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BIOLOGICAL SCIENCES

STUDY ON THE THREAT OF INVASIVE NATIVE AND ALIEN PLANT SPECIES IN THE ALEPU SAND DUNES AND MARSHES (BULGARIAN BLACK SEA COAST)

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Abstract

The aim of the present study is to present an actual information about the diversity and distribution of alien and native invasive plant species in the Sand Dunes and adjacent lakes of the Alepu Marsh and to assess the threat these species pose to the NATURA 2000 habitats in question.

The study area is 178.7ha and includes the following habitat types according the Council Directive 92/43/EEC: 1150 Coastal lagoons, 2130 Fixed dunes with herbaceous vegetation ('grey dunes') and 2190 Humid dune slacks. The investigation was held in the period May-June, 2022. Sample plots were set up on each locality of the invasive species for the estimation of species abundance. The size of the sample plots was 10 m² for grasslands and 100 m² for woodlands and shrublands. Species abundance is measured by plant cover (%) in a sample plot. To assess the impact of each of the influences and threats from the invasive species, the three-level scale was used: H- High - currently acting and/or affecting a large area (>60%) of the habitat; M- medium- has been active in the past and has a high probability of recurrence and/or affects a small area (<30%) of the habitat; L- Low- did not act, but is likely to affect and/or affect a minor area (<5%) of the habitat.

The following invasive alien species have been found in the study area: *Acer negundo* L., *Ailanthus altissima* (Mill.) Swingle, *Amorpha fruticosa* L., *Broussonetia papyrifera* (L.) L'Hér. ex Vent., *Eleagnus angustifolia* L., *Erigeron canadensis* L., *Laburnum anagyroides* Medik., *Parthenocissus quinquefolia* (L.) Planch., *Robinia pseudoacacia* L., *Spartium junceum* L., *Xanthium italicum* Moretti. Among the native plants the following species can be mentioned as invasive: *Phragmites australis* (Cav.) Trin. ex Steud. (this species is not noted in Table 1 because it is widespread in the study area), *Paliurus spina-christi* Mill., *Tamarix ramosissima* Ledeb. and *Rubus discolor* Weihe & Nees. The most dangerous to the habitats invasive alien species is False indigo (*Amorpha fruticosa*) and at the current stage the risk of this species impact is assessed as medium. Among the native species, Common reed (*Phragmites australis*) is the most aggressive species with high level of impact.

The main routes for the spread of invasive alien plant species in the area are determined by the proximity of the hotel complex, where all the established invasive alien species are cultivated; the canal, which is the active water connection between the lakes and the dunes; the coastal road ruderalised in placed and the increased flow of tourists whose vehicles carry seeds and plant parts.

Keywords: habitats, vegetation, dunes, invasive species, NATURA 2000, anthropophytes

INTRODUCTION

Dunes presently comprise only 10% of the entire 412 km long coastline of Bulgaria: they embrace a total length of 38.57 km and a total area of 8.78 km² [1]. The conservation status of the dunes in Bulgaria is regulated in a number of laws, including the Protected Areas Act. [2], Biological Diversity Act [3] and Act on the Black sea coast spatial development [4]. The priority for the protection of these natural resources, which are part of the international NATURA 2000 network, is strengthened when their territories are connected to other valuable habitats such as lagoons, dune-slack pools, dune-slack reedbeds, sedgebeds and canebeds etc. Such a combination of unique habitats is the territory of the Alepu area situated on the Bulgarian Black Sea coast, within Burgas Province, south of the resort town of Sozopol. The Sand Dunes were declared a protected area in 1984, and Alepu Marsh – in 1986 in order to protect the habitats of endangered and rare water bird species, the sand dunes, as well as the water chestnut and both sites belong to the category "natural landmark". In 2002 they were granted an international

status because they are on the territory of Ropotamo Nature Reserve [5]

The aim of the present study is to present an actual information about the diversity and distribution of alien and native invasive plant species in the Sand Dunes and adjacent lakes of the Alepu Marsh and to assess the threat these species pose to the NATURA 2000 habitats in question.

MATERIALS AND METHODS

The study area covers the territory of the Sand Dunes, Alepu area (Figs. 1, 3) and the coastal part of the two lakes located between the national road 99 and the road to the Diuni resort village (Figs. 1, objects 1 and 2). The two lakes are part of the Alepu Marsh (and their total area is about 166.7 ha. It is a lagoon marsh and by origin it is a firth and is separated from the sea by a strip of interesting sand dunes [5]. The area of the Sand Dunes is 12 ha. On the eastern side of the road, where the standing dunes are located, a small canal with constant water (Fig. 1, 4) has formed, which is connected to the lakes and at this stage it does not mouth of the sea. The canal enters the dunes and is a potential vector for the spread of invasive species.



Figure 1. Study area (Satelite image).

Legend: 1 Northern Alepu marsh lake; 2 Southern Alepu marsh lake; 3. Alepu sand dunes; 4. Canal.

The study area includes the following habitat types according the Council Directive 92/43/EEC [6]: 1150 Coastal lagoons (Фиг 1, objects 1 and 2), 2130 Fixed dunes with herbaceous vegetation ('grey dunes') (Figure 1, object 3) and 2190 Humid dune slacks (Figure 1, object 4).

The current study is focused on invasive plant species (native and alien) in the lakes, canal and sand dune area, species characteristic of these specific habitats and species with conservation status whose localities these invasive species threaten.

The investigation was held in the period May-June, 2022. Sample plots were set up on each locality of the invasive species for the estimation of species abundance. The size of the sample plots was 10 m² for grasslands and 100 m² for woodlands and shrublands. Species abundance is measured by plant cover (%) in a sample plot [7].

To assess the impact of each of the influences and threats from the invasive species, the following three-level scale was used [8]: H- High - currently acting and/or affecting a large area (>60%) of the habitat; M-

medium- has been active in the past and has a high probability of recurrence and/or affects a small area (<30%) of the habitat; L- Low - did not act, but is likely to affect and/or affect a minor area (<5%) of the habitat. The established invasive alien species for the territory of Bulgaria in the studied area are according to Petrova et al. (2013)[9]

Results and Discussion

The following invasive alien species have been found in the study area (Table 1): *Acer negundo* L., *Ailanthus altissima* (Mill.) Swingle, *Amorpha fruticosa* L., *Broussonetia papyrifera* (L.) L'Hér. ex Vent., *Eleagnus angustifolia* L., *Erigeron canadensis* L., *Laburnum anagyroides* Medik., *Parthenocissus quinquefolia* (L.) Planch., *Robinia pseudoacacia* L., *Spartium junceum* L., *Xanthium italicum* Moretti.

Among the native plants (Table 1), the following species can be mentioned as invasive: *Phragmites australis* (Cav.) Trin. ex Steud. (this species is not noted in Table 1 because it is widespread in the study area), *Paliurus spina-christi* Mill., *Tamarix ramosissima* Ledeb. и *Rubus discolor* Weihe & Nees.

Table 1.

List of localities of the native and alien invasive species

No of locality	Species name	Geographic coordinates	Sample plot size (m ²)	Cover abundance (%)	Origin of the invasive species
1	<i>Acer negundo</i>	42°22'07.6"N 27°42'15.8"E	100	5	alien
2	<i>Ailanthus altissima</i>	42°20'47.2"N 27°42'52.2"E	100	<1	alien
3	<i>Ailanthus altissima</i>	42°22'22.3"N 27°42'38.1"E	100	10	alien
4	<i>Amorpha fruticosa</i>	42°22'11.3"N 27°42'28.3"E	100	80	alien
5	<i>Amorpha fruticosa</i>	42°20'45.4"N 27°42'55.4"E	100	40	alien
6	<i>Amorpha fruticosa</i>	42°22'11.0"N 27°42'23.6"E	100	10	alien
7	<i>Amorpha fruticosa</i>	42°22'02.9"N 27°42'30.0"E	100	40	alien
8	<i>Broussonetia papyrifera</i>	42°22'09.5"N 27°42'18.2"E	100	3	alien
9	<i>Eleagnus angustifolia</i>	42°22'12.2"N 27°42'25.4"E	100	3	alien
10	<i>Erigeron canadensis</i>	42°21'58.1"N 27°42'28.2"E	10	5	alien
11	<i>Erigeron canadensis</i>	42°21'57.0"N 27°42'29.1"E	10	3	alien
12	<i>Laburnum anagyroides</i>	42°22'22.6"N 27°42'38.4"E	100	5	alien
13	<i>Paliurus spina- christy</i>	42°20'56.0"N 27°43'14.1"E	100	10	native
14	<i>Paliurus spina- christy</i>	42°20'52.6"N 27°43'14.0"E	100	70	native
15	<i>Paliurus spina-christy</i>	42°20'51.3"N 27°43'10.0"E	100	80	native
16	<i>Paliurus spina- christy</i>	42°22'11.3"N 27°42'28.3"E	100	5	native
17	<i>Parthenocissus quinquefolia</i>	42°22'07.8"N 27°42'14.9"E	100	5	alien
18	<i>Parthenocissus quinquefolia</i>	42°22'11.6"N 27°42'25.6"E	100	10	alien
19	<i>Robinia pseudoacacia</i>	42°22'09.2"N 27°42'19.4"E	100	5	alien
20	<i>Rubus discolor</i>	42°22'07.9"N 27°42'29.3"E	100	30	native
21	<i>Rubus discolor</i>	42°22'03.5"N 27°42'28.5"E	100	50	native
22	<i>Rubus discolor</i>	42°21'37.8"N 27°42'44.6"E	100	30	native
23	<i>Rubus discolor</i>	42°21'30.3"N 27°42'48.8"E	100	30	native
24	<i>Rubus discolor</i>	42°20'50.3"N 27°42'50.0"E	100	20	native
25	<i>Rubus discolor</i>	42°21'18.0"N 27°42'24.0"E	100	20	native
26	<i>Rubus discolor</i>	42°21'37.0"N 27°42'07.4"E	100	20	native
27	<i>Rubus discolor</i>	42°21'46.3"N 27°42'02.4"E	100	10	native
28	<i>Rubus discolor</i>	42°22'00.3"N 27°42'09.0"E	100	15	native
29	<i>Spartium junceum</i>	42°21'14.9"N 27°42'26.3"E	100	15	alien
30	<i>Spartium junceum</i>	42°21'39.6"N 27°42'03.2"E	100	10	alien
31	<i>Tamarix ramosissima</i>	42°21'07.8"N 27°43'06.8"E	100	<1	native
32	<i>Tamarix ramosissima</i>	42°22'02.3"N 27°42'31.4"E	100	30	native
33	<i>Tamarix ramosissima</i>	42°22'22.5"N 27°42'38.9"E	100	10	native
34	<i>Xanthium italicum</i>	42°21'47.9"N 27°42'35.0"E	10	10	alien
35	<i>Xanthium italicum</i>	42°21'37.0"N 27°42'42.8"E	10	10	alien

In the study area, localities of 6 species with nature protection status (Figure 2) were registered, which are under the direct threat of the spread of populations of native and alien invasive species.: *Pancreatium maritimum* L., *Stachys maritima* Gouan, *Silene thymifolia* Sm., *Galilea mucronata* (L.) Parl., *Centaurea arenaria* M. Bieb., *Eryngium maritimum* L., which

are under the direct threat of native and alien invasive species populations. *Pancreatium maritimum*, *Stachys maritima*, *Silene thymifolia* и *Galilea mucronata* are included in the Red Data Book of the Republic of Bulgaria [10] as "endangered species" and the first two of them together with *Centaurea arenaria* are under protection of the Biological Diversity Act [3]



Figure 2 Species with conservation status in the study area:

a) *Galilea mucronata*, *Pancratium maritimum*, c) *Stachys maritima*, d) *Centaurea arenaria* M. Bieb.,

On the territory of the former lagoon and the dunes associated with it, which are dynamic natural systems, species characteristic of several types of habitats have been established, including: *Jurinea albicaulis* Bunge, ssp. *kilaea* (Aznar.) Kozuharov., *Artemisia campestris* L., *Centaurea arenaria*, *Cionura erecta* (L.) Griseb., *Galilea mucronata*, *Jasione heldreichii* Boiss. & Orph., *Linaria genistifolia* (L.) Mill., *Pancratium maritimum*, *Silene thymifolia*, *Teucrium polium* L. (characteristic of habitat type 2130), *Ammophila arenaria* (L.) Link, *Cakile maritima* Scop., *Eryngium maritimum* L., *Glaucium flavum* Crantz, *Leymus racemosus* (Lam.) Tzvelev subsp. *sabulosus* (M.Bieb.) Tzvelev, *Salsola kali* subsp. *ruthenica* (Iljin) Soó, *Stachys maritima*, *Xanthium orientale* subsp. *italicum* (Moretti)

Greuter (most characteristic of habitat type 2110 Embryonic shifting dunes and 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')), *Crambe maritima* L., *Eryngium maritimum*, *Salsola kali* subsp. *ruthenica* (Iljin) Soó (1210 Annual vegetation of drift lines), as well as species attached to wet habitats such as *Periploca graeca* L. and *Juncus conglomeratus* L. and such diagnostic for habitat type 1150 *Phragmites australis* (Cav.) Trin. ex Steud., *Lemna minor* L., *Typha angustifolia* L., *Juncus maritimus* Lam., *Schoenoplectus lacustris* (L.) Palla.

Among the established invasive alien species, the greatest danger to the habitats is False indigo (*Amorpha fruticosa*) (Figure 2), and at the current stage the risk of this species impact is assessed as medium (Table 2).



Figure 2. Individuals of *Amorpha fruticosa* threaten a locality of *Crambe maritima*

The percentage participation of the populations of the other invasive species in the total area of habitats is small (below 5%), but the experience with species such as Tree of heaven (*Ailanthus altissima*) and black locust

(*Robinia pseudoacacia*) in similar areas in the country and their strong invasive strategy is a reason to estimate the danger higher from their distribution in the studied territory.

Table 2.

Assessment of the impact of invasive native and alien species

Species name	Habitat type					
	1150		2130		2190	
	Percentage of the total habitat area that the population of the species affects	Leve of impact of species influences and threats	Percentage of the total habitat area that the population of the species affects	Leve of impact of species influences and threats	Percentage of the total habitat area that the population of the species affects	Leve of impact of species influences and threats
<i>Acer negundo</i>	<1	L	<1	L	<1	L
<i>Ailanthus altissima</i>	<1	M	<1	L	<1	L
<i>Amorpha fruticosa</i>	8	M	10	M	10	M
<i>Broussonetia papyrifera</i>	<1	L	<1	L	<1	L
<i>Eleagnus angustifolia</i>	<1	L	<1	L	<1	L
<i>Erigeron canadensis</i>	<1	L	<1	L	<1	L
<i>Laburnum anagyroides</i>	<1	L	<1	L	<1	L
<i>Paliurus spina-christy</i>	15	M	5	M	10	M
<i>Partenocisus quinqifolia</i>	<1	L	<1	L	10	M
<i>Phragmites australis</i>	80	H	65	H	7	M
<i>Robinia pseudoaccacia</i>	<1	M	<1	L	<1	L
<i>Rubus discolor</i>	10	M	<1	L	15	M
<i>Spartium junceum</i>	7	M	<1	L	<1	L
<i>Tamarix ramosissima</i>	2	L	5	M	<1	L
<i>Xanthium italicum</i>	<1	L	8	M	5	M

Among the native species, Common reed (*Phragmites australis*) is the most aggressive species (Table 2), its population has occupied most of the water area of the two lakes of habitat type 1150 and the canal (habitat type 2190), as well as about 7% of the dune territory (habitat type 2130) (Table 2). Around the monodominant reed communities surrounding the lakes, in the part bordering the dunes, are situated alternating formations of *Juncus maritimus*, *Juncus conglomeratus*, and to a lesser extent *Periploca graeca* and *Cionura erecta*, which although characteristic species for the studied habitats with their dense populations in to a certain extent they threaten the biodiversity in them, by displacing protected species such as *Silene thymifolia* and diagnostic species such as *Jurinea albicaulis*, *Teucrium polium*, *Jasione heldreichii*, etc.

Garland thorn (*Paliurus spina-christi*) is particularly aggressive in the south-eastern part of the lakes, where it forms dense communities of about 3000 m² and poses a threat to the habitat's biodiversity including several rear localities of *Stachys maritima* situated there.

Populations of Tamarisk (*Tamarix ramosissima*) currently represent a more serious threat to the biodiversity of habitat type 2130 fixed dunes with herbaceous vegetation ('grey dunes'), where some of the populations of this species (Table 1, site No 32) are distributed near the habitats of the protected species *Pancretium maritimum* and *Stachys maritima*, and enter the localities of characteristic species such as *Erinidium maritimum*, *Glaucium flavum*, *Crambe maritima*, etc. (fig. 3)



Figure 3. Individuals of *Tamarix ramosissima* threaten locality of *Eringium maritimum*

Himalayan blackberry (*Rubus discolor*) forms dense impassable stands by the roads, which gradually enter the wetter parts of the habitats, suppress and displace the characteristic species such as some representatives of the genus *Carex*, *Euphorbia palustris* L., etc. They pose a threat to the wet habitats (type 1150 and 2190) and to the peripheral parts of the dunes.

At this stage, in the western part of the lakes (on the border with national road 99), the smallest number of invasive species and their habitats have been established. In this section, as well as in the northwestern end of the lakes, a part of the autochthonous tree vegetation has been preserved, represented by communities with a well-defined three-layer structure, in which the layer of trees (average cover 75%) is mainly occupied by *Fraxinus angustifolia* Vahl and in more a small extent of *Ulmus minor* Mill., *Populus nigra* L. and *Salix alba* L. The shrub layer has an average cover of 55% and is mainly represented by *Fraxinus angustifolia*, *Ulmus minor*, *Prunus cerasifera* Ehrh., *Crataegus monogyna* Jacq. and *Rosa canina* L.. *Brachypodium pinnatum* (L.) P.Beauv. predominates in the grass layer (50%), accompanied by *Calystegia sepium* (L.) R. Br., *Geum urbanum* L., *Hypericum perforatum* L. etc.

The northern part of the studied territory borders the "Dunes" hotel complex, where 100% of all established invasive alien species are registered. The hotel complex has preserved a small part of the natural forest communities of *Fraxinus angustifolia*, *Ulmus minor* and *Populus nigra*, but they have been penetrated mainly as undergrowth by non native, including invasive species such as *Fraxinus pennsylvanica* Marshall ,

Amorpha fruticosa, *Partenocisus quinqifolia*, *Robinia pseudoacacia* and native species such as *Tamarix ramosissima* and *Paliurus spina-christy*.

The study confirms the finding of Ivanova et al. (2021)[11] that the main problem of Alepu area is the overgrowing with reeds and the gradual swamping that leads to reduction of the open water areas in the protected area. With regard to invasive alien species, what was found in other habitats of a similar type along the Black Sea coast also applies here, regarding the increased presence and impact of *Amorpha fruticosa* and the danger of invasion of natural and alien shrub and three species as *Paliurus spina-christi*, *Ailanthus altissima*, *Robinia pseudacacia*, *Eleagnus angustifolia* [12].

The main routes for the spread of invasive alien species in the area are determined by the proximity of the hotel complex, where all the established invasive alien species are cultivated; the canal, which is the active water connection between the lakes and the dunes; the coastal road ruderalised in placed and the increased flow of tourists whose vehicles carry seeds and plant parts.

Conclusions

At the current stage, a stronger expansion of native species than of alien invasive species has been established in the study area.

Both specific localities of rare and endangered species, as well as the floristic wealth and structure of each of the studied habitats, are threatened.

Measures are needed for the periodic reduction of aggressive species populations in order to prevent the

formation of monodominant coenoses, and these measures must be consistent with the management regimes of territories falling within the NATURA 2000 zone and the conservation status of the Alepu area.

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MICROMYSETS FOUND IN THE TREE OF SOME PINE FORESTS IN AZERBAIJAN

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<https://doi.org/10.5281/zenodo.6912382>**Abstract**

The main purpose of the work was to study the micromycetes that cause the destruction of trees growing in the pine forests of Azerbaijan. The aim was to study the effects of fungi on trees and to clarify ways to combat them. In general, it was concluded that the methods of combating the fungus are very different, but not successful.

Keywords: Azerbaijani forests; fungal diseases; micromycetes.

INTRODUCTION

The research was conducted in the pine forests of some regions of Azerbaijan. The purpose was to investigate the cause of the mass destruction of pine trees. In recent years, in the pine forests of Azerbaijan, the decay and even destruction of the organs of trees for unknown reasons has been observed. When studying the reason for this, it became clear that the role of fungi, especially micromycetes, is more important in the destruction of trees. During the study, a large number of diseases were observed in the trees. More information about the disease is given below.

Root rot. The study will first discuss root rot, one of the diseases of the pine tree. Due to this disease, the pine tree begins to change the color of its leaves and slowly, but surely, the plant withers until it finally dies. The disease is caused by a fungus *Phytophthora cinnamoni*, and if this happens, if it is in a bowl, you can try to remove it, change the whole soil and apply antifungal treatment. But experts know that it is very difficult to save the plant (look picture 1).

In fact, if this happens, it is recommended to cut the root before affecting other branches.



Picture 1

Rust is a disease found in many pine trees. The causative agent of the disease is the fungus *Puccinia*. The disease manifests itself in the tree with many small black spots on the leaves and twigs.

Drying of branches - the death of individual branches and the entire crown, the top and the crown. The disease can occur as a result of infection of the branches, root rot, lack of soil moisture.

Cancer or edema-infection occurs as a result of local thickening of the branches, trunk and root (swollen cancer), mechanical damage or settlement of the flower parasite.

Cancer ulcer - a progressive ulcer that grows every year, sometimes surrounded by discharge.

Stain disease. We can say that this is the most serious pine disease. Because this disease will cause the tree to grow less and grow weaker. The disease is more pronounced in the summer, but may already be infected in the winter. Leaf and conifer staining. Stains come in various shapes, sizes and colors due to fungal, bacterial, viral infections, gas poisoning, chemicals and exposure to sunlight. Infection with this disease weakens the growth process, the leaves dry out, the resistance of shoots and twigs to infectious diseases and non-parasitic factors. Signs that the pine tree is suffering from this disease are: the leaves turn yellow (look picture 2), some even cling to twigs and manifest themselves with pink pustules. All this is done by a fungus (*Rousselian pseudometry*), and the only solution in these cases is to cut all the infected branches from the place where the symptoms begin to appear and burn them immediately. Regardless of the signs of tree disease, the leaves of the tree should also be cut. Because fungal spores have already spread to the surface organs of the tree. As we know, fungal spores have the ability to spread rapidly.



Picture 2

Infection, frostbite, etc. can also be caused by non-parasitic factors. The ulcer is a door through which wood-breaking fungi enter. As a result of infection of resinous plants, the resin breaks down the paths and the flow of resin.

Necrosis is the death of individual organs and tissues. In the case of necrosis of the branches and trunk, a longitudinal dead bark strip accumulates in the upper layer of the branch and trunk. They can also be caused by fungal and non-infectious causes. Infectious necrosis can cause epithelium.

Mummification is a disease associated with the formation of skeletal cells in fruits and seeds or their transformation into fungal stroma.

Deformation - a change in the shape of an organ or part of a plant. Infectious twisting of leaves, deformation of fruits, bending of shoots and branches are observed.

Bending of seedlings - pulling branches, spreading them on the ground and destroying them. Such spread of all species occurs as a result of infection, sunburn, contact with sand. It destroys crops and reduces the quality of seedlings and planting material.

Yellowing of conifers and leaves - discoloration due to destruction of the plant or infection of plant parts. It is caused by infectious and non-infectious factors.

To overcome this, in the case of pine, you need to apply a mixture of sulfur, zineb, maneb and mancozeb, as it is most effective. Now it will take some time for the plant to recover.

MATERIAL AND METHODS

Sampling was carried out systematically (route) and unsystematically, and the samples taken were analyzed according to the known mycological methods relevant to the purpose of the work. Samples were taken mainly from the surface organs of plants, ie leaves, stems, flowers and fruits, and this work was carried out on a seasonal basis.

In general, about 1,000 samples of pine trees in Azerbaijani forests were taken during the research. The

development of the samples was analyzed in the laboratories of the mycology department of the Institute of Microbiology of ANAS.

The probable part of the samples taken by fungi, ie micromycetes, was either washed and transferred to the nutrient medium, or the process itself was transferred to the nutrient medium to obtain a pure culture.

During the separation of macromycetes, the fruiting body (MC) formed by the fungus in the plant, ie basidioma, was used. The extracted MC was used to obtain a pure culture in the laboratory after certification, which is possible in the field. For this purpose, small particles (0.2-0.5x0.2-0.5 cm) are cut from the hymenophore part of the MC with a sterilized lancet and transferred to a nutrient medium, and as the colony is formed, it is transferred to a new medium and the process continues until a homogeneous colony is obtained.

RESULTS

As a result of the research, the names of micromycetes that cause the destruction of trees in the pine forests of Azerbaijan and the diseases they cause, the prevalence were determined (look table 1). Methods of combating fungal diseases were investigated.

Table 1

Fungal diseases observed in pine forests of Azerbaijan and their prevalence (%)

N	Name of the disease	The causative agent of the disease	The degree of spread
1	Brown trunk rot	<i>I.hispidus</i>	12,6-56,7
2	Brown trunk rot	<i>F.pinicola</i>	7,8-12,8
	Brown root rot	<i>F.pini</i>	2,1-4,3
3	White body rot	<i>F.fomentarius</i> <i>G.applanatum</i>	7,8-11,2
4	Stain	<i>A.alternata</i> , <i>C.microsora</i> . <i>L.fumago</i> , <i>Ph.opuli</i> <i>S.populi</i> , <i>Ph.ulmi</i> <i>Rh.salicinum</i> .	1,2-3,9
5	Pas	<i>M.populnea</i> <i>M.salicina</i>	1,7-3,4
6	Flour dew	<i>E.alphitoides</i>	2,3-5,4
7	Necrosis	<i>N.cinnabarina</i> <i>C.quercina</i>	0,7-1,4

To combat this fungus, it is best to remove all dry or yellowish areas, as well as fallen leaves, and burn them immediately. In addition, you need to apply cork products and two more actions:

- Water the leaves without moistening
- Spray once every two weeks in the spring to reduce the chances of the fungus appearing (or reappearing).

It is not normally seen in well-maintained box trees, but is seen in trees that are weaker due to maintenance deficiencies or overcrowding, or because other trees suffer from tree diseases or pests.

To eliminate this, in addition to cutting the most affected parts, it is necessary to remove and burn the leaves that may be on the ground. You also need to apply an antifungal mixture to completely eliminate it.

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CHEMICAL SCIENCES

PHYSICO-CHEMICAL AND X-RAY STRUCTURAL INVESTIGATION OF ALLOYS OF THE As_2S_3 - TlInTe_2 SYSTEM

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Abstract

Chemical interactions in the As_2S_3 - TlInTe_2 system were studied by the methods of physicochemical analysis (DTA, MSA, XPA), as well as the determination of microhardness and density, and a state diagram was constructed. It has been established that the As_2S_3 - TlInTe_2 system is a quasi-binary section of the As_2S_3 - TlTe - InTe quasi-ternary system and belongs to the eutectic type. Solid solutions based on As_2S_3 are formed in the system at room temperature, reaching up to 1.5 mol. %, and on the basis of the TlInTe_2 compound up to -7 mol. %. In the As_2S_3 - TlInTe_2 system, under normal cooling conditions, extensive areas of glass formation are obtained. The temperature dependences of the electrophysical properties of solid solution alloys $(\text{TlInTe}_2)_{1-x}(\text{As}_2\text{S}_3)_x$ ($x=0.02; 0.03; 0.05$) have been studied.

Keywords: quasi-binary, eutectic, incongruent, system, microhardness, syngony.

INTRODUCTION

As a result of a review of the literature, it was established that ternary systems consisting of arsenic and thallium chalcogenides have been sufficiently studied [1–4], and a number of works have been studied in the field of quaternary systems [5–8]. Thallium chalcogenides, like arsenic chalcogenides, are prone to vitrification; under normal conditions, they are obtained in a glassy state.

Arsenic chalcogenides and alloys based on them have optical [9–13], photoelectric [14–18], and luminescent [19, 20] properties. In recent years, the attention of researchers has been attracted to chalcogenide glass fibers based on As_2S_3 and As_2Se_3 , which are used to transmit light in the mid-IR range and have found application in various semiconductor industries [21–25].

Currently, research is being carried out in the field of obtaining materials with functional properties that can meet the requirements of constantly developing microelectronics and computer technology, and the search for safer energy sources. The search for highly efficient optically sensitive and thermoelectric materials is an urgent task of research in this area. The preparation of materials with the participation of indium and thallium chalcogenides of complex phases based on them is also of theoretical and practical importance [26,27].

The purpose of this work is to study some of the physicochemical properties of the obtained phases with the construction of a state diagram of the As_2S_3 - TlInTe_2 system.

As_2S_3 melts with an open maximum at 310°C and crystallizes in a monoclinic system with lattice parameters: $a=11.49$; $b=9.59$; $c=4.25$ Å, $\beta=90^\circ 27'$ (sp. gr. P2/n) [28]. Density and microhardness of crystalline As_2S_3 are equal to 3.46 g/cm³ and 660 MPa, respectively, and glassy As_2S_3 density is 3.20 g/cm³, microhardness is 1300 MPa [28].

The TlInTe_2 compound melts congruently at 772°C and crystallizes in the tetragonal system with lattice parameters: $a = 8.482$ Å, $c = 7.192$ Å, density $\rho = 7.27$ g/cm³, microhardness $H_\mu = 1000$ MPa [29].

EXPERIMENTAL PART

For the synthesis of alloys of the As_2S_3 - TlInTe_2 system, the primary components As_2S_3 and TlInTe_2 were first synthesized, and then the alloys of the system were synthesized directly by the ampoule method. Synthesis was first carried out in the temperature range of 500–900°C, then the temperature was lowered to 400°C and kept at this temperature for 200 h. Physical and chemical studies of alloys of the As_2S_3 - TlInTe_2 system were carried out both in the glassy and in the crystallized state by the methods of differential thermal (DTA), microstructural (MSA), X-ray phase (XRD) analysis, as well as measurements of microhardness and density.

The differential thermal analysis of the alloys of the system was carried out on a TERMOSCAN-2 device with a heating rate of 5 deg/min.

X-ray phase analysis was performed on a D2 PHASER X-ray instrument using $\text{CuK}\alpha$ radiation with a Ni filter. The MSA alloys of the system were examined using a MIM-8 metallographic microscope. When studying the microstructure of the alloys, an etchant of the composition 10 ml NaOH + 10 ml $\text{H}_2\text{O}_2 = 1:1$ was used, the etching time was 15–20 s. The microhardness of the alloys of the system was measured on a PMT-3 microhardness tester at a load of 0.10 N. The density of the alloys of the system was determined by the pycnometric method; toluene was used as the working fluid. The electrical conductivity was measured by the usual compensation method. The samples used had the shape of a parallelepiped. The experimental error was 2.7–3.0 % [30].

RESULTS AND ITS DISCUSSION

Alloys of the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system are compact; with an increase in the content of TlInTe_2 , their color changes from red to dark gray. Alloys of the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system are resistant to water and air. They dissolve well in mineral acids (HNO_3 , H_2SO_4) in alkalis (NaOH , KOH).

As a result of the study of differential thermal analysis, it was found that on the thermograms of the alloys of the system $\text{As}_2\text{S}_3\text{-TlInTe}_2$ in the concentration range of 0-30 mol % TlInTe_2 , there are softening temperatures T_g 170-190°C, typical for glassy samples.

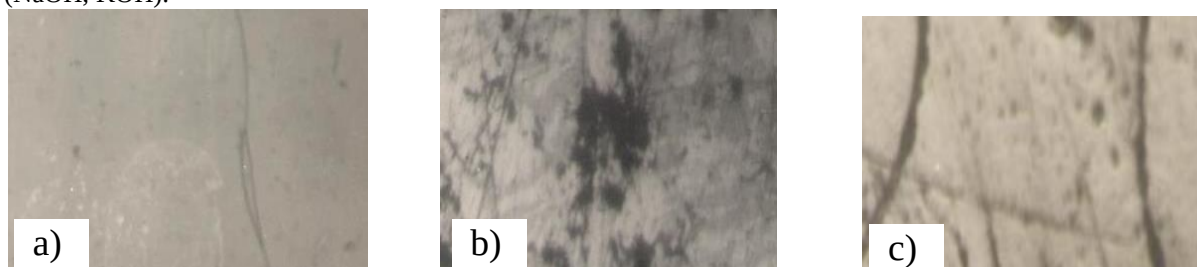


Fig.1. Microstructures of alloys of the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system.
a)-10 mol % TlInTe_2 , б)-40 mol % TlInTe_2 , в)-95 mol % TlInTe_2 .

Microstructural analysis of these alloys 0-20 mol % TlInTe_2 showed that one cloudy phase is visible on the microstructure of the sample. Within 20-30 mol % TlInTe_2 , crystalline inclusions gradually appear in the microstructure. On fig. 1 a, b, c show the microstructures of alloys of the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system from different regions. On fig. 1a shows the microstructure of a

glass alloy with a content of 10 mol % TlInTe_2 , б)-microstructures of two-phase, c) - microstructures of a solid solution alloy based on the TlInTe_2 compound. To confirm the results of DTA, MSA, alloys of the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system, we carried out X-ray phase analysis containing 10, 20 30 mol % TlInTe_2 (Fig. 2).

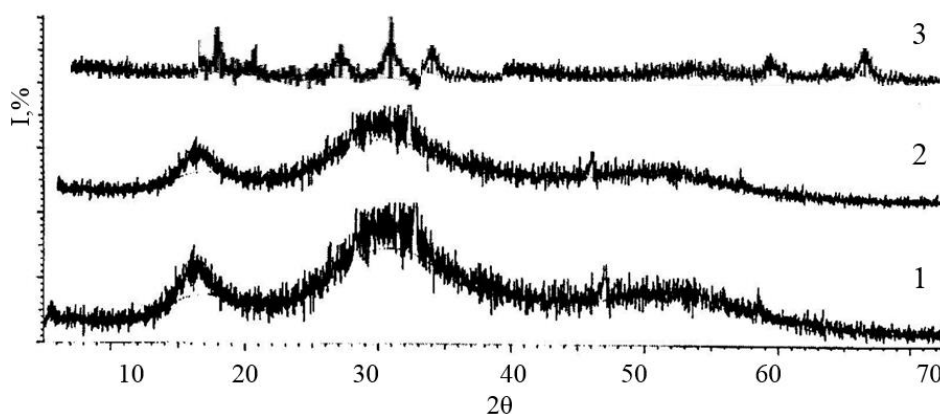
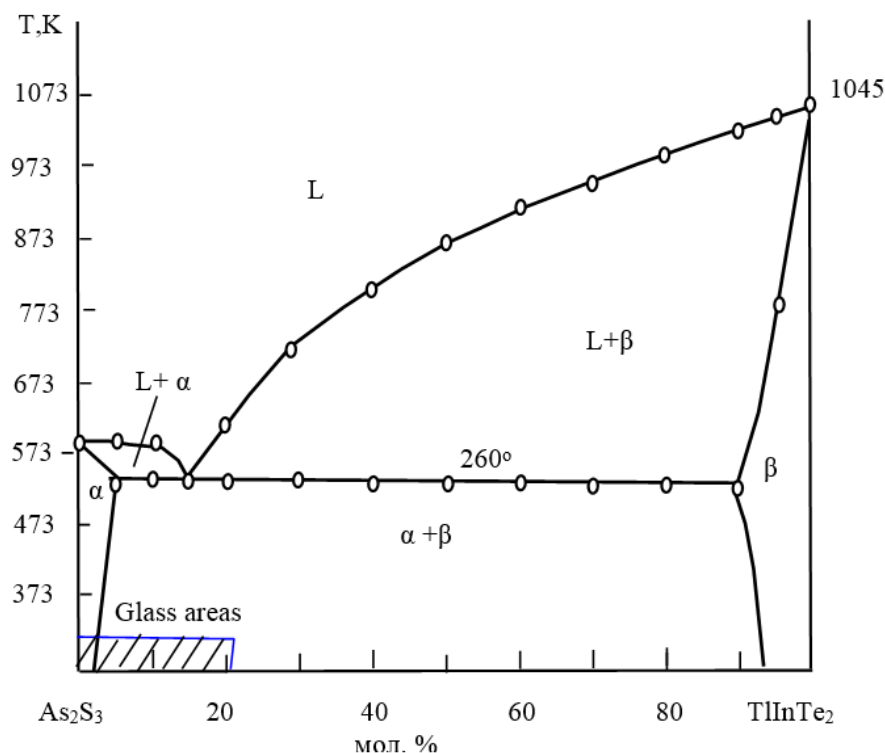


Fig. 2. Diffractograms of alloys of the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system.
1-10 mol %, 2-20 mol %, 3-30 mol %, TlInTe_2 .

As can be seen from fig. 2, on diffraction patterns of alloys containing 10, 20 mol % TlInTe_2 has no diffraction maximum. These alloys are glassy. On the diffraction pattern of the alloy 30 mol % TlInTe_2 , a diffraction maximum appears that this alloy is glass-ceramic. And so, X-ray phase analysis fully confirms the results of differential thermal and microstructural analyses.

According to the results of physicochemical analysis, the T-x phase diagram of the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system was constructed (Fig. 2). It has been established

that the state diagram of the system is quasi-binary, of the eutectic type. In terms of interaction patterns, the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ systems are identical to the $\text{As}_2\text{S}_3\text{-TlInSe}_2$ systems [31]. In the system at room temperature, solid solutions based on As_2S_3 reach 1.5 mol %, and based on TlInTe_2 up to -7 mol %. Under normal conditions, glass formation based on As_2S_3 extends up to 20 mol % TlInTe_2 , and the glass-ceramic region reaches from 20 mol % TlInTe_2 up to 30 mol % TlInTe_2 .



The liquidus of the As_2S_3 - TlInTe_2 system consists of monovariant curves of α -solid solutions based on As_2S_3 and β -solid solutions based on TlInTe_2 . In the concentration range of 0-15 mol % TlInTe_2 , the α -phase is released from the liquid. In the system, the α -phase and β -phase form a eutectic with a composition of 15 mol % TlInTe_2 and a temperature of 260°C . Below the solidus line, two-phase alloys ($\alpha + \beta$) crystallize. As can

be seen from Table 1, in the As_2S_3 - TlInTe_2 system, softening temperatures (T_g), density and microhardness of alloys of the As_2S_3 - TlInTe_2 system increase depending on the composition. Alloys in the range of 0-20 % TlInTe_2 - glass, and alloys with a composition of 20-30 mol % TlInTe_2 belongs to the glass-ceramic region. After prolonged annealing at 200°C for 400 h, the softening temperature T_g disappears (170 – 190°C), and the solidus and liquidus temperatures remain (Table 2).

Tab.1.

Composition of alloys of the As_2S_3 - TlInTe_2 system, DTA, results of measurements of density and microhardness before annealing

Composition, mol %		Thermal effects, K	Density, g/cm ³	Microhardness, MPa	
As ₂ S ₃	TlInTe ₂			α	β
				=0,15 H	
100	0,0	170,310	3,20	1300	–
95	5,0	175,260,310	3,40	1350	–
90	10	180,260,305	3,61	1420	–
85	15	180,260	3,82	1420	–
80	20	185,260,340	4,03	1420	–
70	30	190, 260,445	4,42	–	1040

Composition of alloys of the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system, DTA, results of measurements of density and microhardness before annealing

Composition, mol %		Thermal effects, K	Density, g/cm ³	Microhardness, MPa	
As ₂ S ₃	TlInTe ₂			α	β
				P=0,10 H	
100	0,0	310	3,46	740	–
95	5,0	260,310	3,55	770	–
90	10	260,305	384	810	–
85	15	260	4,03	840	–
80	20	260,340	4,22	Эвтек.	Эвтек.
70	30	260,445	4,,30	–	–
60	40	260,525	4,97	–	1030
50	50	260,590	5,38	–	1040
40	60	260,640	5,74	–	1050
30	70	260,670	6,13	–	1050
20	80	260,715	6,51	–	1050
10	90	260,750	6,90	–	1050
5,0	95	500,760	7,30	–	1050
0.0	100	772	7,27	–	1000

The microhardness of alloys of the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system has been studied both in glass and in crystalline form. Values of microhardness of alloys from the area of 0-30 mol % TlInTe_2 glasses are within (1300-1420) MPa (Table 1). After crystallization of the same areas, the microhardness changes within (740-840) MPa (Table 2). The value of microhardness (1000-1050) MPa corresponds to the microhardness of β -solid solutions

based on TlInTe_2 . It has been established that the microhardness of glassy alloys is higher than that of crystalline alloys. These results are in good agreement with the literature data.

The temperature dependence of the electrical conductivity of the $(\text{TlInTe}_2)_{1-x}(\text{As}_2\text{S}_3)_x$ ($x=0.02; 0.03; 0.05$) solid solution was studied in the temperature range 290-500 K (Fig. 4). The samples used had the shape of a parallelepiped.

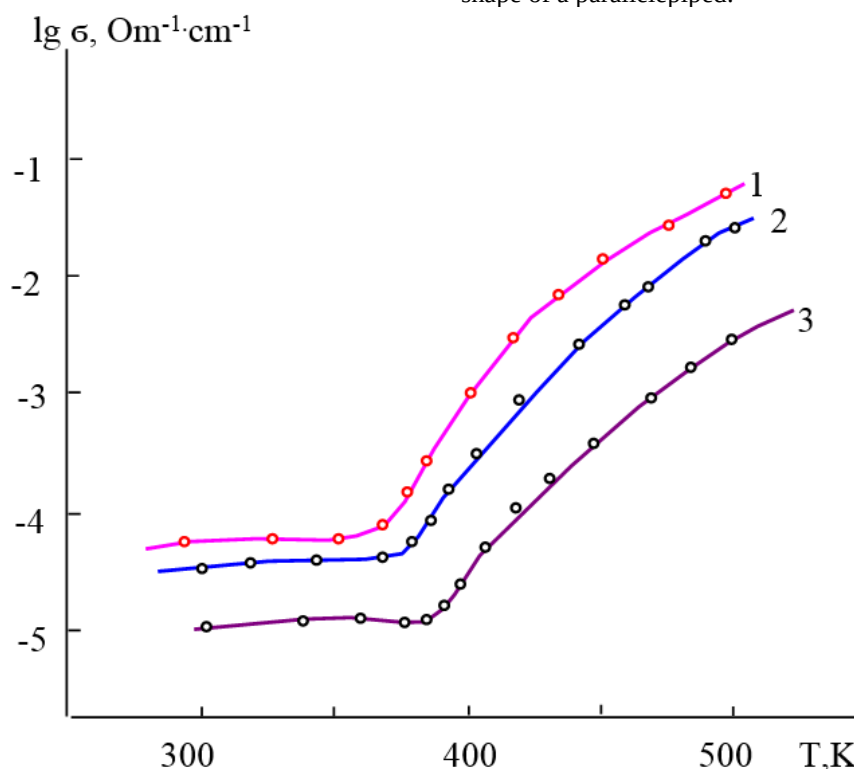


Fig.4. Temperature dependence of the electrical conductivity of solid solutions $(\text{TlInTe}_2)_{1-x}(\text{As}_2\text{S}_3)_x$ ($x=0.02; 0.03; 0.05$). 1-2 mol %, 2-3 mol %, 3-5 mol % As_2S_3 .

As can be seen from fig. 4, the curves of the temperature dependence of the electrical conductivity show that alloys of solid solutions based on TlInTe_2 in the temperature range of 290–500 K have a semiconductor character of conductivity.

With increasing temperature, the electrical conductivity of the alloys increases. With the introduction of TlInTe_2 into the composition, high resistances of compositions of 2, 3, and 5 mol % As_2S_3 , the electrical conductivity of the composition gradually decreases.

Conclusion

The nature of the chemical interaction and glass formation in the $\text{As}_2\text{S}_3\text{-TlInTe}_2$ system was studied by a complex method of physicochemical analysis: differential thermal, X-ray phase, microstructural, as well as the determination of density and microhardness, a state diagram was constructed. It is established that the state diagram of the system is quasi-binary of the eutectic type. In the system at room temperature, solid solutions based on As_2S_3 reach up to 1.5 mol %, and those based on TlInTe_2 up to ~7 mol %. The α -phase and β -phase form a eutectic between themselves, the composition of which corresponds to 15 mol % TlInTe_2 and melts at 260°C. Under normal conditions, glass formation based on As_2S_3 continues up to 20 mol % TlInTe_2 . For solid solutions $(\text{TlInTe}_2)_{1-x}(\text{As}_2\text{S}_3)_x$ ($x=0.02; 0.03; 0.05$) the temperature dependence of electrical conductivity was studied.

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ECONOMIC SCIENCES

EU COMPETITION POLICY

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КОНКУРЕНТНА ПОЛІТИКА ЄС

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Abstract

The article examines the competition policy of the European Union Member States. It identifies the main objectives of the EU competition policy. It was found that the integration of the EU in the context of globalization, viewed as the interdependence of the Member States and their integration into the community, strengthens the competitive advantages of the group as a whole and contributes to its sustainable collective development in the long run.

Анотація

У статті досліджено конкурентну політику країн-членів Європейського Союзу. Ідентифіковано основні цілі конкурентної політики ЄС. З'ясовано, що саме інтеграція ЄС у контексті глобалізації, як взаємозалежність країн-членів та об'єднання їх у співтовариство, зміцнює як конкурентні переваги угруповання у цілому, так і сприяє його сталому колективному розвитку у довгостроковій перспективі.

Keywords: competition policy, competitive advantages, European Union, integration, dezintegration.

Ключові слова: конкурентна політика, конкурентні переваги, Європейський Союз, інтеграція, дезінтеграція.

Сьогодні єдиний внутрішній ринок ЄС кардинально змінює якість таких категорій як витрати (зникають митні бар'єри, але зростають витрати на науково-технічне забезпечення економічної діяльності) та прибуток (за рахунок зростання значення ефекту масштабу ринку). У зв'язку з цим, спокуса підприємств-конкурентів замінити реструктуризацію або модернізацію виробництва на змову щодо розподілу ринку досить велика. При цьому національні держави країн-членів ЄС, у свою чергу, надають підтримку нежиттєздатним підприємствам, на противагу наданню переваг розробці та впровадженню інновацій. Тобто, ці заходи часто-густо можуть мати вплив, еквівалентний кількісним обмеженням торгівлі та сприяти протекціонізму. **Сьогодні основними цілями конкурентної політики ЄС є [1]:**

- контроль бар'єрів, що створюються практикою національних підприємств країн-членів ЄС та розбалансовують або монополізують ринок;

- запобігання неринковим практикам порушення конкуренції державами, які субсидують окремих національних виробників та держпідприємства (включаючи природні монополії);

- стимулювання інновацій і механізми мотивування досліджень та розробок підприємств-лідерів НДДКР;

- сприяння збалансованому регіональному розвитку та зростанню конкурентоспроможності ЄС на світовому ринку.

Регіоналізація глобальних процесів як способа реалізації потенцій глобальної економіки, модифікація існуючих інтеграційних ініціатив (як відповідь на виклики зростаючої конкуренції на тлі усвідомлення ризиків реалізації дезінтеграційних сценаріїв) суттєво прискорилися на початку ХХІ ст. Аналіз свідчить, що наразі дезінтеграційні ефекти у межах інтеграційних угруповань пов'язані не стільки із кардинальними суперечками або формуванням опозиції, скільки з питаннями національної та культурної самобутності, протиріччями симбіозу державних, наддержавних і ринкових регулюючих

інституцій, індивідуалізації розуміння національними урядами понять «єдність/співпраця» і «передача частини власного суверенітету» наднаціональним органам управління. Це вносить суттєві зміни у диспозицію та співвідношення інноваційної сили країн-членів ЄС під впливом модифікованих форм конкуренції.

Хоча сьогодні у межах ЄС інтеграція визначається як провідний вектор розвитку, реформування внутрішньонаціональних економіко-правових механізмів відповідно до структур, зазначених у рішеннях наднаціональних регулюючих інститутів Євросоюзу, по-різному стимулює позитивну соціально-орієнтовану інтеграцію. Відомо, теоретичне обґрунтування інтеграційних процесів ґрунтується на наукових школах федералізму, функціоналізму і неофункціоналізму, однак сьогодні існують різні їх бачення щодо ролі та місця форм інтеграції у об'єднувальних процесах. Мова йде про обмеження державного суверенітету. Воно пов'язане, перш за все із тим, що держава та її інтереси розглядаються як першопричина міждержавних суперечностей (які іноді зумовлюють суттєві конфліктні неузгодження). Крім того, хоча національна приналежність (наприклад, у вигляді громадянства) зберігається, традиційна ліберально-раціоналістична внутрішньоінтеграційна політика перетворюється у панівну у ході якої корисливі національні інтереси та вигоди у замкненому інституційному «середовищі існування» усуваються, а національне громадянство перетворюється у принцип виключення. У зв'язку з цим, саме інтеграція ЄС у контексті глобалізації, як взаємозалежність країн-членів та об'єднання їх у співтовариство, зміцнює не лише конкурентні переваги угруповання у цілому, а й сприяє його сталому колективному розвитку у довгостроковій перспективі.

Ретроспективний аналіз свідчить, що процес інтеграційної взаємодії країн-членів ЄС призводить до зближення господарських механізмів у формах міждержавних угод і регулюється міждержавними інститутами. Загалом, вона не є лінійним процесом (концепція позитивної і негативної інтеграції згідно концепції Тінбергена–Піндера), тобто відбувається, з одного боку, зближення соціально-економічних стратегій і пріоритетів політик, гармонізація діяльності національних владних інститутів, пошук моделей міжкрайової взаємодії. З іншого – формування системи взаємопов'язаних ринків і створення єдиного ринкового економічного простору у групі країн, шляхом зняття бар'єрів у їх торгово-економічному співробітництві. При цьому розширене трактування міжнародних інтеграційних процесів як чотирьохрівневої моделі (глобальний, георегіональний, національний та рівень фірми/ТНК) [2, С. 243–263; 3, С. 180–187] сприяє розумінню трансформаційної природи інтеграційної взаємодії та змін у співвідношенні інноваційної сили країн інтеграційного угруповання. Останні пов'язані із логікою стадійного детермінізму – суперечливими моментами (включаючи кризові явища) процесу зміни характеристик та якісного змісту стадій розвитку інтеграції упродовж тривалого періоду. Перехід від принципу

підпорядкованості (чітка ієрархія та глибока асиметричність відносин залежності) до полі-залежності (рух в бік симетричності за умов формування єдиних правил співпраці і центр-периферійної фрагментації світового господарства) визначає новий формат міжкрайової конкурентної взаємодії у межах інтеграційної співпраці.

У контексті впливу інтеграційних та дезінтеграційних процесів в ЄС на співвідношення інноваційно-конкурентної сили країн-членів важливим є поняття «дезінтеграційний конфлікт», який пов'язаний у сучасних умовах із співвідношенням процесів формальної (зазвичай керованої державою) та реальної (держава практично не втручається) інтеграції. Мова йде про як рівень взаємозалежності від обсягів трансакцій (гранична залежність), так і ступінь ефективності моделей та типів інтеграційного розвитку (не лише їх урізноманітнення) у контексті інституційної трансформації національно-державних структур економіки країн-членів Євросоюзу. Тому вагомість цих показників визначає особливості прояву стримуючого ефекту «дезінтеграційного конфлікту».

Сьогодні висока варіативність розподілу інтересів у європейському інтеграційному угрупованні свідчить про постійне співіснування у його межах конвергентних і дивергентних процесів, фрагментації і локалізації як суперечливих, проте нерозривних тенденцій конкурентно-інноваційного розвитку. Аналіз свідчить, що на різних етапах становлення та розвитку ЄС існували (та існують сьогодні) відмінності у інтересах країн-членів, що детермінують дезінтеграційні ризики, пов'язані із зростанням попиту на протекціонізм. Іноді останній порівнюють із «компенсацією за регіональну інтеграцію» [4], маючи на увазі концентровану природу переваг від протекціонізму (для обмеженої кількості суб'єктів господарювання, що конкурують на внутрішньому ринку) в умовах негативного впливу зовнішньої торговельної лібералізації на окремі галузі національних економік країн-членів ЄС.

Сучасний ЄС являє собою складний механізм міжнародної регуляторної координації у найбільш розвиненій формі послідовної комбінації окремих національних регуляторних агенцій та єдиної транснаціональної регулятивної інституції. Остання, по-перше, визначає окремі загальні правила і впроваджує певні складові спільної політики з огляду на її зміст та час імплементації (об'єднує національні юрисдикції у певній сфері політики). По-друге, формує підґрунтя нової парадигми економічної взаємозалежності (вертикальна інтеграція з елементами економічного федералізму та інституційно-соціальної інтеграції) і передбачає створення єдиного ринку на основі глибокої гармонізації усієї сукупності умов виробництва й обігу товарів і послуг. По-третє, упорядковує багатосторонню взаємозалежність усередині регіонального простору у формі «інтергавернменталізму», що знаходить свій вираз у різноманітних конкретних регіональних проєктах і відповідних їм інституціях. Багатостороння співпраця як ключова типологічна спорідненість стратегій інтеграційної співпраці та стійка орієнтація

країн-членів європейської інтеграції на пріоритетність розвитку внутрішньогрупових зв'язків на противагу позагруповим (формальним інтеграційним намірам та процедурам) визначають міжурядовий «наддержавний» підхід, заснований на використанні «м'якої» сили та ресурсу аттрактивності [5].

ВИСНОВКИ. Сучасна міжнародна регуляторна кооперація ЄС, з одного боку, не лише полегшує міжнародну співпрацю і взаємодію (шляхом імплементації загальних норм, принципів і правил), активізує колективні наднаціональні інтеграційні інститути, а й сприяє формуванню зобов'язань і репутації країн-членів Єврозони, усуненню невизначеності і порушень (шляхом моніторингу і впровадження механізмів санкцій). Більш того, процедурна база для подальшого руху (або для ініціалізації такого руху) налаштована на поглиблення взаємодії у суто матеріалізованих аспектах інтеграції: зростання взаємної торгівлі, збільшення прямих іноземних інвестицій, поліпшення інноваційного процесу, підвищення конкурентоспроможності та продуктивності, збільшення доходу на душу населення, зростання зайнятості. З іншого – гармонізує внутрішнє регулювання галузей, спільну конкурентну політику у контексті реалізації порівняльних переваг виробників на відповідних внутрішніх ринках країн-членів ЄС, пов'язаних із подоланням: а) диференціації національних систем регулювання економічної активності; б) фрагментації міжнародного виробничого процесу і аутсорсингу; в) дисбалансів

цінових факторів виробництва та нових технологічних досягнень; г) недосконалості форм трансферу знань і технологій та технологічної дифузії. Результатом є «проконкурентний» вигравш від реалізації динамічних торговельних переваг на основі принципу «*learning by doing*», розширення можливостей отримання економії на масштабі через торговельну лібералізацію та ефектів (шляхом поглиблених інтеграційних угод) від залучення на світові ринки національних виробників для участі у високотехнологічних прямих іноземних інвестиціях.

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MEDICAL SCIENCES

CHARACTERISTICS OF SPEECH DISORDERS IN ADULTS AFTER STROKE

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ХАРАКТЕРИСТИКА ПОРУШЕНЬ МОВЛЕННЯ У ДОРΟΣЛИХ ОСІБ ПІСЛЯ ІНСУЛЬТУ

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Abstract

The article reviews and analyzes the theoretical aspects of speech recovery in adult stroke survivors. Reviewed the general statistics on the occurrence of strokes in Ukraine and the world and its tendencies to become “younger”; the classical, rare and modern etiological factors of stroke in young people have been studied, also the main types of speech disorders that can occur after cerebral circulatory impairments have been analyzed. The main signs of dysarthria and aphasia were highlighted. The characteristic of the main forms of impairments, according to classical classifications is given. Manifestations of bulbar, pseudobulbar, extrapyramidal (or subcortical), cerebellar and cortical dysarthria in adults who have suffered from stroke are revealed. It is determined that in adults due to various focal lesions of the brain, an impairment of the innervation of the speech apparatus is observed, which leads to motor disorders that differ in severity. The main characteristics of aphasia are also covered, namely: motor aphasia of afferent type, motor aphasia of efferent type, dynamic aphasia, sensory (acoustic-gnostic) aphasia, acoustic-mnemonic aphasia and semantic aphasia. It has been determined that these disorders occur due to damage to the language centers of the brain, the primary consequences to which these impairments can lead are determined. It is substantiated that speech is one of the primary means of communication with the outside world as well as a tool for the complete fulfilment as a person, which argues the need for its primary restoration in the context of post-stroke rehabilitation. The current state of quality of speech and language pathology in these cases gives grounds to conclude that the use of exclusively traditional methods and techniques is insufficient to compensate for speech and language disorders caused by stroke, and encourages further search for ways to improve it. The author sees the need for research aimed at studying speech and language disorders in people who have suffered a stroke, particularly dysarthria and aphasia, as well as identifying special conditions that optimize the process of speech recovery.

Анотація

У статті здійснено огляд та проаналізовано теоретичні аспекти відновлення мовлення у дорослих, що перенесли інсульт. Розглянуто загальну статистику виникнення інсультів в Україні, світі, констатовано тенденції до його «омолодження»; досліджено класичні, рідкісні та сучасні етіологічні фактори виникнення інсультів у молодих людей, а також проаналізовано основні типи порушень мовлення, які можуть виникати після порушення мозкового кровообігу. Виділено провідні ознаки дизартрії та афазії у дорослих.

Keywords: stroke, dysarthria, aphasia.

Ключові слова: інсульт, дизартрія, афазія.

Згідно зі світовою статистикою, на сьогодні відмічається стрімка тенденція до збільшення числа хворих з інсультом, а також до його «омолодження». В Україні щорічно трапляється більше 100 000 випадків інсульту, тобто кожні п'ять хвилин щонайменше одна особа потерпає від гострого порушення мозкового кровообігу. У 10% випадків інсульт трапляється у молодих людей, а до чверті випадків – у людей працездатного віку.

У більшості пацієнтів, які перенесли інсульт, можуть виникнути такі мовленнєві порушення, як дизартрія, апраксія та афазія, що актуалізує реабілітацію людей після інсульту, зокрема відновлення мовлення, що є важливим для взаємодії з оточенням.

Відновлення мовлення у дорослих людей після інсульту з позицій медичного аспекту аналізували

вітчизняні й зарубіжні учені (Віленський, 1999; Волошин, 2006; Гуляєв, 2019; Касте, 2003; Коваленко, 2018; Міщенко, 2017; Ревенько, 2010; Фломін, 2020; D. Leys, 2010 та ін.), котрі розглядали афазію та дизартрію як прояви локальних або дифузних уражень головного мозку.

У літературі досить докладно описано механізми виникнення порушень вимовної сторони мовлення у дітей з дитячим церебральним паралічем, однак проблема виникнення і корекція порушень вимовної сторони мовлення у дорослих пацієнтів з наслідками вогнищевих уражень головного мозку не знайшла в літературі такого ж широкого відображення.

Питання диференційованого впливу глибинних структур головного мозку на картину мовленнєвих порушень в клініці пацієнтів з порушенням мозкового кровообігу розглядалося Візель, 2000; Вінарською 2005; Кучумовою, 2000; Шкловським, 1994.

До сучасних досліджень афазії відносяться такі праці: Берднікович, 2016; Данько, 2007; Ларіної, 2018; Ляної, 2018; Народнової, 2012; Овчаренко, 2020; Пурцхванідзе, 2011; Савицького, 2004; Тонкононого, 1968; А. Цветкової, 1988 та ін. Вагомий внесок у розвиток учення про афазію судинного генезу зробили Бейн, 1964; Бурлакова, 1997; Візель, 2000; Коган, 1948; Лурія, 1947, 1975; Овчарова, 1970; Опель, 1963; Столярова, 1973; Цветкова, 1972 та ін.

Підсумовуюче вищезазначене зауважимо, що питання відновлення мовлення у пацієнтів, які перенесли інсульт, є актуальним та важливим для вивчення. Адже з кожним роком кількість випадків інсульту зростає та відслідковується тенденція до їх «омолодження», водночас мовлення є однією з провідних вищих психічних функцій та забезпечує повноцінну реалізацію потенціалу людини як особистості, перетворюючи відновлення мовлення на першочергове завдання логопеда.

Мета статті – здійснити характеристику мовленнєвих порушень у дорослих, які перенесли інсульт.

Методи дослідження. У проведеному дослідженні був використаний теоретичний аналіз результатів щодо статистичних даних виникнення інсульту, порушень мовлення, що виникають після порушення мозкового кровообігу.

Результати дослідження. Інсульт справедливо вважають захворюванням переважно людей літнього віку, але принаймні 10% випадків інсульту трапляється у молодих людей, а до чверті випадків – у людей працездатного віку [1]. Хоча інсульт у дорослих осіб молодого віку широко обговорюється в літературі і є важливою проблемою сучасної медицини та спеціальної педагогіки, чіткого визначення цього поняття досі немає. По-перше, в англійській літературі використовуються принаймні кілька синонімів: "stroke in the young" (інсульт у молодих), "youngonset stroke" (інсульт, що виник у молодому віці), "earlyonset stroke" (інсульт, що рано виник), і навіть "young stroke" (молодий інсульт) [1]. По-друге, в різних джерелах використовуються

різні критерії визначення верхнього порогу молодого віку від 30 до 65 років, але найчастіше – 50–55 років [2].

Частота випадків виникнення інсульту серед осіб молодого віку зростає, однак причини цього не визначені. Ця тенденція виглядає тривожною, оскільки перенесений інсульт суттєво збільшує смертність серед молодих людей у подальшому житті [3].

Доречно відзначити також, що "звичні" фактори ризику інсульту – артеріальна гіпертензія, діабет, паління, зловживання алкоголем, а тим більше – їх поєднання – найменш часто зустрічаються серед молодих людей, але частка молодих пацієнтів з інсультом, у яких наявні класичні чинники ризику, зростає з віком [4]. І навпаки, "рідкісні" чинники ризику, такі як незарощений овальний отвір, вроджені порушення згортаності крові, аутоімунні, інфекційні та генетичні захворювання, більш притаманні молодим, а з віком їх частка серед інших причин інсульту стрімко зменшується, хоча абсолютна кількість, принаймні деяких з них, можливо, залишається незмінною. До чверті випадків інсульту трапляються у людей працездатного віку, і щорічно в світі інсульт уражає близько 3,6 млн молодих людей [5]. Майже половина загального тягаря інсульту припадає на молодих людей, якщо врахувати, що вони частіше виживають після інсульту, і тривалість їх подальшого життя більша, ніж у старших осіб, а також що інсульт у молодих людей трапляється більшою мірою в країнах з низькими та помірними рівнями доходів [1].

Щорічно в Україні від 100 до 120 тисяч осіб уперше хворіють на мозковий інсульт, тобто захворюваність становить 280-290 випадків на 100 тисяч населення і перевищує середній показник у розвинутих країнах Європи (200 на 100 тисяч населення). Близько третини хворих на інсульт у нашій країні (33-36%) – це люди працездатного віку.

Діапазон можливих етіологічних чинників інсульту у молодих людей набагато ширший, ніж у людей похилого віку. Зауважимо, що до традиційних причин приєднався значний спектр сучасних факторів ризику.

Причини інсульту у молодих людей умовно ділять на три категорії: «звичні» фактори ризику, «рідкісні» фактори ризику, «сучасні» фактори ризику.

До «звичних» факторів ризику належать:

- артеріальна гіпертензія;
- діабет;
- паління;
- зловживання алкоголем [1].

«Рідкісні» фактори ризику:

- відкрите овальне вікно;
- вроджені порушення згортання крові;
- аутоімунні, інфекційні та генетичні захворювання [1].

«Сучасні» фактори ризику:

- вживання заборонених психотропних речовин;
- розшарування стінки артерії;
- прийом пероральних протизаплідних засобів;
- вагітність та пологи;

- мігрень [1].

Підсумовуючи вищезазначене, стає очевидним, що актуальності набувають питання сучасних підходів до відновлення функцій після інсульту у означених осіб. Слід означити, що при цьому у них або взагалі відсутнє експресивне мовлення, або виявляються значні труднощі під час включення в активне мовлення. З огляду на це, особливої гостроти набуває проблема відновлення мовлення та взаємодії з оточуючими вже на ранньому етапі реабілітації після інсульту, який значною мірою вплинув на стан мозкової діяльності.

Ураження головного мозку, причиною якого може бути інсульт, травма або інший патологічний процес, часто супроводжується порушеннями мовлення такими, як дизартрія або афазія.

Дизартрія – це порушення вимовної сторони мовлення, обумовлене недостатністю іннервації мовленнєвого апарату [6].

Дизартричні порушення мовлення спостерігаються часто при різних вогнищевих ураженнях мозку:

- периферичні рухові нерви до м'язів мовленнєвого апарату (язика, губ, щік, піднебіння, нижньої щелепи, глотки, гортані, діафрагми, грудної клітки);
- ядра цих периферичних рухових нервів, розташованих в стовбурі головного мозку;
- ядра, розташовані в стовбурі і в підкіркових відділах мозку, і здійснюють елементарні емоційні безумовнорефлекторні мовленнєві реакції типу плачу, сміху, скрикування, окремих емоційно-виразних вигуків та ін. [7].
- підкірково-мозочкові ядра і провідні шляхи, які здійснюють регуляцію м'язового тону та послідовність м'язових скорочень мовленнєвої мускулатури, синхронність (координованість) в роботі артикуляційного, дихального і голосового апаратів, а також емоційну виразність мовлення. При ураженні цих структур спостерігаються окремі прояви центрального паралічу (парезу) з порушеннями м'язового тону, а також з вираженим порушенням просодичних характеристик мовлення – її темпу, плавності, гучності, емоційної виразності та індивідуального тембру [6];
- провідні системи, що забезпечують проведення імпульсів від кори мозку до структур нижчих функціональних рівнів рухового апарату мовлення (до ядер черепно-мозкових нервів, розташованих в стовбурі головного мозку). Ураження цих структур викликає центральний парез (параліч) мовленнєвої мускулатури з підвищенням м'язового тону в м'язах мовленнєвого апарату, посиленням безумовних рефлексів і появою рефлексів орального автоматизму з більш виборчим характером артикуляційних порушень [7];
- кіркові відділи головного мозку, що забезпечують як більш диференційовану іннервацію мовленнєвої мускулатури, так і формування мовленнєвого праксису. При ураженні цих структур виникають різні центральні моторні порушення мовлення [6].

Найбільш поширена класифікація у вітчизняній логопедії створена з урахуванням неврологічного підходу на основі рівня локалізації ураження рухового апарату мовлення [7].

Розрізняють такі форми дизартрії:

- бульбарна;
- псевдобульбарна;
- екстрапірамідна (або підкіркова);
- мозочкова;
- кіркова [7].

Бульбарна дизартрія – вогнищеве ураження ядер, корінців або периферичних стовбурів IX, X і XII черепно-мозкових нервів. До особливостей рухових порушень належать:

- периферичний параліч (парез) м'язів мовленнєвого апарату (язика, губ, м'якого піднебіння і глотки, гортані, які піднімають нижню щелепу, дихальних);
- атрофія цих м'язів, їх атонія (мовлення мляве, в'яле) [7];
- порушення ковтання (дисфагія або афагія);
- глухий (дисфонія або афонія) або гнусавий голос;
- невиразне і «змазане» мовлення [8].

Останній симптом і називають бульбарною дизартрією.

Псевдобульбарна дизартрія – двостороннє ураження центральних рухових кортико-бульбарних нейронів. Пірамідні спастичні паралічі м'язів мовленнєвого апарату. М'язових атрофій немає. Тонус м'язів підвищений за типом спастичної гіпертонії (язик напружений, відсунутий назад). Глотковий та нижньощелепний рефлекс посилені. Нерідкі насильницькі сміх і плач. Паралічі двосторонні, хоча можливим є їх значне переважання праворуч або ліворуч. Найбільш порушені довільні рухи і найтонші рухи кінчика язика [7].

До клінічних проявів належать: слабкий, сиплий і хрипкий голос; голосні і приголосні звуки вимовляються глухо; тембр мовлення гугнявий; артикуляція голосних та приголосних зміщена назад [8].

Екстрапірамідна (або підкіркова) дизартрія – вогнищеве ураження підкіркових ядер мозку, а також порушення їх зв'язку з іншими структурами мозку. При ураженнях екстрапірамідної системи виникають порушення локомоції, м'язового тону, вроджених автоматизмів, в тому числі різноманітних м'язових синергій; з'являються гіпо і гіперкінези [7].

У пацієнтів спостерігаються порушення темпу мовлення, то його прискорення, то уповільнення, нерідко нерівномірне в часі; раптові і поступово прогресуючі зупинки мовленнєвої продукції; різноманітні стереотипії і персеверації (окремих звуків, складів в слові). Змінюється голос: він може бути слабким, глухим, невизначеного тембру. Артикуляція звуків може бути не чіткою, обірваною, в інших випадках вона досить розбірлива при порушеннях мовленнєвої просодії [8].

Мозочкова дизартрія – вогнищеве ураження мозочка і його провідних систем. Характерним

симптомом вважається порушення плавності мовлення – його так зване скандування. Іншими словами, це диспросодія. Крім того, порушується і виразність мовлення, спостерігається монотонність [8].

Кіркова дизартрія – являє собою групу моторних порушень мовлення різного патогенезу, пов'язаних з вогнищевим ураженням кори головного мозку. Перший варіант кіркової дизартрії обумовлений одностороннім або частіше двостороннім ураженням нижнього відділу передньої центральної звивини. У цих випадках виникає вибірковий центральний парез м'язів артикуляційного апарату (найчастіше язика), що призводить до обмеження обсягу найбільш тонких ізольованих рухів: руху кінчика язика вгору. При цьому варіанті порушується вимова передньоязикових звуків [7].

Другий варіант кіркової дизартрії пов'язаний з недостатністю кінстетичного праксису, що спостерігається при односторонніх ураженнях кори домінантної півкулі мозку в нижніх постцентральных відділах кори. У цих випадках порушується вимова приголосних звуків, особливо шиплячих і африкатів. Пошук потрібного артикуляційного укладу в момент мовлення сповільнює його темп і порушує плавність [8].

Третій варіант кіркової дизартрії пов'язаний з недостатністю динамічного кінетичного праксису, це спостерігається при односторонніх ураженнях кори домінантної півкулі в нижніх відділах премоторних областей кори. При порушеннях кінетичного праксису утруднена вимова африкатів, які можуть розпадатися на складові частини, спостерігаються заміни щільних звуків на зімкненні, пропуски звуків у збігах приголосних. Мовлення напружене, уповільнене [6].

Найбільш складною і суперечливою в цій класифікації є кіркова дизартрія. У дорослих пацієнтів в ряді випадків кіркову дизартрію іноді змішують з проявом моторної афазії. Відповідно до точки зору О. Вінарьської (1973), поняття кіркової дизартрії є збірним. Автор допускає існування різних її форм, обумовлених як спастичним парезом артикуляційних м'язів, так і апраксією. Останні форми позначаються як апраксічна дизартрія [8].

В осіб з уже сформованим мовленням, зазначені форми дизартрії мають спільні прояви:

1. вогнищеві ураження рухових відділів центральної або периферичної нервової системи;
2. порушення вимовної сторони усного мовлення при повноцінній системі фонем, повному словнику і збереженому граматичному ладі. Залишаються збереженими також розуміння мовлення оточуючих, читання про себе, процеси внутрішнього мовлення і мислення [7].

Діагностику дизартрії у дорослих ускладнює відсутність розпаду мовлення. Незалежно від клінічного варіанту дизартрії, вона є ознакою ураження центрального відділу мовнорухового аналізатора і порушенням іннервації м'язів і зв'язків мовленнєвого апарату. Діагностика дизартрії в основному спирається на клінічну оцінку стану особи та логопедичну оцінку структури порушення мовлення.

При логопедичній оцінці обов'язково використовуються показник «зрозумілості мовлення для оточуючих» [6]. За цим критерієм виділяють 4 ступеня тяжкості дизартрії: до першого ступеня відносять порушення звуковимови, які може виявити лише логопед; до другого ступеня відносять порушення звуковимови, які відзначають навколишні, але мовлення зрозуміле; до третього ступеня відносять порушення, які роблять мовлення зрозумілим тільки близькому оточенню; до найтяжчого ступеня (анартрія) відносять порушення, при яких мовлення незрозуміле навіть найближчим людям [6].

Окрім дизартрії, приблизно у третини пацієнтів, які перенесли інсульт, наявне мовленнєве порушення – афазія.

Принципово важливою є диференціювання афазії від периферичних порушень артикуляції або органів слуху (системне порушення мовлення), від розладів засвоєння мовлення (є набутих дефіцитом), від психіатричних хвороб (має очевидні органічні причини) і від дифузних прогресуючих нейропатологій (виникає при «вогнищевих» ураженнях).

Клінічні картини афазій неоднорідні. Відмінності між ними зумовлені насамперед локалізацією осередку ураження. Афазії виникають при ураженнях так званих мовленнєвих зон кори головного мозку, що розташовані в задньому відділі нижньої лобної звивини, у верхній скроневій звивині, нижній тім'яній долі та на стиках тім'яної, скроневої і потиличної областей домінантної півкулі.

Так, при локальному ураженні зазначених зон первинно порушується нейрофізіологічні і нейропсихологічні механізми, що призводять до специфічних системних порушень різних рівнів, сторін, видів мовленнєвої діяльності. При цьому порушення мовлення супроводжуються цілим рядом немовленнєвих порушень: рухових, зорових, тактильних [10].

У вітчизняній і зарубіжній спеціальній педагогіці існують різні класифікаційні системи афазій. Найбільш поширеною серед них є класифікація О. Лурії.

Відповідно до цієї класифікації існують такі форми афазій:

1. Моторна афазія аферентного типу.
2. Моторна афазія еферентного типу.
3. Динамічна афазія.
4. Сенсорна (акустико-гностична) афазія.
5. Акустико-мнестична афазія.
6. Семантична афазія [10].

Афазії, які виникають при ураженні верхньоскроневої і нижньотім'яної зон, що входить в другий функціональний блок (Лурія, 1979), називаються «задніми» формами афазії. Це афазії, при яких порушуються парадигматичні відношення. Афазії, які виникають при ураженні задньолобних відділів мозку, що входять в третій функціональний блок називаються «передніми» афазіями. При цих формах афазії порушуються синтагматичні співвідношення [6].

Моторна афазія аферентного типу – ураження вторинних зон постцентральної і нижньотім'яної відділів кори головного мозку, розташованих ззаду від центральної, або Роландової, борозни.

При аферентній моторній афазії, як правило, порушено і оральний, і артикуляційний праксис. Пацієнти іноді справляються лише з імітацією простих оральних поз, а виконання їх за усною інструкцією в більшості випадків їм недоступно. Спостерігаються пошуки пози, які проявляються в безладних рухах язика та губ. Артикуляційна апраксія є первинним порушенням при цій формі афазії і становить «ядро» всього синдрому [10]. Тривалий час у пацієнтів спостерігаються специфічні особливості порушення розуміння мовлення. Вони полягають у вторинних порушеннях фонематичного слуху. При аферентній кінестетичній моторній афазії виникають труднощі в розпізнаванні на слух слів зі звуками, які мають спільні ознаки за місцем і способом артикуляції [6].

При грубому ступені мовленнєвого порушення спонтанне усне мовлення практично відсутнє, є лише мовленнєві «емболії», які замінюють вербальне мовлення при спробах спілкування з оточуючими. Особи широко користуються жестами та мімікою. При менш грубому порушенні, спонтанне мовлення бідне, складається з окремих слів. Фразове мовлення можливе лише в окремих пацієнтів. Фраза примітивна за логічною структурою [10].

Ефферентна моторна афазія – ураження передніх гілок лівої середньо-мозкової артерії. Воно супроводжується, як правило, кінетичною апраксією, що виражається в труднощах засвоєння і відтворення рухової програми.

Ураження премоторних відділів мозку викликає патологічну інертність мовленнєвих стереотипів, що призводять до звукових, складових і лексичних перестановок і персеверацій [6]. Через персеверації стає неможливим конструювання та побудова речень. Пацієнти можуть вимовляти окремі звуки (іноді слова, короткі речення), але перейти до вимови серії звуків, де необхідно своєчасне та чітке переключення з одного елемента на інший, призводить до розпаду «кінетичної мелодії» [11].

Мають місце також і труднощі сприймання мовлення через відсутність повноцінних артикуляційних опор, а також інертності в області переключення слухової уваги. Відзначається неповне розуміння мовленнєвих конструкцій, в яких граматичні елементи несуть істотне смислове навантаження. Спонтанне мовлення пацієнтів з грубою формою афазії бідне. Воно складається в основному з добре усталених слів, переважно номінацій. Є значні труднощі вимови, які проявляються в «застряванні» на окремих фрагментах слова [10].

Динамічна афазія – ураження задньолобних відділів домінантної півкулі, тобто відділів третього функціонального блоку – блоку активації, регуляції і планування мовленнєвої діяльності [6].

У пацієнтів з динамічною афазією спонтанне мовлення практично відсутнє, за винятком окремих

усталених в колишній мовленнєвій практиці мовленнєвих штампів, переважно розмовно-побутового характеру. При їх відтворенні не виявляється будь-яких вимовних труднощів, проте інтонаційна картина відрізняється одноманітністю. Мовленнєва активність низька. Присутні часті ехोलалії. Виникає постійна потреба у стимулюванні мовлення ззовні [10].

Особи з грубим порушенням розуміють мовлення неповністю переважно внаслідок виснаження уваги, персеверацій. В усному мовленні спостерігається порушення предикативності мовлення: у мовленні мало дієслів, коротка «рублена» пауза, тривала пауза між словами [10].

Сенсорна (акустико-гностична) афазія – ураження задньої третини верхньої скроневої звивини лівої півкулі.

На ранньому етапі після інсульту при сенсорній афазії спостерігається повна втрата розуміння мовлення: чуже мовлення сприймається як нечленороздільний потік звуків. Нерозуміння мовлення оточуючих і відсутність явних рухових порушень призводить до того, що пацієнти не завжди відразу усвідомлюють у себе наявність мовленнєвого порушення. На пізніших етапах і при менш виражених порушеннях спостерігається лише часткове нерозуміння мовлення, заміна точного сприймання слова здогадками [6].

Спонтанне мовлення набуває вигляду «словесного салату»: велика кількість літеральних і вербальних парафазій, логорея, явища звукового і смислового «збіскування». Виявляються численні аграматизми узгодження, але, в цілому, мовлення пацієнтів справляє враження потоку. Інтонації багаті, темп прискорений, є помилки у наголосі; лексика різноманітна. У ній переважають дієслова, а також вигук та інші службові частини мови. Пацієнти супроводжують висловлювання різноманітною мімікою і жестами [10].

Акустико-мнестична афазія – ураження середніх і задніх відділів скроневої області.

Для акустико-мнестичної афазії характерна дисоціація між відносно збереженою здатністю повторити окремі слова і порушенням можливості повторення трьох-чотирьох не зв'язаних за змістом слів [6].

Особи з грубою акустико-мнестичною афазією, як правило, розуміють короткі мовленнєві конструкції. При сприйманні більш розгорнутих текстів виявляються помилки осмислення. При пред'явленні серій назв виникає відчуження сенсу слова. Первинних порушень фонематичного слуху не виявляється, однак обсяг слухо-мовленнєвої пам'яті часто недостатній для утримання мовленнєвого ряду навіть з 3-х елементів – голосних звуків або слів. Прості (однозначні) усні інструкції, як правило, виконуються, багатоступеневі – ні.

Спонтанне мовлення представлене короткими фразами, різноманітними по лексико-граматичній структурі. Водночас мають місце досить часті вербальні парафазії і паузи, зумовлені характерними труднощами знаходження потрібного слова. У довгих, складних за звуковою структурою словах, є

спотворення в послідовності звукоряду, що становить слово: перестановки, пропуски, додавання звуків і слів [10].

Семантична афазія – ураження третинних, тім'яно-потиличних відділів кори лівої півкулі [11].

Розуміння ситуативного і неситуативного мовлення є в тому випадку, якщо в ньому відсутні складні логіко-граматичні мовленнєві звороти. Тексти, що містять логіко-граматичні конструкції, як правило, важко розуміються особою з означеними порушеннями. Експресивне мовлення практично не змінене. Можна відзначити лише обмеження числа складних логіко-граматичних зворотів мовлення, більш рідкісне, використання просторових прийменників і слів з просторовим значенням [10].

Висновки та перспективи подальших досліджень. Аналіз існуючих підходів до характеристики та відновлення мовлення осіб, які перенесли інсульт, дає можливість констатувати той факт, що дослідниками не приділялося достатньо уваги питанням вимовної сторони мовлення у дорослих осіб з наслідками вогнищевих уражень головного мозку. Питання навчально-методичного забезпечення при дизартріях та афазіях також не знайшло в літературі широкого відображення. Тому у сучасній практиці сформувався ряд протиріч між існуючими труднощами у відновленні мовлення при означених порушеннях на етапі реабілітації та теорією і практикою корекційної роботи; існуючим практичним досвідом відновлення мовлення та недостатністю його науково-методичного забезпечення.

Враховуючи все вищезазначене, констатуємо необхідність у проведенні дослідження, що спрямоване на вивчення порушень мовлення у осіб, які перенесли інсульт, зокрема дизартрії та афазії; розробку системи диференційованих сучасних методів відновлення мовлення; визначення спеціальних умов, що оптимізують процес відновлення мовлення та їх експериментальну перевірку.

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PEDAGOGICAL SCIENCES

A CONCEPT FOR HEALTH EDUCATION TRAINING PROGRAM

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КОНЦЕПЦИЯ НА ОБУЧИТЕЛНА ПРОГРАМА ПО ЗДРАВНО ОБРАЗОВАНИЕ

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Abstract

The aim of this article is to present a concept for a health education training program in for students majoring in "Preschool and Primary School Pedagogy" and "Primary School Pedagogy with a Foreign Language" at the Faculty of Education at Trakia University, Stara Zagora, Bulgaria. The discipline is aimed at forming health knowledge and skills, readiness of future primary teachers to teach health topics at the elementary stage of the basic education level.

Анотация

Целта на тази статия е представяне на концепция за обучителна програма по здравно образование за студенти от специалност „Предучилищна и начална училищна педагогика” и „Начална училищна педагогика с чужд език” на Педагогически факултет при Тракийски университет, Стара Загора, България. Дисциплината е насочена към формиране здравни знания и умения, готовност у бъдещите начални учители да преподават здравни теми в начален етап на основната образователна степен.

Keywords: pedagogical students, future primary teachers

Ключови думи: студенти педагози, бъдещи начални учители

Здравното образование е вид обучение, организирана учебна дейност, насочена към усвояване на здравно-хигиенни знания, придобиване на умения, навици и развиване на възгледи, убеждения, ценности, мотиви и самосъзнание за опазване на здравето [4, с. 89]. То изучава закономерностите за формиране и укрепване на здравето и разработване на пътища за повишаване на здравната култура, изграждане на собствен здравословен стил на живот и здравно поведение [7, с. 10].

През 2016 г. се обнародва и влиза в сила Наредба № 13 за гражданското, здравното, екологичното и интеркултурното образование, която се допълва и изменя през 2018 г. Чрез нея се определят основните области на здравно образование: психично здраве и личностно развитие; физическо развитие и дееспособност; превенция на употребата на психоактивни вещества; безопасност и първа помощ; сексуално здраве и сексуално преносими инфекции; лична хигиена; хранене. Посочват се рамковите изисквания за резултатите от проведеното обучение във всяка една област под формата на знания, умения и отношения, съобразени с етапа и степента на образование. В училище здравното образование се осъществяват в процеса на всички видове училищна подготовка - общообразователна, разширена, профилирана, професионална и допълнителна. Провежда се в часа на класа, в

заниманията по интереси в рамките на дейностите по обща подкрепа за личностно развитие [5]. В начална степен основните учебни предмети, по които се придобиват здравни знания и умения, са родинознание, човек и природа, физическо възпитание и спорт, час на класа, както и интегрирано във всички останали.

През 2021 г. се изменя и допълва Наредбата за държавните изисквания за придобиване на професионална квалификация „учител“, първоначално приета и обнародвана през 2016 г. В нея се посочват необходимите компетентности, които трябва да придобие студентът по време на академичното си обучение, за да упражнява професията. Важно за бъдещия начален учител е да овладее знания от научните области (включително и от здравното образование), на които съответстват учебните предмети от началния етап на основното образование, да усвои умения за адаптиране на тези знания към възрастовите особености и степента на познавателно развитие на учениците и да формира готовност за преподаване по подходящ начин на учебното съдържание [6].

Целта на тази статия е представяне на концепция за обучителната програма „Здравно образование“ в обучението на студенти от специалност „Предучилищна и начална училищна педагогика” и „Начална училищна педагогика с чужд език” на Педагогически факултет при Тракийски университет. Дисциплината е избираема

и се провежда през шести семестър с хорариум от 30 часа – 15 часа лекции и 15 часа семинарни упражнения. Насочена е към формиране на компетентности в онази част от здравното образование, към която имат отношение началните учители.

Основна цел на курса е придобиване на широк теоретичен базис от знания от съответните области на здравно образование, формиране на умения за адаптирането на тези знания към особеностите и моментното когнитивно развитие на 7-11-годишните деца и готовност за преподаване и провеждане на обучение, съобразно със здравно-хигиенните изисквания.

В резултат на специализираната подготовка студентът:

- усвоява знания за: компонентите и рисковите фактори за здравето; целта, задачите и принципите на здравното образование; подходите и методите на здравно образование; аспектите на психическото здраве; строежа и функциите на човешкото тяло; влиянието на физическите упражнения и спорта върху различните органи и системи; негативното влияние на различните психоактивни вещества върху човека и здравето му; последователността на действие при оказване на първа помощ при инциденти; анатомичните особености на мъжа и жената и процеса на размножаване; профилактиката на заболяванията, предавани по полов път; профилактиката на социално значими заболявания в детска възраст; личната хигиена; работоспособността и умората на ученика и дневния режим; значението на различните вещества в храната за организма; принципите на здравословно, пълноценно, разнообразно и балансирано хранене;

- овладява умения за: адаптирането на учебния материал от различните области на здравното образование към възрастовите и когнитивни възможности на учениците от начален етап; изработването и представянето на презентация на здравна тема по подходящ начин; оформянето на седмична учебна програма, съобразена с хигиенните изисквания към умствения труд, съставянето на здравословно седмично меню и изграждането на оптимален дневен режим за 7-11-годишни деца;

- формира компетентности за: преподаването на учебното здравно съдържание по подходящ начин, интегрирано в различните учебни предмети в начален етап на основното образование; организирането на учебен процес, съобразен със здравно-хигиенните изисквания.

Учебното съдържание на дисциплината „Здравно образование“ се разпределя в два блока. Първият блок е теоретичен и въвеждащ и има за цел студентите да се запознаят със същността и основните характеристики на здравното образование. Вторият блок е с практико-приложна насоченост и е разделен на седем части в зависимост от тематичната област на здравното образование - психично здраве и личностно развитие; физическо развитие и дееспособност;

превенция на употребата на психоактивни вещества; безопасност и първа помощ; сексуално здраве и сексуално преносими инфекции; лична хигиена; хранене.

Организацията на обучението търси оптимално съчетаване на формите за планиране заетостта на студентите и на подходящите методи на обучение с цел постигане на по-висока степен на усвояване на преподавания материал, дори и в условия на онлайн обучение.

В етапа на формиране на нови знания в областта на здравното образование словесните и нагледни методи се съчетават с презентация. Устното изложение на преподавателя се комбинира с богато онагледяване чрез картини, рисунки, снимки, аудио и видео материали, както и с демонстриране на конкретни действия. От студентите се изисква да възприемат, разберат и запомнят поднесената информация.

В етапа на затвърдяване на учебния материал се използват методи, които предполагат по-голяма активност от страна на студентите. Прилага се съчетание от различни интерактивни методи: дискусия, решаване на казус, симулация.

В семинарите упражнения се провежда дискусия по теми от здравното образование. Като самостоятелна извънаудиторната заетост студентите работят по решаването на два казуса.

Първият е свързан с изработване на презентация от всяка една област от здравното образование. Използва се интегрираният подход с прилагане на цифровите технологии с цел засилване интереса от страна на участниците и по-ефективно обучение [1, с. 137; 12, с. 9]. Създават се възможности всеки бъдещ учител да придобие достатъчно знания и умения за използването на информационни и комуникационни технологии и прилагането им при изработване и по-късното модифициране и обогатяване на собствено дигитално съдържание [10, с. 47; 11, с. 153]. Всеки студент представя задължително една от презентациите си в симулативни условия, след което извършва самооценка на изявата си. Чрез използването на рефлексивни инструменти се очертават проблемните полета в обучението на студентите [8, с. 34].

Вторият казус е насочен към разработване на седмичен дневен режим на ученик в начална училищна възраст, който е съобразен с принципите на личната хигиена и здравно-хигиенните изисквания към учебния умствения труд и храненето. Дейностите, които студентите извършват, са на продуктивно-творческото равнище и изискват субективно, индивидуални творчески търсения на различни пътища за оформяне на становище по казуса. По този начин се търси формиране на траен интерес у обучаваните и потребност за решаването на поставените задачи [2, с. 224; 3, с. 19-20; 9, с. 67].

Очакваните резултати от обучението се формират на три равнища: *базово*, обхващащо запомнянето, разбирането, възпроизвеждането и интерпретирането на здравна информация;

оптимално, свързано със способността да се приложи наученото в нови и конкретни ситуации; *предельно*, предполагащо разбиване на материала и достигане до изводи при липса на информация, творческото му обединяване с интегриране на наученото от други области, аргументирана оценка на значимостта на получения продукт за конкретните цели.

Определяне нивото на формиране на здравни компетентности у студентите става на база три компонента: *тест* - за оценка теоретичните знания в областта на здравното образование; *решение на казус 1 - презентация* – за оценка уменията за оформяне и представяне по подходящ начин на презентации на здравна тематика; *решение на казус 2* – за оценка готовността да се организира хигиенно-съобразен обучителен процес.

Предимството на така представената концепция за обучение по здравно образование е, че може да се реализира и в условията на онлайн обучение. Във всеки случай се създават условия за задълбочаване на здравни знания, усвояване на умения да се преподават по подходящ за 7-11-годишни деца начин и изграждане на готовност за осъществяване на учебен процес, съобразен със здравно-хигиенните изисквания. Всичко това ще допринесе за формирането на професионално-педагогическата компетентност в областта на здравето, необходима за успешната бъдеща реализация в условията на началното училище.

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SOCIAL SCIENCES

EMPLOYING THE CHARACTERISTICS OF A STRATEGIC THINKER IN THE QUALITY OF ORGANIZATIONAL IMPROVISATION

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Abstract

The study aims to determine the impact statement strategic thinker specifications and its impact on the quality of organizational improvisation with academic leaders in a selected sample of Iraqi universities who represent the top of the educational pyramid of the administrative, scientific, The study centered problem that employ intellectual developments of strategic management in educational organizations will add a new enablers pay about the need for a specification leadership of the minds and behavior trends and frameworks thinking strategy that combines conscious assimilation of the field and the possibility of the application, And it adopted the scheme Default study identified through which the objectives of the study and its hypotheses and the researcher used the descriptive analytical approach in order to attain results, and form questionnaire as a key instrument in the data and information on the field side of the study, collection, and was selected three universities (University of Tikrit, Kirkuk University, Samarra University) field to study and test hypotheses, it was the views of a poll (80) leader academically.

The study has come out with a number of recommendations and proposals for universities study population consisted of the most important, that the surveyed universities management bother the results of the relationship between the variables of the study and the reflection of this relationship on the nature of their work, as well as to change the negative perception of improvisation organization for being in accordance with complementary to the planning and is not a substitute for it.

Keywords: strategic thinker, the quality of organizational improvisation , Vision, intelligence, academic leaders, strategic management, educational organizations, specification leadership, strategic role, strategic thinking.

Introduction

Organizations face changing circumstances and work in volatile conditions and are encountered by obstacles and challenges that make achieving the goals for which they were established is uncertain. On the other hand, the conditions, capabilities and capabilities of these organizations and the resources available to them and the pressures they are subject to stemming from their internal conditions vary. All this reduces the possibility of organizations being able to achieve their goals and achieve satisfactory rates of effectiveness by applying what they are accustomed to from traditional practices.

At the level of educational institutions, the tasks entrusted to the leadership position in educational institutions in the context of developments and changes in the environment, especially in the field of information, communication and change, and the multi-purpose and multi-dimensional challenges it has added, require re-considering the construction of the leadership's academic work tasks and containing its contents and ambitions, and related issues. Peculiarities in the specifications and characteristics of strategic minds to make the leadership position a site for making strategic decisions instead of getting caught up in the daily (operational) work details.

In light of these data, the intellectual framework of this study is centered on diagnosing the specifications and behavior of the strategic thinker and its role in the quality of organizational improvisation. It represents

the top of the educational pyramid from an administrative point of view.

Study Methodology

The problem of the study:

Within the framework of what was mentioned, the study believes that employing the intellectual developments of strategic management in educational organizations will add new capabilities that push towards the necessity of having specifications for leadership minds and behaviors with strategic directions and frameworks of thinking that combine conscious understanding of the field and the possibility of application, to form awareness and guide behavior and decisions, and then determine priorities and patterns of dealing With the environment for everything that is new and surprising due to unexpected or unplanned circumstances, by adopting improvisation and making important decisions at the time of realizing the event based on the available resources.

From this point of view, the intellectual framework of this study is centered through diagnosing the specifications of the strategic thinker in educational organizations and their role in the quality of organizational improvisation.

1) Do academic leaders in the study sample have a perception of the characteristics and dimensions of the strategic thinker?

2) What is the nature of the prevailing the quality of organizational improvisation in the educational institutions of the study sample?

3) Is there a relationship between the specifications of the strategic thinker and the quality of organizational improvisation in educational organizations?

4) Are the results of the relationship between the specifications of the strategic thinker a source of the quality of organizational improvisation?

5) Do the different specifications and behavior patterns of academic leaders have a significant impact on the adoption of the quality of organizational improvisation in educational institutions.

The importance of the study:

The study derives its importance from the importance of the topic it deals with and the location chosen for the study, where this study contributes.

▪ **Academic level:** The importance of studying academically is embodied in building a knowledge framework for the topics (specifications of the strategic thinker and the quality of organizational improvisation), as well as enriching and enriching the Iraqi library due to the limited studies related to the variables of the study, so the researcher seeks to provide an intellectual framework that is the starting point for other researchers to enrich this topic.

▪ **Field level:** The field importance of the study topic is reflected in:

1) Determining the specifications of the strategic mind of the academic leaders in the organizations under study.

2) The study of the independent variable (the specifications of the strategic thinker) and its impact leads to the possibility of determining the required level of support for these variables that positively affect the dependent variable (the quality of organizational improvisation) for educational organizations.

3) This study is important at the field level, as it will provide an information base that can be employed in the researched organizations, and this information will guide how to employ the characteristics of the strategic thinker that support the behavior of the leader to

add new possibilities in the leadership's ability to the quality of organizational improvisation.

Objectives of the study: In light of the problem of the current study and the lack of studies linking the variables investigated, the main objective of the study is to determine the specifications of the strategic thinker and their impact on the quality of organizational improvisation in educational institutions.

1) Develop a diagnostic framework for the specifications of the strategic thinker in the field of higher education, and the related capabilities that enhance the academic leadership position.

2) Presenting ways of paying attention to the specifications of the strategic thinker and their role in the field of the quality of organizational improvisation in educational institutions, as the level of awareness, diagnosis and response is the result of the interaction between the specifications of the strategic thinker for leadership, and in light of them, the data of the quality of organizational improvisation is determined as a tool that enables the academic leadership to take important decisions in record time and time Awareness of the event to improve performance and distinction compared to competitors.

3) Report of the academic community's perceptions of the general content of the assumptions from which the study was launched in the field of the specifications of the strategic thinker and their role in the field of the quality of organizational improvisation for educational institutions.

Study scheme: The systematic treatment of the study problem, according to its theoretical framework and field contents, requires building a hypothetical scheme that reflects the nature of the logical relationship between the variables investigated, as well as clarifying the sub-variables of those variables and their effects on the educational institutions under study, taking into account the possibility of measuring these variables and assuming that the relationship is one way.

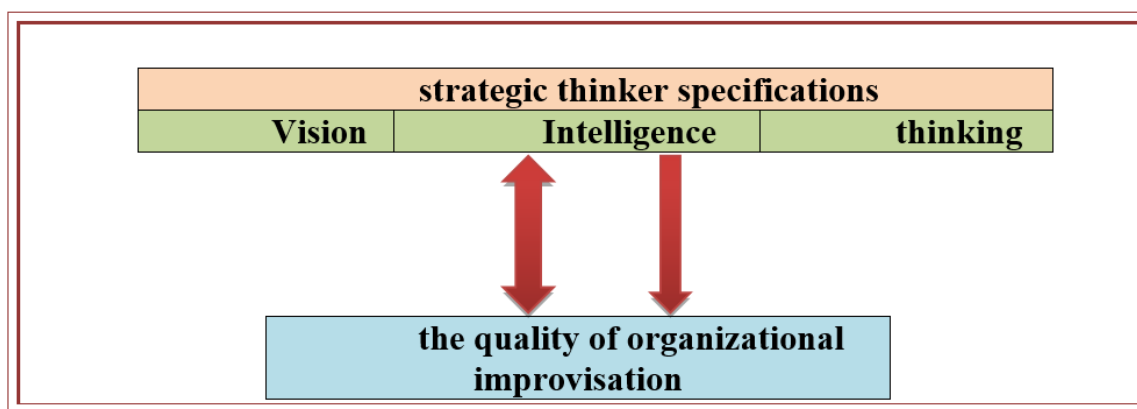


Figure (1) .The hypothetical study scheme

Study Hypotheses: A set of hypotheses were determined based on the scheme in order to prove the statistical relationship and its branches.

✓ There is a significant correlation relationship between the specifications of the strategic thinker for the leaders of the surveyed organizations in terms of their variables and the quality of organizational improvisation.

✓ There is a significant influence relationship between the specifications of the strategic thinker for the leaders of the organizations surveyed in terms of their variables and the quality of organizational improvisation.

✓ The characteristics of the strategic thinker for the leaders of educational organizations in terms of

their variables and the quality of organizational improvisation in educational organizations vary in the study sample

Study Tools

A. Data collection methods: In order to achieve the objectives of the study and test its hypotheses, two types of data collection methods were adopted by:

1. The first type is related to covering the theoretical aspect through many sources represented by scientific references such as books, magazines, studies, theses and periodicals, available in libraries, as well as by relying on the international communications network (Internet).

2. As for the second type of data, it was obtained through the field study, and through the questionnaire form. It is the main tool in collecting data and infor-

mation for the study, whose formulation took into account its ability to diagnose and measure the main and sub-variables of the study.

It included the questionnaire in its final form and after making adjustments to the Its initial form is two-axis:

- It includes a paragraph of personal and functional information for the study sample that pertains to (scientific qualification, scientific title, administrative position, service in the position, university service).
- the questionnaire included two main variables: (specifications of the strategic thinker and the quality of organizational improvisation), as each of these variables includes a set of sub-variables shown in Table (1), which represents the structure of the questionnaire.

Table 1

Structure of the questionnaire

N.	main variables	sub-variables	number of paragraphs	Paragraph
1	Personal information	Academic qualification, title, administrative position, service in the position, university service	5	1-5
2	Characteristics of the thinker	strategic vision	10	1-10
		Strategic thinking	10	11-20
		Strategic Intelligence	10	21-30
3	The quality of organizational improvisation	Internal Resources	12	31-42
		Implicit and Cognitive Capabilities	12	43-54

The study questionnaire, with its approved standards, was subjected to tests of validity and reliability

B. Statistical methods used in the analysis

A set of statistical tools were used, including those related to the description of the study variables, and other analytical tools, as follows:

1. Descriptive statistical tools, which are: percentages, mean, and standard deviation.
2. Analytical statistical tools, including the following: analysis of financial indicators, (F, T) test, simple and multiple correlation, and simple and multiple linear regression.

Description of the study sample universities and the justifications for selection

Determining the sector in which the study is conducted is of great importance, and the process of choosing the field of study is one of the most important axes in scientific research, as the appropriate and appropriate selection of the field of study contributes greatly to the validity of the results and the testing of hypotheses, and through the theoretical and field vision in the organizations, the study sees That there is a need to inculcate the concepts of the specifications of the strategic thinker and patterns of behavior among academic leaders and what leads to the quality of organizational improvisa-

tion in educational organizations, and based on the foregoing, the justifications for choosing the field of study are determined as follows:

- 1) Harmony of the nature and objectives of the study with the reality of educational organizations (universities), with regard to scientific and leadership activity.
- 2) Educational organizations (universities) have leadership mentalities represented by academic leaders who have the ability to present innovative ideas, innovations, research and consultancy, and this is consistent with the nature of academic leadership work.
- 3) The cooperation shown by educational organizations (universities), and their support for us in obtaining the necessary information for study.
- 4) The importance of the role played by educational organizations (universities) in the intellectual, cognitive and social construction of the society in which they operate, and as the tributary to most organizations and the rest of the community circles with qualified scientific and practical staff.

For the purposes of this study, a sample of Iraqi universities was selected as an applied field of study, represented by (Tikrit University, Kirkuk University, and Samarra University), and table (2) shows a brief introduction to the study sample organizations.

Table 2

The study sample organizations

N №	universities sample study	Date of Establishment	number of colleges	number of teaching staff	number of students
11	Tikrit	1987	22	2040	24700
12	Kirkuk	2003	11	700	8500
23	Samarra	2012	5	200	4500

Source: Iraqi universities website

Theoretical framework

What is the concept of the strategic thinker (mind)?

The concept of strategy is one of the relatively recent concepts in the management literature, and it quickly gained exceptional importance in the business world today more than ever before, and perhaps the reason is due to the rapid environmental changes. the strategist is the one who searches for strategies in the event of an emergency and the absence of planning, as well as analyzes the information and presents it on a plate of gold to the senior management in order to use it in formulating the strategy and giving sufficient knowledge to the administrative manager to know what is going on around him from the events as well as doing strategic thinking for the creation of ideas The new one is the one that develops the performance of organizations and makes them more able to achieve their goals.

It seems from the above that the term strategist is very vague and subject to different interpretations as much as strategic leadership itself, and many writers may use the term strategist and strategic leadership when they talk about the mind and strategic thinker. He moves in the available spaces without being closed (Al-Douri and Saleh, 2019:9).

From this point of view, and to identify who is the strategic thinker, we present the following some of the expressions described by some researchers:-

- The strategic thinker is seen as the leadership mindset responsible for actions that focus largely on defining the long-term orientation and strategic vision, communicating this vision to the relevant authorities, loyalty, and the necessary strength to realize and achieve this vision, and inspire others to move towards the direction it is actually intended. Or the correct behavior :

- A strategic thinker is someone who has the ability to share, has a vision, maintains flexibility, has strategic thinking, and works with others to make change that builds a better future for the organization.

- Strategic thinkers use a shared vision to motivate people.

- What is distinguished by the strategic thinker is the high ability to identify deficiencies and untapped opportunities, formulate the ideal future vision for the organization, and express it well, and use unconventional means to achieve the vision and reach the goals (Al-Zoubi, 2012: 10).

- The strategic thinker needs additional specifications and capabilities, as he is responsible for developing the strategy and influencing others to follow it.

Importance And Role Of The Strategic Thinker

(Hill et al, 2016: 490) indicates that there is agreement in viewpoints regarding the importance and role of the strategist and his great responsibility in the success or failure of organizations. The traditional and orientation of the strategic role, which looks to the best horizon, and has the vision as a distinctive characteristic, strategic minds understand the meaning of events without being affected by their phenomena, and have the ability to make decisions quickly. In light of a changing and complex environment, the organization needs a leadership mentality of a new type with a strategic vision and possesses unconventional skills, capabilities and characteristics to overcome reality with a forward-looking vision to achieve the desired goals.

Hence, it calls for attention to strategic minds, because they are the category that is able to think strategically in their dealings with rapid changes and high-risk environments, and they are also able to envision the desired future for their organizations (Sosik and et al., 2015: 47).

Accordingly, the researcher believes that the importance of the strategic mind and the need for it is based on three main premises:

- The changing and complex nature of the environment.
- The nature of the competitive environment.
- The nature of leadership roles, capabilities and practices.

Intellectual Implications Of The Specifications Of The Strategic Thinker

The main and fundamental changes on the axes of strategic management and the developments and developments imposed by them in the course of the leadership roles and the frameworks of thinking that the strategic leadership must promote require specifications, capabilities and knowledge that are in harmony with the new processes of leadership work outside the traditional framework, these specifications represent crucial elements in formulating effective leadership and harnessing it as the basis for establishing the basic force for many strategic actions in any organization. :58), also referred to as leadership specifications as a set of behavioral and professional skills possessed by leaders working in organizations that enable them to achieve the goals set efficiently and effectively (Al-Qahtani, 2016: 143).

Extrapolating the nature of the characteristics that a strategic thinker should perform, makes us feel the importance and role of "mind" and the accumulation of experience and those characteristics that are difficult to have for many leaders in today's organizations. For the future? How do I meet the current selections? And how to support success and continuity on a larger scale, so the question remains, and the answer also justifies the

resort of the strategic mind, and even its need for vision, intelligence and strategic thinking.

There have been many empirical research and attempts that sought to identify and examine the specifications of the strategist as a leader and manager in organizations, but there is a discrepancy in the writers' and researchers' point of view in classifying these specifications that were put forward under the titles of features and characteristics and all that characterizes the thought and mind of leadership, and this is self-evident

due to their difference in Determining what those specifications are, and in general the management literature put forward a set of specifications for the mind or strategic thinker that the book addressed from the angles of their different interests and specializations, but they all revolve around convergent axes, the researcher tries to review some of them and we show them through Table (3) according to the chronological sequence With the selection of specifications to be adopted in the current study.

Table 3

Specifications of the strategic thinker from the point of view of a number of researchers		
№	Researcher	Specifications
1	Al-Naimi, 2013	Strategic vision, strategic thinking, strategic decision
2	White, Colin, 2014	Macro vision and systems thinking, focus on intent or purpose, intelligent seizing of opportunities, real-time thinking, assumption-based thinking -
3	Darwish, 2016	Clarity of vision. High sense of the internal and external climate, initiative, flexibility and keeping pace with change, innovation, determination and perseverance, ability to motivate and build teams
4	Dess et al., 2014	Personal characteristics, intelligence, self-awareness and regulation, empathy, social skills
5	Peter, 2010	Accuracy and insight in evaluating future matters, ability to form a vision and formulate strategic goals, intellectual fluency, ability to interact with environmental conditions and variables, ability and ability to trade-off between strategic alternatives, ability to make strategic decisions

Based on that and in line with the objectives and hypotheses of the study, it has been classified for the purposes of the current study's methodology into three specifications (intelligence, vision and strategic thinking) to express the contents of the specifications of the strategic thinker in which organizations, including educational ones, participate, and occupy a large space in the practice of the administrations of those organizations

Strategic intelligence

The topic of leadership remains at the forefront of cognitive topics of interest to researchers and thinkers.

As organizations have begun to undoubtedly realize the importance of intelligence as a basic feature that must be characterized by the strategic minds leading organizations, and it plays a prominent role in deciphering the environmental complexity faced by organizations by providing the appropriate information at the right time, in addition to the diversity of sources of obtaining this information, so it will be more Accuracy and objectivity will lead to making right decisions that will enable the organization to know what is going on in the environment in which it operates, so the activity of these organizations will turn into a proactive activity, not reactive, and strategic intelligence is one of those entrances that lead organizations to success and achieve excellence in performance. (Al-Azzawi, 2018: 11).

From the foregoing, the intelligence represents one of the specifications and characteristics that characterize the leaders of organizations who enjoy and play a prominent role in upgrading the capabilities of the leaders of organizations, so it is possible to diagnose the aspects of the importance of strategic intelligence through the roles played by this type of intelligence that will strengthen the competitive position of the company

In addition to increasing its profits and gaining a competitive advantage through which it can achieve leadership and leadership over other organizations. The most prominent of these roles are determined through which the importance of strategic intelligence is manifested in the following aspects:

- The role of strategic intelligence in supporting decision-making.
- The role of strategic intelligence as a competitive weapon.
- The role of strategic intelligence in change processes.
- The role of strategic intelligence in resource allocation.

Strategic Thinking

Strategic thinking refers to the availability of the capabilities and skills necessary to practice the tasks of strategic management so as to provide the holder with the ability to examine and analyze the elements of the internal and external environment of the organization and make accurate predictions with the possibility of formulating strategies and making appropriate decisions at the required speed.

The importance of strategic thinking stems from the fact that it represents a contemporary approach to the study of strategic management and by means of which the goals that achieve the mission and goals of the organization can be achieved, in addition to being one of the most important real investments that help the organization to continue and survive. (Al-Salem, 2015: 54-60).

Use the strategic thinking method in organizations to gain a competitive advantage through which they can exploit opportunities and confront the threats they face by building episodic strategies, which is an important

tool for achieving excellence and success (Al-Khafaji, 2014: 74).

Strategic vision

The past events and experiences of previous studies confirm that the main aspect of the strategic thinker's specifications depends indisputably on having a comprehensive vision through which he can determine the direction of business as well as visualize what could happen in the future. That the vision is a work system that requires the leader of the organization to develop the ideal future picture, as well as to make everyone participate in the development of this vision in order to reach the change of work.

The vision was described in a variety of ways, as (Johnson & Scholes, 2014: 13) indicates that the strategic vision represents the desired future of the organization, and thus represents the ambitions or hopes in which the strategic thinker focuses all his interests and motivates the members of the organization around it, and sees (Tharwat, 2017: 96). The strategic vision is a mental image or a dream that the organization aspires to in the future, while (Al-Nasiri, 2013: 39) indicates that the strategic vision is the ideas, ambitions and hopes that the organization clearly draws and tries to aspire to in the future in line with changes in the internal and external environment.

The importance of vision for organizations is highlighted in the following areas (Ali, Al-Lami, 2015: 190), (Al-Ghalbi, Idris, 2015: 210):

- Determining the work that the organization is currently carrying out, through which it determines the needs that the organization is trying to satisfy for the customers and who are the customers that the organization is targeting and determining the culture that the organization uses in serving the target market.
- Determining the future strategic path of the organization, which discloses the extent of the development of the strategic vision, as it represents the creative thinking of the organization's management on how to prepare or prepare for the future.
- Communicate the vision to the lower levels and the workers in the organization in a clear way, to arouse enthusiasm among the workers and increase their understanding of the changes that occur in the business environment.

In light of what has been reviewed in these dimensions, we believe that the strategic thinker should collect, in addition to personal leadership specifications, strategic specifications, and thus become a strategic thinker who has foresight, insight, and a vision for the future, and is able to take appropriate decisions at the right time, and thus promote and develop the organization and achieve Excellence and superiority.

The quality of organizational improvisation The concept.

In recent years, the use of the concept of improvisation has increased within the modern concepts that the leadership mind should adopt and apply in its administrative work if it wants to achieve the goals for which it was established and to ensure its continuity and survival, (Masa'dah, 2013: 75), and despite the many attempts that It has been made in order to define the

concept of improvisation and clarify its features, dimensions, characteristics, methods, tools and challenges. However, the difference still exists among scholars in defining the concept of the quality of organizational improvisation:

- There are those who view the concept from the perspective of organization theory, as it is the ability of people to devise ingenious solutions to sudden, complex and unexpected problems.
- Others look at the concept from the perspective of the optimal use of time by making bold and correct decisions at the moment of the event that leads the organization to great successes, and whenever the time is very short and the improvised person is able to make decisions correctly, this is evidence of efficiency.
- There are those who view improvisation from the perspective of strategy as making decisions and adapting to needs and circumstances "changing" ideas that appear in new and innovative means that were not planned.
- There are those who look at improvisation from the perspective of organizational learning that it is objectivity rather than temporal convergence of planning and implementation" (Miner, & Moorman, 2012:2).

Through the foregoing, we find that both writers and researchers have defined the quality of organizational improvisation based on a specific intellectual background and accordingly we can conclude the following:

1. The quality of organizational improvisation is an intentional act carried out by the organization or one of its members as a result of the great pressures that pertain to the organization's current and future environment, and includes all parts of the organization, and involves making decisions that determine the future of the organization.
2. The quality of organizational improvisation represents a work that is improvised and of a dialectical nature that mixes a number of conflicting concepts such as mixing between planning and representation, between discipline and freedom, and between control and spontaneity.
3. The quality of organizational improvisation is the process of quickly realizing and understanding the event under time pressure and finding the appropriate solution for it according to the available current resources. In this sense, it represents an emergency strategy for confrontation with the aim of obtaining an advantage that enables the organization to improve its competitive position.
4. The quality of organizational improvisation The process of adopting intuition to guide work in a spontaneous manner according to its historical context, as a result of continuous changes in the internal and external environment, and this means that there is no time to allow for planning, and if the problem was delayed and not addressed simultaneously, the damage would have been greater.

Based on this, the study presents its procedural definition of the quality of organizational improvisation in line with the hypotheses and objectives of the current study: "Creativity at the moment of the event aims to

quickly address current and sudden crises through the deliberate integration of the formulation and implementation phase in order to produce everything that is new, so it is considered a complementary work to planning. It is not a substitute for it. In the event of inability to plan, improvisation appears to fill the gaps that occur in the organization's plan."

The importance of the quality of organizational improvisation

The quality of organizational improvisation is not a bad phenomenon except to the extent that it relates to chaos that leads to bad results. Rather, it is an effective tool through which organizations can confront crises and surprises facing the leaders of organizations when they are going through difficult circumstances and crises and under the influence of time pressure and the inability of planning to address these circumstances and crises. Turner, 2012: 10), so improvisation is a necessary necessity through which organizations can confront emergency crises, and organizations that did not improvise cannot face unexpected circumstances and disturbances, which made organizations forced to adapt and react quickly to events, and thus the quality of organizational improvisation became an important issue. For both organizations as well as researchers and scholars, this was confirmed by (kipkell, 2012: 3).

Dimensions and factors of the quality of organizational improvisation

In general, the management literature presented a set of dimensions and factors of the quality of organizational improvisation, which the writers dealt with from the angles of their different interests and specializations, but they all revolve around convergent axes. On (micro-structural procedural memory) because it does not determine if improvisation will occur or not, but rather it affects its extent and quality when it occurs and these factors are leadership, (information flow, characteristics of the improvisation, communication, resources), while study (Al-Anzi and Al-Saadi, 2017: 129) and (Al-Abdali, 2013: 100) the need for the quality of organizational improvisation to the pre-existence of a set of resources on which the improvised launch is based, namely (material, cognitive, emotional, social and cultural resources), and in the direction of Shamil (Al-Atwi, 2012:110) believes that some strategic managers invest in three theories in particular:

- Resource-based theory: it requires the organization to keep pace with the external environment with internal resources
- Capabilities-based theory: the organization must have a strategic position for itself within the market and use distinct capabilities to maintain this strategic position for the organization
- Capabilities-based theory: It links these theories above together through the exploitation of resources, renewal of capabilities, developing capabilities and creating critical capabilities.

Based on this and in line with the study's objectives and hypotheses, the dimensions and factors of the quality of organizational improvisation for the purposes of the current study's methodology have been classified into two axes (internal resources axis, and cognitive abilities axis):

a. Internal resources: which refers to the ability to organize and redirect resources towards certain areas, and includes basic aggregates (material, cognitive, emotional, social and cultural), as (Al-Saadi and Al-Anzi, 2017: 128) sees that improvisation requires a set of available resources. A person cannot improvise without knowing what resources are available to him so that he can carry out the process of improvisation and find an improvised solution to the emergency problem.

b. Cognitive capabilities Capabilities are complex packages of skills, knowledge and accumulated capabilities that help the organization to coordinate its activities and make the most of its resources in an optimal way to achieve success.

1. It is mentioned (Aldridge, 2014: 10) that capabilities are the ability of the organization's management to develop strategies based on sound foundations at a set of different levels, or it is the ability to apply and manage strategic thinking in response to changing environments, and to ensure the organization's capabilities to adapt to rapid changes and provide better performance.

In general, abilities are classified into three dimensions, which are perceptual abilities, learning abilities and integration abilities.

The theoretical relationship between the variables of the study

The term the quality of organizational improvisation has taken on a strategic character with the expansion of organizations' horizons and the development of their future directions to serve their strategic direction. The quality of organizational improvisation represents an emergency strategy in which the formulation phase disappears by implementation in the context of a common awareness of individual or collective performance, based on the implicit capabilities that automatically reveal themselves at the moment of improvisation. , which in this sense shows the organization's ability to respond to the trend of changes and changing situations, and this undoubtedly requires leadership abilities and cognitive abilities (Ojha, 2018:36), and in return, most researchers emphasized the basic characteristics of the strategic thinker (vision, intelligence and thinking) that should be Present in the personality of the strategic mind when improvising.

Based on the analysis of the philosophical content to promote the quality of organizational improvisation in educational organizations, it requires to a large extent the availability of specifications for the leadership mind and the transformation in patterns of behavior to help enable the educational organization to transform its vision into reality and achieve a better situation that leads to increased productivity and achievement of excellence and access to organizational effectiveness.

Describe and diagnose the study variables test their hypotheses

In order to identify the variables adopted in the study model and its hypotheses and the nature of the relationship and influence (for the impact of the specifications of the strategic thinker on the quality of organizational improvisation), and according to the answers of the research sample members to the questionnaire in

the selected universities (Tikrit University, Kirkuk University, Samarra University), which number (80) forms

Describing and diagnosing the dimensions of the specifications of the strategic thinker

It is clear from the percentages, arithmetic means, and standard deviations in Table (4) regarding the attitudes of the study sample (academic leaders) about the specifications of the strategic thinker, considering that the hypothetical mean equals (3) on the scale space, as the results indicate that the specifications of the strategic thinker at the macro level have He achieved an arithmetic mean of (4.17), which is a high level, and this indicates a good level in emphasizing the need for

academic leaders to have strategic specifications, and therefore we note that the standard deviation of (0.70) indicates that there is a small percentage of dispersion in the answers of the study sample, which means that they have a clear vision On the meaning of the required strategic specifications, and these percentages of agreement, neutral and disagreement are supported, amounting to (86.92, 10.21, 2.87), respectively, and one of the most prominent dimensions that contributed to enriching the specification variable is the strategic vision dimension with a percentage of agreement (90.25), an arithmetic mean of (4.28) and a deviation norm of (0.65)

Table 4

The attitudes of the study sample			
Variable	Dimensions	Mean	St. Deviation
strategic thinker	<i>Vision</i>	4.28	0.65
	<i>Intelligence</i>	4.20	0.69
	<i>Thinking</i>	4.04	0.77
Average		4.17	0.70

Describing and diagnosing the dimensions of the quality of organizational improvisation:

It is clear from the percentages, arithmetic means, and standard deviations in Table (5) regarding the attitudes of the study sample (academic leaders) about the dimensions of the quality of organizational improvisation, considering that the hypothetical mean equals (3) on the scale space, as the results indicate that the dimensions of the quality of organizational improvisation at the macro level have He achieved an arithmetic mean of (3.96), which is a good level, and we note that the standard deviation of (0.78) indicates that there is a

small percentage of dispersion in the answers of the study sample, which means that they have a clear perception of the meaning of the quality of organizational improvisation, and these percentages of agreement, neutral and disagreement are supported by (80.28, 14.43, 5.29) respectively.

Among the most prominent dimensions that contributed to enriching the specifications variable is the dimension of strategic internal resources with an agreement ratio of (84.16), an arithmetic mean of (4.04) and a standard deviation of (0.72).

Table 5

responses of the study sample on the dimensions of the quality of organizational improvisation			
variable	Dimensions	mean	St. deviation
the quality of organizational improvisation	internal resources	4.04	0.72
	implicit capabilities	3.87	0.83
Average		3.96	0.78

Study hypotheses test

Testing the first hypothesis: It indicates that there is a significant correlation between the specifications of the strategic thinker for the leaders of the universities in the study sample in terms of its variables and the quality of organizational improvisation.

Table (6) shows the validity of the first hypothesis test, which indicates the existence of a significant correlation between the specifications of the strategic thinker and the the quality of organizational improvisation of the leaders of the surveyed organizations at the total level in the universities surveyed, as the value of the correlation coefficient reached (0.537) at the level of significance (0.05), confirming what was highlighted by The study, in its theoretical aspect, on the impact of the specifications of the strategic thinker in the researched universities in the quality of organizational improvisation. This indicates the contribution of the characteristics of the strategic thinker, represented by strategic vision, strategic intelligence, and strategic

thinking, in achieving the quality of organizational improvisation in the universities surveyed. At the micro level, the results were:

Table (6) shows the measurement of the correlation relationship between the dimensions of the specifications of the strategic thinker and the quality of organizational improvisation to test the validity of the first hypothesis which indicates the existence of a significant correlation relationship between the specifications of the strategic thinker in terms of its dimensions (strategic vision, strategic intelligence, and strategic thinking) and the quality of organizational improvisation. The results reveal There is a significant correlation between the two variables, as the value of the correlation coefficient, arranged according to the dimensions, respectively (strategic vision, strategic intelligence, and strategic thinking), reached (0.464), (0.436) and (0.411), at a level of significance of 0.05)), which is the value of It ranged from very good to relatively good.

These results indicate that the more leaders in the universities surveyed enjoy the characteristics of a strategic thinker, the more they are able to adopt the quality of organizational improvisation.

Table 6

The correlation relationship					
Strategic thinker					average
		<i>Vision</i>	<i>intelligence</i>	<i>Thinking</i>	
the quality of organizational improvisation	internal resources	0.339	0.456	0.446	0.519
	implicit capabilities	0.438	0.274	0.242	0.379
average		0.464	0.436	0.411	0.537

N=80 Sig=(0.05)

Table (7) shows the results of measuring the correlation relationship between the specifications of the strategic thinker and the quality of organizational improvisation at the level of each university. Correlation

at the University of Samarra (0.708), at the University of Kirkuk (0.496), and at the University of Tikrit (0.444), respectively, at a significant level of 0.05

Table 7

Correlation relations at the level of each university			
Correlation Coefficient	N	University	-
0.444	43	Tikrit	1
0.496	22	Kirkuk	2
0.708	15	Samarra	3

N=80 Sig=(0.05)

We conclude from the preceding that all of the test results for the correlation between strategic thinker specifications and the quality of organizational improvisation at the macro and university levels were positive and moral, ranging from good to very good to excellent, and thus we come to accept the hypothesis of the first study

Testing the second hypothesis: Based on the content of the hypothesis that indicates the existence of a significant influence relationship to the dimensions of the specifications of the strategic thinker in the quality of organizational improvisation at the macro level, at the level of dimensions, and at the level of each university, we present the test results as follows:

- **At the macro level:** the results indicate the existence of a significant influence relationship for the specifications of the strategic thinker in the quality of organizational improvisation, as the total of what the dimensions of the specifications of the strategic thinker explain in the the quality of organizational improvisation variable according to the value of (R²) amounted to about (29%), while (71%) of the change in the culture of excellence is attributed to other random variables that cannot be controlled or that they were not included in the regression model, and this is supported by the value of the regression coefficient (B1) of (0.537), which indicates that if the strategic thinker specifications variable increases by one unit The the quality of organizational improvisation variable will increase by (0.537), which is a significant increase according to the calculated (F) value, which amounted to (31.57) and is greater than its tabular value of (4.001) at two degrees of freedom (1.78) and within the level of significance (0.05), as well as According to the calculated (T) value of (5.61) which is greater than its tabular value of

(1.671) under the level of significance (0.05). These results show the importance of the specifications of the strategic thinker in the quality of organizational improvisation.

- **At the dimensional level,** the results indicate the following:

The impact of the strategic vision dimension on the quality of organizational improvisation. Table (8) shows that there is a significant effect relationship to the strategic vision dimension in the quality of organizational improvisation, as the total of what is explained by the strategic vision dimension in the quality of organizational improvisation according to the value of (R²) amounted to about (22%), while (78%) Of the change in the quality of organizational improvisation is attributed to other random variables that cannot be controlled or that they were not included in the regression model, and this is supported by the value of the regression coefficient (B1) of (0.464), which indicates that if the strategic vision increases by one unit, the the quality of organizational improvisation variable It will increase by (0.464) units, which is a significant increase according to the calculated (F) value, which amounted to (21.35), which is greater than its tabular value of (4.001) at two degrees of freedom (1.78) and within a significant level (0.05), as well as according to the value of (The calculated T of (4.62) which is greater than its tabular value of (1.671) under the level of significance (0.05), and these results illustrate the role of the strategic vision dimension in the quality of organizational improvisation.

The impact of the strategic intelligence dimension on the quality of organizational improvisation

Table (8) shows that there is a significant effect relationship for the dimension of strategic intelligence

in the quality of organizational improvisation, as the total of what is explained by the dimension of strategic intelligence in the quality of organizational improvisation according to the value of (R²) amounted to about (19%), while (81%) Of the change in the culture of excellence is attributed to other random variables that cannot be controlled or that they were not included in the regression model, and this is supported by the value of the regression coefficient (B₁) of (0.436), which indicates that if the strategic intelligence dimension increases by one unit, the the quality of organizational improvisation variable will increase By (0.436) units, which is a significant increase according to the calculated (F) value of (18.30), which is greater than its tabular value of (4.001) at two degrees of freedom (1.78) and within a significant level (0.05), as well as according to the value of (T)) calculated amounting to (4.27) which is greater than its tabular value of (1.671) under the level of significance (0.05), and these results illustrate the role of the strategic intelligence dimension in the quality of organizational improvisation.

The impact of strategic thinking on the quality of organizational improvisation.

Table (8) shows that there is a significant effect relationship for the dimension of strategic thinking in the quality of organizational improvisation, as the total of what is explained by the dimension of strategic thinking in the quality of organizational improvisation according to the value of (R²) amounted to about (17%), while (83%) Of the change in the culture of excellence is attributed to other random variables that cannot be controlled or that they were not included in the regression model, and this is supported by the value of the regression coefficient (B₁) of (0.411), which indicates that if it increases after strategic thinking by one unit, the variable of the quality of organizational improvisation It will increase by (0.411) units, which is a significant increase according to the calculated (F) value of (15.85), which is greater than its tabular value of (4.001) at two degrees of freedom (1.78) and within a significant level (0.05), as well as according to the value of (The calculated T of (3.98), which is greater than its tabular value of (1.671), is below the level of significance (0.05). These results illustrate the role of the strategic thinking dimension in the quality of organizational improvisation.

Table 8

results of the influence relationship between variables and dimensions

Ex. Variable Resp. variable	the quality of organizational improvisation				
<i>strategic thinker</i>	B ₀	B ₁	R ²	F	T
<i>strategic vision</i>	0.476	0.464	0.215	21.35	4.62
<i>strategic intelligence</i>	0.416	0.436	0.190	18.30	4.27
<i>strategic thinking</i>	0.424	0.411	0.169	15.85	3.98
<i>Dimensions combined</i>	0.428	0.537	0.288	31.57	5.61

*P ≤ 0.0 df

(1,78)

N= 80

It is clear to us from the above, that the most influential dimensions of the specifications of the strategic thinker in the quality of organizational improvisation is the strategic vision from the rest of the other explanatory dimensions, followed by strategic intelligence and then after strategic thinking finally

The third hypothesis test

Based on the content of the third hypothesis, which refers to the varying levels of influence of the specifications of the strategic thinker in the quality of organizational improvisation in the researched educational institutions, and in light of the results of table (9) we present the test results as follows: (R², which amounted to (0.501), as well as according to the value

of (T) calculated, which amounted to (3.61), while the University of Kirkuk came in second place, where the value of the coefficient of determination reached (R²), (0.246), as well as according to the value of (computed T) which amounted to (2.55), The University of Tikrit comes in third place with a coefficient of determination (R²) that amounted to about (0.197), and this is supported by the value of (T) calculated, which amounted to (3.17).

And the data of these results confirm the acceptance of the third hypothesis, which indicates the varying levels of influence of the specifications of the strategic thinker on the quality of organizational improvisation in the educational institutions studied.

Table 9

The results of the relationship of the impact of the specifications of the thinker in improvisation at the level of each university

Ex. Variable Resp. variable	the quality of organizational improvisation						
<i>strategic thinker</i>	University	N	B ₀	B ₁	R ²	F	T
	Tikrit	43	.335	0.444	0.197	10.04	3.17
	Kirkuk	22	0.532	0.496	0.246	6.51	2.55
	Samarra	15	0.504	0.708	0.501	13.03	3.61

*P ≤ 0.05

df (1,78)

N=80

CONCLUSIONS

To complement the study's methodology, the intellectual frameworks for its variables, and the results of the statistical analysis used in proportion to its limits and hypotheses, this axis is devoted to reviewing the most important results and recommendations made by the study, and through the following two paragraphs:-

The specifications of the strategic thinker are one of the most important requirements for initiating leadership work, but rather for choosing the leadership itself, which represents the solid ground upon which we can build a strategic personality capable of dealing with environmental developments successfully and with distinction.

These specifications are gaining in our changing world a great deal of importance, if we want our businesses to excel and our organizations to succeed and excel and to elevate their social responsibility, now or in the future. Therefore, the strategic minds who aspire to seize opportunities before others who have unimportant intellectual dimensions will prevail. It allows them to visualize, intuition, foresight, and perceive with the aim of penetrating the unknown and approximating the image of the future.

The quality of organizational improvisation is a bold step forward under complex environmental conditions that contribute to the development of administrative leaders and the generation of new and resulting experiences and makes these organizations more capable of achieving the goals for which they were established.

Improvisation is a complement to planning and not a substitute for it. When pre-prepared plans are unable to meet the challenges and ambiguous circumstances surrounding them, in this case the organization resorts to the quality of organizational improvisation and prepares it as an emergency strategy through which it can confront everything that is new and urgent.

Improvisation is not a bad phenomenon except as much as it relates to chaos that leads to bad results. Rather, it is an effective tool through which organizations can face crises and the surprise that faces the leaders of organizations when they are going through difficult circumstances and crises under the influence of time pressure and the inability of planning to address these conditions and crises.

The academic leaders of the study sample possess an understanding and awareness about the study variables, as the answers in general were very good, and the positive trend proves that the specifications of the strategic thinker support the adoption of the process of the quality of organizational improvisation.

The results of the variable of the quality of organizational improvisation and the significance of its dimensions showed that academic leaders in universities have a clear vision of the process of improvisation, and the internal resources dimension ranked first with a rate of (84.16%), which is a very good percentage, then came after implicit capabilities in the second place with a rate of (76.4%). .

The results showed that there is a significant correlation relationship between the specifications of the strategic thinker for the leaders of the surveyed organi-

zations in terms of their variables and the quality of organizational improvisation according to the value of the correlation coefficient at the macro and micro levels. Followed by strategic intelligence, and then after strategic thinking. As for measuring the correlation relationship at the level of universities according to the value of the correlation coefficient, Samarra University was in the first place, then Kirkuk University in the second place, while Tikrit University came in the third place.

The conclusions related to the statistical test confirm the validity of the sixth main hypothesis which states (there is a significant effect relationship to remove the specifications of the strategic thinker in the quality of organizational improvisation) according to the value of the regression coefficient and the (T) and (F) test. As for the results of measuring the influence relationship on The level of universities The sample of the study was Samarra University in the first place, then the University of Kirkuk in the second place, followed by the University of Tikrit.

RECOMMENDATIONS

If the results of the hypothesis testing that it is permissible to speak are an indication of the existence of a problem, the conclusions are an analysis and clarification of the causes of the problem, while the recommendations are a treatment for the problem, and the following study presents a set of recommendations that may be a modest contribution to providing a treatment prescription that can be guided by organizations The study sample to avoid the weaknesses in the dimensions of the study and to strengthen the strengths.

1. The management of the researched universities should be interested in the results of the relationship between the variables of the study and the reflection of this relationship on the nature of the work of the universities of the study sample. The study recommends the need to pay attention to these variables and give them more importance because of their great impact in determining the future of the organization and ensuring its survival, as well as trying to benefit from this connection in Drafting university plans and making the required changes.

2. Activating the the quality of organizational improvisation process system to employ the universities' practice of their roles in community service and everything related to scientific research, consultations, programs, training courses, awareness and education in order to improve the educational level and benefit from new experiences.

3. The university administration should realize beyond any doubt the importance of the role played by academic leaders in universities and the great responsibility placed upon them. Therefore, it must improve the selection of these leaders and conduct specialized development courses for them continuously in order to enhance their knowledge, experience, skills and develop their characteristics. Leadership to support successful organizational change that matches the future directions of these organizations.

4. Organizations that aspire to success and seek to change their negative view of the quality of organizational improvisation, as it is a complement to planning

and not a substitute for it. When previously prepared plans are unable to meet the challenges, organizations resort to the quality of organizational improvisation and consider it an effective tool that enables the leaders of organizations to overcome these difficulties and achieve success. It suggests the need to develop the ability of its employees to the quality of organizational improvisation, and considers it the only way to save these organizations from surprises

5. Since change has become an inevitable issue, and stability has become anomalies or anecdotes, the management of organizations must research the developments of strategic management in order to discover a new method for dealing with everything that is new and emergency. Ambiguity and complexity, and that organizations that do not practice the quality of organizational improvisation will remain captives to traditional plans, and that achieving the goals for which they were established has become a far cry.

6. Given the importance of the topic covered by the study and the great role that academic leaders play in universities, we find it necessary to apply this study to other production and service organizations to diagnose the impact of the specifications of the strategic thinker on the quality of organizational improvisation in a more comprehensive manner.

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TECHNICAL SCIENCES

RECOMMENDATIONS ON THE USE OF DRILLING FLUIDS FOR DRILLING WELLS DUAL COMPLETION

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Abstract

The article deals with the use of drilling fluid for the inter-interval drilling of exploratory wells (directional and vertical). The point-to-point application of the ALKAR-3M drilling fluid and the Versadril type hydrocarbon base solution is highlighted and described. This work can be used to conduct drilling operations in deep exploration wells in fields with difficult mining and geological conditions, in order to conduct drilling operations without complications and accidents.

Keywords: Oil-emulsion humate-lignosulfonate solution, alumocalcium solution, hydrocarbon-based solution, hydrophobization, inhibitor, rheology.

Let's consider the formulation of drilling fluid for two exploration wells drilled at the Northern Goturdepe multi-layer field in order to develop them by dual completion of productive horizons.

By well №147 of the Northern Goturdepe field.

The complex thermogeochemical conditions of drilling well №147 of the Northern Goturdepe area cause, starting from zero and up to the design depth, the need to use drilling fluids with a reduced water yield and easily adjustable rheological and structural-mechanical parameters.

Water-based drilling fluids with an interval change of the type of chemical treatment, providing for a smooth transition from solutions stabilized with sodium - humates and lignosulfonates, are transferred to inhibited systems of alumocalcium solutions - ALKAR-3M.

Temperature ranges of drilling fluids application:

- Oil-emulsion humate-lignosulfonate solution - +22 - +34 °C;
- alumocalcium solutions - ALKAR-3M - +34 - +92 °C;
- hydrocarbon-based solution - +92 - +104 °C

An oil-emulsion humate-lignosulfonate solution is used from the beginning of drilling until its effectiveness drops. With the decrease in the effectiveness of the oil-emulsion humate-lignosulfonate solution, the transfer to the inhibited solutions of the ALKAR-3M system and the opening of productive layers on a hydrocarbon-based solution is carried out [1].

Drilling interval 0 - 600 m

When drilling a well from zero to a depth of 600 m, an oil-emulsion humate-lignosulfonate solution is used to drill unstable sand-clay rocks of the quaternary deposit and stabilize the wellbore.

Stabilizers reagents are used as regulators of the properties of the drilling fluid: humates - coal-alkali reagent and ligno-sulfonates - condensate of sulfate-alcohol bard (KSSB-2) Caustic soda (NaOH) is used to regulate the alkalinity of the calcium solubility solution in

seawater. Oil and graphite are used from specialized reagents functionally designed to hydrophobize the solid phase of drilling fluid and improve lubricating properties. To prevent foaming of the solution, a surfactant HT-48 is used. The hydrogen pH of the solution is 8.5-9.0.

Drilling interval 600 - 2700 m

When drilling a well from a depth of 600 m to a depth of 2700 m, an inhibited ALKAR-3M solution is used. This solution is used to cover high-colloidal "black clays" of the Absheron tier, prone to collapses. ALKAR-3M suppresses the lyophilicity of clays, reduces the accumulation of excess volume of drilling fluid and at the same time provides stability and strengthens the walls of the borehole.

Reagents are used as regulators of drilling fluid properties: stabilizers lignosulfonates - ferrochromolignosulfonate (FHLC) and KSSB-2, inhibitors - alkaline hydrolysates of Portland cement, thermostabilizers - sodium bichromates ($\text{Na}_2\text{Cr}_2\text{O}_7$) or potassium ($\text{K}_2\text{Cr}_2\text{O}_7$), alkalis - NaOH. The hydrogen pH of the solution is 10-12 [2].

Drilling interval 2700- 3800 m

When drilling a well from a depth of 2700 m to a depth of 3800 m, an inhibited heat-resistant solution of ALKAR-3M is used in a zone of moderate temperatures of +92 °C. This solution is used to suppress clays of the lower red-colored thickness, stabilize the borehole and excessive saturation of the drilled rock. Provides stability of the solution parameters in the zone of moderate temperatures.

Drilling interval 3800- 4555 m

When drilling a well from a depth of 3800 m to a depth of 4555 m, a hydrocarbon-based solution is used in the zone of elevated temperatures +104 °C, in order to suppress the clays of the lower red-colored thickness and open the productive layers of the well, stabilize the wellbore and excessive saturation of the drilled rock. Provides stability of the solution parameters in the zone of elevated temperatures.

Hydrocarbon-based solutions provide the possibility of drilling unstable, swelling or expanding rocks in the aquatic environment, prevent oil seal formation and tool grabs due to the pressure drop between the well and the formation. They have the best lubricating properties, protect the tool from corrosion. Such solutions have advantages when drilling deep hot wells, salt, anhydrite sediment zones, when drilling small diameter, directional drilling, when drilling formations containing hydrogen sulfide and hydrogen dioxide.

When drilling wells in the areas of Western Turkmenistan, solutions of the "normal" Versadril system have been widely used. This system is a solution based on diesel fuel with a highly emulsified system that withstands high temperatures and at the same time does not lose the stabilizing properties of the solution. This system is successfully used for drilling deep wells.

By well №37 of the Northern Goturdepe field.

The complex thermogeochemical conditions of drilling well №37 of the Northern Goturdepe field, starting from zero and up to the design depth, the need to use drilling fluids with a reduced water yield and easily adjustable rheological and structural-mechanical parameters.

Water-based drilling fluids with an interval change of the type of chemical treatment, providing for a smooth transition from solutions stabilized with sodium - humates and lignosulfonates, are transferred to inhibited systems of alumocalcium solutions - ALKAR-3M.

Temperature ranges of drilling fluids application:

- Oil-emulsion humate-lignosulfonate solution - +22 - +40 °C;
- alumocalcium solutions - ALKAR-3M- +40-+121 °C.

An oil-emulsion humate-lignosulfonate solution is used from the beginning of drilling until its effectiveness drops. With a decrease in the effectiveness of the oil-emulsion humate-lignosulfonate solution, the transfer to the inhibited solutions of the ALKAR-3M system is carried out [3].

Drilling interval 0-800m

When drilling a well from zero to a depth of 800 m, an oil-emulsion humate-lignosulfonate solution is used to drill unstable sand-clay rocks of quaternary sediment and stabilize the wellbore.

Stabilizers reagents are used as regulators of the properties of the drilling fluid: humates - coal-alkali reagent and ligno-sulfonates - condensate of sulfate-alcohol bard (KSSB-2). Caustic soda (NaOH) is used to regulate the alkalinity of the calcium solubility solution in seawater. Oil and graphite are used from specialized reagents functionally designed to hydrophobize the solid phase of drilling fluid and improve lubricating properties. To prevent foaming of the solution, a surfactant HT-48 is used. The hydrogen pH of the solution is 8.5-9.0.

In the future, the processing of an oil-emulsion humate-lignosulfonate solution is carried out in order to reduce the viscosity of the solution and water loss to the set values of the parameters. If the pH of the solution falls below the value, the required amount of NaOH should be introduced into the solution. Preparation and

addition of reagents in the future is carried out as needed [4].

Drilling interval 800- 2800 m

When drilling a well from a depth of 800 m to a depth of 2800 m, an inhibited ALKAR-3M solution is used. This solution is used to cover high-colloidal "black clays" of the Absheron tier, prone to collapses. ALKAR-3M suppresses the lyophilicity of clays, reduces the accumulation of excess volume of drilling fluid and at the same time provides stability and strengthens the walls of the borehole.

Reagents are used as regulators of the properties of drilling fluid: stabilizers lignosulfonates - ferrochromolignosulfonate (FHLIC) and KSSB-2, inhibitors - alkaline hydrolysates of Portland cement, thermostabilizers - sodium bichromates ($\text{Na}_2\text{Cr}_2\text{O}_7$) or potassium ($\text{K}_2\text{Cr}_2\text{O}_7$), alkalis - NaOH. The hydrogen pH of the solution is 10-12.

For 100 m³ of drilling fluid, it is necessary to add 10-15 tons of oil and 500 – 700 kg of graphite. All these reagents are alternately added to the drilling fluid during one circulation cycle, depending on the volume of the drilling fluid being processed.

The need for further post-treatment of the "weakened" inhibited solution is expedient with an increase in structural and mechanical properties by 10-15%.

Drilling interval 2800-4800 m

When drilling a well from a depth of 2800 m to a depth of 4800 m, an inhibited heat-resistant solution of ALKAR-3M is used in the zone of elevated temperatures +113 °C. This solution is used to suppress clays of the lower red-colored thickness, stabilize the borehole and excessive saturation of the drilled rock. Provides stability of the solution parameters in the zone of elevated temperatures.

Drilling interval 4800-5200 m

When drilling a well from a depth of 4800 m to a depth of 5200 m, an inhibited ALKAR-3M solution is used in the zone of elevated temperatures +121 °C in order to suppress clays of the lower red-colored thickness and open productive layers of the well, stabilize the wellbore and excessive saturation of the drilled rock. Provides stability of the solution parameters in the zone of elevated temperatures.

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DEVELOPMENT OF WELL DESIGNS FOR THEIR DUAL COMPLETION

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Abstract

This article describes the development of a well design for dual completion (DC) of multi-layer deposits in order to accelerate the development and increase oil production with the introduction of new technologies and highly efficient equipment. Calculations were made for the development of a well design for DC from the two-year operation of three large horizons, consisting of 7-9 productive layers. As a result, it was determined that the resulting large inflow of oil during the development of these wells proves the success of drilling operations in this area, proving that it is reasonable to choose the right design for dual completion operation of wells.

Keywords: oil and gas phenomenon, conductor, shoe, annular space, borehole, casing string, wellhead, preventer.

The development of the well design begins with the solution of two problems; the determination by calculation of the nominal diameters of the casing strings and the diameters of the rock-breaking tool.

The number of casing strings is determined based on the analysis of the geological section and the location of the well, the presence of areas where drilling is associated with great complications, analysis of changes in the coefficients of anomalous reservoir pressure and absorption indices, as well as accumulated practical experience of well wiring.

The depth of descent of each casing string is specified in such a way that its lower end is in the range of stable monolithic weakly permeable rocks, and that it completely overlaps the intervals of weak rocks in which hydraulic fracturing can occur when opening zones of abnormally high reservoir pressures in the underlying interval [1].

The diameters of the bits, the diameters of the casing columns, the depth of transition from a larger diameter of the well to a smaller one, the depth of descent of the casing columns, the height of the cement mortar behind the casing columns constitute the concept of the well design. The depth of the conductor's descent is determined by the requirement of fastening the upper unstable deposits and isolation of the upper aquifers or absorbing horizons.

When drilling oil and gas fields with high reservoir pressure, it often becomes necessary to install preventers at the mouth of the conductor, then the depth of the installation of the conductor's shoe is calculated from the condition of preventing hydraulic fracturing during the elimination of oil and gas occurrences according to the formula (1).

$$H = 100 \times P_w + P_{w1} / \gamma_{e.grad} - \gamma_{res.fl.}; \quad (1)$$

The length of the conductor and the height of its cementing are chosen in such a way that it is strong enough and can reliably withstand the forces that may arise when the preventer is closed under the influence of the pressure of productive layers. The possibility of a gas breakthrough from the well through the annular space or through cracks connecting the borehole to the surface should also be excluded.

To select the number of intermediate technical columns and the depth of their descent, a combined graph of changes in reservoir pressure, hydraulic fracturing pressure and hydrostatic pressure of the drilling fluid column is constructed in the coordinates "depth is equivalent to the pressure gradient".

Hydraulic fracturing pressure is determined by the formula (2).

$$P_{frac.} = 0,0083H + 0,66P_{res}; \quad (2)$$

In the intervals of occurrence of rocks in which a violation of the borehole zone of the well is possible, where the density of the drilling fluid is selected taking into account the rock pressure, instead of reservoir pressure, rock pressure is applied to the combined graph.

The zones of compatible drilling conditions are the zones of attachment of wells by casing strings, their number corresponds to the number of casing strings.

The compatibility of drilling conditions is understood as such a combination when the created parameters of the technological processes of drilling the underlying interval of the well will not cause complications

in the drilled overlying interval, if the latter is not fixed by the casing.

The diameter of the drill bits for the selected casing string is determined by the required borehole between the column and the wall of the well. The size of the borehole depends on the diameter and type of connections of the casing pipes and the profile of the well, the complexity of geological conditions, hydrodynamic pressures during drilling and fixing the interval, the exit from under the shoe of the previous column [2]. The

size of the borehole between the casing and the wall of the well is chosen based on the analysis of the experience of drilling and fixing wells in this area and in similar geological conditions of other neighboring fields or according to the results of specially commissioned research work when drilling support wells in this area. If such data are not available, then when choosing bit diameters, you can use the following recommendations in Table 1.

Table 1.

To select the diameter of drill bits

Casing pipe diameter, mm	114-127	140-168	178- 194	219- 245	273-299	324-351	377-426
Borehole, mm	7-10	10-15	15-20	20-25	25-35	30-40	40-50

For the correct selection of the downhole design of directional and horizontal wells, it is necessary to study the lithological and physical characteristics of deposits-reservoir properties of productive layers (porosity, permeability), mineralogical composition, power, conditions of saturation with oil, physical and mechanical properties of rocks [3].

Previously, the following well design was used for drilling wells at the North Goturdepe field.

Conductor Ø 426 mm – 200 m,

I technical column Ø324 mm-1600 m

II technical column Ø244.5 mm – 3600 m

The production column Ø139.7mm is 4000-4500 m. depending on the layers being opened according to the project.

In order to conduct research on our scientific work and in order to select the design of wells for dual completion of several productive formations on one well, a thorough study of previously drilled wells was carried out and new types of well designs were selected with a full analysis of geological and geophysical materials.

Based on the parameters of reservoir pressures at the corresponding depths, calculations were made separately for wells №№ 37, 200 and 156 of the values of the equivalents of reservoir pressure gradients according to the formula (3):

$$P_{grad.res} = P_{res} / 0,01 \times H; \quad (3)$$

Based on the "Safety rules in the oil and gas industry", we find the value of the hydrostatic pressure of drilling fluid for wells №№ 37, 156 and 200.

The minimum excess of the hydrostatic pressure of the drilling fluid column relative to the roof of the formation being opened is shown in Table 2.

The hydraulic fracturing pressure coefficient is determined by the formula (4).

$$K_{frac.} = P_{hydr.} / 0,01 \times H; \quad (4)$$

Based on the calculation results, a combined pressure graph and calculation of the wellbore trajectory were constructed and the following designs were selected.

Table 2.

Minimum excess of the hydrostatic pressure of the drilling fluid column relative to the roof of the formation being opened

Well depth (interval), m	Minimum excess of the hydrostatic pressure of the drilling fluid over the reservoir (repression), kgf/cm ²	
	for oil-saturated reservoirs	For gas-bearing, gas-condensate formations and formations in unexplored intervals of exploration wells
<1000	10,0	15,0
1001 - 2500	15,0	20,0
2501 - 4500	20,0	22,5
>4501	25,0	27,0

When choosing and justifying the design of the well № 37 North Goturdepe, the requirements of the "Safety Rules in the Oil and Gas Industry", the Regulations for calculating intermediate columns when Drilling wells on the areas of the State Concern «Turkmenneft» were taken into account and geological and technical information on previously drilled wells on the North Goturdepe area was used.

The choice of the well design was carried out in accordance with the intervals of compatibility of the well section according to the mining and geological

drilling conditions, based on the forecast curves of reservoir pressure of rock rupture, and the following design was justified.

- the shaft direction Ø720 mm descends to a depth of 10 m, is fixed with butobeton.

- the elongated direction of Ø530 mm descends to a depth of 30 m, in order to overlap unstable, sandy-clay deposits and prevent erosion of the wellhead when drilling under the conductor. The height of the cement lifting is up to the wellhead.

The conductor Ø426 mm descends to a depth of 594 m, provides overlap of the upper part of unstable

sandy-clay quaternary deposits, isolation of the borehole from hydrostatically connected waters with the surface and installation of anti-blowout equipment.

The technical column Ø324 mm descends to a depth of 2781 meters to overlap the swelling and collapse of the "black clays" of the Absheron tier and reduce the interval of the open hole when drilling for the second technical column Ø244.5 mm, is equipped with anti-blowout equipment and to ensure effective well management in case of possible manifestations. The descent of the Ø324mm technical column is carried out in two sections. The head of the I section is installed in a stable part of the open hole section, in the range of 1700-2300 meters with logging adjustments. The height of the cement rise behind the column is up to the wellhead.

The descent of the technical column with a diameter of Ø244.5 mm is carried out to a depth of 4761 meters, in order to prevent the absorption of drilling fluid with a density of 2.08g/cm³ and the tack of the drilling tool under the influence of pressure drop, as well as effective well management during manifestations using blowout equipment. The descent of the Ø244.5 mm technical column is carried out in two sections, and the head of the I section is installed with an approach of 50-100 meters into the Ø324 mm technical column.

The descent of the operational filter shank Ø177.8 mm is carried out to a depth of 4906 meters along the hole (the length of the shank is 4691m-4906m), by installing a suspension device for 50-100 meters inside the casing Ø244.5 mm in order to overlap productive horizons.

At borehole №156 North Goturdepe, the following design was chosen based on a combined pressure graph and calculation of the borehole trajectory.

- the shaft direction Ø720 mm descends to a depth of 10 m, is fixed with butobeton.
- the elongated direction of Ø630 mm descends to a depth of 30 m, in order to overlap unstable, sandy-clay deposits and prevent erosion of the wellhead when drilling under the conductor. The height of the cement lifting is up to the wellhead.

The conductor Ø426 mm descends to a depth of 398 m, provides overlap of the upper part of unstable sandy-clay quaternary deposits, isolation of the borehole from hydrostatically connected waters with the surface and installation of anti-blowout equipment.

The technical column Ø324 mm descends to a depth of 1999 meters to cover the swelling and collapse of "black clays", is equipped with anti-blowout equipment and provides effective well management in case of possible manifestations. The height of the cement rise behind the column is up to the wellhead.

The descent of a technical column with a diameter of Ø244.5 mm is carried out to a depth of 4156 meters, into the roofing part of the productive horizon IX_{d+e} with an adjustment according to logging data. The shoe of the technical column is installed in clay deposits. The casing Ø244.5 mm column was selected according to calculations for the perception of all loads arising during drilling and operation of wells. The height of the cement rise behind the column is up to the wellhead.

The descent of the operational slot shank – filter Ø139.7 mm, is carried out to a depth of 4298.5 meters (the length of the shank is 4147-4298.5 meters), with the installation of a suspension device for 50-100 meters inside the casing Ø244.5 mm. The descent of the slit shank – filter Ø139.7 mm combination with casing pipes is carried out in order to attach the filter to the wall of the well and isolate productive layers from others. The fastening is made by special expansion packers installed as part of the descent slot shank – filter Ø139.7mm [4].

At well №156 North Goturdepe, in order to dual completion several productive horizons separately, the depth of descent of the second technical column was increased by Ø244.5 mm for fixing the upper productive horizons and the lower horizons with special filters without cementing in the form of a shank.

According to well-known schemes, wells with directional finishing filter without cementing in productive zones has the following advantages:

- simple mounting technology;
- the bottom-hole zone of the productive formation is not polluted with cement;
- ensures the safety of the hole;
- it is possible to carry out work on cleaning the hole.

For wells №. 37 and №. 200 of the Northern Goturdepe, in order to dual completion several productive horizons separately, the depth of descent of the second technical column was increased by Ø244.5 mm for fixing the upper productive horizons, and the lower horizons by casing columns Ø139.7 mm with cementing in the form of a shank.

According to the schemes of the well ending in the form of a shank with full cementation in productive zones, there are the following advantages:

- to use the development of the technology of exploration, cementing, secondary opening and development of the well;
- to ensure the overlap of the zones of reservoir water intake and the tightness of the inclined part of the hole;
- to operate overlapping collectors.

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