Cross-sectional Study of Clinical and Psycholinguistic Characteristics of Mental Disorders in HIV Infection *

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Abstract

The paper considers the use of clinical-linguistic examination method for determining linguistic markers for mental disorders in HIV patients who did not receive specific antiviral therapy. The study allows to determine linguistic markers of physical and mental state deterioration, such as increase of verb coefficients and personal pronouns, coefficient of logical coherence and vocabulary diversity and volume. The identified markers could be additional signs to be used by any practical doctor and psychiatrist to presume mental disorders in patients with HIV infection.

Keywords: *HIV infection, mental disorders, disorders of adaptation, organic disorders, central nervous system, psycholinguistic method, corpora, psycholinguistic indexes, linguistic marker*

1 Introduction

Current epidemiological data on the pandemic prevalence of HIV in the world expand the boundaries of the problems associated with the threat of unpredictable spread of infection and the frequency of mental disorders that accompany HIV infection[Novikov, 2019] [1] [2]. The specific treatment of HIV infection is complicated by psychological, psychotherapeutic, social and economic problems that need to be resolved [Sherbourne et al., 2000]. HIV-induced mental disorders have somatogenic and psychogenic etiology. Somatogenic mental disorders are determined by the fact that the central nervous system (CNS) is one of the reservoirs for HIV. HIV is indirectly a neurotropic virus and can cause associated neurocognitive impairment (HAND) [Allory et al., 2000] [Sherbourne et al., 2000][Liu et al., 2000][Nakagawa et al., 2012]. Now it is known that the main structures damaged by HIV infection are the subcortical parts of the brain, in particular the area of the limbic system – the hippocampus. When comparing neuropsychological and neuroimaging methods of studying the state of the central nervous system at the early stages of the HAND formation, it turned out that the following brain regions are involved in the pathological process: anterior cingulate gyrus, shell, mediobasal parts of the temporal lobe, premotor sections, corpus callosum, and reticular formation. Involvement of these structures in the central nervous system is confirmed by symptoms of cognitive impairment and emotional disorders, which are the earliest mental disorders in HIV-infected subjects. [Ellis et al., 2016].

The most commonly used HAND classification was proposed in 2007 and included 3 categories [Antinori et al., 2007]:

- asymptomatic HAND, which are manifested only when performing complex professional activities and have little effect on everyday life; neuropsychological testing reveals violations in at least 2 functional areas, which include speech, attention, working memory, abstract thinking, executive functions, memory (learning, memorization), information processing speed, sensory-perceptual and motor skills;
- mild HAND significantly interfere with professional activities and complicate domestic work and behavior in society;
- severe HAND – HIV-associated dementia that makes a person disabled, requiring care [Everall et al., 2009][Antinori et al., 2007].

According to Simioni, the overall prevalence of all HAND in patients with undetectable viral load (VL) of HIV is 69%, the prevalence of asymptomatic disorders - 50%, lungs - 17% and dementia - 2% [Simoni, 2011]. The psychogenic nature of mental disorders in HIV-infected patients is provoked by an awareness of the severity of the disease, the need for continuous use of antiretroviral therapy (ART), the need to change the usual lifestyle and social functioning [Trofimova et al., 2010][Syropiatov et al., 2013][Koltcova et al., 2011]. A significant cultural and social problem is stigmatization and discrimination of HIV-infected citizens, which sometimes spreads to their family members [Stigmacija & diskriminacija, 2011][Belyakov et al., 2012].

Psycho-traumatic experiences and initial manifestations of HAND are mutually burdensome and create difficulties for an HIV-infected patient in deep awareness and verbalization of their experiences. The latter complicates and reduces the quality of psychological and psychotherapeutic support of the patient.

[1] http://www.demoscope.ru/weekly/2002/069/analit02.php

[2] https://www.who.int/ru/news-room/fact-sheets/detail/hiv-aids

It is known that the dynamics of linguistic characteristics patient's speech is to some extent related to clinical and psychological phenomena. This is manifested in the words and expressions used, in the literacy, accuracy, richness and imagery of speech utterances, in the paralinguistic components of speech, in the features of nonverbal speech and many other signs [Nemov, 2019]. However, even in a few studies on linguistic phenomena in a clinic for patients with mental disorders, speech structures are considered as leading subjective factors in the pathogenesis of mental disorders [Piotrowski, Spivak, 2007]; [Pashkovsky et al., 2015]; [Mikirtumov, 2004]; [Smirnova, 2010]; [Spivak, 2004]. The linguistic aspects of the infectious processes influence on the central nervous system remain currently poorly understood. Several articles report age-specific keywords in HIV patients [Chena et al., 2017]. Confirmed data on neuroimaging changes in the speech areas of the temporal lobes of the cerebral cortex in HIV-infected patients determines the relevance of further additional psycholinguistic studies [Trofimova et al., 2010].

2 Study Objectives

The main objective of the study in question is to substantiate the use of linguistic examination method for determining linguistic markers of mental disorders in HIV patients who did not receive specific antiviral therapy. Such investigation makes it possible:

- to assess the state of mental health in patients with HIV infection from the perspective of the concept of a biopsychosocial model of diseases.
- to study the structural organization and features of the linguistic characteristics of the speech of patients with HIV infection.
- to identify linguistic markers of central nervous system damage in HIV infection.

3 Material and Methods

The study group consisted of patients with HIV infection, who are being monitored at the St. Petersburg State Center for the Prevention and Control of AIDS and Infectious Diseases (AIDS Center) and are not receiving ART. Criteria for inclusion in the study group were as follows:

- - written consent of the patient to participate in the study;
- - confirmed diagnosis of HIV infection;
- - lack of antiviral therapy at the time of examination.

The basis for exclusion from the study were:

- confirmed history of abuse or dependence on psychoactive substances (surfactants) (rubric F1x.x according to the classification of ICD-10);
- post-traumatic changes in the central nervous system (more than 3 craniocerebral trauma (head injury), concussions in the anamnesis);

- concomitant infections of the central nervous system in history;
- confirmed atherosclerotic lesions of the brain;
- concomitant mental disorders of a psychotic level (rubrics F1x.x., F06.5x, F2, F30.x, F31.x, F39.x, F32.3x, F33.2x, F33.3x according to the ICD-10 classification);
- dementia (F02.x according to the ICD-10 classification);
- mental retardation (F7x.x according to the classification of ICD-10).

The methods of the study were:

1. Primary medical records review
2. Clinical interview using psychometric scales:
    - Depression rating scale - MADRS Montgomery;
    - Anxiety rating scale - HAMA Hamilton
3. Experimental-psychological methods:
    - Impact of Event Scale (IES-R) for assessing the impact of the HIV infection traumatic factor on the mental state [Horowitz et al, 1979];
    - Munsterberg test to assess impaired attention and verbal fluency;
    - CRIq [Nucci et al., 2012] cognitive reserve questionnaire for assessing cognitive resources.
4. Psycholinguistic method: content analysis of oral statements of patients.
5. Biochemical method: comparing the data obtained with indicators of the patients' immune status and viral load with measurement performed in the laboratory of the AIDS Center.
6. Lingua-statistical methods: building frequency vocabulary, concordances and collocations with AntConc program (Waseda University, Japan) [Anthony, 2004]. Previously, the texts were lemmatized using the LemmaGen program[JURŠIČ et al.].
7. Statistical processing methods: calculating all quantitative indicators with Statistica 10.0 software (Statsoft Inc., USA) (mean and standard deviations (SD)). For qualitative indicators frequencies and percentages were received. To assess the normality of the distribution the Shapiro–Wilks test was performed. Student's test was used for independent samples to assess the differences in quantitative characteristics between groups (distribution close to normal). Data symmetrization was carried out using logarithm. To compare the mean values, the non-parametric Mann–Whitney test was used for two independent samples. A correlation analysis was also performed using Pearson/Spearman correlation coefficients. Differences were considered statistically significant at a significance level of less than $p < 0.05$. Also, in order to clarify and identify correlation relationships between parameters, we used data mining system Weka [Witten et al., 2007].

4 General Characteristics and Analysis of the Study Group

The cohort of 52 subjects was examined (24 (46.2%) male, 28 (53.8%) female). The average age of the patients was 35.9 ±9.0 (22 to 56) years. The distribution of the sample of patients by stages of HIV infection is presented in Table 1. Most patients were at stages 3 and 4A of HIV infection.

Table 1: HIV stages in the examined patients

HIV stages	**Number of patients**	%
2Б	3	5,9
3	27	51
4А	19	37,3
4Б	3	5,9

The average length of time for registration with the AIDS Center was 1.3 ±3.5 years (from 1 week to 18 years). The age of diagnosis of HIV infection was 1.7 ±3.7 years (from 1 week to 18 years), and in most cases it coincided with the age of registration at the AIDS Center. Most of the examined patients recently learned about the diagnosis of HIV infection, recently registered with the AIDS Center, and underwent a commission examination before starting ART.

Viral load in patients was 198562.1 ±822679.9 (506-5887422) copies / ml. Average CD4 abs. T –lymphocytes were 522.5 ±289.1 (18 to 1283) cells / l. The large dispersion of viral load and CD4 abs. T–lymphocytes is explained by different duration and stages of HIV infection and the lack of correction of ART. Two (3.8%) patients suffered from concomitant chronic viral hepatitis C. Concomitant diseases were observed in 21 patients (40.4%) and were represented by mild and moderate pathology of many organs and systems of the body. Acute and severe concomitant conditions were not observed. Nine (17.3%) patients took medications, most often for the prevention of tuberculosis (isoniazid, vitamin B6).

Thus, the sample included somatically healthy people suffering from HIV infection and not taking medications with neurotoxic effects.

4.1 Patients' social characteristics.

Most of the patients (42.3%) were higher educated. On average, patients had been educated (including school and post-secondary education) for 13.5 ±2.8 (10 to 19) years. Their distribution according to the education level is presented in Table 2.

Patients were divided according to their job rankling level (see Table 3) . The quality of work in 21 patients (40.4%) did not correspond to their education. They were engaged in low-skilled manual labor such as manicurist, gas station operator, housekeeper, assistant educator, cleaner. Professional experience in working patients was 10.3±3.6 (from 5 to 16 years)

Most patients were single 16 (30.8%) and 12 (23.1%) divorced. Living conditions for almost all patients (47 (90.4%) were satisfactory. Only 5 of them (9.6%) lived in separate rooms in social apartments.

Table 2: Educational level of patients

Educational level	**Number of patients (n)**	**To the whole sample**(%)
Lower secondary	2	3,8
Specialized secondary	7	13,5
Secondary	12	23,1
Secondary technical	3	5,8
Incomplete higher	6	11,5
Higher	22	42,3

Table 3: Distribution of patients according to their level of skills

Job rankling	**Number of patients (n)**	(%)
Low skilled manual	21	40,4
Qualified manual	11	21,2
Skilled non-manual	13	25
Professional	6	11,5
Highly responsible intelligent	1	1,9

Table 4: Psychopathological syndromes in the examined patients

Syndrome	**Number of patients (n)**	**Number of patients** (%)
anxious	11	21,2
anxious hypochondria	6	11,5
psychoorganic	5	9,6
anxious depressive	3	5,8
depressive	2	3,8
parasomnic	1	1,9
psychopathic	1	1,9
without pathology	23	44,2

In general, the level of social adaptation in more than half of the patients (30 (57.7%)) was high.

All patients actively used the Internet, a mobile phone, took an active part in household chores (cleaning, cooking, etc.).

4.2 Clinical and psychopathological analysis of the data

Patients complained of anxiety, asthenic hypochondria, and obsessive-phobic feelings. The psychopathological syndromes leading in the clinical picture are indicated in Table 4. Only two (3.2%) patients were previously consulted by psychiatrist. The average duration of mental illness in patients in the sample was 48.2 ±89.6 months (from 1 day to 30 years). Fig. 1 shows the levels of depression according low (0–6 points), moderate (7–19 points) and high (20–34

Table 5: Patients distribution into diagnosis

Diagnostic column (ICD-10)	**Number of patients** (%)
Neurotic and stress related disorders, F4	19 (36,5%)
Organic, including symptomatic, mental disorders, F0	6 (11,2%)
Affective disorders (dysthymia and recurrent affective disorder, remission), F3	2 (3,8%)
Without diagnosis	25(48,1%)

points) distribution. (MADRS) is shown in Fig.1. The average score on the HAMA rating scale of anxiety in the sample was 10.6 ±9.0 (from 0 to 30), which corresponds to a low level of anxiety experiences. The distribution of patients by anxiety levels is shown in Fig. 1.

According to the MADRS scale in women, the level of depression was higher than in men (14.2 ±9.9 points in women vs 5.7 ±5.5 points in men, $p < 0.05$). Also, the level of depression increased with age ($r = 0.3$, $p < 0.05$), especially in people over 35 years old. Often, depressive experiences were accompanied by sleep disorders, anxiety, obsessive–phobic and hypochondriacal symptoms. The frequency of personal pronouns in patients correlated with the magnitude score on the MADRS scale ($r = 0.4$, $p < 0.05$). The average score on the scale of attention and verbal fluency (Munsterberg test) was significantly lower than normal (>= 18 points - 23.1%, < 19 points - 76.9%) and amounted to 14.8 ±4.2 (from 3 to 22 points). The distribution of patients depending on normal indicators or a decrease in the attention scale is shown in Fig. 2.

The attention scale indicators decreased with a decrease in the number of CD4 lymphocytes (CD4%: $r = 0.3$, $p < 0.05$; CD4 abs.: $r = 0.3$, $p < 0.05$). The severity of experiences due to the traumatic factor of HIV infection was evaluated on the IES-R scale. As a result, it is possible to assess the level and characterize the clinical picture of emotional experiences. According to the IES-R scale, the "Invasion" subscale allows to identify nightmares, obsessive feelings, images, or thoughts associated with the possible effects of HIV infection. The subscale "Avoidance" allows to identify avoidance symptoms, including attempts to mitigate or avoid experiences associated with the possible effects of experiences associated with HIV infec-

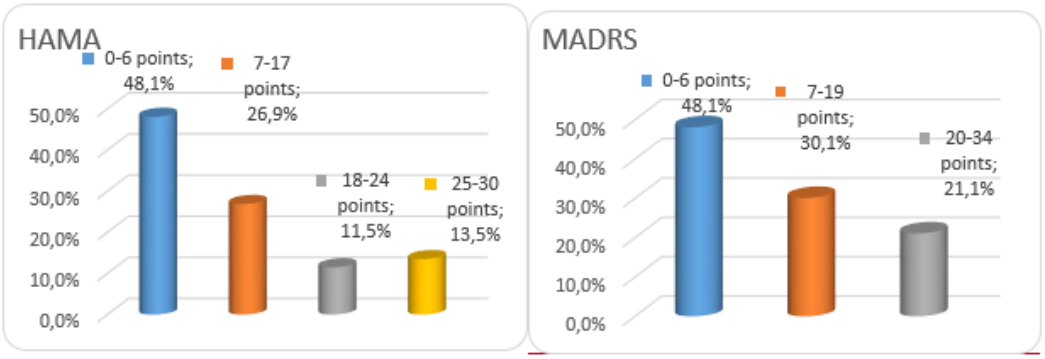

Figure 1: Distribution of patients by depression levels according to the MADRS and HAMA scales

tion, decreased reactivity. Subscale "Physiological excitability" allows to identify the subject's anger and irritability; hypertrophied fright reaction of the possible impact of thoughts about HIV; difficulty concentrating psychophysiological agitation due to memories of the presence of HIV, insomnia. "Integral indicator" is a general scale for assessing the impact of thoughts about HIV as a traumatic effect. It allows to reveal the presence of adverse emotional and personal characteristics among the examined, which have arisen as a result of the subjective perception of the threat from HIV infection. The results of the IES-R scale are shown in Table 7. The highest scores are presented on the "Avoidance" subscale, which characterizes the desire to distance oneself from thoughts about HIV infection, not to remember the diagnosis, unwillingness to visit the AIDS Center, and a likely passive attitude towards the disease.

A third of patients expressed asthenic complaints (18 (34.6%)). Anxious experiences were determined in half of the patients (29 (55.8%)). Moreover, in 7 (13.5%) cases experiences were represented by obsessions, in 7 (13.5%) by phobias of mainly AIDS-phobic content. Hypochondria of an obsessive level was detected in 10 (19.2%) patients, overvalued - in 5 (3.8%).

Eight (15.4%) patients complained of bad mood, which clinically confirmed the presence of depression. 1 (1.9%) patient had suicidal impulse. No one had a suicide attempt in history.

Sleep disorders were found with 15 patients and were distributed as follows: early insomnia in 9 (17.3%) patients, average insomnia in 5 (9.6%), mixed insomnia in 1 (1.9%).

In 11 (21.2%) patients, signs of an asthenic variant of the psycho-organic syndrome were noted. 13 people (24.9%) had a history of up to 2 TBIs of mild severity.

Table 6: IES-R scale results for the examined patients

Subscale	**Average±SD**	**Min-max**	**Socio-psychological tension level**
Invasion	7,4±6,3	0–26	between average and low
Avoidance	13,1 ±8,9	0–32	average
Physiological excitability	5,7±6,3	0–23	low
Integral indicator	26,2±18,3	0–67	between low and average

4.3 Psycholinguistic and lingua-statistical analysis of patient interview

To conduct psycholinguistic measurements, according to the hierarchical levels of language organization, various levels of text analysis were determined:

- lexical—grammatical level percentage ratio of different parts of speech reflected general mental functioning, development of intelligence,
- lexical—stylistic level (Aggressiveness Index, Coherence Index, CTTR) reflected personal characteristics,
- syntactic level (volume of speech production, number of sentences, average size of sentences, percentage of simple and complex sentences) reflected current emotional state,

- pragmatic level (highlighting keywords and semantic categories that reflect a person's unique experience and his subjective world).

During the interview, patients were asked to speak on their health and attitude to the disease in monologue form. It was proposed to describe the impact of HIV infection on their relationships with other people, including the professional environment and family. The patients talked about their diagnosis and how it affects their household activities, family and professional duties. The time of the monologue was not limited. All interviews were conducted in Russian, audio-recorded and then transformed into text form. The total volume of word types was 1995 the total volume of word tokens was 8766.

Main psychometrics indexes, ratios and metrics [Balin et al, 2000] are shown in Table 7.

Table 7: The results of psycholinguistic indexes, rates and metrics in the text corpus of examined patients

Indexes / Rates / Metrics	**Average±SD**	**Min-max**	**Regulatory data**	**Differences between sample data and regulatory data**
N(Volume of patients' speech production)	172,4 ±119,4	56 - 745	–	–
L(Number of sentences in patients' speech production)	18,0 ± 9,4	5 - 47	–	–
Average size of sentences	9,8±3,5	4,6–20,8	6–8	$p > 0,05$
A-Index(Aggressiveness Index) $=\frac{N_{verbs/verb\ forms}}{N} \cdot 100\%$	17,3 ±3,3	10,5 – 26,8	< 60	$p > 0,05$
PWR(Participle per Words/Passive Voice Ratio) $=\frac{N_{participle}}{N} \cdot 100\%$	0,6 ±1,0	0 – 4,4	–	–
PPWR(Personal Pronouns per Words) $=\frac{N_{personal\ pronouns}}{N} \cdot 100\%$	9,0 ±3,3	1,7 - 16,5	–	–
CW(Clq per Words) $=\frac{N_{colloquial\ words\ and\ vulgarisms}}{N} \cdot 100\%$	**7,4 ±4,6**	**0 – 18,1**	**< 1**	**$p < 0,05$**
CTTR(Corrected Type Token Ratio) $=\frac{N_{lemmas}}{\sqrt{2 \cdot N}} \cdot 100\%$	**24,2 ±6,9**	**15,5 – 52,7**	**5 – 15**	**$p < 0,05$**
Coh-Index(Coherence Index) $=\frac{N_{participle}+N_{conjunctions}+N_{prepositions}}{3 \cdot L} \cdot 100\%$	0,99 ±0,47	0,0096 – 2,1	< 1	$p < 0,05$
SCS-Index(Simple to Complex Sentences Ratio) $=\frac{N_{simple\ sentences}}{N_{complex\ sentences}} \cdot 100\%$	151,9 ±124,7	16,7 – 650,0	–	–

Aggressiveness Indexes were very low for all patients ($< 60\%$), this situation characterizes passive, weak-willed participation in one's own destiny, decrease in their aggressiveness level and low readiness for vigorous activity. Indicators increase was observed in patients with anxious, hypochondriacal symptoms, sleep disturbances, presence of a psycho-organic syndrome, compared with patients without these psychopathological phenomena ($p < 0.05$). The *A-Indexes* decreased depending on the severity of the somatic state ($r = -0.4$, $p < 0.05$) (Fig.2).

Participle per Words/Passive Voice Ratio stands for number of passive voice in the text shows the level of verbal intelligence. It was lower in anxious patients than in patients with-

out anxiety symptoms (0.9±1.3% in patients without anxiety vs 0.3 ±0.6% in patients with anxiety, $p < 0.05$).

In patients with mental disorders, compared with mentally healthy people, the *Personal Pronouns Ratio* was higher (10.5 ±3.3% vs 7.6 ±2.8%, $p < 0.05$). Thus, the *PPR* was clearly higher in people with anxious, depressive experiences, sleep disturbances, and presence of obsessive-phobic symptoms compared with patients without such conditions ($p < 0.05$). Compared to men, women had higher rates (7,9±2,5% for men vs 10,0±3,7 for women), the increasing was observed depending on the presence and duration of leisure activities (sports, hunting, dancing, chess, coin collecting, etc.) ($r=0,6$, $p< 0,05$).

The results of *Clg per Words Ratio* shows that indicators of HIV infected patients were higher than normal ($p < 0.05$). Most often we have observed such as *вот* и *ну*. We did not find other internal connections for this ratio.

One of the strongest indicators in the speech diagnostics is Type Token Ratio (TTR), which shows the lexical richness. We have chosen the TTR formula with underwent simple corrections by Carrol, well-known as *CTTR*[Carroll, 1964] . Usually mezure of *CTTR* is in the range of 5 to 15%. However for patients with HIV infection, this one was higher than normal and directly depended on the level of labor qualification ($r = 0.3$, $p < 0.05$). It decreased depending on the length of professional work absence ($r = 0.6$, $p < 0.05$).

Coherence index(Coh-Index) was increasing with growth of the average size of sentences.

The speech of patients with an organic disorder was longer, more detailed, in comparison with other patients, as well as in the presence of hypochondriacal experiences ($p < 0.05$). The volume of speech production decreased significantly depending on the length of service of patients ($r = –0.6$, $p = 0.05$).

The average size of sentences increased depending on the level of patient labor qualification ($r = 0.3$, $p <0.05$), level of professional work (managing director of a small company, lawyer, individual entrepreneur, contractor, doctor, teacher, engineer, etc.) ($r = 0.5$, $p <0.05$), decreased depending on the stage of low professional manual labor (farmer, gardener, housewife, educator, waiter, driver, mechanic, plumber, call-center operator, nurse, etc.)) ($r = –0.5$, $p <0.05$).

There were no connections between speech fluency (Munsterberg test) and psycholinguis-

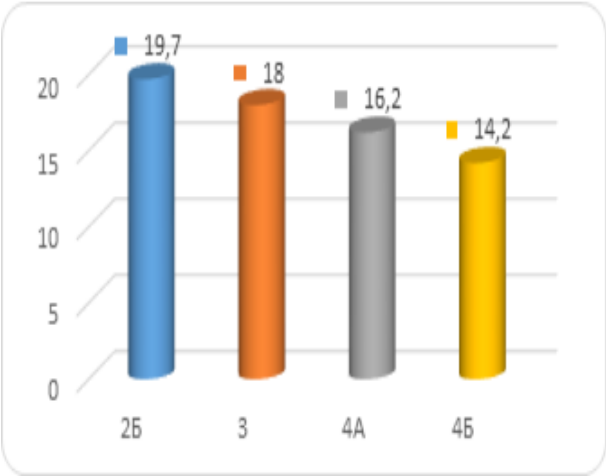

Figure 2: Aggressiveness index dependence on the stage of the disease

tic indicators.

The linear relationships between different indexes were detected using the Pearson correlation coefficient, see Fig. 3. Blue lines correspond to positive correlation and red lines correspond to negative correlation. In addition, solid lines correspond to high correlation coefficient value from 0.7 to 1, dotted lines correspond to moderate correlation coefficient value from 0.5 to 0.7. In the upshot, it can be noted that linguistic indicators, such as ratio of personal pronouns or aggressiveness increase with deterioration in the mental state of patients, as well as with such activities as needle working, gardening or other leisure.

Subsequently, a frequency analysis of patient interview texts was carried out. We identified the most frequent nouns and personal pronouns, such as: *я/ I /, человек/ man, работа/ work, жизнь/ life, отношение/ relationship, друг/подруга/ friend, girlfriend, страх/, fear, семья/family, партнер/ partner, болезнь/ illness, терапия/ therapy*; verbs: *знать/ know, мочь/ be able, думать/ think, сказать/say, влиять/ influence*; adjectives: *нормальный/, normal, большой/ large, общий/ general, здоровый/ healthy, хороший/good*. These tokens were regarded as keywords.

Due to comparison of keyword collocations with other tokens, found by AntConc program, we have identified clear differences in the content of the interview texts between patients without mental disorders / with a diagnosis of organic non-psychotic mental disorders and patients with adaptation disorders and non-psychotic affective disorders (Table 8).

Table 8: Collocations of the particle *не/not* with verbs in patients with adaptation and neurotic disorders

Without mental disorders	**Adaptation disorders and non-psychotic affective disorders**	**Organic non-psychotic mental disorders**
знать/ to known, *давно/ for a long time,* *человек /man,* *умирает/ dies,* *общение/ communication,* *честно/ honestly,* *понимаю/ understand,* *родственники/ relatives,* *хотеть/to want*	*подхватил(ла)/ to have picked up,* *испугалась/ to be frightened,* *изгой/ outcast,* *сторонюсь/ I'm avoiding,* *слабенькая/ weak,* *мнительный/ doubtful,* *замкнулась/ locked up,* *жалею/ I regret,* *бросит/ throws,* *боюсь/ I'm afraid,* *страшно/ scary*	*приходила/ I have came,* *общаюсь/ I communicate,* *живу/ I live,* *обычная /normal,* *признаюсь/ I confess,* *попросила/ I asked,* *переживаю/ I'm experiencing*

Thus, the speech of a group of patients with neurotic and stress-related disorders, in comparison with other groups, reveals the signs of emotional tension, depression, anxiety, anxiety about health, about their relations with colleagues. In other two groups, word forms were more likely to be of everyday, concrete content, emotionally inexpressive. In comparison with patients with organic CNS disorders, in groups of patients without mental disorders and in patients with psychogenic psychic non-psychotic disorders, a more frequent use of the

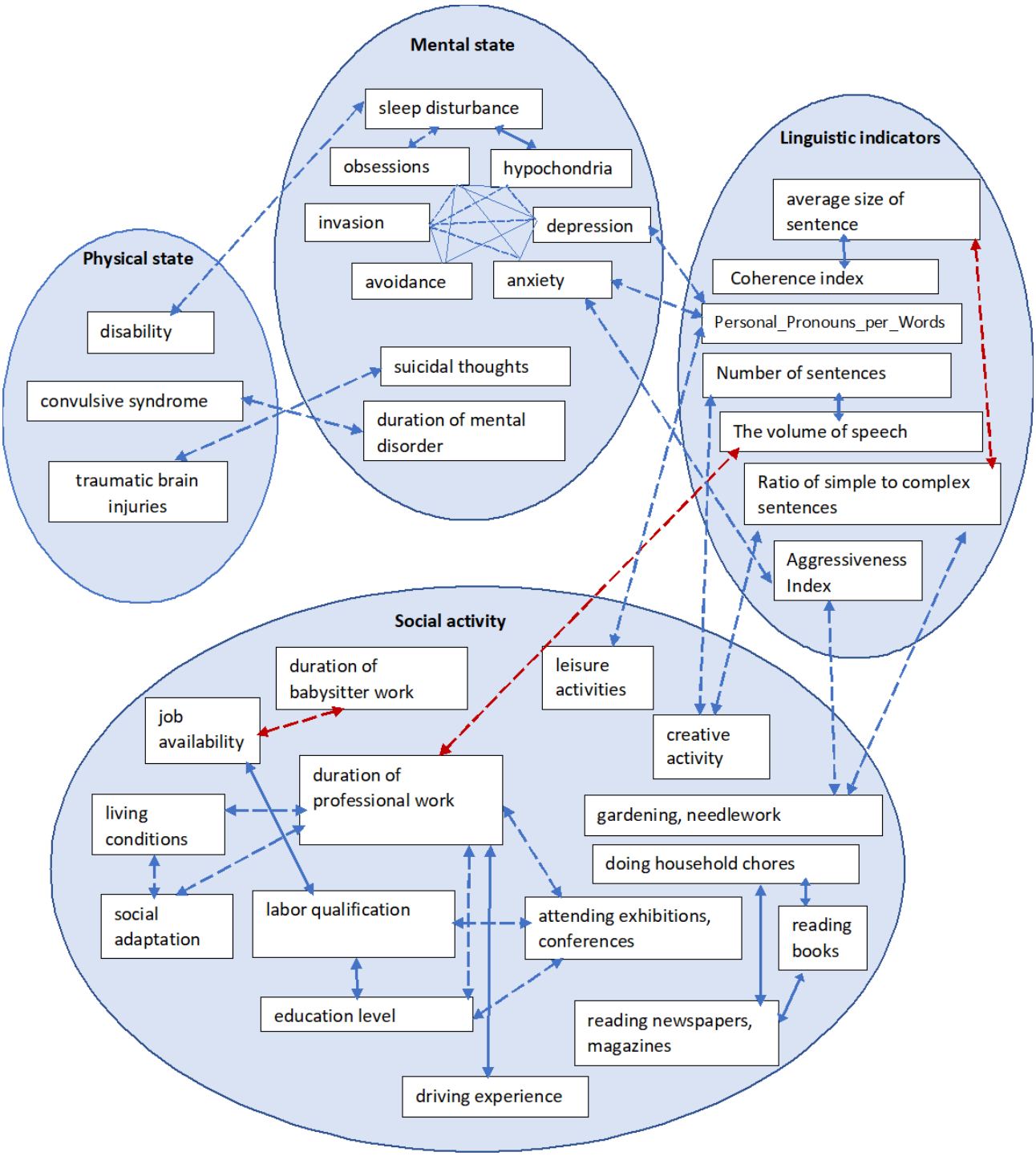

Figure 3: Linear relationships between patients' characteristics

не/not/no particle was revealed (p <0.05). Thus, the occurrence of the *не/not/no* particle in relation to the entire body of texts in patients without mental disorders was 16.9%, in patients with emotional disorders 14.0%, and in patients with organic disorders 9.6%. The most frequent collocations of analyzed particle with verbs in patients with adaptation and neurotic disorders are shown in Table 9.

Table 9: Collocations of the particle не/not with verbs in patients with adaptation and neurotic disorders

Rank	**Freq**	**Freq**(L)	**Freq**(R)	**Statmeasure (Mi)**	**Collocates**
2	30	3	27	4.00880	*знать/to know*
6	11	0	11	3.43010	*мочь/to be able*
14	9	3	6	3.75726	*говорить/to speak*
21	7	0	7	3.60114	*хотеть/to want*
25	6	1	5	4.49423	*понять/to understand*
35	5	1	4	4.49423	*измениться/to change*
29	5	5	0	4.23119	*стараться/to try*
33	5	1	4	4.00880	*повлиять/to influence*
31	5	3	2	3.23119	*работать/to work*

An example of the concordance of a *not* particle with the verb *to know* in three groups of patients, depending on the psychiatric diagnosis, is shown in Table 10.

Numerous negative statements of patients without mental disorders or with nosogenic reactions may be associated with inadequate perceptions of themselves and surroundings, disharmonious attitude to the disease. In the group of patients without mental disorders, this allows us to think about the possible dissimulation of experiences or the presence of experiences

Table 10: A fragment of the concordance of a *не/not* particle with the verb *знать/to know* in an interview with patients, depending on the psychiatric diagnosis

Diagnosis, ICD-10: Organic Mental Disorder, F06		
Не повлияет, если об этом, конечно же, никто	***не***	*узнает. Вот. На общение с другими людьми опять же не влияет.*
..., да, при условии, что об этом никто	***не***	*узнает. Разговор, э-э-э...Рассказывать никому не собираюсь.*
Сейчас все нормально. Брат у меня	***не***	*знает. И не надо ему знать об этом, потому*
...у меня не знает. И	***не***	***надо*** *ему знать об этом, потому что он под этим делом, ...*
Diagnosis, ICD-10: Neurotic and stress-related disorders, F04		
.... почему я не кормила. На работе никто	***не***	*знает. Ну были в шоке с мужем, когда узнали.*
....уже. Услышал. Вот. Ну мне страшно. Я	***не***	*знаю, что еще сказать, на самом деле, потому что, ...*
.....говорили, и читала я, что окружающие	***не***	*должны знать об этом. Ну насколько я знаю. Знают только, ...*
Перед приемом терапии, так... страшно немножко.	***Не***	*знаю, какие будут последствия побочные, типа.*
Diagnosis, ICD-10: No psychiatric diagnosis		
....не будешь заразен. Раньше я этого просто	***не***	*знал. Ну на работе тоже неизвестно, как работодатель*
ть... одного человека... Окружающие никак об этом	***не***	*узнают, поэтому это как-то так. Да, конечно, я,*
Ну, думаю, что если эти люди	***не***	*знают об этом, то никак. Потому что, на самом деле ...*
.... быть, это связано с каким-то, ну	***не***	*знаю, с выплеском адреналина или чего-то.*

of a subclinical level. Numerous negative statements of patients without mental disorders or with nosogenic reactions may be associated with inadequate perceptions of themselves and entourage, disharmonious attitude to the disease. Collocations of the particle *not* and the verbs *to be*, *be able*, *want*, *speak* and others imply a passive, indifferent position in relation as to both illness and health, and to life in general.

5 Conclusions

The clinical and psychopathological method, implemented through speech interaction between the doctor and the patient, is the main one for mental disorders diagnosis. However, the patient's emotional experiences can be masked by functional impairments on the part of the somatic sphere or by maladaptation in the professional field, and may not be determined during a doctor's routine conversation. In addition, some patients tend to dissimulate experiences. As a result, it was found that 50% of HIV-infected patients not suffering from addiction syndromes or surfactant abuse have mental disorders, which are characterized mainly by disorders of adaptive reactions and mild cognitive impairment. 57.7% of HIV-infected people who do not use surfactants showed a high level of social adaptation. For patients who do not use surfactants, and who have undergone a commission examination before starting ART, the leading psychopathological syndromes are anxiety, anxiety-hypochondria. 44.2% of patients did not have obvious psychopathological symptoms.

In the course of the work, linguistic markers of deterioration of both somatic and mental state were revealed. These markers include: a) the verb coefficient decreases with increasing stages of HIV infection and the duration of the disease; b) the coefficients of verbality and personal pronouns increase as a characteristic of emotional disorders, obsessive states in patients with HIV infection.

The level of education did not significantly affect the speech of patients. The coefficient of logical coherence and vocabulary diversity, vocabulary volume directly depend on the level of qualification of labor, availability of work, work experience. Pathognomonic for neurotic stress-related disorders was the frequent use of a *not* particle.

Thus, a significant result of the research is that the structure of emotional experiences was revealed in patients who recently learned about the burden of a serious chronic disease with the corresponding fear of death and self-stigmatization. The group of patients with organic mental processes of HIV genesis was small, therefore it was not possible to determine the psycholinguistic features in patients with VANR.

Identified psycholinguistic markers are additionally signs that can be used by physicians and psychiatrists to diagnose both cognitive impairment and emotional impairment in patients with HIV infection.

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