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Evaluation of Specialized Outpatient Care for Patients With Type 2 Diabetes in Georgia

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Abstract
The aim of the study was to evaluate the availability and efficiency of specialized outpatient care for patients with type 2 diabetes mellitus (DM) in Georgia and to identify factors and obstacles that prevent getting timely and adequate healthcare services by medical institutions, medical personnel and patients. Develop recommendations for achieving effective outcomes in the face of limited material resources.

Within the frames of the research, the investigation of normative-legal basis for managing Type 2 Diabetes Mellitus (DM) in Georgia and the structure of the existing services have been conducted, and geographical and financial availability was assessed. In addition, a sociological survey with participation of the groups of physicians involved in the process - endocrinologists, family physicians, profile specialists.

Research objectives
Determining the availability and effectiveness of specialized outpatient medical care in patients with type 2 diabetes was the aim of the study, as well as identifying the obstacles that hinders the provision of timely and adequate services

Methodology and Material of the Study
Informational and analytical investigation of legal-normative acts under the legislation of Georgia. Investigation of service delivery based on official data of the Ministry of Internally Displaced Parsons from the Occupied Territories, Lab or, Health and Social Affairs of Georgia.

Cross-sectional study conducted in medical facilities in Tbilisi distinguishing with high rate of referrals. The study population consisted of the groups of physicians involved in the process. In total, 115 physicians (endocrinologists, family physicians (GPs), profile specialists - cardiologists, ophthalmologists, neurologists) from 11 healthcare facilities in Tbilisi (Capital) participated in the study.

Keywords: Diabetes mellitus; Health Care Programs; Outpatient Care; Availability of medical services.

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Introduction

Diabetes mellitus is considered as one of the most actual diseases worldwide. It is recognized that a diabetes mellitus is approaching epidemic proportions on earth. Diabetes morbidity rate is 9%, globally (who. int, 2021). According the IDF, every year, 6.7 million people worldwide die of diabetes-related complications. Approximately 537 million adults (20-79 years) are living with diabetes. The total number of people living with diabetes is projected to rise to 643 million by 2030 and 783 million by 2045. Over the period 1980-2014, the diabetes prevalence increased from 108 million to 432 million and is still growing steadily. However, almost half of all patients living with diabetes are undiagnosed. (Dianna J Magliano (Co-chair), Edward J Boyko (Co-chair), 2021).

At the same time, this number is steadily increasing. According to the 2016 WHO Global Diabetes Report, the number of people with diabetes worldwide increased from 108 million to 432 million between 1980 and 2014. It is estimated that 40% of this growth is due to population growth and aging, 28% to the specific prevalence of age, and 32% to the interaction between the two. In the last 3 decades, the prevalence of diabetes has increased in all income-level countries. Globally, the prevalence of diabetes increased from 4.7% in 1980 to 8.5% in 2014. (Gojka Roglic, 2016).

It is especially noteworthy that diabetes is a chronic disease and is characterized by acute and chronic complications. Chronic complications do not occur aggressively and rapidly, thats why their detection occurs late when pathological processes have already gone too far. (Pablo M Aschner, 2016).

This pandemic is especially dangerous because it is being kept hidden. Almost half of the disease remains undiagnosed. (About WDD, 2018). Based on the above, it can be concluded that Diabetes Mellitus exceeds only medicine, medical aid or medical measures and gains public importance. Therefore, it should be considered in the context of public health or population health. (Karamanou, 2016;)

To stop the diabetes epidemic, a global plan to fight diabetes has been developed (National Strategy for Diabetes Control, 2014), which has three key tasks:
1. Improving the health of people with diabetes;
2. Prevention of the development of type 2 diabetes;
3. Eliminate discrimination against people with diabetes.

Involving people with diabetes in the management of their own disease, in the prevention and control of diabetes, is a powerful tool in the fight against type 2 diabetes. (Marissa Zwald, 2016).

The diabetes incidence rate is considered as one of the most important problems in Georgia as well. The prevalence of the disease in the country is quite high and is increasing every year. At the end of 2018, 86,709 patients were diagnosed with diabetes (prevalence rate per 230,000 population - 2304)). (NCDC. ge, Statistical Yearbook 2018, 2019).

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As a member-state of the United Nations and WHO, Georgia is involved in the global processes of diabetes prevention and control. (NCDC. ge, GEORGIA Health Care Highlights., 2018).

Information-analytical study of normative basis and service distribution:

Epid-surveillance of diabetes in Georgia is carried out by NCDC; Medical practice is conducted in accordance with approved guidelines and protocols in the country and recognized international practice; A "National Strategy for Fighting Against Diabetes Mellitus" has been developed with the main goal of stopping disease spread and reducing diabetes-related early deaths by 25% by 2025. Non-Governmental Organizations and sectoral associations are working on the diabetes prevalence issues. In Georgia, health care service delivery to the population is conducted under the State Health Care Programs. State programs are elaborated and developed by the Ministry of Internally Displaced Parsons from the Occupied Territories, Labor, Health and Social Affairs of Georgia, and progress is supervised and controlled by special state control agencies of the Ministry (moh.gov.ge, 2022). In addition, a well-developed private medical health insurance system is available in Georgia.

The current state programs of different scopes, envisage diagnostics and management of patients with diabetes mellitus (Healthcare State Programs, 2022). In this regard, the state programs - "universal health care", "maternal and child health", "treatment of patients with rare diseases and treatment of patients undergoing permanent or replacement therapy", "rural doctor", should be emphasized. Within the frames of these programs patients with diabetes mellitus can receive state-funded emergency inpatient and minimal ambulatory care.

In addition, there is a “State Diabetes Management Program”, which is of special importance in the process of managing diabetes mellitus.

The program envisages treatment, diagnostics, and drug provision for patients with diabetes mellitus. Medical care services consist of 3 components:

1) Healthcare services for children - services for children up to the age of 18 years with diabetes; services for diabetic patients over 18 years of age with visual impairment (blindness), congenital cerebral palsy and/or diabetes insipidus;
2) Specialized outpatient care, including medical care for patients with diabetes;
3) Supplying specific medications for population with diabetes mellitus. Issuance of medical certificates and prescriptions for people with diabetes mellitus.

One of the sub-components of the program envisages specialized ambulatory care for people with diabetes. In particular, patients are given the opportunity to receive outpatient care from an endocrinologist for dosage correction and delivering appropriate medical education within 1-month period. If necessary, they are referred to other specialists - neurologist, cardiologist, ophthalmologist and angiologist - and for clinical-laboratory examinations: blood - glucose, glycohemoglo bin, creatinine, urea, C-peptide, Homa-2 index; CBC, urine test; Microalbuminuria test; ECG. Patients can apply for these services once a year. The program envisages patient's copayment - 30% for insulin-dependents and 50% for non-insulin dependents. For socially

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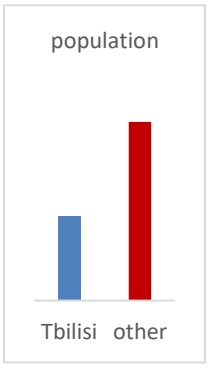
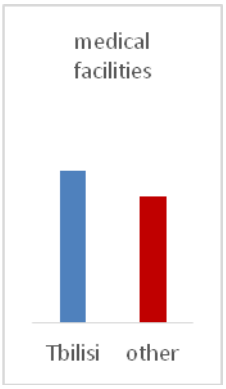
vulnerable groups, State Service Development Agency provides 100% coverage of these healthcare services.

As of today, any medical facility offering related services and expressing a desire to join the program based on an official application can be registered as a program provider. Program budgeting increases every year. In 2014-2021, the budget has been increased from 5.7 million to 16 million GEL. The program implies early detection of complications and starting timely and adequate treatment that will significantly improve health status of the patient.

As of 2021, the population of Georgia equaled 3,723,500 persons, almost 1/3 of them are the capital city residents (figure1). In 2021, 108 settings were registered as program providers (figure2), of which 59 in Tbilisi (capital), and 49 - in the rest of Georgia (9 centers in the Autonomous Republic of Adjara and 40 centers in 9 regions of Georgia, respectively). There are the regions where no such service providers are available. According to the data of 2017-2021, 88% of the program beneficiaries used this service in Tbilisi, while 12% applied to the settings located in the rest of Georgia to receive the service(figure3).





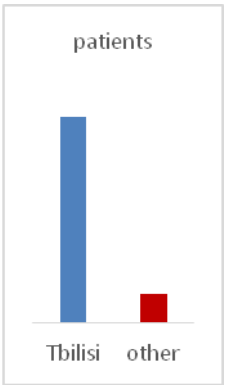


Figure 1 Figure 1 Figure 3

Results of Sociological Study

115physicians were interviewed among the study. Including 35Endocrinologists, 15Cardiologists, 15Neurologists, 25Ophthalmologists, 25Family doctors (General Practitioners). Most often their age ranges vary from 41 to 55 years. Percentage of age among physicians is presented on figure 4.

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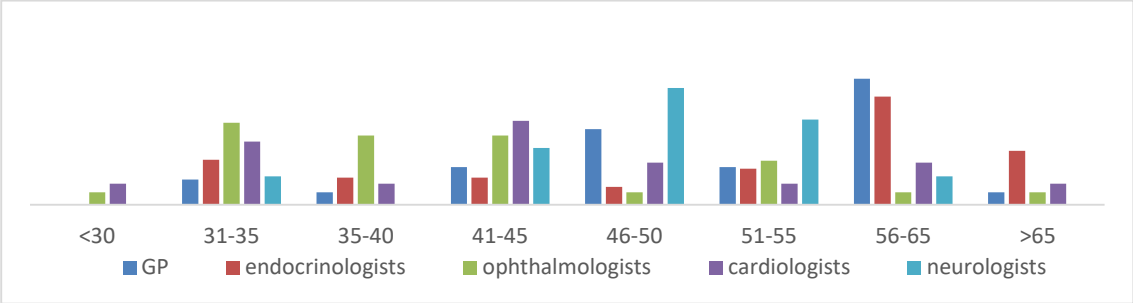
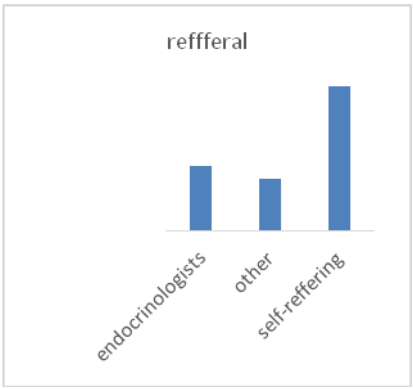
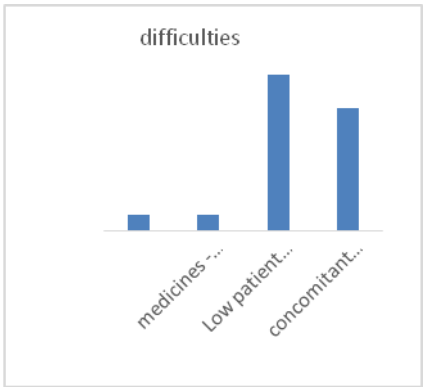
Figur2 Percentage of age among physicians



Majority of GPs (96%) are women. By age groups, dominate people 56-65 years of age (40%), followed by 41-45 years (24%). Most often their age ranges vary from 41 to 65 years. The mentioned should be due to the trainings of family doctors launched in Georgia in the early 2000s. Most of them are certified-in other specialties with certain experience in their own specialty; while the residency programs in this specialty for new graduates has been launched since 2007.

The majority of GPs(64%) have more than 15 years of working experience. 70% of them have passed extra training on DM, although according to the majority of family doctors (96%) they participated in continuing medical education programs and most of them (80%) does so twice a year. 88% of patients with type 2 diabetes mellitus are self-referring to the surveyed family doctors(figure. 5). The vast majority (95%) of surveyed family doctors believe that in most cases early detection of type 2 diabetes mellitus is possible by measuring blood glucose levels in routine practice.





Figur5 Figur6

The physicians involved in the study were suggested to select measures necessary for early detection of diabetes-related complications. It was possible to fix several answers from the suggested options and add their own opinion as well. The most frequently mentioned options

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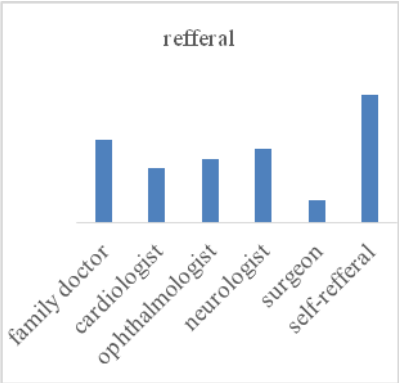
were: delivering regularly organized screening programs to various target groups (88%), raising public awareness through mass media campaigns in population (85%), implementation of an interdisciplinary approach when providing medical services (56%).

The most frequently answers about the difficulties revealed at consultations of patients with diabetes are: low obedience (76%) and presence of concomitant diseases (60%).

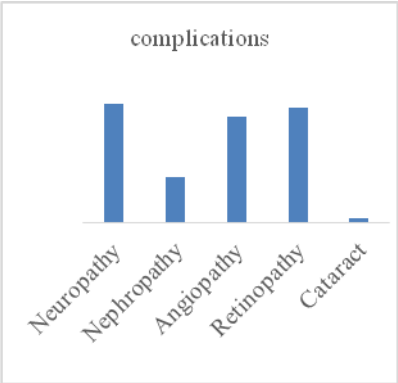
Most of the surveyed endocrinologists (95%) were women. There was no particular trend regarding the age group, although, individuals of different ages were represented, most (35%) were 56-65 years of age.

The majority of endocrinologists (65%) have more than 15 years of working experience. 95% of them have passed extra training on diabetes mellitus. According to the endocrinologists, they participate in continuing medical education or professional development programs and most of them (55%) does so twice a year. In general, 100% of physicians are trained at least once a year. Over the past 5 years, only 25% of respondents participated in a screening program for the early detection of type 2 diabetes mellitus.

70% of respondents participate in the State Diabetes Management Program. To the question how a patient with diabetes mellitus accesses an endocrinologist, it was possible to fix several answers from the suggested options. According to the answers received 90% of patients are self-referral, 58% are referred from a family doctor, and 42% from an ophthalmologist (Figur 7). 72% of the surveyed endocrinologists keep a registry of complications diagnosed by other specialists (therapists, angiologists, cardiologists, neurologists, ophthalmologists). 70% of surveyed endocrinologists consult 5 to 10 patients.



Figur7



Figur8

The highest percentage of the listed type 2 diabetes-related complications, revealed at counseling patients with type 2 diabetes mellitus, falls on: diabetic angiopathy-78%, diabetic neuropathy - 83% (Figur8).

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Among the diabetes mellitus-related lower extremities complications, diabetic neuropathy of lower extremities was diagnosed in 80%, diabetic macroangiopathy of lower extremities in 62% and diabetic foot syndrome in 18% of cases, respectively. Among the cardiovascular system-related concomitant diseases, arterial hypertension was detected in 78% of cases.

Majority of endocrinologists adhere to state-issued guidelines and protocols in their work.

However, among the fixed responses the most common (80%) is adherence to a state guideline/protocol. 45% use the guidelines and protocols suggested by European Association for the Study of Diabetes, 35% use the documents issued by the American Diabetes Association. Another 20% use the guideline/protocol suggested by International Diabetes Federation (IDF). It is noteworthy to emphasize that such a distribution of responses was caused with the given opportunity of choosing several options.

Most of the respondents (51%) are acquainted with the requirements of the ambulatory care component of the "Universal Health Care Programme". As for other legislative/regulatory documents related to the diabetes mellitus management process in Georgia, 33% of respondents were familiar with the treatment component of pregnant women at high risk, lab or, puerperium's and patients. 90% are acqwainted with the State Diabetes Management Program. 80% of endocrinologists always inform the patients about treatment plan as well as side effects and risks associated with the treatment, while 35% of them do so almost always. Endocrinologists believe that the most important information to be provided when consulting patients with type 2 diabetes mellitus is: lifestyle changes (eating habits, physical activity, foot care) (74%), medication regimen (90%); information about diabetes-related complications (65%) and self-management (74%) is of great importance as well.

Part of respondents (67%) believe that they need to enhance their competencies in provision of health care services for type 2 diabetes mellitus.

To the question regarding difficulties at diagnosing and treating type 2 diabetes mellitus, endocrinologists were allowed to fix several answers from the proposed options. Lack of patient's obedience was fixed in 62% of the responses obtained, presence of concomitant disease - in 78% and incomplete treatment due to limited financial resources of the patient - in 78%, respectively.

The majority of physicians surveyed (61%) believe that the facilities available at the clinic (infrastructure, equipment, etc.) are limited and insufficient for diagnosing and treating patients with type 2 diabetes mellitus.

Surveyed endocrinologists were suggested to select the measures to improve outpatient care for patients with type 2 diabetes mellitus. In addition, they were given the opportunity to choose several answers from the list and add their own opinion.

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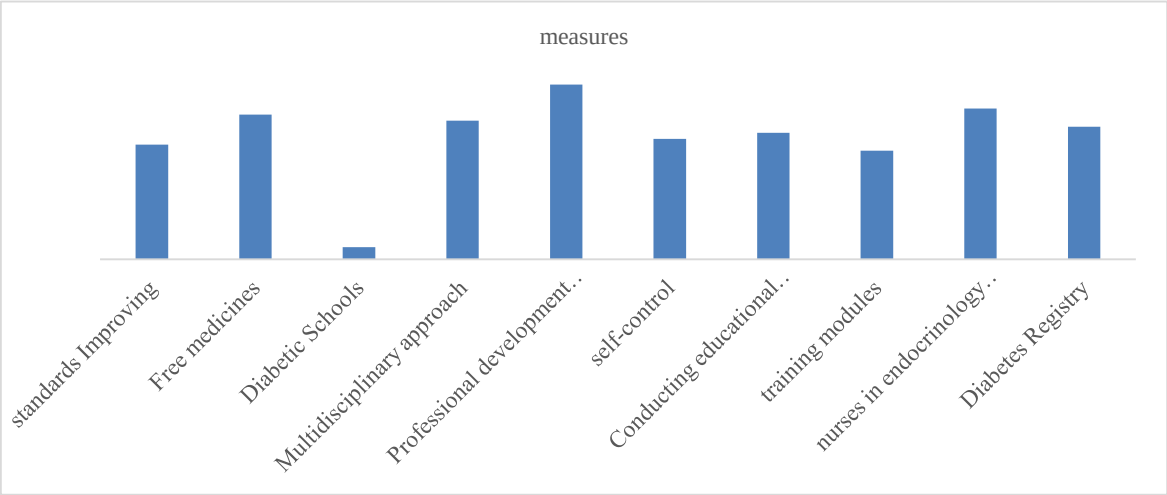
The percentage distribution of the answers obtained is as follows: increase in the number of nurses at endocrinology offices (90%); patients' active participation in treatment process (self-monitoring) (80%); Professional development of medical personnel (80%); Implementation and execution of multidisciplinary approach at NCDs(75%); establishing a diabetes registry (70%);

Improvement of health care regulatory framework, standards, creation of diabetes schools' network for people with diabetes mellitus (77%); Free medicine supply – (77%); conducting a sanitation and educational activities, specialized training modules - on eating habits, physical activity, self-monitoring, etc. 58%; (Figur 9).

Figur9



Majority of Ophthalmologists(87%) are women. By age groups, dominate people 31-35 years of age (26%), followed by 41-45 years (22%). Most of them (70%) are over 45 years old.

The majority of Ophthalmologists (45%) have 5-10 years of working experience. Only 22% of them have passed extra training on DM, although according to the majority of Ophthalmologists (70%) they participated in continuing medical education programs and most of them (57%) does so at least once a year. 83% of patients with type 2 diabetes mellitus are self-referring to the surveyed Ophthalmologists. 96% of Ophthalmologists say that they visit patients with type 2 diabetes with patients with complications, and only 22% maintain an organized register of these complications.

Retinopathy is the most common (96%) complication of type 2 diabetes detected by Ophthalmologists in patients. According to the respondents (91%), a patient with type 2 diabetes should see an Ophthalmologist at least once a year, and a patient with complications twice a year. The majority of Ophthalmologists (91%) consult patients who need urgent treatment for diabetic retinopathy, 91% of them provide patients with detailed information about retinopathy

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and its consequences, and 70% of them have information on the geographical and financial availability of laser surgical treatment for diabetic retinopathy.

Majority of Cardiologists (93%) are women (Fig.1). By age groups, dominate people 41-45 years of age (27%), followed by 31-35 years (20%). Most of them (61%) are over 45 years old (Fig. 2). The majority of Cardiologists (45%) have 5-10 years of working experience (Fig. 3). Only 40% of them have passed extra training on DM (Fig. 4), although all of Ophthalmologists participated in continuing medical education programs (Fig. 5) and most of them (67%) does so at least once a year (Fig. 6). 93% of patients with type 2 diabetes mellitus are self-referring to the surveyed Cardiologists. 93% of Ophthalmologists say that they visit patients with type 2 diabetes with patients with complications, and 60% maintain an organized register of these complications.
Ischemic heart disease is the most common (96%) complication of type 2 diabetes detected by Cardiologists in patients.

According to the respondents (60%), a patient with type 2 diabetes should see an Cardiologistsat least once a year, and a patient with complications twice a year (60%),

The majority of Cardiologists(87%) provide patients with detailed information about complications and its consequences, and 70% of them have information about levels of HBA1 in patients.

Conclusions

examinations and consultations included in the program allow providing early detection of complications and starting timely and adequate treatment that will significantly improve the health condition.
From 2008 to 2021, the official incidence and prevalence rates associated with diabetes are steadily increasing.
According to the IDF (International Diabetes Federation) Atlas, the number of patients with diabetes in Georgia is almost 2 times higher compared to the statistical data of Georgia.
Data about definition of complications and are scarce and unspecified.
There is no National Diabetes Registry in Georgia (State Program of 2006 envisages establishing such a registry).
There is no space where comprehensive information on diabetes for service providers can be found.
There is no space where comprehensive information on diabetes for patients can be found.
There is not publicly available list of medical facilities/service providers and information about them
Delivery of type 2 diabetes management services within the frames of the State Diabetes Management Program is unevenly distributed throughout Georgia.
Among the 108 settings participating in the program, 55% are located in Tbilisi and 45% in the rest of Georgia.
88% of patients involved in the program receive services in Tbilisi, and 12% in all other regions of Georgia put together.

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In 4 regions of Georgia there are no facilities delivering program services to the patients.
The number of patients enrolled in the program has been steadily decreasing over the last 5 years.
In 2020-2021, the number of beneficiaries has sharply decreased that coincides with the figure at pandemic onset; In 2020, the number of program beneficiaries decreased by twice as much compared to 2017.
The specialist- physicians involved in the study either did no extra training on DM at all, or only a small number of them did so; A small amount of them keep a register of complications. Majority indicate that patients most often (70-90%) apply spontaneously. Most specialists (50-90%) reported difficulties in managing diabetes due to low adherence of the patients; To improve diagnosis and prevention of complications, the specialists most often recommend conducting regularly organized screening programs in the various target groups and raising public awareness through mass media campaigns.

Recommendations:
Expanding and maximum utilization of Diabetes Management Program resources - examinations and consultations included in the program allow providing early detection of complications and starting timely and adequate treatment that will significantly improve the health status;
Specify the data on the definition of complications and disability status;

Establish the National Diabetes Registry;
Create an electronic space where complete information on diabetes for service providers will be collected;

Create an electronic space where complete information on diabetes for patients will be collected;
Proportional and equal distribution of existing type 2 diabetes management service delivery under the State Diabetes Management Program in Georgia;
Raise awareness about the Diabetes Management Program;

Establish at least 1 office in each regions where the Program services will be delivered to beneficiaries;

Maximally facilitate program delivery locally;
Develop and implement CME/ CPD programs for healthcare practitioners on diabetes mellitus;
Develop and implement special educational programs for patients envisaging various aspects about diabetes mellitus (DM) - lifestyle changes, eating habits, physical activity, diabetes-related foot care, etc .;

Implement regular organized screening programs for different target groups;
Raise public awareness about diabetes and its complications through mass media campaigns;
Develop and implement state guidelines and protocols for endocrinologists;
Strengthening the role of nurses in diabetes management;
Develop and implement multidisciplinary approaches;

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Strengthening the role of primary health care in detection of diabetes and prevention of complications.

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