INVESTIGATION OF PSYCHOLINGUISTIC INDICATORS OF DOCTORS' PROFESSIONAL COMMUNICATION UNDER WAR CONDITIONS IN UKRAINE

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The aim of the study was to investigate the psycholinguistic features of future doctors' communication competence under war conditions in Ukraine. The study used the bibliosemantic method as well as the methods of system analysis, comparison, and generalisation. Empirical methods included direct observation of the language used by doctors and patients and the typology of empirical data based on socio-demographic factors. A total of 286 "doctor-patient" dialogues were collected. Subsequent to obtaining informed consent from the study participants, audio and video recordings were made in compliance with ethical, bioethical, and legal standards. The initial typology of dialogues, their lexical-semantic analysis, and the identification of typical positive and negative communicative strategies were carried out. A content analysis of 48 dialogues was conducted using the specialised computer programme "Textanz" for two distinct samples: "Doctors" and "Patients". The analysis of "doctor-patient" dialogues provided psycholinguistic markers that allowed for the identification and description of typical physiological, mental, social, and spiritual states of individuals seeking medical assistance during martial law.

It is also worth paying attention to those lexemes that are found either only among doctors or, on the contrary, only among patients in various contexts. This fact is a characteristic from the point of view of psycholinguistics. In particular, it is necessary to mention the differences in the semantic content of the "Physiological and mental processes, states, qualities" category. For example, there are such lexemes as "thoughts", "attention", "memory", "wisdom" only in the sample of doctors. This fact indicates the efforts of specialists to transfer communication with the patient to rationalistic notions, to appeal to the intellectual abilities of the recipients, to stimulate their reflection on their own conditions. Instead,

the concepts of "irritability" and "panic" are found only in a sample of patients. This testifies to their efforts to convey the negative psycho-emotional states caused, in particular, by the conditions of military operations. The doctors, however, avoid such words in order not to retraumatize their patients.

Key words: higher medical education, martial law, psychilinguistics, doctors, communication competence, numbing.

Кучин Юрій Леонідович, Стучинська Наталія Василівна, Савелюк Наталія Михайлівна, Литвиненко Ніна Павлівна, Микитенко Павло Васильович, Кучеренко Інна Іванівна. Дослідження психолінгвістичних показників професійного спілкування лікарів в умовах війни в Україні

Метою дослідження було вивчення психолінгвістичних особливостей комунікативної компетентності майбутніх лікарів в умовах війни в Україні. Для досягнення мети дослідження використано бібліосемантичний метод, а також методи системного аналізу, порівняння й узагальнення. Емпіричні методи передбачали пряме спостереження за стилем і конструкцією діалогів між лікарями та пацієнтами, а також типологією емпіричних даних на основі соціально-демографічних факторів. Усього було зібрано 286 діалогів «лікар – пацієнт» за згодою всіх учасників дослідження з дотриманням етичних, біоетичних і правових стандартів. Проведено первинну типологізацію діалогів, їх лексико-семантичний аналіз, виявлено типові позитивні та негативні комунікативні стратегії. Здійснено контент-аналіз 48 діалогів за допомогою спеціалізованої комп'ютерної програми Textanz для двох окремих вибірок: «Лікарі» та «Пацієнти». Аналіз діалогів «лікар – пацієнт» дав змогу виявити психолінгвістичні маркери, ідентифікувати й описати типові фізіологічні, психічні, соціальні та душевні стани осіб, які звернулися по медичну допомогу в умовах воєнного стану.

Також було виокремлено лексеми, які зустрічаються або лише серед лікарів, або, навпаки, лише серед пацієнтів у різних контекстах. Цей факт є характерним з погляду психолінгвістики. Зокрема, слід зазначити відмінності в семантичному наповненні категорії «Фізіологічні та психічні процеси, стани, якості». Наприклад, такі лексеми, як «думки», «увага», «пам'ять», «мудрість» зустрічаються лише у вибірці лікарів. Цей факт свідчить про намагання фахівців перевести спілкування з пацієнтом на раціоналістичні уявлення, апелювати до інтелектуальних здібностей реципієнтів, стимулювати їх рефлексію над власним станом. Натомість поняття «дратівливість» і «паніка» зустрічаються лише у вибірці пацієнтів. Це свідчить про їхнє намагання передати негативні психоемоційні стани, зумовлені, зокрема, умовами бойових дій. Однак лікарі уникають таких слів, щоб не травмувати своїх пацієнтів повторно.

Ключові слова: вища медична освіта, воєнний стан, психолінгвістика, лікарі, комунікативна компетентність, намбінг.

Formulation of the problem. The war waged by the Russian Federation affected the physical and mental well-being of every individual in Ukraine. The number of patients with inclusion, chronic psychotraumatization, the consequences of physical and mental injuries, the manifestation and exacerbation of mental and chronic non-infectious diseases, and other issues that require systematic psychological support, assistance, and rehabilitation is steadily rising.

Participating in hostilities, being under occupation or in an area with constant rocket and artillery fire significantly increases vulnerability to psychosocial stress, leads to chronic distress, and contributes to the spread of such mental disorders as depression, anxiety and post-traumatic stress disorders. Different mental health disorders can be also caused by moving to other regions or countries with the associated loss of work and a familiar, comfortable environment; household troubles; financial difficulties; social isolation; uncertainty about the future and anxiety for family and friends; distress due to lack of sleep, separation from close people (death, moving, etc.)

In works [1–5, 7–9], typical recommendations regarding the interaction of a doctor with patients in various clinical situations are considered. There is a noticeable problem of the psychological retraumatization risk of the patient when contacting a doctor. This problem is caused by a combination of numbing (avoidance of trauma reminders) and increased vulnerability to the quality of medical communication.

The aim of the article is creating a catalog of "doctor-patient" dialogues and their psycholinguistic processing in order to develop the strategies and tactics aimed at the formation of professional communication of doctors in the conditions of martial law.

Research results. In order to study the psycholinguistic features of the future doctors' professional communication under the war conditions, we have organized the collection of materials to create a database of "doctor-patient" dialogues. The dialogues were recorded through collaboration with doctors who work in war conditions and patients who have experienced stressful situations. Currently, the collection consists of 286 dialogues recorded with voluntary consent in video and audio formats in compliance with ethical, bioethical, and legal norms. Each dialogue is accompanied by information about gender, age, education, marital status, region of permanent residence, professional employment, presence of physical and mental injuries in the anamnesis.

After the initial typology of dialogues (medical, patient; age categories; gender categories; regions of material collection, etc.), they were transcribed with maximum preservation of all the features of "live speech". Then, we held the lexicaland semantic analysis of dialogues with the identification of typical positive and negative communication strategies and tactics, analysis of the structure of sentences and features of the certain grammatical constructions usage for different types of messages, recommendations, and questions.

We analyzed 48 dialogues in the "Doctor-Patient" system (considering the official procedure of a patient's visit to a doctor). Obtained with the voluntary consent of the communicators, all audio recordings were transcribed into texts and subjected to the content analysis procedure using the "Textanz" (v. 2.3) dedicated computer software.

The texts were analyzed separately in two samples: "Doctors" (sample 1) and "Patients" (sample 2). After the obtained quantitative indicators, only those words, the recorded frequency of which reached an indicator of 3 or more [6, 10], were taken for further semantic analysis, generalization, and interpretation, because such an indicator is a statistically significant one within the framework of the psychosemantic approach. The obtained results are summarized in Table 1.

Let us now analyze the obtained results in more detail exploring such a main part of speech as noun. Based on the results of the content analysis of the transcribed texts, 1,781 nouns were singled out; namely, 1,272 nouns are in the Doctors» sample, and 509 are in the Patients» one (as already mentioned above). Now, we can analyze the most frequent first 5 categories of the recorded nouns (Table 2).

Table 1

Dominant categories and lexemes of different parts of speech

Part of speech (total word count)	"Doctors" sample			"Patients" sample		
	Total count	Basic category (absolute/relative number)	Basic lexemes	Total count	Basic category (absolute/relative number)	Basic lexemes
I. Main parts of speech (7519)	5037			2482		
Pronoun (2327)	1621 (32,18%)	You (720 / 44,42%)	You, Your	706 (28,44%)	I (356 / 50,42%)	I, me, my
Noun (1781)	1272 (25,25%)	Diseases and symptoms (253 / 19,89%)	problems, pain, illness, disorder	509 (20,51%)	Temporality (141 / 27,70%)	day, time, years
Verb (1595)	1099 (21,82%)	Communication and its components (335 / 30,48%)	talk, speak, think, understand, move in space	496 (19,98%)	Being (137 / 27,62%)	was, be, last, continue
Adverb (1472)	834 (16,56%)	Temporality (249 / 29,86%)	after, then, now, often	638 (25,71%)	Temporality (196 / 30,72%)	sometimes, seldom, after, then, now
Adjective (294)	174 (3,45%)	Neutral (99 / 56,90%)	that, possible, general	120 (4,83%)	Neutral (55 / 45,83%)	last, that, previous
Numeral (50)	37 (0,73%)	–	once, several, one, first, two, second	13 (0,52%)	–	once, several, three, one, first
II. Additional parts of speech	**2660**		The most frequent part	1814		The most frequent part
Conjunction (1853)	1220 (45,86%)	–	and	633 (34,90%)	–	and
Preposition (1516)	987 (37,11%)	–	in, on	529 (29,16%)	–	in, on
Particle (876)	331 (12,44%)	–	no, not	545 (30,04%)	–	no, not
Exclamation (216)	109 (4,10%)	–	please	107 (5,90%)	–	well
Interjection (13)	13 (0,49%)	–	for example	–	–	–

Table 2

Results of the nouns content analysis

Category	"Doctors" sample (number of lexems within category and its share in total count)	Basic lexems (total count)	"Patients" sample (number of lexems within category and its share in total count)	Basic lexems (total count)	All the nouns (X average number of lexemes within category
Diseases and symptoms	**(253 / 1 / 19,89%)**	problems (42), pain (41), ilness, disorder (33)	**(98 / 2 / 19,25%)**	pain (27), problems (17), weakness (9)	175,5
Temporality	**180 / 3 / 14,15%**	day (78), time (27), years (17)	**141 / 1 / 27,70%**	day (64), time (27), years (23)	160,5
Examination, treatment, and results	**213 / 2 / 16,75%**	analyses, examination (58), treatment (23), appointment (20)	**17 / 10 / 3,34%**	Treatment (7), help (7), recommendations (3)	115
Physiological and mental processes, states, qualities	**154 / 4 / 12,11%**	state (29), distress, tension (24), anxiety, fear (23)	**43 / 4 / 8,45%**	distress, tension (17), feeling (8), anxiety, fear (5)	98,5
The body and its components	**128 / 5 / 10,06%**	blood, haemoglobin (34), teeth (23), throat (7)	**54 / 3 / 10,61%**	teeth (18), head (14), part (of the body) (6)	91
Medicines and treatment	**40 / 9 / 3,14%**	medicines, (19), iodine (6), solution (3)	**0**	–	40
Personal	**46 / 7 / 3,62%**	name (20), middle name (15), last name (11)	**21 / 7 / 4,13%**	name (19) and middle name (2)	33,5
Abstract notions	**50 / 6 / 3,93%**	system (14), causes (12), situation (6)	**10 / 13 / 1,96%**	background (4) and type (6)	30
Communication and its components	**43 / 8 / 3,38%**	goodbye, see you (19), question (16), information (4)	**15 / 11 / 2,95%**	goodbye, see you (15)	29
Location and residence	**35 / 12 / 2,75%**	Ukraine (7), city (7), country (4)	**22 / 6 / 4,32%**	Ukraine (7), city (7), university (5)	28,5
Diet and its components	**37 / 10 / 2,91%**	food, diet (16), alcohol (5), vegetables (4)	**19 / 9 / 3,73%**	food, diet (19)	28
Doctors and other experts	**36 / 11 / 2,83%**	doctor (15), pchycologist (5), dentist (4)	**20 / 8 / 3,93%**	doctor (20)	28
Military	**20 / 14 / 1,57%**	war (17), air alarms (3)	**33 / 5 / 6,48%**	war (19), shelling (6), air alarms (5)	26,5
Health and its prerequisites	**26 / 13 / 2,04%**	health (14), life (9), rest (3)	**6 / 14 / 1,18%**	energy, strength (6)	16
Activity	**11 / 15 / 0,86%**	work (8), studying (3)	**10 / 12 / 1,96%**	work (10)	10,5

The "Diseases and symptoms" category (351 words) became the most numerous among this group of nouns. In terms of total number, it occupies the first position in the sample of doctors, but the second – in the sample of patients. A more detailed analysis of the category content shows that doctors use the terms "problems" and "pain" about twice as often as patients, while the latter use the concept of "weakness". On the one hand, this testifies to the professionally directed emphasis of doctors on finding and identifying specific symptoms of diseases, and, on the other hand, it may indicate

probable psychophysiological exhaustion of patients who seek medical help.

The next overall ranking, the "Temporality" category, is almost equal in number to the dominant one (321 words). However, the relative importance of this category is approximately twice as large in the "Patients" sample, although the dominant lexemes are the same in both samples, namely "day", "time", and "years". On the one hand, it shows that patients are more oriented to the temporal parameters of life; on the other hand, we distinguish the dominance of the temporal

concept of "day" in the perception of time by the representatives of both samples.

The significant differences between the samples are observed within the "Examination, treatment, and results" category (total number is 230 words). Thus, it is naturally on the second position in the sample of doctors, while it is only in the tenth place in the sample of patients. Considering this, we note significant differences in the content of this category as well. For the doctors in this context, such lexemes as "analysis, examination", "treatment" and "appointment" are dominant; while the patients have also "help" and "recommendations" in addition to "treatment". Thus, we apparently state that the leading focus of specialists is on finding, first of all, the true cause of the patient's complaints. Contrary, the patients themselves rely more on receiving help from experts.

The "Physiological and mental processes, states, qualities" category ranked fourth in both samples (197 words). Also, the dominant lexemes in both samples are "distress, tension" and "anxiety, fear". Such a result is completely predictable in the conditions of martial law, which was added to the uncertain situation of the "COVID" pandemic. In fact, both these issues prolonged the chronic distress state of the Ukrainian population of Ukraine for an indefinite period. In terms of basic lexemes between the samples, the only difference is that while doctors talk about the general "condition" of the human body more often, the patients talk more about their specific "feelings".

On average, the category "Body and its components" ranks fifth (182 words) and, in relative importance, is approximately equal for the representatives of both samples. Meanwhile, we observe differences in the content of the category. Well, the dominant lexemes in this context are "blood, hemoglobin", "teeth" and "throat" for doctors; while patients, in addition to "teeth", use also more generalized concepts of "head" and "part of the body". We associate this fact with the greater professionally determined cognitive differentiation of doctors compared to their patients. Accordingly,

if the former are aimed at localizing exact symptoms, the latter simply describe problem parts of the body in general (i.e. "complaining that it hurts" as a way of psycho-emotional "release").

As it was already mentioned above, the other categories are significantly less frequent. It is also worth paying attention to those lexemes that are found either only among doctors or, on the contrary, only among patients in various contexts. This fact is a characteristic from the point of view of psycholinguistics. In particular, it is necessary to mention the differences in the semantic content of the "Physiological and mental processes, states, qualities" category. For example, there are such lexemes as "thoughts", "attention", "memory", "wisdom" only in the sample of doctors. This fact indicates the efforts of specialists to transfer communication with the patient to rationalistic notions, to appeal to the intellectual abilities of the recipients, to stimulate their reflection on their own conditions. Instead, the concepts of "irritability" and "panic" are found only in a sample of patients. This testifies to their efforts to convey the negative psycho-emotional states caused, in particular, by the conditions of military operations. The doctors, however, avoid such words in order not to retraumatize their patients.

Conclusions. The results of the analysis of "doctor-patient" dialogues made it possible to identify and describe psycholinguistic markers of typical physiological, mental, social, and spiritual states of people seeking medical help under martial law conditions; single out the markers of positive emotional states (optimism, confidence, empathy, etc.) and affective and negative emotional processes (anxiety, fear, anger, aggression, sadness, depression, etc.).

The results of the study can be used in the development of scientifically based recommendations regarding the content of both mandatory questions and precedent textual and event allusions, which should not be mentioned during the collection of anamnesis and performed physical examination. They also should be avoided when discussing sensitive and taboo topics with the patient during the collection of anamnesis and further observation.

List of references:
1. Asanova A. Khaustova O. Typical difficult situations in doctor-patient interactions. *Psychosomatic medicine and general practice*. 2018. 3 (3). doi: 10.26766/pmgp.v3i3.125.
2. Blahun S., Stuchynska N., Lytvynenko N., et al. The communicative competence of future healthcare specialists in the context of pharmaceutical market transformation. *Archives of Pharmacy Practice*. 2022. 13 (1). P. 74–81. doi: 10.51847/geyd1jzGpp.
3. Chaban O., Khaustova O. Medical and psychological consequences of war distress in Ukraine: what we expect and what needs to be taken into account when providing medical care? *Ukrainian medical journal*. 2022. 4. P. 150. doi: 10.32471/umj.1680-3051.150.232297.

4. Chaban O., Khaustova O. Mental health during the COVID-19 pandemic (features of psychological crisis, anxiety, fear and anxiety disorders). *NeuroNews: psychoneurology and neuropsychiatry.* 2020. 3 (114). P. 26–36.
5. Kaniura, O.A., Melnyk, B.M., Mykytenko, P.V., et al. Professional training of masters of dentistry within quarantine restrictions and martial law: a comparative analysis of educational process. *Wiadomosci lekarskie.* 2023. 76 (4). P. 772–777. doi: 10.36740/WLek202304111.
6. Koval L.M. Psycholinguistic analysis of the text as an integrative method of modern linguistics. *Collections of scientific works of the professor-teaching staff of Vasyl Stus DonNU.* 2021. P. 118–120.
7. Kuchyn I.L., Vlasenko O.M., Melnyk V.S., et al. Simulation training and virtual patients as a component of classroom training of future doctors under Covid-19 conditions. *Wiadomości lekarskie.* 2022. 75 (5). P. 1117–1122. doi: 10.36740/WLek202205112.
8. Kuchyn I.L., Vlasenko O.M., Stuchynska N.V., et al. Physical health of students and digitalization of higher medical education: risk factors. *Wiadomości lekarskie.* 2023. 76 (4). P. 758–764. doi: 10.36740/WLek202304109.
9. Tan K.I., Foo J., Ang B.W., et al. Perspectives of medical students on local medical education during COVID-19. *Singapore Med J.* 2022. 63 (7). P. 402–404. doi: 10.11622/smedj.2020105.
10. Zasiekina L.V., Zasiekin S.V. Psycholinguistic diagnosis. Tutorial. Lutsk. 2008. 188 p.

References:
1. Asanova, A. & Khaustova, O. (2018). Typical difficult situations in doctor-patient interactions. *Psychosomatic medicine and general practice.* 3 (3). doi: 10.26766/pmgp.v3i3.125 [in English].
2. Blahun, S., Stuchynska, N., Lytvynenko, N., et al. (2022). The communicative competence of future healthcare specialists in the context of pharmaceutical market transformation. *Archives of Pharmacy Practice.* 13 (1). P. 74–81. doi: 10.51847/geyd1jzGpp [in English].
3. Chaban, O., & Khaustova, O. (2022). Medyko-psykholohichni naslidky dystresu viiny v Ukraini: shcho my ochikuiemo ta shcho potribno vrakhovuvaty pry nadanni medychnoi dopomohy? [Medical and psychological consequences of war distress in Ukraine: what we expect and what needs to be taken into account when providing medical care?]. *Ukrainskyi medychnyi chasopys – Ukrainian medical journal.* 4. P. 150. doi: 10.32471/umj.1680-3051.150.232297 [in Ukrainian].
4. Chaban, O., & Khaustova, O. (2020). Psykhichne zdorovia v period pandemii COVID-19 (osoblyvosti psykholohichnoi kryzy, tryvohy, strakhu ta tryvozhnykh rozladiv) [Mental health during the COVID-19 pandemic (features of psychological crisis, anxiety, fear and anxiety disorders)]. *NeiroNews psykhonevrolohii ta neiropsykhiatrii – NeuroNews: psychoneurology and neuropsychiatry.* 3 (114). P. 26–36 [in Ukrainian].
5. Kaniura, O.A., Melnyk, B.M., Mykytenko, P.V., et al. (2023). Professional training of masters of dentistry within quarantine restrictions and martial law: a comparative analysis of educational process. *Wiadomosci lekarskie.* 76 (4). P. 772–777. doi: 10.36740/WLek202304111 [in English].
6. Koval, L.M. (2021). Psykholinhvistychnyi analiz tekstu yak intehratyvnyi metod suchasnoho movoznavstva [Psycholinguistic analysis of the text as an integrative method of modern linguistics]. *Zbirnyky naukovykh prats profesorsko-vykladatskoho skladu DonNU imeni Vasylia Stusa – Collections of scientific works of the professor-teaching staff of Vasyl Stus DonNU.* P. 118–120 [in Ukrainian].
7. Kuchyn, I.L., Vlasenko, O.M., Melnyk, V.S., et al. (2022). Simulation training and virtual patients as a component of classroom training of future doctors under Covid-19 conditions. *Wiadomości lekarskie.* 75 (5). P. 1117–1122. doi: 10.36740/WLek202205112 [in English].
8. Kuchyn, I.L., Vlasenko, O.M., Stuchynska, N.V., et al. (2023). Physical health of students and digitalization of higher medical education: risk factors. *Wiadomości lekarskie.* 76 (4). P. 758–764. doi: 10.36740/WLek202304109 [in English].
9. Tan, K.I., Foo, J., Ang, B.W., et al. (2022). Perspectives of medical students on local medical education during COVID-19. *Singapore Med J.* 63 (7). P. 402–404. doi: 10.11622/smedj.2020105 [in English].
10. Zasiekina. L.V., & Zasiekin, S.V. (2008). Psykholinhvistychna diahnostyka [Psycholinguistic diagnosis]. Tutorial. Lutsk. 188 p. [in Ukrainian].