (9), UTI stands for “urinary tract inflammation”. There is a difference between the urinary system and the urinary tract. The urinary system refers to all the organs and parts involved in the production, storage, and elimination of urine from the body, while the urinary tract refers to the pathways through which urine travels. From these definitions, the urinary tract is a part of the urinary system. Hence, the translator adopted the modulation procedure in rendering “urinary tract” as الجهاز البولي instead of "المسالك البولية". He also used literal translation in rendering “inflammation” as التهاب.

5.4. Eponyms

An eponym refers to one for whom or which something is believed to be named. It is used in the scientific domain to fill the lexical gaps created by new discoveries, inventions, practices, or models (Elewa, 2016). The best way of rendering an eponym into Arabic is the use of functional equivalence or transliteration. For example, “Parkinson” can be rendered into Arabic as "الشلل الرعاش" (functional equivalent) or "مرض باركنسون" (transliteration).

4. Table of Analysis (Eponyms)

No.	Eponym	Arabic Translation	Translation Procedure
1	Parkinson	الشلل الرعاش	equivalence
2	Al-Zheimer	مرض الزهايمر	Borrowing
3	Fahrenheit	فهرنهايت	Borrowing
4	Celsius	مئوية	Equivalence
5	Non-Hodgkin's	اللاهودجكن	Borrowing + Adaptation

Discussion

In examples (1) and (4), the translator adopted the procedure of equivalence. Parkinson's disease is a condition that is characterized by a degenerative condition of the brain. It is an eponym that is named after James Parkinson who medically described it as a neurological syndrome. This term can be rendered even by using a functional equivalent which is "الشلل الرعاش" or transcribing it as "باركنسون". Here, the translator used the procedure of equivalence. Celsius scale is a temperature scale that is named after Andrew Celsius who invented it. This eponym can be rendered even by using a functional equivalent which is "مئوية" or transcribing it as "سيليزية". Here, the translator adopted the procedure of equivalence to convey the same lexical item by using different stylistic and structural methods.

In examples (2) and (3), the translator adopted the procedure of borrowing. Al-Zheimer's disease is a condition that is characterized by a progressive neurological disorder. It is an eponym that is named after Alois Alzheimer. This term has been rendered into Arabic by using the borrowing procedure via transcribing it as الزهايمر. Fahrenheit scale is a temperature scale that is named after Daniel Gabriel Fahrenheit who proposed it in 1724. Also, this eponym has been translated into Arabic by using the borrowing procedure via transcribing it as فهرنهايت.

In example (5), two different translation procedures have been used to render this eponym into Arabic: borrowing and adaptation. First, the proper name ‘Hodgkin’ has been transliterated into Arabic as هودجكن. Second, the negation prefix "Non-" has been adopted into the Arabic "لا".

6. Findings

The application of Vinay and Darbelnt’s model (1958) proved to be effective in addressing the morphological challenges related to the translation of medical texts from English into Arabic. Sometimes, only one translation procedure is used to translate a morphological feature into Arabic, and at other times two procedures are adopted together to render one morphological feature into Arabic. The procedure of literal translation was frequently used in translating the affixations and acronyms. The procedures of equivalence and borrowing were frequently employed for translating medical eponyms from English into Arabic. The procedures of literal translation and equivalence were used in translating medical abbreviations and most of Vinay and Darbelnet’s translation procedures are applicable in the translation of medical compounds.

Conclusion

The morphological analysis of medical texts and their translations from English into Arabic and the complexities of medical language constitute a set of challenges for translators. The translator must be careful about maintaining the morphological integrity of medical terms and also take into consideration both the syntactic and morphological conventions of both the English and Arabic languages. This research paper investigated those features in English medical texts and tried to highlight whether or not the translator succeeded in transmitting them into Arabic through conducting a contrastive analysis of these morphological features and their Arabic translations utilizing the strategies proposed by Vinay and Darbelnet’s model (1958). This model with its categorization of direct and oblique translation strategies provided a useful

framework for analyzing these morphological features included in the medical terminology in English and Arabic. It was found that this model could be applied adequately in translating the morphological features of highly specialized medical texts.

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Appendix

(https://storage.googleapis.com/healthinfotranslations pdfdocs/LoweringSodium_ar.pdf)

What is sodium?

Sodium is a mineral that is needed for good health and is present in all foods. Most people eat more sodium than they need. If the body cannot get rid of the extra sodium, fluid builds up. Extra fluid increases the work of the heart and kidneys, and may increase blood pressure. Eating less sodium may help control these problems. You will sometimes see the term sodium abbreviated "Na," as in NaCl (sodium chloride), which is **table salt**.

The current guideline for how much sodium we should eat is 2,300 milligrams (mg). The guideline is even lower at 1,500 mg for those over 50 years old, with high blood pressure and for African Americans. These sodium goals can be hard for some people to reach, especially if they are eating large amounts of sodium now. Many people can get to the lower sodium goal over time by making small changes to their diets. This handout can help you start to do this.

ما هو الصوديوم؟

الصوديوم هو أحد المعادن الضرورية للحفاظ على الصحة ويدخل في تكوين معظم المواد الغذائية. ويتناول الكثيرون الصوديوم بكميات تزيد عن حاجتهم. ولكن إذا لم يتمكن الجسم من التخلص من هذه الكميات الزائدة، فإن السوائل تتراكم في الجسم. وتتسبب هذه السوائل في زيادة عمل القلب والكليتين وقد تؤدي إلى ارتفاع ضغط الدم. إلا أن تناول كميات قليلة من الصوديوم يساعد في الحد من هذه المشاكل. ويُرمز إلى الصوديوم في بعض الأحيان بالاختصار "Na" كما في NaCl (كلوريد الصوديوم) وهو **ملح الطعام**.

تشير الإرشادات الحالية إلى أن نسبة الصوديوم التي يحتاجها الجسم هي 2,300 ملليغرام (ملغ). وتقل هذه النسبة إلى 1,500 ملغ لمن تزيد أعمارهم عن 50 عامًا، ومن يعانون من ارتفاع في ضغط الدم، وكذلك لدى الأمريكيين ذوي الأصول الأفريقية. وقد يصعب على البعض تحقيق هذه النسب وبخاصة إذا كانوا يتناولون نسبة كبيرة من الصوديوم في الوقت الحالي. ولكن يستطيع البعض الوصول إلى أقل نسبة بمرور الوقت، وذلك بإدخال بعض التعديلات البسيطة على عاداتهم الغذائية. وسيساعدك هذا المنشور على القيام بذلك.

Sodium Guidelines

Even low sodium or sodium-free foods contain small amounts of To choose foods that are healthier for you, look for these labels:

- **Sodium-free:** less than 5 milligrams of sodium per serving
- **Very low-sodium:** 35 milligrams or less per serving
- **Low-sodium:** 140 milligrams or less per serving

إرشادات استخدام الصوديوم

حتى الأطعمة منخفضة الصوديوم أو الخالية من الصوديوم تحتوي على كميات صغيرة منه. ولاختيار المواد الغذائية ذات الفوائد الصحية، يُرجى التأكد من وجود الملصقات التالية عليها:

- **خالية من الصوديوم:** تقل نسبة الصوديوم في كل حصة عن 5 ملليغرام
- **نسبة الصوديوم ضئيلة جدًا:** 35 ملليغرام أو أقل في الحصة
- **نسبة الصوديوم قليلة:** 140 ملليغرام أو أقل في الحصة

Know Your Salt

When you are trying to lower the sodium in your diet, even a small amount of salt has a lot of sodium in it.

Amount of sodium in salt:

- ¼ teaspoon salt has 600 milligrams of sodium
- ½ teaspoon salt has 1,200 milligrams of sodium
- ¾ teaspoon salt has 1,800 milligrams of sodium
- 1 teaspoon salt has 2,300 milligrams of sodium
- 1 teaspoon baking soda has 1,000 milligrams of sodium

How can I limit sodium?

General tips:

- Slowly cut back on the amount of salt that you add when cooking or eating foods until you **do not use any salt.**
- **Avoid seasoned salts.** These include onion salt, celery salt, lite salt, low-sodium salt and sea salt. Accent, meat tenderizers and lemon pepper should also be avoided.
- Be careful if you choose a salt substitute. Many substitutes have large amounts of potassium in them which can cause medical problems for some people. Lite salts contain sodium in smaller amounts, but they are still too high for people who need to restrict sodium. Ask your doctor or dietitian if a salt substitute is okay for you.

تعرّف على نسبة الأملاح

عندما تحاول تقليل نسبة الصوديوم في نظامك الغذائي، ضعي في حسبانك دائمًا أن الكميات القليلة من الملح تحتوي على نسبة كبيرة من الصوديوم.

نسبة الصوديوم في الملح:

- ¼ ملعقة صغيرة من الملح تحتوي على 600 ملليغرام صوديوم
- ½ ملعقة صغيرة من الملح تحتوي على 1,200 ملليغرام صوديوم
- ¾ ملعقة صغيرة من الملح تحتوي على 1,800 ملليغرام صوديوم
- ملعقة صغيرة من الملح تحتوي على 2,300 ملليغرام صوديوم
- ملعقة صغيرة من بيكربونات الصوديوم تحتوي على 1,000 ملليغرام صوديوم

كيف يمكنني التقليل من نسبة الصوديوم؟

نصائح عامة

- يرجى تقليل كمية الملح المضافة عند الطهي أو عند تناول الأطعمة بالتدريج حتى تصل لمرحلة **عدم إضافة أي ملح.**
- **تجنب الأملاح المتبلة**، ويتضمن ذلك؛ ملح البصل وملح الكرفس والملح المخفف والملح الذي يحتوي على نسبة قليلة من الصوديوم وملح البحر، كما يجب كذلك تجنب استخدام أحادي جلوتومات الصوديوم وتوابل اللحم وفلفل الليمون.
- توخي الحذر عند اختيار بديل للملح. حيث تحتوي العديد من هذه البدائل على نسبة مرتفعة من البوتاسيوم قد تسبب مشاكل صحية لدى البعض. تحتوي الأملاح الخفيفة على نسبة صوديوم ولكن بكميات أقل، ولكنها لا تناسب من يرغبون في خفض نسبة الصوديوم. يُنصح باستشارة الطبيب أو أخصائي التغذية لمعرفة ما إذا استخدام بديل للملح يناسبك أم لا.