# Trends in Persian medicinal terminology a progressing field of interdisciplinary research

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## ABSTRACT

Conceptualization for new findings is the main aim of science and technology development. Sometimes new concepts are pathfinders for science and starting fundamental revolutions in science. An important area in scientology or scientific studies is the concept and term field, so terminology and its effect on science and technology is one of the most important subjects in the last decade. Standardization in scientific terms (scientific term selection) is one of the strongest terminology methods. These methods break down the terms to their meaningful parts or use prevalent terms, which are common among people or use eponyms and abbreviation processes, and finds the appropriate equivalent for them. The word parts are prefixes, suffixes and stems. In medical sciences, terms are mostly originated from Latin stems, so this method could be extremely efficient in these fields. The terminology committee of Persian Academy studied the highly frequent prefixes, suffixes and stems to help the standardization of terminology in medical sciences. This research introduces methods of term selection, some approved terms and their Persian equivalents. Term selection for medical terms is not an obligatory rule, but is a proposal for meeting the researchers need to strength Persian language as a scientific language.

**Keywords:** medicinal sciences; term selection; scientific terminology; standardization; etymology

## INTRODUCTION

Since new science have a foreign origin, there are only two ways ahead of students and researchers; either using the foreign terms in their speaking and writing, or creating new terms. Although using the foreign word seems to be easier and less problematic, in the long run, it negatively affects the structure of Persian language; consequently, Persian language will be full of these foreign terms so that it loses its identity and nothing remains out of it. Moreover, these loan terms are not clear enough for Persian speaker and they cannot internalize such terms or use them to make new constructions and combinations. As a result, through the time, the rules of morphology become obsolete and useless so that the language itself starts to lose its identity. based on the mentioned difficulties, those Iranian, who are interested in their national language, have been constantly trying to contribute to enrich the treasury of their terminology by making native and local equivalents and equip their language with devices to express new concepts . Throughout the history, Persian language has been capable of fulfilling the requirements of its speakers as well as expressing scientific and literary concepts. Nevertheless, due to the fact that it has been relying on Arabic since 1400 years ago, and it has compensated all areas of needs through borrowing from the mentioned language, today, some assume that Farsi no longer is able to cover some concepts by its own, especially, in the field of science. On the other hand, in the present century, most of the scientific and theoretical concepts, in addition to industrial and non-industrial goods and products are imported from western countries and that is why borrowing has shifted from Arabic to European languages. The huge amount of imported terms has made the scientists and people who are concerned about Persian language to find solution and they have felt responsible to start making new terms as well as finding suitable equivalents not only to enrich Persian language but also to expand and

to increase its capabilities in expressing new concepts and issues.

In the field of science, the emphasis of authorities in charge of making new terms is on the accuracy and exactness. As a result, it seems that while it is attempted to preserve the actual meaning, they want the newly made equivalents to be clear and understandable enough. Based on surveys, word formation processes such as compounding, derivation, clipping and blending have a wider range of application. In this article, even though different processes of terminology and word formation in science are mentioned, a focus of attention is only on those processes that are in highly frequent in the formation of medical terminology.

**1. Language of science and Persian language**

The formation of equivalents occurs when two languages come to a close contact in areas such as scientific, cultural, military, political or economical relations. When these two languages do not have commonalities in the mentioned areas and one of them is more powerful and enriched in quality and quantity, the other one which doesn't contain the proper equivalents available for the phenomena in the first language will be forced to create equivalents in various ways. [13] It is sometimes assumed that because a new term contains novel meanings and are unfamiliar, some difficulties arise in understanding them.

But based on experience, if such terms follow morphological, syntactic and semantic regulation existing in language, they can easily find their place in language and soon become one of the usual words of that language [1, 2] .

Although some believe that semantic expansion of words which adds to the semantic load of words, can cause difficulty in perception of message due to the ambiguity risen based on having multi meaning, this semantic expansion can also be useful.[1]

In other words, after a period, language users, especially in technical usage of words, will be able to differentiate these semantic domains and correctly get the intended meaning. It is probable that only at the beginning, novice and inexperienced students would be forced to learn the technical meaning of words. But it seems to be very natural. Even if they wanted to learn the subject from the source language, they had to learn the technical meaning of words in that source language [2].

Since eleventh century AD, the language of science in Farsi has been dealing with a foreign but powerful language both in ancient and modern science in all the times and because of its immediate need to education as well as the accelerating development of science, there was no time for Farsi to be recovered. On the other hand, based on the disagreement among scientists, no criterion language for science has been introduced [3]. Consequently, in spite of the fact that Farsi has not been unable to develop the language of science, it has not been able to use all its facilities and capabilities because of not being the producer of science itself. The present problems of Persian language in the areas of science and technology are related to imitation from foreign language structures, differences in scientific terms, and disagreements between authors and translators. The solution of these problems is stabilizing the scientific and technical terminology at the basic levels and mass media [3].

In order to facilitate the transition of meaning and concepts, the language of science should have two characteristics; preciseness and stabilization. It is believed that three groups of specialists, translator's authors and professional terminologists should shoulder the burden of forming and using scientific terminology. The available scientific terminology are not consistent, and in different dictionaries, in some cases, for a single foreign word, there are various Persian equivalents or there are various foreign equivalents for a single Farsi word; as a result, it is claimed that scientific expressions are inconsistent [4, 14].

Language planning seems to be the only way to change Persian language into the language of science and planning in terminology is one of its sections. Language planning, standardization, and modernization have been started by the foundation of the terminology department in Persian Academy. Establishing criteria and modernization of language mostly is because of producing scientific and technical terms so that the understanding of complex novel scientific and technical subjects would be easier. In addition to the committee of Academy, this important task is also done by some organizations and publishing institutes through translating scientific, cultural and sociological pieces of work [2].

Inside every language, a kind of language known as special language forms. In special language, technical words of each field are

different from other fields and they are formed based on technical and scientific needs of these groups.

The special language is common among the people involved in that particular field and it is used for transacting knowledge in that specific area.[16,5].

Different languages use various methods for the formation of new terms. Even in different periods, speakers may use different methods for the formation of new terms. In cases that scientific terms have become internationally accepted, they have also been accepted by different languages with no change. Furthermore, every technical language has used special methods of word formation based on its own needs. In other words, each word formation process can be used differently or frequently or less frequently in various fields.

In the following sections, the most frequent processes of word formation in medical sciences are discussed. Now many terminological scientific studies are operating in universities. The experience of such previous research evoked academic society to involve in continuing the trend of scientific term selection [17-21].

**2. Processes of word formation in medical sciences**

Surveys on the frequently used terminology in medicine reveals that some processes are more frequent in the formation of new terms and equivalents [6,11] :

**A**-One way is to use the popular terms which originate in traditional medicine or were common among ordinary people such as /sar?/ as an equivalent for "epilepsy" [6].

**B**- The second method is to use terms which have a Latin root and derivational rules can be applied to them easily in European languages. An example can be the word cardio which means heart in different combinations such as electro cardiogram, endocarditic, epicedium, cardiovascular, and cardiologist. The use of Latin prefixes and suffixes are quite frequent in this method. Most of the roots are combined with suffixes and prefixes such as *epi-*, *meta-, hyper-*, *-osis, -itis*, and *-oma* to make terms that carry more specific meanings. By finding the exact equivalents of suffixes, prefixes and roots, in most cases it is possible to make proper words for such terms [15,16,22].

The smallest meaningful unit of word is morpheme which either carries meaning or shows a grammatical function. Morphemes are of two types: Free and bound. Bound morphemes cannot be used alone and have two types, derivational and inflectional. While derivational morphemes are used either to change the meaning or change the part of speech, inflectional morphemes only show other aspects of a word. Derivational are categorized into prefixes, infixes and suffixes according to the place of attaching to a stem [12]. If needed, languages begin making and producing new affixes. This can be achieved by changing a stem into an affix or by borrowing from a foreign language or either from dialects and accents available in the language itself [12]. Conclusively, affixes are elements that can't be used alone and they should be attached to a stem (simple or compound). If they only show another aspect of the word such a "plural s", they are called inflectional, and if they make a new word (no matter if they change the part of speech or not) they are called derivational.

**C**- Using proper names (eponyms) is another way of forming new terms. When a novel phenomenon is discovered, since there is not enough information about it, finding a comprehensive name for it would be difficult. That's why this phenomenon is named after the first person who encountered it or the place in which it occurred for the first time or even the similarity it may have to a particular item or thing. Cat's cry syndrome, in which a child cry sounds like of a cat, is such example. [6]

**D**- Another very common way is using abbreviation. The very highly frequent terms such as AIDS (Acquired Immune Deficiency Syndrome) and ABG (Arterial Blood Gas) fall into this category [22].

## PROCEDURES AND METHODS

In order to find out about these methods and standardization in terms, the researchers have referred to the findings of medical sciences committees of the terminology department in Persian Academy[7-11]. These committees consist of biology, medicine, food and nutrition, cultivation and environment. The findings of medical sciences committees have been the center of attention in this survey. Each of the terms is referred to the approved equivalents issued by its technical department and related explanations are followed by it in comment column.

**RESULT**

Terms selected due to their public popularity or their origin in traditional medicine:

| | English term | Persian equivalent | comments |
|---|---|---|---|
| 1 | ampoule | /Ampul/[1] | medicine |
| 2 | anatomy | /tashrih/ | medicine |
| 3 | angina | /galudard/ | medicine |
| 4 | blister | /tAval/ | medicine |
| 5 | cataract | /AbmorvArid/ | medicine |
| 6 | coryza | /zokAm/ | medicine |
| 7 | eczema | /egzemA/ | medicine |
| 8 | tremer | /ra?she / | medicine |
| 9 | bile, gall | /zardAb/,/safrA/ | medicine |
| 10 | flatulence | /nafkh/ | medicine |
| 11 | gall bladder | /zahre/ , /kiseye safrA/ | medicine |
| 12 | buphthalmic | /gAvcheshm/ | medicine |
| 13 | myope | /nazdikbin/ | medicine |
| 14 | presbyope | /pircheshm/ | medicine |
| 15 | pulse | /nabz/ | medicine |
| 16 | pupil | /mardomak/ | medicine |
| 17 | nyctalope | /shabkur/ | medicine |
| 18 | menopause | /yA?esegi/ | medicine |
| 19 | antipyretic | /tabbor/ | medicine |
| 20 | beat | /zarabAn/ | medicine |

Terms selected with the aim of their roots and etymological aspect:

| | English term | Persian equivalent | comments |
|---|---|---|---|
| 1 | chromatopsia<br>(chroma- + -opsia) | /rangbini/<br><br>/rang/ (*color*)+- /bini/(*to see*) | medicine |
| 2 | subcutaneous<br>(sub- + -cutaneous) | /zirjeldi/<br><br>/zir/ (*under*)+ /jeldi/ (*pertaining to skin*) | medicine |
| 3 | diplopia<br>(dipl- + -opia) | /dobini/<br><br>/do/ (*two*)+ -/bini/(*to see*) | medicine |
| 4 | dysfunction<br>(dys- + function) | /doshkAri/<br><br>/dosh/- (*bad*)+/ kAri/ (*to work*) | medicine |
| 5 | epigenesis<br>(epi- + -genesis) | /paszAyesh/<br><br>/pas/- (*after*)+/ zAyesh/ (*to give birth*) | medicine |
| 6 | metaplasia<br>(meta- + -plasia) | /degarruyesh/<br><br>/degar/- (*another*)+/ ruyesh/ (*to grow*) | medicine |
| 7 | hypogastrium<br>(hypo- + -gastrium) | /pAinshekam/<br><br>/pAin/- (*under*)+ /shekam/ (*belly*) | medicine |
| 8 | hypotrophic | /kamparvard/ | medicine |

[1] More information about phonetic symbols available in appendix1.

| | | | |
|---|---|---|---|
| | (hypo- + troph + -ic) | /kam/- (*little*)+ /parvard/ (*to nurrish*) | |
| 9 | paraclinical (para- + clinic + -al) | /pirApezeshki/ /pirA/- (*around*)+/ pezeshki/ (*medicine*) | medicine |
| 10 | pathogenesis (patho- + -genesis) | /bimArizAi/ /bimAri (*disease*)+ -/zAi/ (*to generate*) | medicine |
| 11 | micronutrient (micro- + -nutrient) | /rizmoqazzi/ /riz/- (*small*)+ /moqazzi/ (*nutrient*) | medicine |
| 12 | homeopathy (homeo- + -pathy) | /hamsAndarmAni/ /hamsAn/- (*the same*)+ /darmAni/ (*to cure*) | medicine |
| 13 | acidosis (acid- + -sis) | /asidbAri/ /asid/ (*acid*)+ -/bAri/ (*to have*) | nutrition |
| 14 | alkalosis (alkal- + -sis) | /qalyAbAri/ /qalyA/ (*alkaline*)+ -/bAri/ (*to have*) | nutrition |
| 15 | gametocyte (gameto- + -cyte) | /kAmyAkhte/ /kAm/ (*sex*)+ /yAkhte/ (*cell*) | biology |
| 16 | neurocyte (neuro- + -cyte) | /pey-yAkhte/ /pey/ (*nerve*)+ /yAkhte/ ( *cell*) | medical science |
| 17 | ovulation (ovul- + tion) | /tokhmakgozAri/ /tokhmak/ (*ovul*)+ -/gozAri/ (*to lay*) | medicine |
| 18 | cephalography (cephal- +-graphy) | /jomjomenegAri/ /jomjome/ (*skull*)+ /negAri/ (*to visualize*) | medicine |
| 19 | cephalogram (cephal - + -gram) | /jomjomenegAre/ /jomjome/ (*skull*)+ /negAre/ (*visualized*) | medicine |
| 20 | hysterectomy (hyster- + -ectomy) | /zehdAnbardAri/ /zehdAn/ (*womb*)+ /bardAri/ (*to remove*) | medicine |

Terms selected by using proper names (eponyms):

| | English term | Persian equivalent | comments |
|---|---|---|---|
| 1 | Bowman's capsule | /pushineye boman/ | biology |
| 2 | Casparian strip | /navAre kAspAri/ | biology |
| 3 | fissure of Rolando | /shiyAre rolAndo/ | biology |
| 4 | fissure of Sylvius | /shiyAre siliyus, shiyAre gijgAhi/ | biology |

Some abbreviations used in approved terms:

| | abbreviation | full form | Persian equivalent | comments |
|---|---|---|---|---|
| 1 | DRIs | Dietary Reference Values | /deram/ | nutrition |
| 2 | EAR | Estimated Average Requirement | /niyAb/ | nutrition |
| 3 | AI | Adequate Intake | /dark/ | nutrition |
| 4 | UL | Upper tolerable intake Level | /had/ | nutrition |

**Appendix1**

| | | | |
|---|---|---|---|
| a | b**a**d | k | **k**ey |
| A | f**a**ther | h | **h**ot |
| o | *similar to sound* o *in* **o**pen | s | **s**oon |
| u | t**oo** | sh | **sh**ip |
| e | b**e**d | ch | **ch**eer |
| i | happ**y** | kh | **خ** *in Farsi* |
| p | **p**en | q | **ق** *in Farsi* |
| b | **b**ack | v | **v**iew |
| m | su**m** | f | **f**at |
| n | su**n** | r | **r**ed |
| g | **g**et | y | **y**et |
| j | **j**ump | ? | **ع** *in Farsi* |
| t | **t**en | z | **z**ero |
| d | **d**ay | l | **l**et |

## DISCUSSION AND CONCLUSION

The presence of terminology department in Persian Academy as an organization to standardize and make policies in language has been very effective for medical terminology. The presence of clear and unambiguous scientific policies and the constant and precise application of principles in word formation not only has led to the production of proper equivalents for English word, but also it has paved the way for specialists in medical sciences to be able to find equivalents for the newly loaned terms by using those stabilized methods of word formation.

This can be very crucial based on the fact that new sciences are developing with a rapid pace in medicine and inter-related sciences. However, if equivalents are chosen unbiased and they will be with a high degree of exactness, the applicability and endurance of them are guaranteed.

Biased tendencies towards pure Persian words or prejudice about some ambiguous words will reduce the chance of new equivalents. The present research aims at introducing the importance of having a scientific technical look at the word formation process. With regard to lack of researches in the area of word formation which are based on a specific field, some suggestions are presented. However, it is left to the readers that by paying attention to the used patterns in finding equivalents and their frequency rate, they find an intermediary and appropriate way in order to keep Persian language active and progressive as the language of science. The way of doing such research in medicine and all other fields is continuously open and such studies will add to the richness of Persian language. Many of these brilliant experiments are now carrying on in many medical branches such as: basic medical sciences, microbiology, health sciences, osteology and orthopedics and proteomics. Doors are still open to new cooperative activities with members of the medical society that do concern in our maternal language Farsi as a scientific language.

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