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STUDY OF TRAINING PRIORITIES FOR PROVIDING PHARMACEUTICAL CARE TO PEOPLE WITH DIABETES MELLITUS IN UKRAINE.

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ИЗУЧЕНИЕ ПРИОРИТЕТОВ ОБУЧЕНИЯ ДЛЯ ПРЕДОСТАВЛЕНИЯ ФАРМАЦЕВТИЧЕСКОЙ ПОМОЩИ ЛЮДЯМ С САХАРНЫМ ДИАБЕТОМ В УКРАИНЕ.

Summary. Priorities of training to provide pharmaceutical care to people with diabetes have been investigated. The majority of pharmacists express their support for the implementation of pharmaceutical care to patients with diabetes. Pharmacists need to increase knowledge to provide pharmaceutical care to patients with diabetes. Based on this research, we have identified the main aspects of knowledge and skills for the training program for pharmacists for the implementation of pharmaceutical care to patients with diabetes.

Аннотация. Исследованы приоритеты обучения для оказания фармацевтической помощи людям с сахарным диабетом. Большинство фармацевтов высказываются за введение фармацевтической помощи больным сахарным диабетом. Установлена необходимость повышения знаний фармацевтов для предоставления фармацевтической помощи больным данной нозологией. Установлены основные потенциальные вопросы и навыки для программы тематического усовершенствования провизоров и фармацевтов по внедрению фармацевтической помощи больным сахарным диабетом.

Key words: *pharmaceutical care, diabetes mellitus, postgraduate education, pharmacist, pharmacy, patient with diabetes mellitus.*

Ключевые слова: *фармацевтическая помощь, сахарный диабет, последипломное образование, фармацевт, аптека, пациент с сахарным диабетом.*

Introduction.

Diabetes mellitus is rapidly becoming a "epidemic of the twenty-first century." According to the latest data from the Atlas of the International Diabetes Federation, 1 in 11 adults has diabetes and according to prognosis, in 2045 there will be 629 million people with diabetes. The disease increases the risk of heart attack, stroke, blindness, kidney diseases, and limb amputation. Therefore, undoubtedly the global pandemic of diabetes is a significant burden on healthcare systems [1].

Investigations of scientists show a significant role of pharmacists in diabetes care for patients with diabetes. They, in collaboration with other health providers, can improve the results of diabetes treatment through the provision of qualified pharmaceutical care (PC). This improves glycemic, lipid control and blood pressure, reduces the risk of serious complications in patients. This promotes

compliance with medical standards. Thus, pharmacists, in partnership with other healthcare providers, can address the growing medical and economic risks of diabetes [2].

The specialist's who provide PC must have the appropriate knowledge and practical skills to help patients with diabetes to manage their illness effectively, provide health lifestyle, etc. Today, the relevance of applying the personified approach has increased, taking into account age, gender, cultural and national traditions and preferences. All this requires additional training of specialists. Therefore, they should be encouraged in postgraduate training.

In the world there are examples of aimed work of pharmacists with this category of people and the introduction of training programs for pharmacists about diabetes. Thus, the Canadian Pharmacists Association developed the Diabetes Strategy for Pharmacist to provide education and tools that allow

pharmacists to improve care for people with diabetes [3]. In Germany, certified education programs are developed, such as «pharmaceutical care for patients with diabetes, asthma, coronary heart disease, hypertension, and the like. These programs are offered by all the State Chambers of Pharmacists [4]. In the US, the American Pharmacists Association offers a Certified Program for Pharmacist and Patient-Centered Diabetes Care [5].

Also, in the United States America, you can go through a course and get a certificate in the program "Pharmaceutical Care for Patients with Diabetes", which promotes adherence to the developed Standards of Diabetic Training for Patient-Providing Pharmacists (The Scope and Standards for the Practice of Diabetes Education by Pharmacists) [6]. Also, the American Pharmacists Association has published "Understanding insulin management: Role of the Pharmacist», which allows pharmacists to improve their knowledge in this area and promote the provision of professional PC for the treatment of this group of patients [7]. The Pharmaceutical Society of Australia has been training and supporting pharmacists for the implementation of the Diabetes Medication Assistance Service [8]. But each standard requires consideration of national peculiarities, conditions and priorities. But each standard requires consideration of national peculiarities, conditions and priorities. Therefore, it is important to study the specialists' opinion regarding the introduction of diabetes mellitus in patients with diabetes across Ukraine.

Goal are to conduct a study about the implementation PC for people with diabetes in Ukraine; to identify the knowledge of pharmacists and establish topics for improving knowledge of diabetes problems.

Materials and methods of research.

A survey was conducted in the form of questionnaires. Graphic and structural research methods were also used. The questionnaire for specialists was developed, according to the requirements for sociological tools [9]. The first socio-demographic section included questions about age, sex, region and place of residence (city or village) and work experience.

The second section was devoted to establishing the level of knowledge of pharmacists about diabetes and practical skills for providing PC for patients with diabetes.

Another section served as a definition of the skills necessary for inclusion in the training program of pharmacists for the introduction of PC for patients

with diabetes. The list of proposed skills was based on the document "Practice Guidance on the Care of People with Diabetes," developed by the Royal Pharmaceutical Society of Great Britain [10]. This document was created to help pharmacists, as members of the diabetic care team, to improve and develop the services of patients with diabetes.

Respondents were divided into four groups depending on their work experience.

Results

Participants of the study were pharmacists, trainer pharmacists and pharmacist interns who were undergoing training at the Shupyk National Medical Academy of Postgraduate Education from 01.11.2016 to 20.12.2018. Respondents were from different regions of Ukraine. In analyzing the socio-demographic section, it was found that 382 respondents (92,4% of women and 7,6% of men) participated in the research. The majority of respondents represented Kyiv and Kyiv region (72%). The respondents were also from the regions of Cherkasy (6,8%), Chernihiv (6,0%), Vinnytsa (4,7%), Zhytomyr (2,6%), Sumy and Khmelnytsky (2,1%), Mykolaiv 1,3%, Ternopil, Odessa, Rivne (0,8%). 70% of all respondents live in cities, and 30% - in villages.

To determine the peculiarities of the point of view according to the work experience, respondents were divided into four groups. Pharmacists-interns (57,1%) presented a group of people without work experience. The second group are people with work experience 1 - 10 years (29,8%), the third group are pharmacists with work experience 11 - 20 years (8,1%), and the fourth - specialists with work experience more than 20 years (5,0%).

The specialists were asked to answer questions about DM knowledge of the problem to establish the level of training specialists to provide PC to patients with diabetes. On the question: *The percentage of the incidence of diabetes in the European countries and in Ukraine* was as follows: 10,7% of the polled could not determine the percentage of patients with diabetes at all and only 14,4% indicated correct (or close to the correct figures), others indicated high interest rates morbidity from 20 to 80%. This is probably due to the fact that experts understand the significance of this problem, but do not know a real situation with the incidence of diabetes.

In order to establish awareness about the current state of diabetes, the question is asked. *Select the current classification of the diabetes mellitus*. For the answer are proposed 3 options.

Option to answer	Classification of diabetes mellitus
№ 1	Insulin dependent non-insulin dependent
№ 2	Insulin dependent - type 1 non-insulin dependent – type 2
№ 3	Type 1 Type 2

According to the results of the last study, a group of scientists proposed a new classification of diabetes, taking into account the severity and mechanism of the disease. It is believed that DM is actually five different diseases and treatment should be adapted to

each form of the disease. Experts agree that this study is a predictor of future diabetes treatment, but changes will not be rapid [11]. Therefore, we used the existing etiological classification of diabetes (approved by the WHO) [12, 13], which distinguishes two main types

of the disease - the type 1 and type 2. Also there are gestational diabetes and other specific types of diabetes (diabetes MODY-2, 3, 4, 5, etc.) ((we did not consider them because of the rarity and complexity of these types of diabetes).

The correct answer (option 3) was given by 35,6% of the respondents, and it was the specialists with the work experience of 10-20 years, they gave the correct answer in their group (67,7% in the group), and the least accurately identified the modern classification of specialists with work experience more 20 years. This confirms that, despite the length of work experience, knowledge needs to upgrade.

It is important to know the symptoms of diabetes, which are different for type 1 and type 2 DM. Sometimes, there may not be any symptoms at all, but there is a set of symptoms of diabetes, typical for diabetes of both types: increased thirst and frequent urination (polyuria), dry skin, weight loss, convulsions of the calf muscles, visual impairment, itching of the skin and mucous membranes genital organs. The presence and severity of the symptoms depends on the degree of decrease in insulin secretion, the duration of the disease and the individual characteristics of the patient. Optionally, the presence of all these symptoms is enough and part of the listed signs [14].

On the question *Identify the main symptoms of diabetes*, specialists showed knowledge of only some of the symptoms of diabetes, in addition, all the main symptoms were noted by a small number of

respondents. In general, 2,1% of the respondents could not answer on this question, in this case they were pharmacists of the first group of interns who has not work experience.

The main part of the respondents indicated symptoms: thirst (81,0%), polyuria (32,7%), weight reduction (28,5%), dry skin (29,3%), and tiredness (23,8%).

It should be noted that some specialists know that infectious diseases of the skin (including bacterial and fungal infections of the mucous membranes) (8,9%), skin itching (10,2%) and poor healing of wounds (12,3%). This is very important to know for providing PC, so as not to complicate the course of the disease. Some experts noted as a symptom of diabetes - problems with the legs (pain, convulsions, numbness, edema, tremor) (17,0%) and visual impairment (17,8%). Some pharmacists one of the symptoms indicated the presence of smell of acetone (13,6%) - one of the symptoms of acute complications of diabetes ketoacidosis. The respondents were also called the symptom of increased sweating (8,9%), most likely due to their knowledge about the hypoglycemia [12]. Overweight (obesity) was indicated as a symptom of diabetes (32, 7%), but rather it characterizes the condition of the patient with type 2 diabetes. In Figure 1, information is provided on the responses of specialists regarding to the symptoms of diabetes.

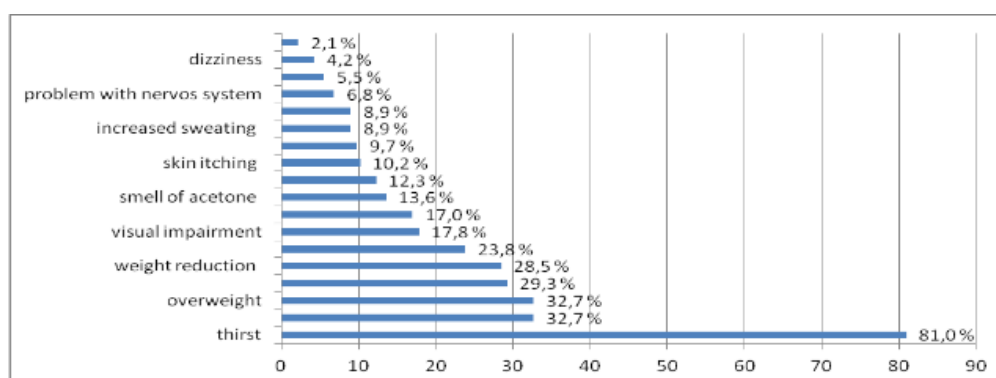


Figure 1. Responses of experts regarding indication of the main symptoms of diabetes mellitus

The following questions relate to insulin. The question *What are the reasons for classification of insulin* suggested to specify several answers, because the single classification of insulin does not exist. It should be noted that the basic knowledge that is required for the provision of PC to patients with diabetes in this regard, available from specialists. 82,0% of respondents noted "by duration", 50,8% - "by source of receipt", 49,7% - "with the possibility of combining short and long duration of insulin in one syringe" and 25,1% - by "concentration"

In another issue relating to insulin, it was suggested that *manufacturers of insulin which on pharmaceutical market of Ukraine*, be indicated [15]. Despite the fact that Ukraine has domestic insulin manufacturers, experts are not well aware of this issue. Thus, 6,0% of respondents did not at all be able to answer this question. But more than half of

specialists noted domestic producers: "Indar", "Farmak" are noted 58,5%, 59,9% respectively. "Sanofi - Aventis" (Germany) is noted 52,5% by the respondents. Despite the fact that the company "Novo Nordisk" (Denmark) has been working on the Ukrainian market for a long time, only 28,2% of the pharmacists noted this company. The same applies to the company "Bioton" (Poland), although it has a significantly shorter working time on the domestic market – 24,2% of the respondents mentioned this manufacturer of insulin. Other manufacturers were noted by a small number of respondents (2,1% - 4,7%).

The low awareness of pharmacists about diabetic medications was determined. At the same time, 33,8% of the respondents could not answer the question *about the main three groups of diabetic medications according to the mechanism of action* [12], moreover,

more than half of the experts surveyed, namely, in the group with a work experience of 11-20 years (in group 58,1 % could not answer the question). Only 5,5% of specialists provided the correct answer to this question. Moreover, most of the specialists in the

group with a work experience of 11-20 years gave correct answers, compared with the number of correct answers in other groups of respondents. Other specialists noted some subgroups of diabetic medications, or indicated some drugs.

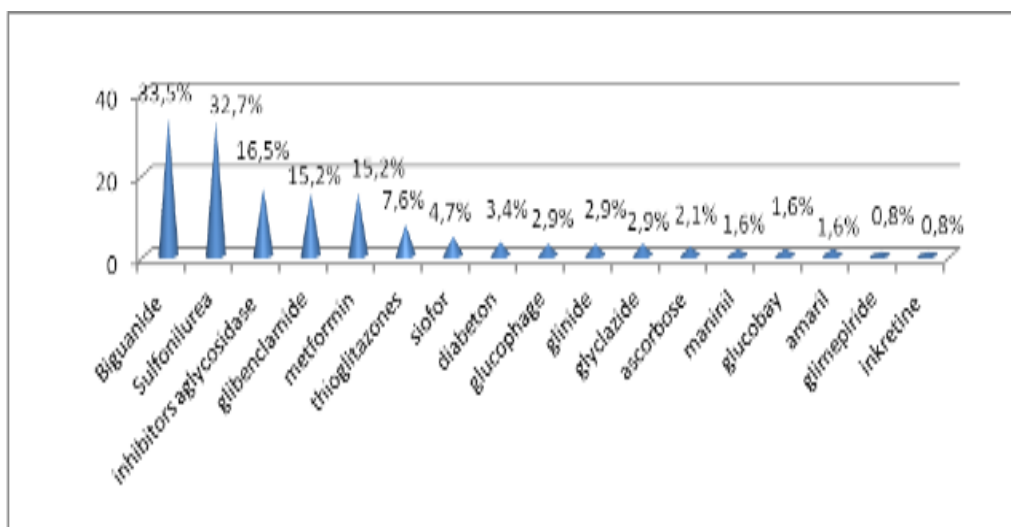


Figure 2. Responses of the specialists about the main groups of tableted glycemic drugs.

It is important to have knowledge about the prevention of diabetes, for the educational work of a pharmaceutical worker - an element of PC. On the question of whether there is a possibility of prevention of diabetes type 1, only a third (31,4%) of specialists gave the correct answer about the lack of data on the prevention of type 1 diabetes. More than half of the respondents (53,1%) answered yes, 15,5% were not determined. And on the question *Is it possible to prevent diabetes type 2?* More than half of the respondents (53,1%) answered correctly - "yes", "but this is not enough, because it is important to know that DM type 2 prophylaxis is possible and includes factors that reduce the risk of developing the disease not less than in 2 times [16, 17, 18].

Despite the fact that 10 years ago, the Resolution of the Cabinet of Ministers of Ukraine dated August 19, 2009, No. 877 (on behalf of President Viktor Yushchenko), was approved by the Cabinet of Ministers of Ukraine on the holding of the annual World Diabetes Day (November 14) at the state and regional levels), when asked about *World Diabetes Day (indicate a month)*, only 42,1% of specialists correctly answered this question. In addition, the largest percentage was in the group of specialists with a work experience of more than 20 years (57,9%). But for the sake of objectivity it is necessary to note, in pharmacies of the Municipal Enterprise "Pharmacy" in Kyiv, for over 15 years, there are social actions on the World Diabetes Day. This makes possibility not only to raise the awareness of the population about DM, but also to detect undiagnosed diabetes. This experience is distributed to pharmacies of other regions (Boryspil, Zaporozhye, etc.).

The question of whether *It is necessary to implement pharmaceutical care depending on the patient's nosology (for example, patients with diabetes)*, most of the specialists (80,7%) responded

positively, and some added comments: "attention should be paid to the care of patients with diabetes when a combination of drugs is in their interaction"; "It is necessary, because the problem becomes large, and the knowledge of the patient is small"; "To prevent the negative consequences of diabetes and inform patients at risk of developing the disease"; "Raise awareness of the population, which will help to detect undiagnosed diabetes"; "Relieve the patient's condition"; "Will help the patient to use the medicine properly"; "The patient should be able to determine the level of blood glucose in the pharmacy"; "Necessarily" and so on. This indicates the understanding of the problem and the need for its solution, and the responsible attitude of the pharmacists to them works. At the same time, 3,4% of the respondents answered "no", where they added comments: "no, because many analyzes are necessary", "this should be done by a doctor, he can diagnose this diseases," etc. In groups with work experience of 11-20 years and over 20 years, there were no negative responses. Other respondents (15,9%) were not identified on this issue.

Thus, despite the lack of knowledge about the problems of diabetes, experts have an understanding of the importance of addressing the problems of patients with diabetes and the need for the introduction of PC, for people with diabetes.

For the introduction of PC for patients with diabetes pharmacists need special knowledge and skills on this issue. This can be solved at the postgraduate education. In developing the curriculum, in addition to taking into account international experience, it is necessary to take into account national characteristics and needs.

In Next block of questions were asked to establish the necessary knowledge and skills to provide PC for patients with diabetes.

The specialists were offered a block of skills and determined *What questions and what skills you need to improve for providing pharmaceutical care for people with diabetes and in the area of diagnosis and monitoring of the patient's condition*, with the indication of this and not, has not been determined.

Respondents indicated the relevant questions (skills) that they needed to provide PC for patients with diabetes (Table 1). The largest percentage (79,1%) of the respondents identified the *Information to provide advice for the prevention of diabetes mellitus*.

Skills to help communicate properly with patients with diabetes were reported by 72,0% of respondents, *Skills for worker as a member of the multidisciplinary diabetic care team* – 73,6%, *Skills to provide adapted information corresponding to the needs and capabilities of the patient* – 75,7%. Despite the fact that *other questions/skills to ensure that the patient understands the advice and information were provided by the pharmacist and skills to identify and overcome barriers in counseling the patient*, the pharmacist scored less votes: 68,1% and 55,8% respectively, but all exactly more than half of the specialists recognized the need for training and on these issues too.

Table 1

ANSWERS OF RESPONDENTS ABOUT THE NECESSARY KNOWLEDGE AND SKILLS FOR PROVISION OF PHARMACEUTICAL CARE FOR PATIENTS WITH DIABETES

Knowledge and skills for provision of pharmaceutical care for patients with diabetes	Groups of respondents							
	Without work experience		work experience 1 - 10 years		work experience 11 - 20 years		work experience more than 20 years	
	Number of people who provided the appropriate answers (%)							
	person	% in group	person	% in group	person	% in group	person	% in group
Correctly communicate with patients with diabetes	y - 161	y - 73,8	y - 65	y - 57,0	y - 31	y - 100	y - 19	y - 100
	n - 52	n - 23,8	n - 39	n - 34,2	n - 0	n - 0	n - 0	n - 0
	nd - 5	nd - 2,4	nd - 10	nd - 8,8	nd - 0	nd - 0	nd - 0	nd - 0
Skills to work as a member of a diabetic care team (doctors, nurses, pharmacists, associations)	y - 169	y - 77,5	y - 73	y - 64,0	y - 21	y - 67,7	y - 19	y - 100
	n - 36	n - 16,5	n - 26	n - 22,8	n - 3	n - 9,7	n -0	n - 0
	nd - 13	nd - 6,0	nd- 15	nd - 13,2	nd - 7	nd - 22,6	nd - 0	nd - 0
Give tips for preventing diabetes	y - 174	y - 79,8	y - 83	y - 72,8	y - 26	y - 83,9	y - 19	y - 100
	n - 34	n - 15,6	n - 23	n - 20,2	n - 0	n - 0	n - 0	n - 0
	nd - 10	nd - 4,6	nd - 8	nd - 7,0	nd - 5	nd - 16,1	nd - 0	nd - 0
Skills to ensure that the patient has understood the advice, information	y - 156	y - 71,6	y - 65	y - 57,0	y - 21	y - 66,7	y - 19	y - 100
	n - 32	n - 23,8	n - 28	n - 24,6	n - 0	n - 0	n - 0	n - 0
	nd - 10	nd - 4,6	nd- 21	nd - 18,4	nd- 10	nd - 32,3	nd - 0	nd - 0
Skills to provide adapted information in accordance with the needs and capabilities of the patient	y - 167	y - 76,6	y - 78	y - 68,4	y - 26	y - 83,9	y - 19	y - 100
	n - 41	n - 18,8	n - 18	n - 15,8	n - 0	n - 0	n -0	n - 0
	nd - 10	nd - 4,6	nd- 18	nd - 15,8	nd - 5	nd - 16,1	nd - 0	nd - 0
Do you think that the same information is necessary for people living with patients with diabetes or it should be another different focus.	y - 185	y - 84,9	y - 78	y - 68,4	y - 24	y - 77,4	y - 19	y - 100
	n - 23	n - 10,5	n - 15	n - 13,2	n -2	n - 6,5	n -0	n - 0
	nd - 10	nd - 4,6	nd- 21	nd - 18,4	nd - 5	nd - 16,1	nd - 0	nd - 0
Skills to identify and overcome barriers to patient counseling pharmacist	y - 133	y - 61,0	y - 54	y - 47,4	y - 17	y - 54,8	y - 11	y - 57,9
	n - 70	n - 32,1	n - 34	n - 29,8	n - 2	n - 6,5	n -8	n - 42,1
	nd - 15	nd - 6,9	nd- 26	nd - 22,8	nd- 12	nd - 38,7	nd - 0	nd - 0

Note: "y" - yes, "n" - no, "nd" - not determined.

In addition, there were questions about practical skills, the answers to which helped identify the skills for inclusion in the training program (Table 2). On the

question *Do you know where to send patients with diabetes, if necessary, to other providers of medical services (doctors, nurses, community organizations,*

schools of self-control) 73.6% of specialists know where to send patients with diabetes if necessary, especially if there are wound processes and skin problems. Only half part of the specialists (54,5%) know *how to calculate the body mass index* needed to give the PC about overweight, which is a factor of diabetes. Only 44,0% of specialists said that if necessary, they could show *how the glucose meter*

works (a portable device for measuring blood glucose), but in different groups this percentage varied in the group of inexperienced people and in the group with experience more than 20 years is similar the percentage of 23,4% and 21,1% respectively. And in the other two groups, about 80% of specialists answered positively.

Table 2

ANSWERS OF RESPONDENTS ABOUT THE NECESSARY PRACTICAL SKILLS FOR PROVISION OF PHARMACEUTICAL CARE FOR PATIENTS WITH DIABETES MELLITUS

Practical skills for provision of pharmaceutical care for patients with diabetes	Groups of respondents							
	Without work experience (218)		work experience 1 - 10 years (114)		work experience 11- 20 years (31)		work experience more than 20 years (19)	
	Number of people who provided the appropriate answers (% in group)							
	«Yes»	«No»	«Yes»	«No»	«Yes»	«No»	«Yes»	«No»
Do you know where to send patients with diabetes, if necessary	169 (77,5%)	49 (22,5%)	75 (65,8%)	39 (34,2%)	21 (66,7%)	10 (33,2%)	19 (100%)	0
Do you know how to calculate the body mass index	133 (61,0%)	85 (39,0%)	49 (43,0%)	65 (47,0%)	21 (66,7%)	10 (32,3%)	6 (31,6%)	13 (68,4%)
Can you show to the patient how to use a blood glucose meter	51 (23,4%)	167 (76,6%)	87 (76,3%)	27 (23,7%)	26 (83,8%)	5 (16,2%)	4 (21,1%)	15 (78,9%)

The prospect of the study is the development of a training program for pharmacists, which will facilitate the introduction of PC for patients with diabetes.

Conclusions

1. The majority of pharmacists (80,9%) understand the importance of the problem of providing special assistance to patients with diabetes and express their support for the implementation PC for patients with this disease.

2. Based on the study, insufficient knowledge of pharmacists about diabetes to provide pharmaceutical assistance to patients with diabetes was found. This state of knowledge does not depend much on the work experience of a specialist.

3. Based on the research conducted by experts, the main potential issues and skills for the training program for pharmacists "Pharmaceutical care for patients with diabetes mellitus" were established.

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