Metaphorical Models of Ophthalmology Terms in Kazakh and English

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Abstract

The article is devoted to the identification of cognitive mechanisms of metaphor in term coining. The introduction provides an overview of the metaphor study. Scientific works on metaphor in foreign and domestic linguistics are analyzed. The relevance of the research is determined. As the basic hypothesis of the research, it is possible to say the verbal expression of the pragmatic reworked special scientific knowledge, which shows the language of metaphors in Kazakh and English terminology of ophthalmology, the basics of mental activity, professional experience, and linguistic and cultural competence of specialists. The method of component analysis, modeling method, and etymological and statistical methods were used to determine the structural and semantic characteristics of metaphorical units. A syntactic analysis of Kazakh and English metaphor terms of ophthalmology was made, as a result of which two-component metaphor terms prevailed in both languages. Metaphor-terms created by the semantic method are divided into several frames based on the similarity of 1) colour, 2) shape, 3) colour and shape, 4) construction, 5) other features, 6) action, 7) service, and a conclusion was drawn with specific examples. The study of cognitive mechanisms of metaphors in the termsystem of ophthalmology showed that they have universal characteristics and national-cultural features. Natural and anthropomorphic metaphorical models in Kazakh and English termsystems of ophthalmology were determined and proved with concrete examples. It was concluded that the completion of the term system by metaphor-terms is realized as a result of the professional thinking of the terminologist or specialist.

Keywords: term, terminology, term system, metaphor, metaphor-terms, metaphor model, cognitive mechanism, ophthalmology terms

1. Introduction

Like other branches of science, linguistics is rapidly developing within the framework of a new research paradigm. The secret of the so-called anthropocentricity of the new paradigm of linguistics is directly related to the position of "man in language, language in man." The language of any nation is considered a means of reflecting its way of life, culture, traditions, mentality, consciousness, life position and worldview, behavior, and psychology.It is impossible to study a language outside of the language creator. In this regard, this study is guided by the scientific conclusions of cognitive linguistics, which arose within the framework of the anthropocentric paradigm in linguistics, balanced perception and thinking of the surrounding world, categorization and conceptualization of knowledge, modeling, storage, and delivery. In the formation of terms that form the basis of the language of science, like words in general use, there are scientific and cognitive mechanisms based on national specificity. A unique study of the cognitive mechanisms of the metaphor in the term formation is related to such a problem. In our research, attention is paid to new findings and rules that have emerged regarding the theory of metaphors. The mechanisms of metaphorization of Kazakh and English ophthalmology terms are analyzed in a comparative aspect.

For many years, in scientific discourse, metaphor has been considered an artistic and literary method characteristic of literary style. The scientist V.G. Gak writes: "In the study of metaphor, attention has always been paid to its function: on the one hand, it served as a name for a nameless thing, on the other hand, it served as a tool for artistic speech. The tradition formed since ancient times gave importance to the peculiarity of the second function of the metaphor" [Gak, 1988].

In the current period of development of anthropocentric linguistics, the concept of "metaphor" is supplemented with a new interpretation. In the research on metaphor, special attention is paid to its essential role in the formation of a person's conceptual and verbal system, its active participation in thought processes and perception, linguistic categorization (Davidson 1990; Kassirer 1990; Kubryakova 1999; Lakoff 2004; Lakoff, Johnson 2003; Mishlanova 2002; Chudinov 2001; Fauconnier 1999; Turner, Fauconnier 1995, 1998, etc.).

At the end of the last century, interest in the study of metaphor began to grow, which led to its consideration from the point of view of various scientific directions. One such direction was cognitive linguistics, within the framework of this scientific direction, the cognitive theory of metaphor was born, the main findings of which were reflected in linguist J. Lakoff and the philosopher M. Johnson's

"Metaphors We Live By" [Lakoff & Johnson, 2003]. After analyzing many examples, researchers have proven that metaphors not only form an integral part of everyday communication but also form the basis of our conceptual system. This means that we not only use metaphorical phrases in our language but also think about the categories and concepts with which they correspond.

It can be seen that metaphor and epithet are studied from different angles in domestic linguistics. G.O. Mukhambetkalieva's study "Linguistic nature of regular similes"[Mukhametkalieva, 1995] identifies the linguistic nature of regular similes in Kazakh language, their structural, lexical-semantic features. The relevance of constant similes to the field of phraseology is determined, the interrelationship of poetic and linguistic similes is determined, and their role among tropes and figures is clarified. The use of words in a variable sense as the main factor in the formation of stable similes is emphasized.

A.S. Sybanbaeva's study "The function of conceptual metaphor in Kazakh language" [Sybanbaeva, 1999] is devoted to the study of conceptual metaphor's linguistic nature, identifying it as one of the types of metaphor in Kazakh language. The scientific work explains the nature of metaphor and reflects its cognitive and national features. A review of works on ancient linguistics, world languages, and metaphors in Russian linguistics and Kazakh linguistics is conducted, focusing on the level of its study. Gives a scientific definition of the types of conceptual metaphors from the point of view of the modern linguistics scientific paradigm. Similarities and differences in tropes such as metonymy and comparison are considered. The role of conceptual metaphor in the formation of the national language of science is determined. Conceptual metaphors distinguished by groups of meaning are considered from the point of view of their use, especially their role in the language of science is clarified. Conceptual metaphor is analyzed according to its composition and structure, communication forms, and syntactic structure.

The aim of I.S. Muratbayeva's study "Semantics of metaphorical terms in the Kazakh and Russian languages" [Muratbayeva, 2000] is a comparative-semantic analysis of metaphorical terms and nominal units in Kazakh and Russian languages, which have entered the linguistic stock through metaphorical non-terminization. The place and role of metaphor in the language of science and its relation to terminology are shown. Naming and connotative aspects of the process of metaphorization in the field of terminology are considered. The researcher writes that the comparative analysis revealed that many terms in Kazakh language are loaning terms of the Russian language. It is concluded that in the term system of both languages, there are terms that have a national character and convey the language of people. Metaphorical terms in Kazakh and Russian languages are classified into semantic groups. The origin of the number of term units of the studied languages and different levels of metaphorization of terms are determined.

The object of S.K. Sansyzbayeva's research "Metaphor-frequency in the sphere of "animal-person" (on the material of Russian and Kazakh languages)" [Sansyzbayeva, 2001] is animal names used to describe people and zoomorphic verbs derived from them. The researcher aims to study the metaphors consisting of the names of animals and the zoomorphic verbs formed from them in the comparative-semantic and linguacultural aspects. Using semantic analysis, the metaphors used in depicting the appearance, behavior, and lifestyle of a person are compared. The anthropocentric nature of zoomorphisms is determined by the imposition of certain properties of animals on humans. It is concluded that an important fragment in the linguistic image of the world is the concept of a person, which includes signs specific to the ethnos and universal signs in the recognition of the world. A linguistic and cultural analysis of zoomorphic metaphors is made, and a Kazakh-Russian dictionary defining the zoomorphic character of a person is compiled. Conclusions are made by comparing zoomorphic verbs in Kazakh and Russian languages.

The subject of G.N. Zaysanbayeva's study "Cognitive aspect of metaphorical naming (on compound nouns)" [Zaysanbayeva, 2004] is language names created by combining words. The purpose of this research is to reveal the metaphorical nature of the formation of compound nouns, to study them in a cognitive aspect, and to divide them into meaningful groups. The role of metaphor in creating compound nouns is determined. Cognitive aspects of imagery in the formation of new names through the combination of words are considered. Taking into account the structural characteristics of the human thinking system, the features of creating names with the help of frames are revealed. It is shown that the naming units created with the help of metaphor are created based on information exchange between two or three frames. Types of linguistic metaphors are distinguished taking into account their functions in the cognitive-nominative aspect. Among other characteristic properties of metaphor, the predominance of its figurative-evaluative property is determined.

G.S. Kusainova in the study "Functional aspect of political metaphors on the pages of Kazakh and English-language newspapers" [Kusainova, 2006] defines the pragmatic function, and functional nature of political metaphors in texts of newspaper and journalistic style. The place and role of political metaphors in the newspaper style of modern Kazakh and English languages are shown. Motivational groups of political metaphors in English and Kazakh political discourse are determined. A comparative analysis of the functioning and motivational nature of political metaphors in Kazakh and English-language newspapers is carried out, their common and distinctive features are indicated.

F.Z. Seitova's study "Metaphor in art (painting) texts" [Seitova, 2007] deals with metaphors through semantic and conceptual analysis of language facts taken from art texts. The main types of metaphors related to the field of art are defined. Some conclusions in the general theory of metaphor have been clarified to metaphors in art studies. The main types of metaphors inRussian are defined. It is described that the language of art is a special branch of the national language. Metaphors in language and metaphors in painting are separated. The main directions of metaphors in modern linguistics are defined. Types of metaphors are classified according to their meaning changes.

G.O. Dyusenbayeva's study "Metaphorical potential of verbs of movement in Russian" [Dyusenbayeva, 2008] examines the features of

representation of body movement frames in the process of metaphorization of verbs of movement in Russian depending on "time". Features of metaphorization of thematic groups "mental world of man", /"natural phenomena", /"word/speech"/, and "vehicles" in the basic metaphorical models are studied.

M.V. Trichik's study "Conceptual metaphors in political discourse (based on the materials of the election speeches of B. Obama and M. Romney)" [Trichik, 2014] considers conceptual metaphors that show the cognitive mechanisms of giving meanings in the American electoral political discourse. A classification of conceptual metaphors in the political messages of B.Obama and M. Romney in the 2012 election companies has been developed. Linguistic means of representation of ideology in American political discourse are defined and described by systematizing conceptual metaphors. A personal cognitive matrix model of "The United States presidential campaign" is presented.

A.M. Toleubayeva's study "Features of the translation of metaphors in A. Nurpeyisov's work "The Last Duty" as a linguistic and cultural lacuna" [Toleubayeva, 2018] considers linguacultural metaphors in the Kazakh-English versions of A. Nurpeyisov's novel "The Last Duty".The artistic knowledge of the English version of the novel translation is shown based on a comparative analysis of the culture and language of two peoples: Kazakh and English. Metaphors in literary texts are given as indicators of national knowledge. Metaphors in a work of art are defined as a national cultural code. The nature of the epithet is defined in the text. Phraseological metaphors are compared. The problem of national recognition of the world is clarified through the prism of translating literary metaphors into other languages.

Zh.T. Ospanova's study "Idio-ethnic features of conceptual metaphors in the Kazakh and German languages" [Ospanova, 2021] considers the problem of metaphorical conceptualization of spatial orientation. A comparative analysis of metaphors depicting spatial orientation in Kazakh and German is carried out.

As we can see, in domestic linguistics, metaphor, and metonymy studies are dominated by works on metaphor. Those studies are devoted to the function of conceptual metaphors, and features of word classes, including metaphors made from complex nouns and verbs of motion. At the same time, there are many works devoted to the comparative aspect of the Kazakh-English, Kazakh-German, and Kazakh-Russian languages. In particular, the function of political metaphors in newspaper articles, conceptual metaphors in American political discourse, etc.There are also studies on the appearance of metaphors in works of art and their translations. Despite the variety of directions and topics of works dedicated to the study of metaphor in domestic linguistics, among these works, only two works on the features of metaphorization of terms can be found. One of them is the study "Semantics of metaphorical terms in Kazakh and Russian" [Muratbayeva, 2000] by I.S. Muratbayeva, and the other is by S.K. Sansyzbayeva's study "Metaphor-frequency in the sphere of "human-animal" (on the material of Russian and Kazakh languages)" [Sansyzbayeva , 2001]. Here we are talking about special dissertations written in connection with the metaphorization of the term. In all the special studies written about Kazakh terminology, there was a word or two about the metaphorization of terms. For example, in Sh. Kurmanbayuly's work "Termination of the Kazakh Vocabulary" (1998), "the original meaning of commonly used words became a term by being metaphorical, and other concepts got a common name. As a result, a new word appeared and intersystem homonyms appeared" [Kurmanbayuly, 1998].

The relevance of the study is due to the interest that causes the identification of the patterns of organization of the terminology of a new branch of knowledge, which can be useful for the study of developing terminological systems. Further study of the cognitive aspects of term formation, including the analysis of metaphorical naming mechanisms in special scientific and branch termsystems from the point of view of cognitive linguistics, is also relevant.

A cognitive study of the mechanisms of the emergence of metaphors in new term systems is considered relevant because, despite certain achievements in the study of this complex process, many aspects of this issue are still controversial. Rich experience has been accumulated in the field of research of medical terminology. Processes of formation of medical terminology, and lexical-semantic features of medical terms are studied. The results of the study of medical terms are confirmed by the development of the theory of terminology. In the current period of development of linguistics characterized by anthropocentrism, that is, when considering linguistic phenomena related to a person, his activities, and thinking, the concept of "metaphor" began to be explained in a new way. Studies dealing with the issue of metaphor show its important role in the creation of conceptual and verbal systems of a person, active participation in the categorization of the surrounding world, and thinking and perception processes.However, there are no works dedicated to the comprehensive study of terminological systems and metaphorical terms in fields of knowledge such as ophthalmology. This study is devoted to the study of ophthalmology metaphors in structural-semantic, linguistic-cognitive, and functional aspects. The methodological basis of the work was a systematic approach that allows for additional consideration of aspects of the metaphor, that is, using the results obtained during the study of one aspect of the metaphor for a deeper study of its other aspects. The main theoretical rules of the work were based on works on the theory of naming, the theory of semantics, and the theory of cognitive linguistics. The object of research is the terminology of ophthalmology in Kazakh and English. The subject of the study is metaphor as a way of representing special knowledge in the terminology of ophthalmology.The main goal of the work is to explain the features of metaphorical modeling from the point of view of naming theory and cognitive linguistics and the ways of using metaphors in the terminology of ophthalmology in Kazakh and English. The purpose and subject of the research were the basis for setting the following specific tasks: 1) to determine the corpus of metaphor-terms in ophthalmology in the Kazakh and English languages and their naming characteristics; 2) to define the specificity of the metaphorical name in the formation of the studied term system; 3) to identify the main sources of metaphor-terms and creating metaphorical models in the studied term system; 4) to study the ways of verbalization of metaphors and to present models of metaphors in the studied terminology.

As the basic assumption of the research, it is possible to say the verbal expression of the pragmatic reworked special scientific knowledge, which shows the language of metaphors in the Kazakh and English terminology of ophthalmology, the basics of mental activity, professional experience, and linguistic and cultural competence of specialists.

2. Materials and Methods

The research materialswereindividual and complex term metaphors in Kazakh (47) and English (52) languages obtained by continuous sampling method from monographs, terminological explanatory dictionaries, encyclopedias, handbooks, online catalogs, industry journals, as well as official documents, international classifications, etc. The work was performed from a nominative-cognitive point of view, using the methods of definitional analysis. Conceptual integration, and cognitive analysis methods were used in the work, which allows us to consider language as one of the important systems of representation of mental knowledge and human knowledge. When describing the structural and semantic characteristics of metaphorical units, the method of component analysis, modeling method, and etymological and statistical methods were used.

3. Result

Lately, scientist N.D. Arutyunova writes that metaphor is not only a figurative tool of poetic language but also a name in language [Arutyunova, 1990]. Metaphor, when performing a nominative function, names new objects, phenomena, or processes based on similar features of previously well-known, well-known objects and phenomena, processes, and objects, thereby facilitating the discovery and understanding of the meaning of new phenomena. The role of metaphor in perceiving new things, phenomena and learning new types of actions is based on the working mechanism of human memory, therefore, the study of the mechanisms of metaphor use cannot be understood without the results of the field of cognitive science, their connection with the study of mental processes and mental states. "The name of an object and the object itself are not the same, but by distinguishing the object from other objects, the child learns the name and other properties of that object. Seeing and recognizing objects such as sheep, horses, dogs, and cats in their live state through toys is formed in the child's mind along with their names, and gradually, those names are not only objects seen in the house and barn but abstract objects with general properties. It is understood as names" [Balakayev, 1989], the opinion of M. Balakayev once again proves that language is formed through cognition.

Among the semantic types of term formation, the metaphorization approach is one of the most popular and widely used. Expressive and artistic metaphor terms are actively conquering the language of science in various fields (natural, exact humanities).Terminology is rapidly developing in many fields of science (medicine, physics, astronomy, biology, psychology, information technologies, etc.). The main role of language is to store information and convey information, and to introduce accurate and precise content of data into science. Because we accept the world as it is given. Therefore, accurate language data is very important. In the same way, international organizations (ISO - international standardization organization, Infoterm - international information terminological center) have a great influence on the introduction of specific terms in the scientific language. The language of science is not just for conveying an idea or proving a principle. In scientific research, language serves as a "conceptual tool", that is, it guides the scientist to the right path, in science it is also called "generative force". "Language is a tool. Language concepts are tools ...Concepts make us flexible for research. They are the key to our interests and they drive our interests." Terms allow us to expand scientific knowledge and understanding. The role of language in science is known for its use based on metaphor. A metaphor in a scientific language performs a communicative function, performs a cognitive-cognitive function, that is, it is related to cognitive sciences, including cognitive linguistics. The adoption and use of metaphor affect the development of science in various fields because metaphor not only organizes our thoughts but also directs them to a certain object. Metaphorization is the acceptance of one concept in a different broad sense under the influence of another concept.Finally, metaphors change a phenomenon or idea with the influence of another phenomenon and idea; and have the effect of revealing a greater and broader meaning and concept. Metaphorical theory contributed to changing the concept of modern term creativity. The language of science, which used to rely only on specific and short, unambiguous, and abstract Greek-Latin terminology, now relies on metaphorical terms and has become widespread. Previously, scientific emotion was not used alongside scientific terminology and scientific metaphor, but now it has become an integral, inseparable factor of these fields. Metaphor terms not only describe a new scene but also help to understand and accept that new scene. R. Hoffmann writes: "Metaphor can be used as a means of explanation and description in any field: in psychotherapeutic conversation, conversation between aviation pilots, traditional dances and programming language, quantum mechanics and visual education. Metaphor, no matter where we encounter it, always enriches language and knowledge, understanding of human behavior" [Hoffman, 1987]. Metaphorization is based on the ability of a person to compare, connect, and the comparison is carried out depending on the amount of a person's knowledge and information. Metaphors are found in all fields of science. The transferability of metaphor is one of the phenomena of social thinking, which occupies the most important place in scientific knowledge. "Metaphor" (from the Greek "metaphora" - "shift") is a trope or speech, consisting of the use of words to describe some group of things and phenomena, to describe similar details related to a certain relationship, to name an object in other groups, or to describe an object that belongs to another group. mechanism. In a broad sense, the term "metaphor" is related to any type of use of a word with a variable meaning" [Linguistic encyclopedic dictionary, 1990]. Metaphorterms that appear in the process of cognition, in the language of science and technology, in a complex cognitive process, establish a small or large amount of complex association between objects and phenomena in the surrounding world. resulting. The creators of the term and its users believe that the cognitive activity of understanding the meaning of the metaphor is carried out.

4. Discussion

Terms are a necessary condition for the development of human knowledge. The heuristic role of the term as an integral element of a certain terminological system is primarily determined by the fact that it is a tool of professional and scientific activity. One of the productive means of forming terms is always considered an associative metaphor. The analogy underlying a metaphor is an indispensable tool for explaining what the definition of a term means. After all, being able to compare is a partial understanding [Volodina, 1998].

Creating, perceiving, and understanding metaphors as a way of denoting concepts shows the ability to get into the meaning of things, and the ability of the mind to search and discover [Budassi, 2000]. The study of the mechanisms of transformation of sensory and thinking categories into language structures, the role and importance of symbolic images in the process of receiving, transmitting, and processing information, determining the laws of change and harmony of lexical material depending on the nature of information and communication conditions is important for understanding the laws of thinking underlying the cognitive activity of an individual [Norenko, 2003].

It is important to take into account the cognitive-informational aspect of the terminological nomenclature aimed at the formation of terms that are the linguistic expression of metaphorical terms, which act as a carrier of information about special knowledge. The cognitive context of metaphorical structures is our universal knowledge of the world that serves as the background for metaphorizing. Metaphor is based on connecting ideas and changing the context of use. To create and decode a metaphor, it is necessary to connect the two thoughts by resorting to knowing the literal meaning of "donor" and obtaining all its characteristics [Shiryaeva, 1999].

Therefore, the mechanism of metaphorization is based on the similarity of the name. Since the signs of the concept are expressed in the language as a component of meaning, they often speak not about giving a name, but about giving a meaning, that is, a variable meaning, our knowledge of the surrounding world is the basis on which the process of metaphorization takes place. Given that a metaphor cannot be expressed in a single word (formally, it is either two-component or multi-component), we use the more commonly used name "metaphorical phrase". The names "metaphorical complexes", "metaphorical structures" [Baranov, 1991], "metaphorical reasoning" [Black, 1990], and "binary" [Basilaya, 1971] are also found in the literature.

Developing the concept of binary, N. A. Basilaya provides a detailed description of exactly the double-component metaphor, assuming that other syntactic models of the metaphorical phrase express the same meaning of the metaphor. According to him, regardless of the complexity of the models, the principle of division into "metaphorical" and "being metaphorized" is always used in metaphor. In this case, the metaphorical term has a material meaning rather than a sign [Basilaya, 1971]. Based on N.A. Basilaya's binary theory, we analyzed the structure of ophthalmology metaphors selected from medical reference literature [Albert & Jakobiec, 2022; Basic and Clinical Science Course, 1995; Duane's Ophthalmology, 1996].

The following syntactic models of two-component metaphor terms were determined in the Kazakh language:1) Adjective + noun:*qara katarakta, dóńes lınza, qurǵaq keratıt, qabatty keratoplastıka, túıirshikti konúnktıvıt, qapshyqty glaýkoma, ushyqty keratıt;* 2) Noun + noun: *kóz sańylaýy, kózuıanyń qalqasy, kóz túbi, kóz almasy, kóz burshaǵy, kózburshaq qapshyǵy, sańyraýqulaqshalyq keratıt, ógiz kóz, mysyq kóz sındromy, qoıan kóz, badyraq kóz, "kózildirik" sımptomy, kobra belgisi, kóz shemeni, kóz aınasy, kóz súńgisi, kózuıalyq bet, kózuıalyq jıek, kózqaraqtyń qyrtysy* 3) Verb + noun:*kórý tómpesi,kórý qyrtysy.*Three-component metaphors: 1) Noun+adjective+noun: *kózdiń torly qabyǵy;*2) Verb+noun+noun:*kórýdiń seleýbas jasýshasy;* 3) Noun+preposition+noun: *urshyq tárizdes katarakta, dısk tárizdi keratıt* [https://kazmedic.org/archives/3126].

The following syntactic models of two-component metaphors have been identified in English: 1) Adj.+N:Adj.+Ncc For example: *heavy eye* – high-level unilateral myopia; *ndritic keratitis* - branched keratitis; *pink eye* - acute conjunctivitis. 2) Noun + noun: N cc (attr.) + N cc. For example: *pindle cell* – urshyq pishindi jasýshalar (a cell whose shape resembles a pindle/ cell - jasýsha - kóleńke (a dead cell with a saved schema); *"berry" aneurysm* – a sac-shaped aneurysm resembling a mini-berry, 3) Noun in possessive case + noun: N pc + N cc. For example: *cat's eye/pupil* – mysyq kóz belgisi (the appearance of a yellow glow in the pupil when light hits); *bull's eye* – ógiz kóz belgisi (enlargement and protrusion of the eyeball outward); *melancholic's eye* - positive reaction of pupils to light with a negative reaction to accommodation; a symptom of major depression [English-Russian Medical Encyclopedic Dictionary, 1995]. 4) Compound adjective + noun: Compound Adj. + N cc. For example: *cherry-red spot* – shıe súıegi belgisi (the vascular membrane of the eye in the form of a small red spot in the area of the macula with a light, distinct retinal edema). 5) Compound noun + noun: Compound N cc + N cc. For example: *cotton-wool spots / patches* - "maqtaly túıirshik" (a yellow-gray or white spot visible on the inner retina of the eye with lupus disease, from which there is withering); *pinhole effect / pupil* – kúrt tarylǵan qarashyq; *"keyhole pupil"* – týa bitken koloboma (iris defect), with an inverted tear or keyhole; *honey-bee lens* - eye lenses showing the ribbed structure of a bee's eye. Metaphorical phrases with three or more components are found: 1) (Adjective + noun) + noun: (Adj. + N cc) + N cc. For example: *natural killer cells* - tabıǵı óltirýshi jasýshalar/tabıǵı óltirýshiler (human blood lymphocytes; tumors or viral target cells exhibit sieve toxicity regardless of antibodies and complement); *watered silk retina* – the effect of retinal glow (sometimes observed in children) [Encyclopedic dictionary of medical terms, 1982]; 2) Compound adjective + noun + noun: For example: *sea-blue histiocyte syndrome* - splenomegaly is a rare disease characterized by the presence of morphologically pronounced granular histocytes of dark blue colour; *butterfly-shaped pigment dystrophy* - bilateral symmetrical reticular pigmentation in the form of butterfly wings. 3) (Noun + preposition / conjunction + noun) + noun: For example: *salt and pepper fundus* - fundus covered with small blue pigmented and orange depigmented spots: observed in patients with syphilis, as well as in some other diseases, such as rubella; *café au lait spots* - coffee-colored spots with milk; the same light brown spots on the skin with clear edges, oval, are characteristic of neurofibromatosis, but also occur in healthy people [Dorland's Illustrated Medical

Dictionary, 1940]. Thus, at the syntactic level, at least two components are needed, which form an important context for understanding what the match is and whether the metaphorical phrase is used figuratively rather than literally. A. Vezhbitskaya describes a metaphor as a "combined comparison" [Vezhbitskaya, 1996], because, in both a metaphor and a simile, two subjects are compared, where one compares to the other based on the presentation of a common sign (signs), in the comparison, this sign is verbally expressed and "like" (Eng. like, as) syntactic marker-formant is used, but this marker does not occur in English metaphor. In the Kazakh language, when creating a metaphor, it is used to convey the meanings of sıaqty, ispetti, uqsas, sekildi. The predominance of two-component metaphor terms was observed in both languages. The frequency of use of the noun in creating multi-component metaphor terms was determined in both of the compared languages. Complex nouns and complex adjectives are used more often in English than in Kazakh. It was found that in English, verbs are not used in the creation of metaphor terms, on the contrary, the verb is found in the Kazakh language, albeit partially, in the creation of metaphor terms. It can be seen that prepositions and conjunctions are used more often in English than in Kazakh. Analyzing the mechanism of metaphorization underlying the creation of ophthalmological term phrases, we relied on M. Black's theory which defined the metaphorized object as a frame, that is, we recognize the metaphorical thing that is already known and serves as a basis of comparison as a focus, that is, we understand why the act of comparison takes place [Black, 1990].

In ophthalmological metaphorical phrases, it was found that the frame is based on the following: 1) ***similarity of colour*** (for example, in English: *salmon patch* - a yellowish nodule located on the cornea of the eye (salmon colour): seen in syphilis; *"Tomato catsup" fundus* - caused by a choroidal hemangioma red-orange conjunctivitis; in Kazakh: *qara katarakta* - occurs when brown pigment accumulates in the vacuoles (cavities containing fluid) in the advanced stage of the disease. It paints the eyeball black or dark brown.2) ***similarity of shape*** (for example, in Kazakh: *kórytómpesi* - a hump-like structure occupying the central part of the diencephalon; *kóz sańylaýy* - narrows due to a slight drooping of the upper eyelid, which is due to a decrease in the muscle and weakening of the levator; *kózuıa* - a paired cavity in the skull, which looks like a bird's nest; *kózuıanyń qalqasy* - a well-defined thin fibrous-elastic structure that forms the anterior movable wall of the orbit together with the cartilage plates of the eyelid, that is, it resembles a shield because it is a structure that protects, covers, and shades the eyeball; *kóz túbi* - a term that combines several anatomical structures of the eye, such as the retina and the eye vessels [Russian-Kazakh explanatory dictionary: Biology, 2007]. The meaning of the original Kazakh word "lower layer, bottom of something hollow inside" [Zhanuzakov, 2008] was metaphorized, and the term fundus was coined to represent the bottom layer of the eye cavity; *kóz almasy* -(translated from Latin means bulb and eye) is the main part of the organ of vision, shaped like a ball. On the one hand, the resemblance of the eye to a sphere or an oval bulb is reminiscent of an apple, hence the term eyeball metaphor; *kóz burshaǵy* – term was coined as a result of a process of metaphorization due to its shape being similar to a pea; *qapshyqty glaýkoma* – an eye disease characterized by the presence of scales on the anterior surface of the eyeball capsule, which are cloudy and granular in texture; *kózburshaq qapshyǵy* - the basement membrane of epithelial cells covering the pupil from all sides;*urshyq tárizdes katarakta* – blurring of the pupil occurs from the anterior capsule to the posterior capsule, the shape is like a ball, it leads to a severe decrease in vision; sańyraýqulaqshalyq keratıt – inflammation of the cornea due to fungal infection; *dısk tárizdi keratıt* – characterized by disc-like clouding of the cornea; *tarmaqtanǵan keratıt* – an image resembling the branches of a tree appears on the cornea of the eye, an inflammation that occurs due to apical keratitis; *kórýdiń seleýbas jasýshasy* – the eye cell for seeing different colours, got this name because it resembles a sedge grass in shape; *kóryqyrtysy* - this is the part of the cerebral cortex that is responsible for processing visual information, a term created by the metaphorical meaning of the common cortex - the outer layer of the earth, the surface; *kózqaraqtyń qyrtysy* - the superficial, less dense part located under the capsule of the lens; *dóńes lınza* - these are hemispheres with the same radius of curvature over the entire area, the shape of the lens is not flat, but convex; *kózdiń torly qabyǵy* - it is the inner back of the eyeball that receives light signals, shaped like a retina.

In English: *goblet/beaker cell* – epithelial cell (producer of mucous secretion; after secretion, a crater-like or cup-like structure remains at the cell site); *horseshoe tear* - horseshoe-shaped tear of the retina; *bulb of eye* [Lexicon Medicum, 1971] – kóz almasy (literally the lamp of the eye) (bulb – lamp, bulb); *eyeball* [Lexicon Medicum, 1971] – kóz almasy (literally the eyeball (ball – in the sense of a ball); *hordeolum* Lexicon Medicum, 1971] – terisken (from the Latin word hordeum - barley, the nodule that appears in the inflammation of the eye resembles a grain of barley); *uvea* [Lexicon Medicum, 1971] – vascular membrane of the eye (from the Latin uvea - grape, that is, the eye veins remind a bunch of grapes); *cataract coralliform* - "pearl-like" cataract, i.e. clouding of the eyeball, in which a coral-like pattern can be observed); wing cell/"qanatty jasýsha", a cell behind the cornea of the eye; 3) ***similarity of colour and shape*** (for example, in English: *snowflake cataract* - cataracts, which include many cloudy gray or bluish-white flakes, which are common in childhood diabetes; *strawberry nevus* - hemangioma; a congenital vascular nevus resembling the shape and colour of a strawberry; *sun/lower cataract* - light-colored turbidity, usually sunflower-like in colour; *pupil* - qarashyq. In Latin, “pupilla” means doll or girl. A person sees a miniature version of himself in the pupil of another person, which reminds him of the image of a doll. So, the black circle in the middle of the eye was called "pupil" in English); 4) ***similarity of structure*** (for example, in English: *"jelfy" bumps* - jelly-like mucous layers on the surface of contact lenses produced by goblet cells of the conjunctiva; *pulveriformis cataract* – untaq tárizdi katarakta; *sclera* [Lexicon Medicum, 1971] – sklera (from the Greeksklēros – hard); *trachoma* [Lexicon Medicum, 1971] – trahoma (from the Greek trachys - rough); *jelly trachoma* - "qoımaljyń" trahoma (Conjunctival adhesions); in Kazakh: *qurǵaq keratıt* – characterized by dryness of the eye area due to low tear production or various abnormalities; *qabatty keratoplastıka* - effective, but complex and highly skilled surgical treatment method. This allows for stepwise incisions that allow the endothelium to remain intact and the transplant area to enlarge; *túıirshikti konúnktıvıt* - it is accompanied by the formation of granules - characterized by the accumulation of lymphoid tissue in "grains"; *былшық* – a pus-like discharge or yellowish fluid from an inflamed eye or from the eyes of an elderly person. The unpredictability of the structure of the creamy substance that appears at the edge of the eye was the basis for its metaphor. 5) ***similarity of other features*** (for example, in

Kazakh: *ógiz kóz* - a disease characterized by deterioration of eye function, as a result of which the patient's eyes resemble the eyes of a bull or an ox; *mysyq kóz sındromy* - a very rare genetic disorder, usually present at birth, that results in an elongated pupil that resembles a cat's eye; *qoıan kóz* - complete or partial closure of the eyelids, the rabbit's eyelids are short, so when they sleep, their eyes are not completely closed, it is considered a disease for a person to sleep with his eyelids open, such people are called rabbit eyes; *badyraq kóz* - a disease characterized by displacement of the eye from its socket, where the eye protrudes from its socket; *"közildirik" sımptomy* – it is characterized by bruises around the eyes, which are similar to the symptoms observed when the eyes of a person who wears glasses for a long time are sucked out by the glasses, or this disease is also called raccoon eye, because the area around the eyes of the raccoon is black. These symptoms were the basis for the creation of the term *"közildirik"* symptom. In English: *crocodile shagreen* - corneal opacification in the form of mosaic, polygonal gray inclusions on a light background resembling crocodile skin; *fish-eye disease* - a disease characterized by cloudiness of the cornea, which is characterized by the appearance of the eye of a boiled fish; *zebra bodies* - concentric, layered cytoplasmic inclusions of Schwann cells, isolated or clustered as a result of degeneration, and visually reminiscent of the pattern in zebra skin; *bovine eye* - "buqa" kóz. In glaucoma, the flow of intraocular fluid is disturbed, which causes the eyeball to enlarge, and then it begins to look like a bull's eye.); 6) ***similarity of action (***for example, in English: *doll's eye* – qýyrshaq kózi (son Vidrovitsa's symptom) - paralysis of accommodation with mild exophthalmos and rare blinking seen in diphtheria polyneuritis; *crocodile tears* - "qoltyraýyn" kóz jasy sındromy; lacrimation when chewing; *cat's cry syndrome / cri-du-chat syndrome* - "mysyqtyń aıqaıy" sındromy (A disease caused by abnormality of chromosomes in group B; characterized by microcephaly, mental retardation," visual impairment, as well as abnormalities in the development of the larynx, as a result of which the child's cry resembles a cat; *funnel-shaped retinal detachment*-pitting of the retina. This is a complete detachment of the retina, where it remains only in one place - around the optic disc, which creates the image of a hole); in the Kazakh language: *mysyqtyń aıqaıy sındromy (*also called*mysyqtyń jylaýy*) – genetic, very rare disease; *qoltyraýyn jas sındromy* – Due to the improper treatment of paralysis, tear glands are stimulated during eating, and tears come out of the person's eyes. Crocodiles shed tears when they feed. The crocodile's tears during feeding were the basis for the creation of the term ophthalmology.7) ***similarity of service*** (for example, in English: *eyelid* [Lexicon Medicum, 1971] – qabaq (lid – cover) The term lid - qabaq - comes from the old English word "hlid" and in the general literary language has the meaning of lid, cover, and in ophthalmology it has this meaning. It was acquired due to the function of the eyelid as an eye lid, because it protects the eye from the ingress of foreign objects and drying; in Kazakh: qabaqis a protruding bone on the upper part of the eyeball [Zhanuzakov, 2008], the eyelid of the cliff, which means a high place on both sides of a cliff, a gorge , the term was created by metaphorizing the words "high ground, top" in the phrases of jardyń qabaǵy, shatqaldyń qabaǵy.

In both languages, the function of the term eyelid is the same [Arutyunova, 1998].Termed metaphorical phrases are indirectly motivated, because the semantic connection between one word and the second, special, and primary meaning of the concept is indirectly, evident only from the dictionary definition of the term, without directly naming the motivational sign. Sometimes in medical metaphors, the association arises from a reference to a literary or mythological character whose appearance, character, or destiny corresponds to it [Chernyavsky, 1982]. In ophthalmological terminology, the following example based on a mythonym was identified: in English: *Cyclopian eye* (from the Greek κύκλος - one-eyed giant Cyclops) - developmental anomaly; having only one eye located on the midline of the head. In Kazakh: jalǵyz kózdilikis birth with one eye due to genetic and other factors. The one-eyed giant is a common image in Kazakh, Iranian, and Arab fairy tales. It is mentioned in the dualistic myth of the ancient Turks [Mythoanthroponyms of Kazakhstan, 2022]. The image of some associative terms comes from their foreign language meanings. For example, the term *lagophthalmus* is derived from the combination of the Greek words λαγός - rabbit + ophthalmos - eye; one of the characteristic symptoms of this syndrome is the incomplete closure of the eyelids, like a rabbit. Metaphorization of this term is also observed in its Latin counterpart occulus leparinus (Lat. oculus - eye + lepus - rabbit). The term Opsoclonus (in Russian ophthalmological terminology, the sign of the dancing eye) Greek term unit -ops - eye + clonus - unstable movement, confusion; a syndrome characterized by rapid, irregular, irregular movements of the eyes horizontally and up-and-down. There are also hidden components in the meaning of metaphor terms. For example, the term Asian eyelid (syn. Mongolian eye) includes the ethnonym Asian (Mongolian), which is interpreted as a fold of the eyelid that is present in the fetus and is preserved in representatives of some other groups of the Mongoloid and Australonegroid race but is considered a developmental anomaly in other races."The structural-semantic organization of the term emphasizes not only the adequate perception of the object or phenomenon but also an informative approach to a certain action" [Zhabotinskaya, 2013]. For example, the *can-opener technique* (method of cutting the rim and removing the anterior capsule of the lens during cataract extraction), *bridle suture* (a suture through the rectus muscle above the entire rotation of the eyeball) not only receives certain terminological information but also guides the actions of the surgeon.Thus, termed metaphorical phrases clearly and accurately reflect the results of sensory experience and practical activities of many generations of doctors, confirm professional and scientific knowledge about the properties of termed objects and phenomena, and reveal their important features.

Since the center of the metaphorical image of the world presented in ophthalmological terminology is the human eye organ, as a result of direct sensory perception, the appearance and properties of the human eye are compared to certain animal organs that humans do not have (balyq kózi, mysyq kózi, leopard kóz túbi, etc.). In this case, metaphorization is mainly based on the names of domestic and wild animals. Thus, metaphor terms created by the semantic method are divided into several frames depending on their similarity1) similarity of color, 2) similarity of shape, 3) similarity of color and shape, 4) similarity in structure, 5) similarity of other features, 6) similarity of action, 7) function. All of the seven equivalents listed in English are considered productive. In the Kazakh language, there were no metaphors based on the similarity of type, color, and shape, and we conclude that the terms of ophthalmology are metaphorical based on six other

similarities. Among them, metaphor terms based on the similarity of form in the Kazakh language have priority over the English language. On the contrary, the research showed that the metaphors created in English based on the similarity of type, color and shape, action, and service are numerically superior to the Kazakh language.

Let us consider the formation of medical metaphor-term models. Determining the features of the emergence and use of medical metaphors by analyzing the conceptual models formed by the type of source (donor) - receiver (recipient) [Lakoff & Johnson, 2003] made it possible to create a system of cognitive-motivational drawings that categorize and organize segments of specialized medical vocabulary. The main donor domains in the medical metaphor are natural and anthropomorphic conceptual domains. Metaphors that appear within given conceptual spaces, in turn, are divided into more differentiated models. Natural metaphors include zoomorphic, botanical, and geographic models. Anthropomorphic metaphor is based on social, artifactual models in medical terminology [Alekseeva, 2002].

The most productive zoomorphic model in the conceptual field of "nature". The similarity of forms and phenomena of the animal world is transferred to the forms and phenomena of the medical field and forms metaphor-terms in the zoomorphic model. For example, in Kazakh: *ógiz kóz, mysyq kóz sındromy, qoıan kóz, janat kóz, buqa kóz, kobra belgisi, mysyqtyń aıqaıy sındromy (mysyqtyń jylaýy), qoltyraýyn jas, taýyq soqyry, "shıe súıegi" sındromy, "kolıbrı" qysqyshyand others.* In English:*wing cell, cat's eye/pupil, bull's eye, honey-bee lens, butterfly-shaped pigment dystrophy, salmon patch, crocodile shagreen, fish-eye disease, zebra bodies, bovine eye, crocodile tears, cat's cry syndrome/cri-du-chat syndrome, lagophthalmusand others.*

A geographic model generates terms based on the similarity of a medical phenomenon or anatomical feature to certain landscape features. For example, in Kazakh: *dóńes lınza, qabatty keratoplastıka, kóz túbi, geografıalyq keratıt, kózuıalyq jıek, kózqaraqtyń qyrtysy, kórý tómpesi, kór ýqyrtysy and others.* In *English*: *funnel-shaped retinal detachment, Asian eyelid (syn. Mongolian eye),* and others.

The botanical model motivates the formation of medical terms, which include a metaphorical component taken from the conceptual area "Flora" in its structure. For example, in Kazakh: *kóz almasy, kóz burshaǵy, kózburshaq qapshyǵy, sańyraýqulaqshalyq keratıt, kórýdiń seleýbas jasýshasyand others.* In English: *"berry" aneurysm, cherry-red spot, cotton-wool spots/patches, café au lait spots, "tomato catsup" fundus, hordeolum, uvea, cataract coralliform, snowflake cataract, strawberry nevus, sun/lower cataract,and others.*

The conceptual sphere of "man", which is the source of the most productive anthropomorphic metaphorical model, is divided into differentiated areas, such as social, artifact models. A metaphorical transition from the conceptual field of "man as a social subject" (social anthropomorphic model) is carried out based on the similarity of the disease to the social role, age, status, or product of a person: *can-opener technique* (method of cutting the rim and removing the anterior capsule of the lens during cataract extraction); *bridle suture* (a suture through the rectus muscle above the entire rotation of the eyeball); *natural killer cells* - natural killer cells (human blood lymphocytes; exhibit antibody - and complement-independent cytotoxicity against tumor or virified target cells); *jasóspirimdik glaýkoma, qarttar kataraktasy, etc.*

Artifact metaphor forms the conceptual basis for creating medical terms (usually consisting of two parts), one of the components of which is the name of any object (mainly household items and clothing). This conceptual model is the most productive. For example, in Kazakh: *qapshyqty glaýkoma, kózburshaq qapshyǵy, kóz aınasy, urshyq tárizdes katarakta, dısk tárizdi keratıt and others*. In English:*pindle cell, "keyhole pupil, goblet/beaker cell, horseshoe tear, bulb of eye, eyeball, pupil, "jelfy" bumps, doll's eye, eyelid,and others.*

Kazakh and English metaphors in the field of ophthalmology showed that the universal features of the terms prevail. However, each nation's characteristic features were also observed in the creation of terms. For example, in English, the term *optic cup* (glaznaya chasha) is associated with the round shape of the bowls that English people use to drink water and tea every day; and this term is called the metaphorical term *kóz sharasy* in Kazakh, because in Kazakh *shara* is tegene, aıaq, a large wooden bowl with a groove inside [Zhanuzakov, 2008]. As we can see, the bowl carved by the Kazakh with his own hands created an association with the name of the cranial cavity where the eyeball is located, and a successful term was created. The national-cultural specificity in the creation of metaphor terms can be seen in the models of geographic metaphors in the Kazakh language. For example, *dóńes lınza, qabatty keratoplastıka, kózuıalyq jıek, kózqaraqtyń qyrtysy, kórý tómpesi, kór ýqyrtysy and others.* It is not difficult to notice that all the words dóńes, tómpe, jıek, qyrtys, qabatwhich are the basis for the metaphorization of these terms, were very familiar with the topography of the Kazakh nation due to the nomadic way of life, and gave each of them individual names. On the contrary, research has shown that this model is rarely found in English. In the English language, the botanical metaphor model has priority over the Kazakh language. For example, *café au lait spots* - it is noted that the creation of a metaphor with the definition of coffee with milk spots is because English people often drink coffee with milk every day, and when they see black, brown spots, which are considered a sign of disease, they immediately associate the color of spots with coffee with milk. The study of cognitive mechanisms of metaphors in the term system of ophthalmology showed that they have universal characteristics and national-cultural features.

Thus, the metaphorical models in the Kazakh and English terminological systems of ophthalmology (Table 1, Table 2) are similar, which is explained by the fact that the main feature of the scientific style is the use of term names in one sense, the precise and clear designation of the scientific concept and the phenomenon of linguistic universality common to all mankind. Metaphors and metaphorical phrases are common in term systems. Terminology is supplemented by metaphor terms as a result of the professional thinking of the term maker or specialist.

Table 1. Metaphorical models in ophthalmological term system

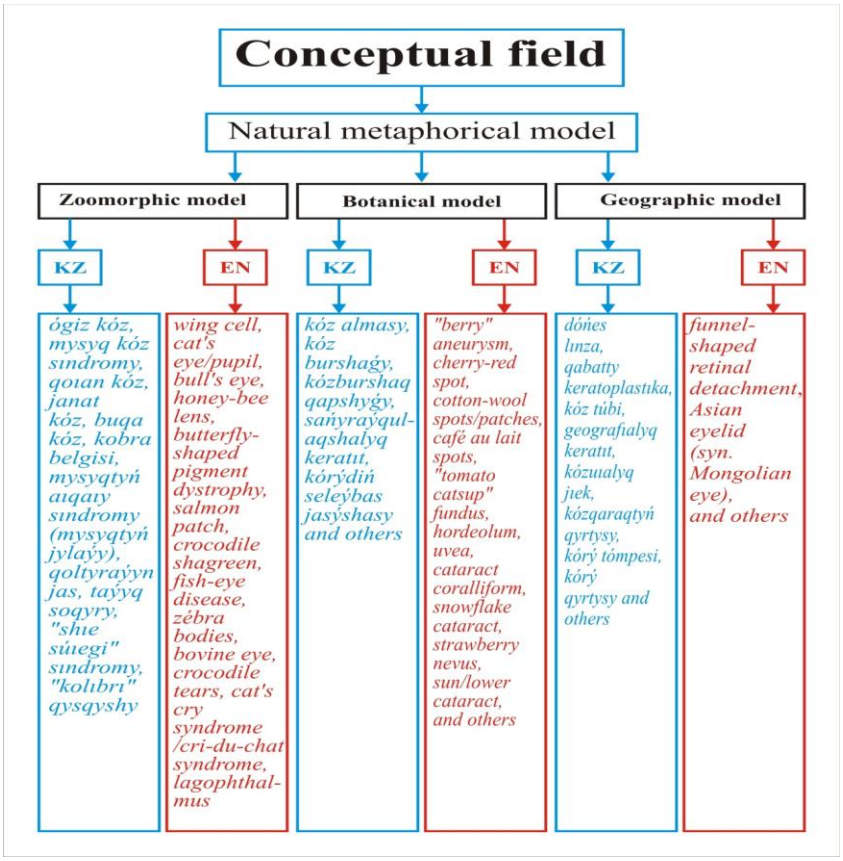
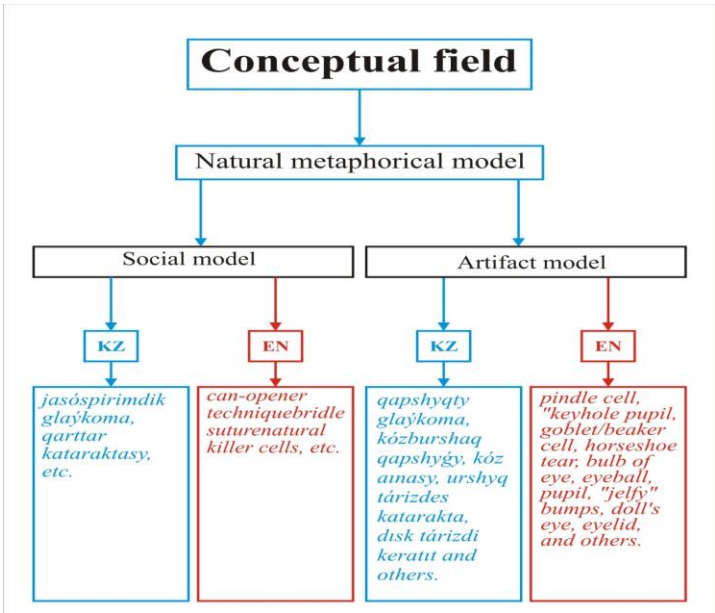


Table 2. Metaphorical models in ophthalmological term system



5. Conclusions

Thus, the syntactic analysis of Kazakh and English ophthalmology terms leads to the following conclusions: 1) two-component metaphorical terms predominated in both languages. The frequency of use of nouns in creating multi-component metaphor terms in both languages under comparison was determined. Compound nouns and compound adjectives are used more often in English than in Kazakh. In the English language, the use of verbs was not found in the creation of ophthalmology metaphorterms, on the contrary, the verb was found in the Kazakh language, albeit partially, in the creation of metaphor terms. It can be seen that adverbs and conjunctions are used more often in English than in Kazakh.

Metaphorterms created by the semantic method can be divided into several related framesaccording to 1) similarity of colour, 2) similarity of shape, 3) similarity of colour and shape, 4) similarity in structure, 5) similarity of other features, 6) similarity of action, 7) similarity of service. All of the seven equivalents listed in English are considered productive. In the Kazakh language, there were no metaphors based on the similarity of type, colour, and shape, and we conclude that the terms of ophthalmology are metaphorical based on six other similarities. Among them, metaphorterms created based on similarity of form have priority over English. On the contrary, the study showed that the metaphors created in English based on the similarity of type, colour, shape, action, and service are more numerous than in the Kazakh language.

The study of cognitive mechanisms of metaphors in the term system of ophthalmology showed that they have universal characteristics and national-cultural features.

Therefore, the metaphorical models (natural: zoomorphic, botanical, geographical metaphorical models and anthropomorphic: social, artifact metaphorical models) in the Kazakh and English ophthalmology terminological systems are similar, we explain it with the common linguistic universal phenomenon asthe main feature of the scientific style is the use of term names in the same sense, the precise and clear definition of the scientific concept and the common humanity. Terminology is supplemented by metaphor terms as a result of the professional thinking of the term maker or specialist.

In conclusion, it should be noted that the role of metaphor in medical discourse is very important from a cognitive-pragmatic point of view. The use of cognitive metaphors makes it possible to model a certain relationship of a person to the world, which not only solves the communicative tasks set in this field of human relations but also carries out cognitive activities in terms of acquiring and processing information, as well as acquiring and mastering new knowledge. Due to the specificity of this type of discourse, the metaphorical representation of medical concepts performs several functions to convey information of a special nature: on the one hand, cognitive metaphor can be used to explain the meanings embedded in these concepts, on the other hand, it is ethically determined reconstruction, euphemism, as well as to hide the real situation in the professional sphere. In other words, the use of cognitive metaphor in medical discourse can serve to focus on a certain type of information and to soften, neutralize, or hide it. In some cases, the use of metaphors based on the implementation of linguistic units of different semantics with negative connotations can contribute to the achievement of professional goals, primarily in terms of creating a favorable psychological climate among patients. Cognitive metaphor in medical discourse plays a unique role in the study of the essence of scientific phenomena and processes, which is confirmed by several studies and reflected in unique literature.

Thus, the study of metaphor types helps to determine the general direction of the development of metaphorical meanings. Monitoring the connection between language and culture, and national-cultural features of the meaning allows us to determine its typological characteristics, which are created with the help of visual tools, including the ability to see the features of a certain language.

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Authors' contributions

Prof. S.Issakova and doctoral student B. Khassangaliyeva were responsible for study design and revising. PhD A. Albekova was responsible for data collection. Prof. S. Issakova drafted the manuscript and PhD A. Issakova revised it. All the authors read and approved the final manuscript. All the authors contributed equally to the study.

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No additional data are available.

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