JACARDI

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PUBLIC HEALTH CENTER

Pilot survey report:

EVALUATION OF PREPAREDNESS AND CAPACITY OF PRIMARY HEALTHCARE FACILITIES IN KHMELNYTSKYI REGION TO PROVIDE EXTENDED SCOPE OF SERVICES RELATED TO TYPE 2 DIABETES PREVENTION, SCREENING AND CONTROL, TO HIGH-RISK GROUPS

Kyiv 2025

The report was prepared based on the findings of the pilot survey performed by State Enterprise "Public Health Center of the Ministry of Health of Ukraine" under the Joint Action on Cardiovascular Diseases and Diabetes (JACARDI). The Initiative aims at reducing the burden of cardiovascular diseases and diabetes across Europe both at the individual and societal levels.

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ABBREVIATIONS

ABP	Arterial blood pressure
FGD	Focus group discussion
IDP	Internally displaced persons
MOH	Ministry of Health of Ukraine
NCD	Non-communicable diseases
NHSU	National Health Service of Ukraine
НСЗУ	Національна служба здоров'я України
PHC	Primary healthcare
rCDC	Regional Center for Disease Control and Prevention

SURVEY PASSPORT

The title of the survey:	Evaluation of preparedness and capacity of primary healthcare (PHC) facilities in Khmelnytskyi region to provide extended scope of services related to type 2 diabetes prevention, screening and control, to high-risk groups
Purpose:	Review the capacity and the existing barriers in PHC facilities of Khmelnytskyi region to deliver extended scope of services related to type 2 diabetes prevention, screening and control, to high-risk groups.
Objectives:	1. **Analyze the current state of service provision** on type 2 diabetes prevention, screening and control in PHC facilities of Khmelnytskyi region.. 2. **Identify the main barriers and challenges** in providing and using the services of type 2 diabetes prevention, screening and control
Design:	Qualitative research methods and the review of local programs on non-communicable disease prevention, in particular, type 2 diabetes in the territorial communities of Khmelnytskyi region
Geography:	Khmelnytskyi region, 32 primary healthcare facilities[1]
Data collection and sample	• 8 focus-group discussions (FGD), 57 participants • 20 in-depth interviews
Target groups:	• Healthcare workers of all PHC facilities of Khmelnytskyi region: • Family doctors and nurses with at least 3 years of work experience in the selected PHC facilities[2] (FGD), with the largest and smallest number of type 2 diabetes cases • Patients with newly diagnosed type 2 diabetes in 2024 (in-depth interview): • 10 men and 10 women; 3 individuals - 24-35 y.o., 4 individuals – 36-45 y.o., 6 individuals – 46-55 y.o., 7 individuals – 56-69 y.o.; 13 individuals – employed, 6 individuals – unemployed, 1 person did not specify the employment status
Data collection schedule:	• Focus-group discussions: June 3-10, 2025 • In-depth interviews: June 14-24, 2025

The survey aimed at identifying the barriers and challenges affecting the effectiveness of type 2 diabetes prevention, screening and control service delivery and use. Based on the findings, recommendations will be issued and pilot intervention plan will be developed to improve the delivery of type 2 diabetes prevention, screening and control at the level of Khmelnytskyi region communities. The design and planning of the pilot interventions will require comprehensive discussions and local stakeholder engagement to ensure joint and coordinated planning.

After implementation of the pilot interventions, barriers and challenges in using type 2 diabetes prevention, screening and control services will be reassessed. This will enable to compare the received data with the initial findings, evaluate changes in patients' experiences and determine the effectiveness of the implemented polit measures and practices.

1 This region was selected based on the analysis of the statistical information of the National Health Service of Ukraine. Khmelnytskyi region has the higher number of type 2 diabetes patients over 18 y.o. that have concluded declarations with a family doctor. When selecting the region for the survey, the review included areas located in territories where no active hostilities are taking place and that are not under occupation, taking into account the security situation and the feasibility of conducting the research.

2 With the exception of two healthcare workers who had only one year of experience in their respective PHC facilities: in one case, the facility was unable to nominate another healthcare worker who met the work-experience criterion; in the other, the healthcare worker had technically been employed for four years but had spent three of those years on maternity leave.

INTRODUCTION

Diabetes mellitus (DM) is one of the most prevalent diseases globally. According to the Ukrainian Diabetic Federation data, the estimated number of people with DM in Ukraine is 3.5 mln., including only 1.2 mln. diagnosed cases[3]. The rate of undiagnosed diabetes reaches 65%, being two times higher than in the UK (33%) and Poland (31%). At the same time, it must be noted that accurate tracing of DM mortality and morbidity trends in Ukraine is impossible because, starting 2017, the Ministry of Health of Ukraine (MOH) stopped collecting the statistics on DM mortality. Such changes were associated with the reorganization of the health statistics framework and the discontinuation of the corresponding reporting form. In addition, since 2014, there have been no statistics on the incidence and prevalence of the disease across the entire territory of Ukraine, including the occupied areas.

DM is often associated with severe complications resulting in premature death and disability. Most common complications of diabetes mellitus are cardio-vascular diseases, vasopathies, nephropathies and retinopathies.

According to estimates by the Kyiv School of Economics, the total economic burden attributable to diabetes mellitus and its complications in Ukraine is estimated to range from 36 to 104 billion hryvnias per year, representing approximately 1 to 2.5 percent of the national GDP[4].

There are two main types of diabetes mellitus. Type 1 diabetes is characterized by an absolute insulin deficiency, primarily caused by genetic factors, and typically manifests at an early age. Type 2 diabetes, which predominantly develops in middle-aged and older adults, is associated with impaired insulin secretion by the pancreas and/or reduced ability to fully adsorb glucose. Patients with Type 1 diabetes require continuous insulin therapy. In contrast, the treatment of Type 2 diabetes is typically implemented in stages and may include lifestyle and dietary modifications, administration of non-insulin glucose-lowering medications, and insulin therapy or combination treatment. According to the International Diabetes Foundation (IDF), the prevalence of type 2 diabetes is 10 times higher than type 1 diabetes: 91-96% of DM patients have type 2 diabetes.

Currently in Ukraine the facilities for timely DM screening, diagnostics and management are present. However, the rate of advanced cases, complications due to uncontrolled diabetes, low diagnostic rate indicate a system failure in the mechanisms of providing care to patients with DM. In particular, in management of diabetes, very few DM patients control all the three indicators (glycated hemoglobin (HbA1c), arterial blood pressure (ABP), low density lipoproteins (LDL)) (0.5% of DM patients in Ukraine, 8.2% in Poland, 41% in the UK) or the main target indicator HbA1c (12.8% of DM patients in Ukraine, 40% in Poland, 67% in the UK).

The survey results may be useful for identifying the perspectives and the capacities for the provision of type 2 diabetes prevention, detection, control and treatment services to various patient groups. In addition, the obtained information can be used in design of medical guarantees programs at PHC level that could expand access to non-communicable disease (NCD) prevention and treatment services. Development and implementation of such programs will facilitate equal access to qualified healthcare for different groups of population.

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THE RESULTS OF THE QUALITATIVE COMPONENT OF THE SURVEY

1. THE ROLE OF PRIMARY HEALTHCARE AND PATIENTS' AWARENESS

1.1. The role and the efficiency of primary healthcare in type 2 diabetes prevention and detection: practical experience of healthcare workers

The focus group participants were unanimous in highlighting the key role of a general practitioner in prevention and early detection of type 2 diabetes. At the same time, they commented that prevention effectiveness does not depend merely on the actions of the healthcare provider, but also on patients' willingness to cooperate and broader informational support from the government and the community.

The respondents mentioned that primary healthcare in Ukraine demonstrates overall high efficiency in implementation of type 2 diabetes prevention activities through accessibility of screening facilities, individual communication, and continuous interaction between the doctor and the patients. At the same time, excessive workload of the healthcare staff, lack of time for prevention activities and low motivation of patients to undergo prevention examinations reduce the efficiency of PHC performance. The healthcare workers stressed the need to enhance the national communication campaigns aiming to increase public awareness, community engagement and development of digital communication channels (messengers, social networks) which will facilitate building awareness in the population and reduce the workload of the healthcare staff.

In most PHC facilities the approaches to type 2 diabetes detection are well-established – screening protocol are applied, blood glucose levels are tested with a glucometer, blood tests are performed, specifically, glycated5 hemoglobin test. Introduction of PHC quality indicators significantly improved the consistency and regularity of type 2 diabetes diagnostics, especially due to the requirement of annual preventive exams. Healthcare workers actively screen patients with risk factors for type 2 diabetes, organize community-based examinations, including door-to-door visits in some cases. At the same time, the effectiveness of primary medical care in preventing and detecting type 2 diabetes is limited by low motivation among some patients, financial and logistical barriers to undergoing certain tests (especially glycated hemoglobin analysis), staff shortages, and high workload for physicians.

1.2. Patients' awareness of type 2 diabetes: practical experience of healthcare workers

Healthcare workers note that the degree of patients' awareness about type 2 diabetes varies. Some patients are well aware about the subject, are interested in treatment and ask about modern medications. One respondent mentioned that patients are interested not only in the treatment of the diagnosed condition but also in the disease prevention methods and assessment of individual risks if the diagnosis has not yet been established. At the same time, many people have superficial ideas about the disease, lack of understanding of its seriousness and related risks, and sometimes ignore the importance of lifestyle changes. Healthcare professionals highlight that patients often gain information from the internet which may be wrong or inaccurate, therefore the help of a family doctor to systematize the knowledge and filter reliable facts is very important. The focus group participants also pointed out the need in systemic educational activities to raise the patients' awareness, both during the visit to the physician and through mass media, social networks and civil society organizations. However, this needs extra material resources, staff and time which are currently insufficient.

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1.3. **Patients' awareness of type 2 diabetes:** особистий досвід пацієнтів.

«One person I knew in my village died after diabetes mellitus, I heard it's a very serious thing»

Most in-depth interview respondents perceived type 2 diabetes as a serious and even insidious disease, associating it with constant fatigue, weakness, the need to control diet, and adherence to treatment. Some respondents had witnessed the progression of the disease among family members, which made them aware of its severe consequences – from amputations to death. At the same time, some individuals did not take their diagnosis seriously or failed to understand the nature of the disease before beginning treatment. Several respondents believed that type 2 diabetes develops due to "nerves" or stress, which, in their view, worsened during the war.

Most respondents learned about type 2 diabetes only after being diagnosed or did not associate their symptoms with the disease. Symptoms such as dry mouth, thirst, and fatigue were often attributed to heat, stress, or overwork. A significant proportion of respondents had never shown interest in the topic of diabetes before their diagnosis, even when people with type 2 diabetes were present among their relatives or friends. Those who had heard about diabetes generally possessed only superficial knowledge, lacking an understanding of its risks and symptoms. The most common sources of information about the disease were personal stories from friends or relatives; less frequently, respondents mentioned the internet, healthcare workers, and knowledge acquired at school or university. Overall, the respondents acknowledged that their knowledge was insufficient, or they did not consider it important, believing that diabetes concerned other people rather than themselves.

2. TYPE 2 DIABETES SCREENING, DIAGNOSTICS AND PREVENTION

2.1. Prevention, screening, diagnostics and communication: how to effectively change patients behavior regarding type 2 diabetes: practical experience of healthcare professionals

Most focus group participants confirmed that their facilities offer routine screening for type 2 diabetes, specifically, blood glucose testing. The screening covers mainly patients in the age of 40/45+ and risk groups (people with obesity, hereditary factors, hypertension, metabolic syndrome, women after complicated pregnancies, etc.). Some health professionals highlighted that all patients are screened for type 2 diabetes at the first appointment during a year, regardless of their complaints, and upon patient's request. Planned lists of patients belonging to the risk groups, are actively used; blood glucose levels are tested with a glucometer in the doctor's office. Outreach visits to rural primary healthcare sites are performed regularly to reach larger population, including palliative patients and people without health complaints. Healthcare workers of certain facilities noted that application of PHC quality indicators significantly improved type 2 diabetes screening consistency and coverage among declarants.

The FG participants noted that the risk of type 2 diabetes development is to a large extent conditioned by health, behavioral and social factors, therefore they **distinguish the following most vulnerable groups of patients:**

- people with excess weight and obesity;
- 45+ age group;
- people with family history of diabetes mellitus;
- people with arterial hypertension, ischemic heart disease, metabolic syndrome;
- people with pancreas diseases (pancreatitis, lipomatosis, fibrosis);
- patients with comorbidities;
- pregnant women, especially with history of gestational diabetes;
- people leading sedentary lifestyle;
- people with unhealthy eating habits and people who consume tobacco and alcohol;
- patients with history of viral diseases, especially COVID-19;
- patients on corticosteroid treatment or chemotherapy;
- military personnel and internally displaced persons (IDPs);
- people in a state of chronic stress;
- hypodynamic teenagers;
- elderly people.

The FG participants noted that comprehensive approach, in particular, the combination of clinical examinations, individual monitoring, communication with patients and motivational counseling to encourage lifestyle changes, is key for effective prevention, screening and diagnostics of type 2 diabetes.

Type 2 diabetes prevention and early detection instruments used by the FG participants:

- Preventative counseling on lifestyle modification, including nutrition and physical activity;
- Using informational materials for various populations, in particular, for teenagers to communicate the harmful consequences of sweets, sweetened beverages, chips, etc. consumption;

- Explanation of type 2 diabetes symptoms, including thirst, frequent urination, etc.;
- Informing about type 2 diabetes complications (diabetic retinopathy, nephropathy, renal failure, neuropathy, etc.);
- Using "intimidation" or real examples of other type 2 diabetes patients (especially in case of a family history);
- Anthropometric measurements: body mass index, waist circumference (men 40+ y.o., women 45+ y.o.);
- Blood glucose level testing (with the use of a glucometer and/or laboratory testing) in institutions, companies, among IDPs;
- Referral to an endocrinologist if type 2 diabetes is suspected;
- Pancreas sonography examination.

Most often, type 2 diabetes is detected at routine or wellness visits when patients, especially 40+ y.o. have their blood glucose level and/or glycolyzed hemoglobin tested. It is a common practice to perform such tests to achieve PHC quality targets or under planned medical examination. Another common situation is patients seeking care with complaints about thirst, frequent urination, weakness, excessive body weight (sometimes weight loss) or dry mouth. Type 2 diabetes is often detected accidentally – in pre-surgery examinations, in the process of hospitalization for other diagnosis or after infectious diseases, including COVID-19. Physician's awareness of the patient's family history plays an important role in disease detection: in case of a family history of diabetes, other family members may be screened even if they have no complaints. Sometimes such examinations are initiated by the patient.

«The last case of diabetes was detected in the end of May. The patient had a stroke before, 4 years ago. She came to the doctor due to pronounced dizziness. There was no history of diabetes in her family. We referred her to test TTH, blood glucose, of course, total blood count, cholesterol, etc. She came back with TTH 16.4 and blood sugar 13.2. But the patient associated this with the stroke she had had earlier. And she came "just for some infusion" which is popular among patients».

The physicians use various approached to motivate the patients for life-style changes for type 2 diabetes prevention and after the diagnosis is established, ranging from personal conversation to real-life examples. However, the motivational effect largely depends on the inner readiness of the patient to change his or her lifestyle. General advice is rarely effective without specific examples, emotional engagement or practical instructions.

Main strategies to motivate patients for changing their lifestyle:

Specific advice, rather than general phrases. Rather than saying the general "eat healthy" the physicians explain what the "healthy nutrition plate" looks like, how to count calories, how to gradually modify nutrition and physical activity.

Information about complications. Patients are informed about possible consequences of uncontrolled type 2 diabetes – diabetic foot (in severe cases - amputation), vision deterioration, up to complete loss of sight, diabetic nephropathy (renal failure in severe cases), cardiovascular diseases (stroke, myocardial infarction), etc. If such conversations are systemic and regular, they may encourage patients to modify their lifestyle.

Real examples and "shock prophylaxis. Healthcare professionals consider that the examples from real life are effective in changing the patient's behavior, especially those about their friends or relatives with type 2 diabetes. Some participants consider effective

the tours to the surgery unit physicians can organize for their patients where they can see the severe complications of the disease with their own eyes – one of the physicians shared such experience. Healthcare professionals also use printed communication materials (brochures, booklets), sometimes real photos, or show video to their patients.

> *«It works when we tell them about diabetes complications. How people live with the complications, what are the health risks. Especially when you tell them that insulin-dependent people cannot eat or drink anything, or they cannot go anywhere without this injection of life. Well, they are kind of scared. And when we give them these brochures with some visual illustration of such complications»*

Financial arguments. Healthcare professionals explain to their patients that disease prevention is much less expensive than the treatment of complications, especially due to less costs of medications (including insulin), and less costs related to inability to work. This is especially effective for elderly people or people whose budget is limited.

Appealing to patient's personal experience. Those who saw the disease in their loved ones, are more sensitive to the doctor's recommendations and advice. Parallels with familiar cases help to emotionally engage the patients thus improving the motivation to take care of their own health.

Building relationships based on trust. Health professionals highlight that the atmosphere of trust in communication with the patients is key for effective motivation. Patients often change their behavior when they feel the support of the healthcare staff rather than judgement or pressure.

2.2. Patient's pathway to diagnosis: symptoms, diagnostics and support: patients' experience

In most cases, type 2 diabetes was diagnosed accidentally – at wellness visits, routine tests or at visits to doctor for other reasons. Often, the first warning signs were the following symptoms: severe thirst, fatigue, frequent urination, excessive body weight (sometimes weight loss), dry mouth, itching or vision deterioration. Some patients admitted that for years they ignored the symptoms or attributed them to other conditions or diagnoses, particularly hypertension or age-related changes. Often it was relatives who noticed the changes in the patient's health or behavior and advised to seek medical care and undergo examination. In some cases, type 2 diabetes was detected at hospitalization or additional examinations before treatment of another condition. To establish the diagnosis, patients were usually tested for capillary blood glucose level using a glucometer, as well as for glycated hemoglobin. In some cases, additional examinations were performed (ultrasound of the pancreas or abdominal organs, urinalysis, etc.). Some patients were immediately referred to an endocrinologist, while others went through several stages of consultations with a family doctor.

In most cases, type 2 diabetes was diagnosed due to regular examinations or due to alertness and initiative of family doctors or other healthcare workers. Some of the in-depth interview respondents noted that the cumulative knowledge gained from prior experience, e.g., observing relatives with type 2 diabetes or basic awareness about the symptoms of this condition, became the key factor in establishing the diagnosis. In some cases, such symptoms as severe thirst, fatigue, vision deterioration prompted the patient to seek medical care. Some patients highlighted the role of a specific medical specialist who initiated the necessary tests or suggested to test the blood glucose level even when no obvious signs or symptoms were present.

> *«…Thanks to the doctor… If the doctors ignored… firstly, my physician who treated me and referred me to an endocrinologist»*

Overall, the in-depth interview participants were not unanimous regarding the timeliness of type 2 diabetes detection. Some patients admitted that looking back they should have sought care earlier or paid more attention to their own symptoms to ensure earlier diagnostics. Some respondents recognized that they lacked information about type 2 diabetes signs, therefore they did not associate some signs with the disease. Some participants regretted about their prior nutrition choices, neglecting body weight control and lack of physical activity. At the same time, other respondents believed that their condition was timely detected.

3. LIFESTYLE MODIFICATION AFTER DIAGNOSING TYPE 2 DIABETES

3.1. Impact of type 2 diabetes on lifestyle and social relationships: patients' experiences

Patients' rate of the impact of type 2 diabetes on their lifestyle and participation in social relationships, including professional activity, communication with friends, travel and recreation, differently. For some respondents, the disease restricts their physical activity due to reduced strength, fatigue and ache, especially in the legs. Some respondents mentioned the need to modify their eating habits and follow a diet which affects certain social tradition but this is not perceived as a significant restriction. On the contrary, others do not believe that the diseases significantly affected their social life and say that they could adapt and remain active within their capacity. Many respondents highlighted the importance of self-control, regular medication intake and support by family and friends which helps to maintain the life rhythm they are accustomed to. At the same time some respondents acknowledge that type 2 diabetes causes certain psychological pressure due to constant need to control the health status. In general, although type 2 diabetes does affect the lifestyle and requires certain modifications, most patients strive to remain socially active.

After being diagnosed with type 2 diabetes, most patients changed their diet. They started consuming more vegetables, cereal, lean meat and dairy products, reduced the amounts of sweets, pastry, fat and smoked products in their diet. Many adhere to their diet, eat smaller portions and plan their meals. Alcohol and smoking, once present, were reduced or completely excluded. However, some patients admit that they allow small dietary deviations, in particular, some sweets.

Most patients changed their level of physical activity after receiving the diagnosis. Some respondents reported reducing their activity, while others, on the contrary, started moving more—engaging in sports, exercising, and taking regular walks. Changes in physical activity were influenced not only by the diagnosis of type 2 diabetes but also by each person's overall health status and lifestyle prior to the diagnosis.

«Well, I keep doing what I used to do before. When I just learned about my diagnosis, it was, well, a little…stressful situation. But then I got accustomed somehow – you just live with it, that's all.»

The in-depth interview participants noted that their social circle did not undergo significant changes after the diagnosis was established. Family, friends, and colleagues are mostly supportive, showing care by jointly adapting their diet, reminding them to take medications, and helping with daily tasks. Some respondents noted that their family members try to adhere to the diet together with them which created the feeling of mutual support. At the same time, some patients mentioned that their social circle may not take their disease seriously, sometimes ignoring the necessary dietary restrictions. In some cases, changes in social interactions were linked to giving up alcohol or tobacco, which led to certain people in their social circle distancing themselves.

These results show that the reaction to the established diagnosis is individual and highlight the importance of personalized approach to supporting the patient on the way to lifestyle modifications.

4. TYPE 2 DIABETES TREATMENT, SELF-CONTROL AND MONITORING

4.1. Institutional documents on type 2 diabetes management in primary healthcare facilities: practical experience of healthcare professionals

> *«We also have local protocols, but really, you rarely consult them. They are in place, but a direct verbal consultation is better. You can't go through pages back and forth.»*

The majority of the respondents confirmed that local clinical patient pathways or internal protocols on type 2 diabetes prevention, screening and control are in place in PHC facilities. They are mostly based on current orders of the Ministry of Health and essentially duplicate the officially approved state-level protocols. Often, such documents are developed in response to the requirements of accreditation or contracting by the National Health Service of Ukraine (NHSU) but some healthcare workers believe that their actual practical value is arguable. Some physicians admitted that although they use the local patient pathways, they do not refer to these documents very often for they are limited in time or they believe that direct discussion or consultation with colleagues is more efficient. Some respondents were not aware whether such documents were in place in their facilities. Some respondents reported that their facilities had new or updated local protocols based on international clinical protocols, such as Duodecim Medical Publications Ltd..

4.2. Medication prescription and awareness of their use: patients' experiences

Most surveyed patients with type 2 diabetes receive treatment in the form of one, and sometimes two, oral glucose-lowering medications. Some patients noted that the physician gradually adjusted the treatment regimen, prescribing one medication first to be replaced or complemented by another later if necessary. Insulin treatment was prescribed rarely and occasionally – during hospital stay or for critical increase of the blood glucose level. Some respondents admitted that they are trying to avoid insulin therapy, while others reported that thanks to dietary control and regular intake of glucose-lowering medications there is no need in the insulin therapy so far.

Most respondent reported receiving basic instructions from their physician about the administration of the prescribed drugs. The instruction they mentioned, were related to when and how to take the medications, the importance of treatment adherence and the need to maintain the diet. As for the possible side effects, most patients confirmed that they did receive some information about the side effects from their physicians, but they did not specify what information they received. Some respondent reported that the physicians warned them about potential adverse reactions and recommended to seek care in case of symptoms. At the same time, smaller share of patients either did not receive such information or did not remember discussing it. In some cases, patients had to look up the information about side effected on their own – in the instructions to medications or in the internet.

4.3. Self-control and prevention measures for type 2 diabetes: patients' experiences

The frequency of **blood glucose level** control varies significantly among patients ranging from daily measurements or several times a week to occasional control or at visits to the doctor. Some respondents admitted that they measure their blood glucose level only when they do not feel well or at medical examinations. Half of the respondents have their own glucometer and use it with various regularity, while do not have the device either because the doctor believes it is not needed, or they do not consider it a necessary or affordable control tool.

> *«Take the medication every day, do not reduce the dose. Well, side effects… the blood sugar will increase if I don't take the medication every day. But you can easily guess – if you take too much if it, something will go wrong»*

Absolute majority of the surveyed patients do not keep the **type 2 diabetes self-control diary**. The main reasons were lack of relevant recommendation or poor understanding of the benefit of such an activity. Only several respondents stated that they keep a diary in their phones entering the blood glucose and glycolyzed hemoglobin levels and discuss these records with their physician. One respondent mentioned keeping a diary for a short period of time, but once he felt better, he stopped this practice.

The regularity of **cholesterol level** control is uneven among the patients. The majority of the respondents undergo planned laboratory tests every three to six months, along with other indicators as part of planned general examination or at hospitalization. Other respondents control this indicator much less often or do not control it at all – sometimes for lack of motivation or awareness of its importance, in some cases due to financial limitations. Several patients admitted that the doctor highlighted the importance of monitoring but they delayed the laboratory tests.

The majority of the surveyed patients regularly measure their **arterial blood pressure (ABP)**, as they have diagnosed hypertension or other cardiovascular diseases. The measurement frequency varies from daily (sometimes 2-3 times a day) to occasional, when feeling worse or upon doctor's recommendation. Some respondents rarely control ABP or do not control it at all relying on subjective feelings. Most in-depth interview participants have blood pressure gauges at home which facilitates control. Also, patients associate stable ABP with regular intake of antihypertensive medications prescribed by the doctors.

The majority of the patients did not receive or do not remember receiving any specific recommendations on **foot care** after being diagnosed with type 2 diabetes, therefore, they are not aware about potential complications, such as diabetic foot, and do not pay enough attention to it. Only some respondents noted that family doctors or other specialists remind to them from time to time about the need to control the condition of their feet, paying attention to edema, cold feeling or pain in the feet. Some patients reported receiving advice on preventative exercise for the feet or using special ointments.

The majority of the surveyed patients realize the need of annual **ophthalmological examination** due to type 2 diabetes. Some of them regularly follow the doctor's recommendations and undergo preventative examinations. At the same time, some patients admitted that they neglect such examinations although they were informed about their importance. Some patients were not informed about such examinations or do not remember if they were. Some respondents undergo regular ophthalmological examination in the framework of prevention check-ups at work.

The survey participants rely on several main approaches to control their health status: adherence to diet, regular medication intake, blood glucose level measurement

with a glucometer and exercising. At the same time, they also pay attention to their own physical sensations that may signal changes in blood sugar levels, such as thirst, dry mouth, or a general decline in well-being.

«What do I know… I read the booklet and its annex. That's it, I don't know more. Yes, of course I would like to learn more.»

Half of the respondents believe that they have enough information about self-control of type 2 diabetes. They often receive information from doctors, informational materials or the internet. At the same time, other respondents admit that the information they have is not sufficient for complete understanding, so they would like to receive more practical advice and methods, including from people with similar experience. Patients would like to receive additional materials (e.g., brochures) and information (lectures, personalized consultations) to be able to better control the disease. Overall, the in-depth interview participants are open towards the new knowledge, especially about the self-control techniques that will help them to improve their quality of life and prevent complications.

5. EXPERIENCE OF CONTACT WITH THE HEALTHCARE SYSTEM AND ACCESS TO SPECIALIZED CARE

5.1. Professional interaction and partnership in type 2 diabetes management: practical experience of the healthcare workers

> *«Now things are working very well. We have an endocrinologist on staff, and this greatly facilitated our work and made patients' lives easier. Before it was a bit challenging because patients had to travel far. Immediately after our endocrinologist resigned, we called to the neighboring districts. They were reluctant to help us. Well, they never saw the patient, so they didn't want to do anything. But later we simply phoned them for a consultation, and they were very, very helpful.»*

The focus group participants generally evaluate the interaction between primary healthcare workers and endocrinologists in type 2 diabetes management as positive, despite the presence of significant organizational and personnel challenges. In most cases, family doctors are able to refer the patient to an endocrinologist for further diagnostics or treatment adjustment, also they can contact the endocrinologist by phone or through informal professional connections for a consultation. At the same time, it remains a challenge to ensure continuous presence of an endocrinologist on staff in primary healthcare centers: in some facilities, such specialists have been absent for extended periods or have been frequently replaced. This creates additional workload for the primary healthcare doctors as they need to identify the specialists they can consult, on their own. In addition, the focus group participants admit that the accessibility of an endocrinologist for the patients largely depends on the location – it is much simpler in a town than in rural communities.

Most participants stated that they have an opportunity to consult their colleagues, both family doctors and endocrinologists working in the same facility or elsewhere. Some respondents highlighted that such interaction is possible due to established collaboration and personal contacts. At the same time, a smaller proportion of health care workers report a lack of effective communication with specialist physicians, pointing to reluctance or difficulties on the part of the latter to provide remote consultations. The focus group participants also viced the need in regular methodological support from specialist physicians, primarily endocrinologists; in updated recommendations; in establishing a professional community to discuss complex clinical cases online or off-line.

The discussion with the healthcare workers also covered their interaction with the regional Centers for disease control and prevention (rCDCs) in terms of strengthening partnership and improving type 2 diabetes control and prevention. Most surveyed healthcare workers do not see any real interaction with rCDCs. There is a prevailing impression that such collaboration is either absent or poorly structured and barely visible in physicians' daily practice. Some respondents have no clear idea of what this interaction could look like in practice.

5.2. Collaboration with civil society organization on type 2 diabetes management: practical experience of the healthcare workers

Almost all FG participants stated that their facilities do not cooperate with civil society organizations or communities of patients; many were not aware of such an opportunity at all. Only one respondent mentioned the "School of Diabetes" as a professional communication platform, and another one – periodic field visits of the Red Cross Society to communities to measure blood sugar level in the population. These examples are isolated and do not indicate any systemic interaction.

5.3. Interaction between the patient and healthcare workers: informing, communication and support: patients' experiences

Most patients started to actively **seek care from a family doctor or a nurse** immediately after being diagnosed with type 2 diabetes and followed the set visit schedule, usually once a month or more often if necessary. Prior to being diagnosed with type 2 diabetes, patients visited a doctor less often, mainly when necessary, due to other chronic diseases or acute conditions.

Some in-depth interview participants mentioned that they had to change their family doctor for one of the reasons, such as distance to the healthcare facility, the doctor's maternity leave or individual reasons, such as looking for a more competent or attentive doctor. In general, while most patients maintain stable relationship with the family doctor, which has a positive influence on type 2 diabetes control, the duration of collaboration with a family doctor varies from several months to several years.

Slightly more than half of the surveyed patients reported receiving sufficient information from their doctors about the management, treatment, and prevention of comorbidities, including the importance of following a proper diet, controlling blood pressure, and avoiding smoking and alcohol consumption. Doctors regularly emphasize the importance of these aspects and explain the risks of complications, which, according to respondents, include eye, foot, and joint problems, as well as cardiovascular diseases. However, a small proportion of patients feel they receive insufficient information or would like to know more. Some also noted that they had not received such counselling or had not previously considered certain preventive measures.

In general, the surveyed respondents are satisfied with doctor's explanation of their condition and treatment: the majority stated that the explanation is clear. At the same time, one study participant noted that, based on personal experience, younger doctors tend to provide recommendations more thoroughly, whereas older physicians are often perceived as taking a more superficial approach or paying insufficient attention to the patient. They were also described as less patient and more rigid in their communication style, which can undermine trust and reduce the patient's willingness to return for follow-up visits. Another challenge is the limited time allocated for each visit (about 15 minutes), which is often insufficient to discuss all issues in detail or to fully understand the doctor's explanations. In addition, some patients report difficulties understanding medical advice due to the excessive use of professional terminology. To improve communication, respondents suggested extending consultation time, establishing peer support groups for patients with similar conditions, and ensuring opportunities to contact the doctor outside office hours by phone or other communication channels.

Patients reported that physicians and nurses often **use printed informational materials:** brochures, booklets, memos containing recommendations on diet and nutrition, giving up smoking and alcohol consumption, blood glucose level control. Most patients consider these materials useful, especially at the initial stages of treatment and follow-up. At the same time, some recommendations, particularly those related to eating multiple times throughout the day, may be difficult to implement in daily life. Some patients admit that they do not always read the informational materials carefully, but overall, they consider them a valuable supplement to verbal consultations.

> *«I have a book by Mankovskyi "How to reach blood glucose level", it's on my desk right now. Yes, yes, they are useful. I also have a memo to the patient about type 2 diabetes. Yes, they are all the time here with me, lying on my desk.»*

Patients positively evaluate **the support and guidance** by primary healthcare workers. They acknowledge the attention of doctors and nurses, their willingness to answer additional questions, and timely issuance of medications and referrals to examinations. Most patients consider the level of support to be sufficient or good, noting the professionalism and courtesy of some specialists. At the same time, a few patients feel the effects of doctors' limited time due to workload and bureaucracy, which can make access to services more difficult. Only a small number of respondents reported receiving little or insufficient support from healthcare workers. Nonetheless, the vast majority are satisfied with the attention and guidance they receive.

5.4. Post-diagnosis specialized care: patients' experiences

The majority of the in-depth interview participants stated that, upon consultation with a family doctor and suspicion for type 2 diabetes they were referred to an endocrinologist for additional examinations and specialized consultation. Many patients were also referred to other specialists, most often, an ophthalmologist, cardiologist, gastroenterologist or a general practitioner in an inpatient unit. In general, patients evaluated positively the organization of patient pathways, highlighting quick and timely referral by family doctors to specialist physicians. At the same time, there were isolated cases in which patients were not referred to other specialists after the diagnosis was established, or the patients themselves did not see the need for such referrals.

The majority of patients reported that receiving specialized care was quite easy: the issuance of referrals was uncomplicated, visits to doctors were by appointment, without queues, consultations and examinations were performed at scheduled time. When problems did occur, they were mostly related to long waiting times specifically for an endocrinologist appointment – sometimes lasting several weeks – forcing patients to turn to private clinics. However, such cases were rare. Some respondents also noted the limited availability of specialists in their area of residence.

«No, everything is fine. Now I have undergone all the examinations, and in 6 months I will come again. My family doctor will issue me a referral, so it is not difficult. Even if I will not be able to visit my family doctor to pick up the referral, he can issue it remotely.»

Almost all patients reported that they currently do not need additional consultations, as they are under the supervision of a family doctor or have already undergone the necessary examinations. At the same time, some respondents expressed a desire to see an ophthalmologist, vascular surgeon, or another endocrinologist for further medical advice and assessment, mostly for preventive purposes or due to existing comorbidities.

6. EDUCATION, TRAINING PROGRAMS AND SUPPORT

6.1. Training, sources of information and suggestions to improve the knowledge of type 2 diabetes: practical experience of the healthcare workers

Not all FG participants completed additional training on type 2 diabetes prevention, screening and control. While the majority of respondents stated that no formal trainings or training programs were conducted at the level of their healthcare facilities, some doctors participated in webinars, listened to lectures or took self-study courses on platforms such as "Progress", "Endshkola", and used the resources of the Public Health Center of the Ministry of Health of Ukraine, NHSU Academy, MOH clinical protocols, registers of medical technology documents and materials published by Zaslavskyi Publishing House. The initiative for such training often came from the doctors themselves or from PHC center teams; however, this practice is fragmented and does not ensure consistent coverage of all specialists. Other sources of professional development mentioned included international platforms such as UpToDate and thematic journals, as well as participation in professional communities, for example, Facebook groups, that facilitate rapid exchange of experience. Some respondents noted that they rely on local protocols and do not feel the need for additional sources.

> *«It is important to have continuous access, not during certain office hours when you are physically unable to conduct this training, and after the working hours the platforms become inaccessible.»*

Overall, healthcare workers positively assess the availability of training resources, especially online formats, which have become much more accessible than before. At the same time, most note that the main barrier is the lack of time for systematic learning. The available information is often scattered, overly extensive, or insufficiently adapted to the daily needs of primary care professionals. Materials that present key updates on type 2 diabetes concisely and in a well-structured manner are considered particularly valuable. In some cases, respondents mentioned that access to high-quality training requires personal expenses, which limits opportunities for continuous knowledge updates.

Among the educational resources that healthcare workers would like to have permanent access to, the most frequently mentioned are UpToDate, Medvoice, "Progress," and the materials from the Cochrane Library translated into Ukrainian. Platforms offering systematized, evidence-based content are particularly valued, although their cost remains a barrier. Physicians suggest making these resources free of charge or partially funded by the state. They also highlight the need for short courses and lectures on type 2 diabetes prevention, as well as the possibility to receive updates in the form of newsletters or notifications (for example, via Viber) to quickly respond to changes in clinical approaches.

The respondents proposed a number of solutions to improve informing of the healthcare professionals, including: regular brief webinars or off-line lectured by practitioners, monthly online or printed digests of clinical protocol updates, and the launch of a universal public online resource with relevant clinical recommendations. The respondents highlighted he importance of direct professional exchange – round tables, Zoom-discussions and meetings of PHC and secondary healthcare specialists.

6.2. Participation in the training and support programs for patients with type 2 diabetes: patients' experiences

None of the respondents participated in the support program or training sessions for people living with type 2 diabetes. The majority admitted that no one proposed them to participate in such initiatives, so they never heard of any.

7. BARRIERS AND MOTIVATIONAL FACTORS IN TYPE 2 DIABETES SCREENING AND PREVENTION

7.1. Factors complicating type 2 diabetes screening and prevention at PHC level: practical experience of healthcare workers

The analysis of responses provided by healthcare workers participating in the FG, demonstrates that the main challenges in type 2 diabetes prevention and detection are associated with a number of barriers.

While glucometers are in place in many PHC facilities, there is a risk of inconsistent test stripes supply, especially in the second half of the year. In most PHC facilities, laboratory diagnostics (glycated hemoglobin test) is not available free of charge on-site, and required referral to a specialist. This is most relevant for the facilities that do not have the equipment necessary to conduct such a test, or a contract with NHSU.

Excessive workload of doctors, including record keeping, patient verification, working with electronic record system is another challenge, as this limits the time for prevention activities even in the most motivated staff.

In addition, barriers related to patients' behavior were identified, including low interest in prevention and late seeking of care. This leads to challenges in type 2 diabetes prevention and early detection even despite sufficient motivation of the healthcare workers.

Barriers and challenges:

Limited access to glycated hemoglobin test. Many PHC facilities do not offer glycated hemoglobin test for lack of equipment or reagents. Often such tests are performed only in secondary level facilities which requires a referral and a long wait. Sometimes patients have to use the services of private laboratories which is associated with financial barriers. This may result in delayed diagnostics and control of the disease.

Inconsistent supply of test stripes. Primary healthcare facilities often run out of the test stripes for glucometers, and their timely replenishment is delayed due to limited public funding. Some healthcare facilities sometimes have to approach the local authorities requesting additional funding to secure supplies. Many patients cannot afford buying test stripes, which complicates regular blood glucose level monitoring and affects treatment adherence.

Poor quality of glucometers or rapid deterioration of their technical state. In some primary healthcare facilities glucometers quickly break down, sometimes after several months of use. Healthcare workers sometimes have to buy the devices at their own expense.

Significant administrative burden on the family doctor. Maintaining electronic patient records, patient registration, electronic referral generation, verification of information and other bureaucratic procedures take up a large portion of the appointment time. The healthcare workers admit that often they have a feeling that they are not merely physicians but "PC operators", which distracts them from their treatment and prevention activities, adding up to professional burn-out and stress.

Standard appointment time does not meet the real patient's needs. Standatd appointment time (15-20 minutes) is not enough for thorough examination, history collection, conducting examinations and, especially, prevention counselling. Often patients have several comorbidities (for example, diabetes mellitus, arterial hypertension or other cardiovascular diseases, gastrointestinal pathology, etc.), which takes extra time. Physicians try to keep with the schedule which results in superficial discussion of the preventive activities.

Lack of established practice of preventive visits. The majority of patients visit the physician with specific complaints rather than for prophylaxis. As a result, prevention activities are discussed superficially or in case risk factors are detected.

Low motivation and psycho-emotional challenges reduce the focus on health and the need in lifestyle modification. Patients often ignore the advice to change their diet or physical activity, sometimes for the fear of changing the lifestyle they are accustomed to. This reduces the efficiency of discussing prevention activities, as it takes time requiring additional explanations. Many patients skip control exams or ignore doctor's prescriptions or recommendations. The impact of war on the psycho-emotional status is another negative factor, as chronic stress and anxiety reduce the patients' capability to take care of their health, adhere to treatment and undergo the necessary examinations. This increases the risk of late diagnostics and development of complications.

Men are a hard-to-reach target population, and this is exacerbated by the ongoing Martial Law in Ukraine. Men, especially those of conscription age, avoid seeking care for the fear to receive a draft notice, resulting in their less frequent engagement in preventive activities and later detection of the disease.

Difficult access to specialized (secondary) healthcare. A number of examinations (for example, the glycated hemoglobin test) require a referral from an endocrinologist or another specialist. In some communities, scheduling an appointment with such specialists is difficult due to long queues. As a result, diagnostics are delayed, increasing the likelihood of losing the patient during the transition between different levels of care.

Financial and logistical barriers due to the distance to healthcare facilities and laboratories. Limited budgets to cover examination or transportation costs may restrict patients' access to medical care. Residents of rural or remote areas often face difficulties commuting to healthcare facilities and laboratories due to irregular public transport and long travel distances. As a result, diagnostic check-ups and routine health monitoring become more complicated, leading to delays in disease detection and diagnosis.

Low level of patients' awareness about free health services. Not all patients are aware that some tests and examinations are available free of charge under state programs. As a result, they avoid preventative measures or use private services which increases their financial burden and reduces healthcare coverage.

Difficulty to maintain contact with the patients due to migration or social factors. Change of the place of residence, moving abroad, serving at the frontline or other social circumstances result in inaccessibility of some patients to the healthcare system, undermining continuity of diagnostics and treatment.

Lack of symptoms at the early stages of type 2 diabetes preventing patients to timely seek care. Due to asymptomatic early stages of the disease, patients do not seek care, do not undergo screening and receive recommendations for disease prevention. This results in late diagnostics and development of complications.

Difficulties in the work with socially vulnerable populations and individuals with low motivation for prevention and treatment. Medical workers often encounter reluctance or indifference toward examinations among elderly people, people with addictions, individuals experiencing homelessness, and those with a low level of engagement in their own health. Such patients rarely undergo preventive check-ups, avoid screening, or insist on receiving medication without additional examinations. This complicates efforts to provide adequate care to these groups and delays the timely detection of type 2 diabetes.

7.2. Motivation and support of the healthcare workers in type 2 diabetes prevention: practical experience of healthcare workers

> *«In addition to financial incentive, I would like to see better control of the quality and the composition of food products at the national level ...I believe it is not controlled properly now. I would like the food to contain less spreads, less palm oils. Like in Japan – they promote healthy nutrition at the government level. Even if you want to buy something unhealthy, you have to try and find it»*

Health professionals are motivated by professional responsibility, their willingness to prevent complications in a patient, and by clear healthcare quality indicators which are a formal motivation. Positive feedback from patients also plays an important role – when a patient follows the recommendations, the physicians can see the result of their effort, and this motivates them to continue. At the same time, patients' indifference, excessive administrative load, low salary and lack of additional funding from the state demotivates them. Some respondents highlighted that systemic support, such as extending the list of eligible medications in the "Accessible drugs" program or a separate screening package could significantly improve the doctors' engagement in preventative activities.

To enhance the effectiveness of prevention and control of type 2 diabetes, respondents proposed several solutions: increasing public awareness through the media; offering financial or symbolic incentives (e.g., a treat, notebook, calendar, or other small motivational items) for patients who follow medical recommendations; extending consultation time; reducing the administrative burden on doctors; and introducing an advanced practice nursing model that would allow nurses to assume some of the physicians' responsibilities. It is also important to ensure that all necessary tests for diagnosing type 2 diabetes can be performed free of charge at the primary care level, without the need for referrals to private laboratories or specialized care.

7.3. Barriers to diagnostics, treatment and lifestyle modification faced by patients with type 2 diabetes : patients' experiences

Establishing the diagnosis. All respondents reported that they did not face any significant barriers at the stage of type 2 diabetes diagnostics. According to the patients, tests, consultations with family doctors and referral to further examination were generally accessible. In most cases, diagnostic activities were systemic and performed without delay, patients quickly received their results, and communication with healthcare workers was effective.

Accessibility of medications. An absolute majority of the surveyed type 2 diabetes patients never faced any serious problems related to obtaining the medications they were prescribed. Usually drugs were available in pharmacies, especially in cities, and electronic prescriptions facilitated the procedure. Some respondents mentioned that if a medication was temporary unavailable in a pharmacy, they ordered it beforehand or found it in other pharmacies. At the same time, some respondents mentioned financial burden if several drugs were prescribed or reluctance to replace medications unavailable in pharmacies, with similar drugs.

Adherence to the recommendations and medication intake schedule. In general, in-depth interview participants reported that they do not face any significant difficulties with adherence to medical recommendations or drug intake schedule. Some respondents noted that they had already become accustomed to their established regimen or felt a clear link between taking their medication and their well-being, which motivated them to stay disciplined. However, some participants faced life circumstances that made regular medication intake more difficult, such as work schedules, military service, or the absence of a well-structured daily routine.

Lifestyle i.e., diet, modification. The in-depth interview participants admitted that changing their lifestyle and diet was a challenge for them. Giving up sweets and favorite foods, as well as adjusting family meals, were the most challenging aspects, since not all family members chose to follow healthy eating principles. Patients also faced financial constraints related to healthy nutrition, as well as a lack of time and energy due to work and fatigue, which made it difficult to prepare meals in line with recommendations. In addition, it appears that following dietary advice often causes more difficulties than taking medications regularly. Overall, family and close social support play an important role in the process of change, as relatives often try to adjust their own habits and motivate patients to adhere to the new eating regimen. Information support from healthcare providers is also crucial—they offer advice and explanations on what to eat and what to avoid. Self-control and personal initiative are equally important: some patients emphasize the importance of internal readiness and recognizing the value of these changes.

8. SUGGESTIONS REGARDING IMPROVING TYPE 2 DIABETES PREVENTION, SCREENING AND CONTROL EFFORTS

8.1. From facilities to communities: recommendations to improve type 2 diabetes prevention activities:: practical experience of the healthcare workers

The healthcare workers proposed a number of solutions to strengthen type 2 diabetes prevention and control efforts at community and healthcare facility level. Such suggestions include improving access to services, strengthening awareness-raising activities, intersectoral cooperation, organizational changes and training.

Extending access to type 2 diabetes screening. Ensure continuous funding for reagents, test stripes, glucometers and consider the possibility of arranging screening in pharmacies or on-site to increase screening coverage, especially in remote communities.

Strengthening awareness-raising activities. Posting information about diabetes mellitus in local media, blogs, social networks, articles, banners and multimedia (video) will help people to better understand type 2 diabetes specifics, possible risks and the need of regular monitoring. Doctors reported that personal stories of patients with complicated disease have high motivational effect and can be used for educational efforts. "Schools for people with type 2 diabetes" comprised of regular meetings or online sessions to train patients on self-control, diet changes, understanding risks or other aspects of living with type 2 diabetes, are a format that needs to be developed.

Development and strengthening cross-sectoral partnership for type 2 diabetes prevention. It is important to ensure effective interaction between PHC, secondary (specialized) care facilities, schools and companies to exchange information about available services, patient pathways, and organization of type 2 diabetes prevention activities. Healthcare professionals can conduct awareness-raising activities for teenagers, youth, parents, school personnel and companies' employees.

Training doctors on communication with patients and motivational counselling. Additional trainings for physicians on the communication skills with various categories of patients, motivational counselling and prevention counselling.

Regular organization of type 2 diabetes prevention days / weeks. Organization of type 2 diabetes prevention days of weeks with preventative examinations in healthcare facilities, communities or in the open air will ensure broader coverage. For effective implementation of such activities, it is important to ensure local funding of prevention initiatives, including the resources to cover the cost of supplies, transportation, informational campaigns, etc. Endorsing programs at the community level with relevant allocated budget will allow consistent and regular organization of prevention days / weeks.

Promoting patient's personal responsibility for type 2 diabetes prevention and control. Some health professionals highlighted the importance of patients' responsible attitude towards their health. Such motivation needs to be strengthened through regular informing and engagement in awareness-raising activities.

Healthcare workers unanimously believe that the prevention of type 2 diabetes should be based on a combination of a healthy lifestyle, annual medical check-ups, and increased personal responsibility of patients for their own health. They also emphasize the need to improve public awareness of available medical services, the role of the family doctor, and the dangers of self-medication. Physicians consider the active engagement of the patient to be the key factor for successful prevention.

In the context of type 2 diabetes prevention, healthcare workers primarily emphasize regular preventive visits to the family doctor, including an annual check-up with mandatory blood glucose measurement, as well as undergoing laboratory tests such

as complete blood count, urinalysis, lipid profile, liver function tests, and others. An important component is open communication with the physician regarding individual risk factors that may indicate the likelihood of developing diabetes.

Healthcare workers also emphasize the importance of balanced nutrition and weight control, as well as avoiding tobacco and alcohol use. In addition, they recommend regular physical activity: moderate exercise, daily walks, and sports at any age. They also draw attention to the need for stress management and maintaining a healthy rest routine, which includes adequate sleep, relaxation, and reducing emotional strain.

Respect for the physician's role is another important factor, reflected in adherence to medical recommendations, trust in the specialist, and recognition of the authority of healthcare professionals.

Finally, a significant aspect of prevention is improving patients' health literacy: knowing their rights, being aware of available services, avoiding self-medication, and trusting professional medical care..

8.2. Efforts suggested by the patients to improve the system of care and support for type 2 diabetes: patients' experiences

In general, patients are happy with the system of medical care and support for type 2 diabetes, but they see the need in targeted improvements.

Improved access to specialized care: simplified procedure of booking appointments and shorted waiting time to the endocrinologist.

Broader informational support: provision of complete and accessible information about the disease, recommendations regarding diet, possible complications and consequences of the disease, increased focus on prevention.

Patient support: creating communities and platforms for experience-sharing and motivation among people with type 2 diabetes.

Treatment accessibility: reducing the cost of medications and expanding free coverage.

Comprehensive approach: combining pharmacological treatment with healthy nutrition, physical activity, and psychosocial support.

ANALYSIS OF LOCAL PROGRAMS ON NCD PREVENTION, SPECIFICALLY TYPE 2 DIABETES

Inclusion of dedicated strategies or clearly defined priorities within local programs enables a systematic approach to the prevention and early detection of NCDs, in particular, type 2 diabetes. It allows for coordination between primary and secondary healthcare facilities, ensures timely financing of necessary activities and resources, and increases public awareness and engagement. This contributes to reducing complications, improving treatment effectiveness, and enhancing the overall health of the community. Local programs can become a key tool for setting priority areas of work and ensuring the stable development of the healthcare system. In addition, well-defined NCD prevention and control programs help cultivate a culture of health within the community, strengthen trust in the healthcare system, and create conditions for long-term improvements in population health outcomes.

Out of 60 communities of Khmelnytskyi region, 31 communities are the founders and the funders of 32 community-owned primary healthcare centers. Some communities sustain 2 PHC facilities, and in some cases a PHC facility is jointly sustained by several communities.

The analysis demonstrated that 31 communities endorsed programs on development and support of the community-owned healthcare facilities. Only one community has a designated action plan of NCD prevention. At the same time, none of the approved programs focus exclusively on type 2 diabetes control and prevention.

In the majority of the programs, the theme of type 2 diabetes in included as a part of overall NCD prevention activities. Only one community of the region demonstrated a systemic approach to the issue of type 2 diabetes. In other communities the diabetes prevention activities are more general or are mentioned occasionally within broader activities on chronic illnesses prevention **(Table 1).**

Table 1. Analysis of local NCD prevention programs, in particular, type 2 diabetes, in the communities of Khmelnytskyi region

Community	Program developed at the community level	Brief program description in terms of NDC prevention
Khmelnytskyi city territorial community	The program for the development and support of community-owned healthcare facilities and the provision of medical services beyond the scope covered by the state guaranteed package of medical care for the population of the Khmelnytskyi city territorial community for 2024 – 2026	The Program is aimed at improving the quality and accessibility of medical care, in particular through the introduction of modern medical technologies, as well as the prevention and early detection of diseases. Special attention is given to reducing the risks of noncommunicable diseases, strengthening public health, and increasing the duration of active life. In particular, the Program includes: - effective measures to combat oncological diseases; - activities to prevent and treat cardiovascular and cerebrovascular diseases among the city population; - effective measures to improve medical and social rehabilitation of patients and the conditions of their integration to the society; - activation of prevention measures against cardiovascular, oncological diseases, diabetes mellitus and socially significant diseases. The Program emphasizes that diabetes mellitus is a serious social problem accompanied by high disability and mortality rates. Addressing this issue requires state support and coordinated action across all levels of government. Key areas of work include prevention, early detection, treatment, and rehabilitation of people with diabetes, as well as ensuring adequate pharmaceutical and material-technical support.
Viitivtsi territorial community	On endorsement of the Healthcare facilities support program in the territory of Viitivtsi Town Council for 2021 – 2025	The purpose of the Program is to reduce morbidity, disability, and mortality among the rural population by establishing and ensuring the effective functioning of a system that provides accessible and high-quality primary care based on the principles of family medicine. The Program does not include specific information regarding the prevention of NCDs or type 2 diabetes
Volochysk territorial community	On endorsement of the Program of primary healthcare development in Volochysk city council for 2021-2025	The purpose of the Program is to reduce morbidity, disability, and mortality among the population by establishing and ensuring the effective functioning of a system that provides accessible and high-quality primary healthcare based on the principles of family medicine. In particular, the Program emphasizes shifting the focus from treatment to disease prevention and the promotion of a healthy lifestyle, as well as introducing a multidisciplinary approach to improving the health of the territorial community. One of the ways to implement the Program is to improve the system of preventive measures, ensure effective follow-up care for patients, and conduct high-quality preventive examinations for both children and adults. The Program places particular emphasis on cardiovascular and cerebrovascular diseases, including arterial hypertension.

Humentsi territorial community	1. The financial support program of the communal non-profit enterprise "Primary healthcare center" of Humentsi village council for 2024-2026	1. The main objectives of the program include but are not limited to: - planning, organizing, participating in and supervising preventive check-ups and medical examinations of the population, carrying out preventive measures, including continuous monitoring of the patient's health status for the timely prevention, diagnosis and treatment of diseases, injuries, poisonings, and pathological or physiological conditions (including pregnancy); - consultations on the prevention, diagnosis, and treatment of diseases, injuries, poisonings, pathological or physiological conditions (including during pregnancy), as well as guidance on maintaining a healthy lifestyle. - participation in carrying out informational and educational activities among the population to promote a healthy lifestyle.
	2. Comprehensive program "Health of the population of Humenets village council" for 2025-2028	2. During the implementation of the Program, a number of objectives are planned to be achieved, aimed at meeting the population's healthcare needs, ensuring citizens' rights to accessible and high-quality medical care, and creating conditions for promoting a healthy lifestyle. The main programmatic objectives include: - Rare Right to Live – medical support of patients with orphan diseases. - Restoring Vision – Preserving Quality of Life (prevention and treatment of glaucoma and other ophthalmological conditions) - prevention and treatment of chronic non-communicable diseases. - development of medical and physical rehabilitation and restoration treatment in Humenets village council in line with the up-to-date requirements. - shaping motivation for a healthy lifestyle in the population. - improvement of the health status in all categories of population, reducing mortality, morbidity, stabilization of disability rates. - implementation of up-to-date high-tech techniques in prevention and diagnostics of certain disease leading to disability. - implementation of informational and popular science materials to shape mindful and responsible attitude of population to their health and safety.
Derazhnia territorial community	On endorsement of "The program for social, economic and cultural development of Derazhnia city community for 2025"	One section of the Program dedicated to "Physical Culture and Sports," emphasizes that physical activity and sports are important components of a healthy lifestyle. They contribute to improving the population's quality of life, reducing morbidity, and engaging young people in an active community life. The Program does not contain specific information regarding the prevention of NCDs or type 2 diabetes.

Krasyliv territorial community	Program for development and financial support of communal non-profit enterprise "Krasyliv primary healthcare center" of Krasyliv city council, Khmelnytskyi raion, Khmelnitskyi region, for 2025-2026	The purpose of the Program is to reduce morbidity, disability, and mortality among the population by establishing and ensuring the effective functioning of a system that provides accessible and high-quality primary healthcare based on the principles of family medicine. One of the main objectives of the Program is: to ensure medical support for maintaining a healthy lifestyle
Smotrych town territorial community	Program on development and support of communal non-profit enterprise "Smotrych primary healthcare center" of Smotrych local council for 2025	The purpose of the Program is ensuring a reduction in morbidity, disability, and mortality among the population by establishing and maintaining the effective functioning of a system that provides the population with accessible and high-quality primary healthcare. The key measures of the Program include, in particular: - planning, organization, participation in, and oversight of preventive medical examinations and health check-ups of the population; implementation of preventive measures, including continuous monitoring of a patient's health in order to ensure timely prevention, diagnosis, and treatment of diseases, injuries, poisonings, as well as pathological and physiological (including pregnancy-related) conditions; - providing consultations on the prevention, diagnosis, and treatment of diseases, injuries, poisonings, pathological and physiological (including pregnancy-related) conditions, as well as on maintaining a healthy lifestyle; - input in the communicational and awareness-raising outreach activities among the population on healthy lifestyle promotion; - screening examinations, prevention, diagnosis, and treatment of specific diseases in accordance with the procedures established by relevant programs and legislation.
Rozsokhy territorial community	Program for development and support of communal non-profit enterprise "Khmelnytskyi raion primary healthcare center" (facilities accountable to Rozsokhy village council) for 2025	The aim of the Program is preserving and strengthening the health of the population and improving the quality and effectiveness of medical care. The Program does not contain specific information regarding the prevention of NCDs and type 2 diabetes

Chornyi Ostriv territorial community	Action plan of non-communicable disease prevention in Chornyi Ostriv community (2025-2027)	The plan is presented in the form of a table containing the list of actions to be taken, in particular: - establishing a coordination council on NCD prevention - evaluation of the health status pf community population - conducting annual Health Days - "Our health is in our hands" campaign in the social networks - dissemination of informational materials - physical exercise groups - expanding the network of sports grounds - "Healthy nutrition in schools" program - screening examinations - electronic registration of the risk groups
Shepetivka city territorial community	Program to ensure operation and development of communal non-profit enterprise "Shepetivka City Primare Healthcare Center" for 2024-2025.	At the time of the review, the program was not published on the official website of the community.

CONCLUSIONS

1. The role of primary healthcare and patients' awareness. **Healthcare workers** noted that although the role of a family doctor in type 2 diabetes early detection and prevention is critical, the effectiveness of this process also depends on the patients' willingness to cooperate and on the availability of communication support at the national level. They highlighted that low level of awareness about the disease, its consequences and the importance of regular screening among the population are a significant barrier for early type 2 diabetes detection. **Patients** reported that the majority learned about their diagnosis by accident which may indicate lack of understanding of the symptoms and risk factors or irregular prevention examinations. The majority of patients did not associate such signs as constant thirst, fatigue, excessive body weight, weight loss, with possible type 2 diabetes symptoms, before their diagnosis was established. Patients came to realizing the significance of the disease only after the consultation with the physician. The knowledge they had before the diagnosis (mainly from internet or from friends) were superficial or wrong.

2. Type 2 diabetes screening, diagnostics and prevention. **Healthcare workers** reported that routine screening practices are established in most primary healthcare facilities, with active engagement of patients belonging to risk groups; outreach examinations are also conducted. At the same times, lack of supplies (test stripes) and limited capacities to identify glycolyzed hemoglobin level free of charge are the main barriers for broader screening coverage. According to the healthcare workers, type 2 diabetes most frequently diagnosed at preventive examinations or when patients seek care for typical symptoms. **Patients** reported that timely detection of the disease was mainly possible due to the examination prescribed by the doctor, or during visits for another reason (planned hospitalization, examinations for medical certificates, monitoring of other chronic diseases).

3. Lifestyle changes after type 2 diabetes diagnosis. **Patients** reported that, although they tried to modify their diet and physical exercise after being diagnosed with type 2 diabetes, they find it difficult to adjust family meals, give up eating sweets, and change their established habits. Some challenges are related to financial constraints. According to the patients, the support of the healthcare workers and family is a decisive factor in this process.

4. Type 2 diabetes treatment, self-control and monitoring. **Healthcare workers** reported that they provide patients individual recommendations but may not be able to check the patient's adherence. **Patients** reported that although in general they follow the doctor's advice, medication intake or glucose level monitoring is a challenge for some of them. The main reasons they named were forgetting, complex work schedule or excessive workload. Most patients rated the access to glucose-reducing medications under the "Affordable medicine" program as good, however, some patients noted that prescription of several medications was an additional financial burden for them.

5. Experience of interaction with the healthcare system and access to specialized care. **Healthcare workers** admitted that having an endocrinologist within a primary care facility significantly improves the quality of care for patients with type 2 diabetes. In the absence of such a specialist, family doctors consult colleagues from other districts or private facilities. **Patients** reported that, for the most part, they have well-established communication with their family doctors; however, access to an endocrinologist is often limited. Despite receiving referrals in a timely manner, scheduling an appointment with an endocrinologist is frequently delayed due to a shortage of specialists.

6. Education, training programs, and support. **Healthcare workers** indicated that they need accessible, practical, and well-structured information on managing patients with type 2 diabetes. They highlighted the importance of regularly updating their pro-

fessional knowledge, as they lack convenient educational resources, concise summaries (digests), and formats for experience-sharing, especially between primary and secondary levels of care. **Patients** noted that they had not been involved in educational or support programs and are generally not informed about their existence.

7. Barriers and motivational factors in screening and prevention of type 2 diabetes. Healthcare workers reported that the main barriers to screening, prevention, and treatment of type 2 diabetes include overload with additional responsibilities, limited access to certain laboratory tests, and low motivation among some patients. **Patients,** in turn, highlighted difficulties related to changing established lifestyle habits, financial constraints, lack of time, and insufficient support from their social environment. Both groups of respondents emphasized that motivation for change and support from family or healthcare providers are important factors for implementing preventive measures and disease management.

The healthcare workers and patients share the opinion that consultations with a family doctor are strictly time-limited (for example, "up to 15 minutes"). This perception can sometimes discourage patients from initiating more in-depth discussions on important topics during the appointment and creates conditions for less effective information provision, counseling, and motivational support.

8. Recommendations for improving the prevention, screening, and management of type 2 diabetes. **Healthcare professionals** noted that improvements in the prevention, screening, and management of type 2 diabetes could be achieved by reducing bureaucratic burdens, engaging communities in the awareness-raising activities, expanding preventive programs, and strengthening the educational component for both patients and professionals. **Patients** highlighted the need for better awareness about the disease, access to support groups to help them better understand life with type 2 diabetes, easier access to specialized medical care, and an expanded list of medications covered under the "Affordable Medicines" program.

9. An analysis of local programs for the prevention of non-communicable diseases (NCDs), including type 2 diabetes, in the Khmelnytskyi region revealed that issues related to the prevention and screening of type 2 diabetes are insufficiently addressed in local strategic documents. These measures are mostly integrated into general NCD initiatives. Therefore, to establish a sustainable approach to type 2 diabetes prevention at the community level, it is advisable to develop dedicated programs or integrate specific targeted sections into existing programs, outlining concrete actions, developing effectiveness indicators, and establishing monitoring mechanisms.