Tuijin Jishu/Journal of Propulsion Technology
ISSN: 1001-4055
Vol. 46 No. 3 (2025)

The Basic Principles of Constructing a Thesaurus of Pharmaceutical Terms in Uzbek and English

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Abstract

The article justifies the need to create a thesaurus of pharmaceutical terms in Uzbek and English. The development of medical terminology is still undergoing a unique process of evolution. Today, pharmaceutical terminology in Uzbek and English includes a large number of lexical units. The names of modern medicines and the development of the pharmaceutical industry create the basis for the formation of new terms. The use of terms with multiple meanings, synonymy in lexical units, and the use of terms in a broad and narrow sense create a number of problems in the assimilation of concepts. This requires the systematisation and organisation of pharmaceutical terms. A suitable way to systematise, organise and assimilate terms is to create a thesaurus database.

The article provides information about lexical and terminological thesauri that exist in Russian and English, their extralinguistic markings, structure, and composition. The content of the pharmaceutical thesaurus in Uzbek and English is described.

Keywords:thesaurus, thesaurus model, computer thesaurus, pharmaceutical terms, medical terms, semantic relations, ideographic dictionary, information retrieval system, printed thesaurus, Wordnet, EUROVOC, Rutez, Macmillan thesaurus, Uzingtez.

Introduction. The history of medical terms dates back to the period before our era. On a global scale, medical terminology, in particular pharmaceutical terminology, has its roots in ancient Roman and Latin languages.

Global medical terminology has evolved over time under the influence of social reality and interlingual relations. Based on social development and the development of the industry, the following features of modern medical terminology can be noted:

1) as a result of the development of medicine, the discovery of new types of diseases, and the production of new medicines, the number of terms has increased;

2) As a result of the development of medical equipment and technology, new concepts directly related to practice have been formed.

3) The historical foundations of medical terminology in each language, in particular in Uzbek and English, have been studied, and a basis for the reuse of many concepts has been created.

As a result, a large set of medical terms has emerged.

It is emphasised that the abundance of terms in quantitative terms, as well as their disorderliness, are a serious obstacle to the exchange of information in many languages. Based on the results of a sociological survey, researchers analysed the problems of pharmaceutical terminology, dividing them into the following groups: "1) different interpretations and understandings of the same term; 2) the term does not correspond to the essence of the issue; 3) different acceptance of the same term by specialists and non-specialists; 4) multifaceted interpretation of a particular term and lack of certainty; 5) lack of work experience in the institution; 6) unconscious assimilation of many terms by young specialists as a result of poor attention during classes, based on a subjective worldview; 7) lack of definitions for new terms" [5,80].

Medical terms are lexical units that express specific concepts related to a particular field and, in most cases, refer to a specific part of the social stratum. Medical terms are concepts used by representatives of all strata and used in everyday social life.

Therefore, the systematisation and organisation of medical terms is of practical importance.

‘Problems in terminology, particularly medical terminology, are solved on the basis of the linguistic integrity of the information retrieval system, which is built on the basis of natural languages, achievements in term equivalence, and by creating an array of terms using foreign languages’ [5,82].

The international information network, the Internet, is improving as a global achievement of humanity, performing the functions of rapid information transfer, data collection and transmission. The Internet also serves to update the terminology system, introduce terms and improve the process of terminology formation. Modern information and communication technologies, as in all areas, influence the development of medical terms.

Along with natural languages, the medical terminology of the Uzbek language is enriched with new concepts, the system of treatment with innovative methods is expanding in quantitative terms with the help of modern terms and lexical means, and is also improving in qualitative terms. "As a result of a number of concepts coming from foreign pharmacy, erroneous units appear in terminology, terms that do not have the same content and are understood differently. Terminological errors are common in the translation of foreign scientific and technical literature. The main reason for translators' mistakes is the lack of officially accepted terminology and reference books that meet the requirements. There is an acute need for pharmaceutical terminology dictionaries, glossaries and thesauruses both in Russia and abroad [5,82].

Thesaurus (Greek thesaurus) comes from the Greek language and means ‘treasure’, “wealth”, ‘reserve’. Thesaurus is defined differently in scientific literature and dictionaries. A thesaurus has the following capabilities:

1) an ideographic dictionary representing the contextual capabilities of lexical units of a language; 2) ‘a collection representing the semantic relationships between specific language units’ [15]; 3) a dictionary reflecting the semantic relationships between lexical units [14,507]; 4) a dictionary based on an information retrieval system that identifies the semantic connection between a word and other words; 5) a system for regulating lexical units; 6) a type of dictionary that summarises the semantic possibilities of a word in a specific language in one place [3,356].

Thesauruses, which cover the composition of terms, morphological features, semantic relationships and valency possibilities, play an important role in every information system. A thesaurus of terms is a systematic collection of terms from one or more fields that are linked by one or more characteristics.

In the developed languages of the world, a great deal of work has been done to enrich computer systems with linguistic databases. This includes linguistic support for thesauri. In particular, about forty terminological thesauri have been created in Russian alone: in librarianship, scientific information, computer science, geology, economics, demography, physics, political science, religious studies, law, sociology, literature, literary studies, folklore studies, linguistic terminology, linguistics, theoretical and applied linguistics, organic reactions, philosophy, motor transport, atomic science and technology, ferrous metallurgy, powder metallurgy, organic manager association, semantic language multiplier, semantic education, synonyms, associative concepts, gender studies, idiomatics, proverbs, and thesauri for Baltic-Slavic languages have been created. There is also a Russian version of the EUROVOC thesaurus.

Hypertext information retrieval thesauri based on metalanguages provide definitions of key terms, illustrations, explanations, comments, definitions, interpretations, defining texts, comments, excerpts, excursuses related to a particular science or related to that science, excerpts, excursions [7]. Today, Rutese contains 95,000 language units, 61 of which are language units consisting of a single word [8].

Based on existing definitions and descriptions in scientific literature, the following types of thesauri can be distinguished:

1. Contextual thesauri - thesauri that reflect the contextual meanings of words.

2. Thesaurus of linguistic units - a thesaurus that presents the semantic relationships between linguistic units: lexemes, phraseologisms, syntactic constructions.

3. Thesaurus of lexical units. Such thesauri are divided into three groups: a) thesauri reflecting semantic connections between words; b) thesauri in which the semantic possibilities of each word of a particular language are summarised in one place; c) synset thesauri - synonyms consisting of cognitive synonymic series.

Thesauri are used in two variants:

1. Printed thesauri - thesauri published in book form.

2. Computer thesauri - thesauri based on information retrieval systems.

The history of the formation of printed thesauri goes back to ancient times and is reflected in ideographic dictionaries, which constitute a certain part of Eastern lexicography. These dictionaries made it possible to collect information around a single concept and gain a deeper understanding of the meaning of objects and phenomena, actions and states. Printed thesauri include the best examples of Turkic dictionaries. The foundations of a thesaurus dictionary can also be seen in Mahmud Kashgari's work *Divan Lughat al-Turk*.

Computer thesauri appeared as a result of the development of computer science. As a result of the development of computer technology, the question of solving linguistic problems with the help of computer capabilities was put on the agenda. Computer lexicography, which emerged as one of the branches of computer linguistics, laid the foundation for the development of computer thesauri. Electronic thesauri are formed as computer dictionaries.

Studying the issue. In Central Asia, the works of Abu Ali ibn Sina, ar-Razi and “Saydana” by Abu Rayhan Beruni are considered to be the first sources of pharmaceutical terms. In the history of world medicine, in the early stages of its development, the use of natural substances as medicines was predominant. B. Suyunov, citing the combinations ‘blacksmith's water’ and ‘iron water’ from the “*Canon of Medicine*” notes that these words and phrases were actively used in the speech of medieval doctors. He mentions that iron water was used for medicinal purposes, and to this day there is a folk practice: to prevent heart failure or rupture in a person who has been greatly frightened by something, iron (an iron object) is heated, immersed in water, and this water is given to the patient to drink [12,16].

In the East, antimony was used to treat eye diseases. 1 Antimony is a chemical element in group V of Mendeleev's periodic table, a silvery-white brittle metal. 2 A blackish cosmetic dye containing this element (used to dye eyebrows and eyelashes) [17,594]. In ancient times, antimony was known by the Persian-Tajik name *to`tiyo*. Tutiya [f.] is a crystal formed from copper rust. 1 Copper vitriol (a substance consisting of large transparent blue crystals, copper sulphate). 2 In ancient times, this medicine was used to treat eye pain or to brighten the eyes.

On this basis, the expressions *ko‘zga to‘tiyo, to‘tiyo qilmoq*. *To‘tiyodek ko‘zga surtmoq, e’zozlamoq* [18, 249]. (To rub one's eyes with tutiyo, to appreciate).

Pharmaceutical terms have been studied as part of research devoted to medical terms: Y.B. Neifakh studied German pharmaceutical terminology [9], M.N. Chernyavsky studied pharmaceutical terminology recorded in the researches of Hippocrates [13,186]. A. Kasimov systematically studied Uzbek pharmacological terms. He studied the methods of forming pharmacological terms and the semantic relationships between pharmaceutical terms. He explained medicines by dividing them into semantic groups depending on the material of preparation [4,24]. There are few studies on the thesaurus of pharmaceutical terms. N.V. Lukashevich conducted a study of the lexical thesaurus base of the Russian language as a whole [8]. E. Korzhavikh and L.V. Moshkova reported on the study of research on pharmaceutical terminology, the scope and directions of work carried out in this field [5,90]. E. Korzhavikh highlighted the theoretical and methodological foundations of pharmaceutical terminology [6]. S.V. Lesnikov created the structure of a hypertext thesaurus [7]. The thesaurus of pharmaceutical terms in Uzbek and English has not been the subject of monographic research.

Thesaurus of pharmaceutical and medical terms in English. The power of English as a technical and technological language is also evident in the creation of thesauri. The WordNet thesaurus [19] is an English language lexical database developed by Princeton University, based on software, an electronic dictionary and a semantic network

of lexical units, and is a striking example of a computer thesaurus in world linguistics. WordNet is described as a lexical ontology.

WordNet consists of four different networks: nouns, verbs, adjectives and adverbs. WordNet is a contextual thesaurus based on lexical units and text. The vocabulary of this thesaurus is not made up of words, but rather a series of cognitive synonyms called synsets, which combine words into semantic networks based on meaning. Each synset is accompanied by texts relating to the context of use of determiners and words. Polysemous words can belong to several synsets and different syntactic and lexical groups. Synsets are interconnected by hypernym-hyponym, has-member, member-of, meronym, and antonymic relationships.

Other semantic relations are also expressed in the WordNet thesaurus. The hypernym-hyponym relation occupies a special place in the semantic relations between words in WordNet. Hyponymy provides for the formation of synsets in the form of a semantic network. Synsets acquire conceptual-semantic and lexical connections. The structure of WordNet makes it useful for computational linguistics and natural language processing. WordNet was originally created based on the model of human memory [20].

In English, remedium->remedy, sirupus->sirup, herba->herb, herbage; folia-> foliage, fructus->fruits, absinthium >absinthium, absinth (e); There are terms derived from Latin Mentha piperita-> peppermint, Chamomila-> chamomile, camomile [2,12] Medical terms in English and pharmaceutical terms can be found in the Wordnet [20] and Macmillan [18] thesauri, which contain a lexical database of this language. These thesauri express hypo-hyperonymic (ail ‘to be ill,’ ailment ‘illness,’ contagious disease ‘infectious disease,’ pest “plague”), synonymic (fitness - heartiness - wholesomeness - wellness ‘health’; debility - decrepitude - feebleness - frailness - infirmity - ‘weakness’; contagious disease - contagium ‘infectious disease’; pest-pestilence-plague ‘plague’; antonymic relationships (ailment-health ‘illness-health; infirmity-recuperation ’weakness-strength").

English pharmaceutical terminology includes a large number of terms. The fact that the thesaurus of terms covers a term and related semantic concepts shows that it has broad capabilities. Pharmaceutical terms semantically include a number of terms and concepts.

For example, several terms have been created based on the single term ‘drug’. Concepts related to the term ‘drug’ in English can be grouped as follows: a) concepts used in a denotative sense, denoting the properties of drugs and medicines: drug n. ‘medicine, medication,’ drug product ‘finished medicinal product,’ drug safety ‘harmlessness of medicine’; drug history ‘history of medicines used,’ drug inventory "list of medicines.

A number of concepts related to the denotative meaning of medicine are used: drug addict ‘drug addict,’ drug dealings ‘drug trafficking,’ drug dependency ‘drug addiction and abuse.’ The use of a narcotic substance in the meaning of ‘medicine’ comes from the use of this substance as a medicine. In medicine, a mixture of this drug is used in small quantities during anaesthesia. The consumer takes the narcotic drug as a medicine, using it to treat mental and physical conditions. Regular use of this substance leads to a deterioration in the consumer's condition and the development of various diseases.

Thesaurus of pharmaceutical and medical terms in the Uzbek language. The semantics and thesaurus of medical terms in the Uzbek language have been studied in a monographic plan. Medical terms in the Uzbek language are analysed on the basis of two models [12]: the thesaurus model of the semantic field of medical terms in the Uzbek language (thesauruses reflecting the semantic connection between words); the thesaurus model of the semantic network of medical terms (a thesaurus that collects in one place the semantic possibilities of a particular word in the language) [12]. The first thesaurus model is based on the semantic field of medical terms and semantic relations within this field. In the network thesaurus, semantic relations are considered from the point of view of each term. Due to the lack of a thesaurus of medical terms in the Uzbek language, the semantic relations between medical terms in English are considered [18] [12]. Medical terms in the Uzbek language are analysed based on the model of S. Bikova [1,15]. The study uses the following models: SO – semantics khudud (semantic domain), SP – semantics maidon (semantic field), SSP – semantics submaidon (semantic subfield), SM – semantics mikromaidon (semantic microfield).

The necessity of a thesaurus in modern terminology is justified as follows: "a thesaurus eliminates the problem associated with synonymy, expands the possibilities of searching for words close to the concept, and ensures the accuracy of information. In addition, thesauri increase the relative perfection of translated texts. It should be noted that thesauri are important in learning the meanings of words and developing linguistic competence. Maximum completeness and accuracy also play an important role in the field of medicine, which is related to human life and destiny [12].

A thesaurus has a grid or tree structure. The following relationship between terms is provided in a thesaurus:

Broad concept (term) - narrow concept (term). Concept (term) - associatively related concept (term). Terms formed on the basis of the first principle have the form of a tree, in hierarchical order. Thesauri compiled according to the second principle have the form of a semantic string. Thesauri constructed according to both principles have the form of a mesh tree. Thesauri are based on the semantics of lexical units. Semantics is based on the relationship between linguistic units and logical units. The expression of a logical unit - a concept, a cognitive unit - a concept in terms is based on a semantic-logical connection.

Terms, as lexical units, exhibit properties inherent to lexemes. A term is, first and foremost, a word. It is the attribution of a specific word to a narrow field and its scientific nature. "When searching for a specific term related to pharmacy, you encounter a term next to it or one that enters into a semantic relationship with it. For example, if it is indicated that treatment was carried out with lidocaine, and if the thesaurus indicates the relationship ‘anaesthetic-lidocaine,’ then treatment can be carried out with any anaesthetic. It is advisable, first of all, to supplement thesauri with terms that are understandable to most people. In the future, it will be effective to enrich terms denoting narrow concepts [10,61]. Pharmaceutical thesauri, along with providing information about pharmaceutical concepts, form knowledge about their application and use. Therefore, a thesaurus of pharmaceutical terms is a database that is of practical importance both for linguistic research and for the general public.

Conclusion. The need to create a thesaurus of pharmaceutical terms in Uzbek and English.

The creation of pharmaceutical terms in Uzbek is a process that stems from the possibility of developing computer linguistics and the need for innovative development in the medical field. The need to create a thesaurus of pharmaceutical terms is justified by the need to determine the total volume of pharmaceutical terms in Uzbek, systematise and organise terms, and improve the efficiency of term assimilation.

A thesaurus is of great importance in the unification and systematisation of pharmaceutical terms. Pharmaceutical thesauri of pharmaceutical terms in Uzbek and English serve as instructions. The compilation of pharmaceutical terms is based on existing principles. "The compilation of a thesaurus is based on two principles:

1. A term associated with each term is determined on the basis of association; 2. A term is considered as a concept explained by the internal facets of meaning" [11].

The thesaurus of pharmaceutical terms in Uzbek and English, based on existing models of term thesauri [7], consists of the following data frame:

The top slot contains the name of the thesaurus (uzingfarmtez) and basic interface buttons that connect to other slots, such as the initial part, operational communication between slots, transition to the main page, help request, reverse mode, and a number of basic structures (key concepts: symbol, word, text, language, metalanguage, application).

The left slot covers macro- and microfields of pharmaceutical terms.

The right slot contains the Latin (English) alphabet for searching for the semantic interpretation of pharmaceutical terms in the information retrieval system by letter.

The bottom slot contains the Uzbek alphabet based on the Latin alphabet.

The central slot contains the main content of pharmaceutical terms and their distribution [7;22].

The thesaurus of pharmaceutical terms in Uzbek and English, based on the structure of existing thesauri, consists of [8]:

1. The meaning of pharmaceutical terms is based on a hierarchical system through expression in the text and synonymic series.

2. Elements of the thesaurus: concepts, language units, expressions, relationships between language units, and relationships between concepts are expressed.

Pharmaceutical terms in the Uzbek language consist of Turkic, Persian-Tajik, Arabic, and Russian-international units. The majority of Russian-international terms are of Latin and English origin.

The correct understanding and application of concepts related to medicine and pharmacy is linked to the assimilation of the meaning of terms. The assimilation of terms is linked to the concept, knowledge of meaning, and understanding. The semantics of a term covers a number of semes related to the concept. The role of thesaurus dictionaries in covering these topics is incomparable.

The creation of a thesaurus of pharmaceutical terms in Uzbek and English is also important in the following.

1.Thesaurus - provides information for artificial intelligence [8]. Artificial intelligence is artificial intelligence formed on a computer that is capable of creating text, voicing, performing a question and answer process, and creating images based on specified parameters. Artificial intelligence currently performs a number of tasks. Text creation, word search, data transfer, and data classification are performed by a machine using artificial intelligence.

Types of artificial intelligence perform tasks in English, Russian, Turkish and other developed languages almost correctly. For example, tasks in English and Russian are performed well. Tasks in Uzbek are performed incorrectly in most cases. The reason is that the database in Uzbek is very small in the computer's memory. Therefore, the principle of functioning of artificial intelligence in Uzbek does not meet the requirements. The thesaurus of pharmaceutical terms serves to provide the artificial intelligence system with the necessary speech tools for medical communication.

2.The computer thesaurus also performs the task of teaching [10,61]. The thesaurus of pharmaceutical terms also helps to grasp the essence of concepts. In particular, synonymic relationships in some terms allow concepts to be explained in other forms. The combination of term meanings in thesaurus models helps to define semes. The presentation of terms based on associative relationships provides an understanding of the content by providing several associations related to a single concept. The etymology of a term provides information about the process of concept formation and its further semantic development.

3. The thesaurus of pharmaceutical terms is important for determining the volume of terms in Uzbek and English, the ratio of native and borrowed layers. It also helps to determine the number of Latin terms that form the basis of pharmaceutical terminology in Uzbek and English.

4. The thesaurus of pharmaceutical terms is of particular importance in the translation of scientific literature into Uzbek and English. It also helps to ensure the accuracy of terms when translating the works of Abu Rayhan Beruni, Abu Ali Ibn Sina, and Ar-Razi into English.

The thesaurus of pharmaceutical terms in Uzbek and English allows improving the terminology of the Uzbek language on the basis of the developed terminological base of international languages, highlighting the semantic relationships between terms, systematising terms, and determining the frequency of their use.

LITERATURE

1. Быкова С.Е. Тезаурусное моделирование юридической терминологии (на материале французского языка в сопоставлении с русским). – Екатеринбург, 2006. – С. 14-15.

2. Доткулова Залина Олеговна. Терминологическая номинация лекарственных препаратов в научном дискурсе (на материале англоязычных статей и монографий по фармации и фрамацевтике). Дисс. ...канд. филол. наук, Нальчик, 2019.

3. Караулов, Ю.Н.Общая и русская идеография. –М.: Наука, 1976. – 356 с.

4. Касымов А.И. Фармацевтическая терминология в современном узбекском языке: Автореф.дисс.канд. филол.наук. –Тошкент, 1982. – 24 с.

5. Коржавых Э.А., Мошкова Л.В. Характеристика исследований в области фармацевтической терминологии. Вестник Российского университета дружбы народов. Серия: медицина, 2004. –С.80-90.

6. Коржавых Э. А.Теоритические и методические основы фармацевтического терминоведения. Дисс.... док. фармацевт. наук. –М.,2005.

7. Лесников С.В. Конструирование гипертекстового тезауруса метаязыка науки. 2011.

8. Лукашевич Н.В. Тезаурус русского язқка для автоматической обработки больших текстовқх коллекций. Сборний.2002.

9. Нейфах Е.Б. О немецкой фармацевтической терминологии. Дисс. канд. филол.наук. – Казань, 1996.

10.Поповьян Р.А., Будкова Н.Н,, Раковский А.А., Богосян М.Х. Составление тезауруса –важний шаг по настройке работы информационной системы в любой области медицины. 2005. –№4. –С. 57-61.

11.Поповьян Р.А. Диагностирование в медицине, основанное на привлечении тезауруса терминов выбранной предметной области, и оценка точности процесса с применением нечеткой логики. Врач и информационные технологии. ИТ и диагностика. Cyberleninka.ru/article/n/diadnostirovanie-v –meditsine. 2006. –№2.

12.Суюнов Б. Тиббий терминлар семантикаси ва тезауруси. Филол.фан.д-ри (DSc) ... дисс. астореф. – Тошкент, 2023. – 36 б.

13.Чернявский М.Н. О состоянии древнегреческой фармацевтической терминологии по трудам Гиппократа. дисс. канд. филол.наук. – М., 1996. – 186 с.

14.Шайкевич, А.Я. Тезаурус // Языкознание: Большой энциклопедический словарь. – М.: Большая Российская энциклопедия, 1998. – С. 506-507.

15.Шрейдер, Ю.А. Тезаурус // Большая Советская энциклопедия. – М.: Советская энциклопедия, 1976. [электронный ресурс].

16.Ўзбек тилининг изоҳли луғати. I. − Тошкент: Ўзбекистон Миллий энциклопедияси Давлат илмий нашриёти, 2006. −680 б.

17.Ўзбек тилининг изоҳли луғати. III.-Тошкент: Ўзбекистон Миллий энциклопедияси Давлат илмий нашриёти, 2006. − 688 б.

18. Ўзбек тилининг изоҳли луғати. IV. −Тошкент: Ўзбекистон Миллий энциклопедияси Давлат илмий нашриёти, 2008. −608 б.

19. Structural and semantic characteristics of pharmaceutical terms and neologisms. European Journal of research. volume 6 issue 3 2021, ISSN 2521-3261 (Online)/ ISSN 2521-3253 (Print) DOI 10.37057/2521-3261.

20. Practical And Theoretical Features Of Teaching The Linguistic And Exctralinguistic Factor Of Pharmaceutical Terminology. Journal for Educators, Teachers and Trainers, Vol. 13 (6) 534-540 Web of science.

21. https://www.macmillanthesaurus.com.

22.ru.wikipediya.org/wiki/WordNet.

23. Wordnet.princeton.edu/aiting-wornet

24.https://www.macmillanthesaurus.com.

25. URL: http://slovari.yandex.ru/~книги/БСЭ/Тезаурус (дата обращения 23.03.2009).