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# A QUALITATIVE STUDY ON THE IMPROVEMENT OF DISEASE MANAGEMENT POLICIES IN DIABETES IN TURKEY*

## Türkiye'de diyabette hastalık yönetimi politikalarının iyileştirilmesi üzerine nitel bir çalışma*

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**Abstract**

This study aimed to identify the need for disease management in diabetes in Turkey and present recommendations for diabetes management policies as a part of the established needs. This study was planned as a case study, and the snowball sampling method was used as a part of qualitative research. Twenty-one individuals, including six doctors, three diabetes nurses, six academics, and six adult diabetic patients, were included using semi-structured forms with the in-depth interview technique. The data were analyzed using descriptive analysis and content analysis methods. In the analysis, the "NVivo 12. Program" was used. The results were discussed along with the relevant literature, and conclusions and recommendations were reached in line with the research objectives. The participants stated that practices related to disease management in diabetes improved compared to the past, but the development process should continue. The participants reported a need for a multidisciplinary systematic process to prioritize the patient and their needs and help patients live healthy and free from complications. In terms of disease burden, diabetes is a significant issue that affects all countries worldwide. We recommend the determination of health policies, health service delivery schemes, changes in the health system, and multidisciplinary work related to diabetes management in Turkey, and steps should be taken to improve these issues.

**Keywords:** Diabetes, diabetes management, disease management.

**Özet**

Çalışmada Türkiye'de diyabette hastalık yönetimi ihtiyacının belirlenmesi ve belirlenen ihtiyaçlar kapsamında diyabette hastalık yönetimi politikaları için öneriler ortaya koymak amaçlanmıştır. Bu çalışmada; araştırma deseni durum çalışması olarak planlanmış ve nitel araştırma kapsamında kartopu örnekleme yöntemi kullanılmıştır. 6 hekim, 3 diyabet hemşiresi, 6 akademisyen ve 6 yetişkin diyabet hastası olmak üzere toplam 21 kişi ile yarı yapılandırılmış formlar aracılığıyla derinlemesine görüşme tekniği ile mülakat gerçekleştirilmiştir. Toplanan veriler betimsel analiz ve içerik analizi yöntemleri ile değerlendirilmiştir. Verilerin analizinde "NVivo 12. Programı" kullanılmıştır. Çözümleme sonucu elde edilen bulgular, ilgili literatüre dayalı olarak tartışılmış ve araştırma amaçları doğrultusunda sonuç ve önerilere ulaşılmıştır. Katılımcılar tarafından diyabette hastalık yönetimine ilişkin uygulamaların eskiye oranla iyileştiği fakat gelişim sürecine devam etmesi gerektiği belirtilmiştir. Katılımcılar, hastayı ve ihtiyaçlarını ön planda tutan, hastaların hayatlarını sağlıklı ve komplikasyondan uzak bir şekilde geçirmelerine yardımcı olacak, multidisipliner, sistematik süreç yapılandırılmasına ihtiyaç duyulduğunu ifade etmişlerdir. Diyabet hem dünyada hem de Türkiye'de var olan global bir sorundur ve hastalık yükü açısından önem arz eden bir noktadadır. Bu çalışmada Türkiye'de diyabette hastalık yönetimi yaklaşımına ilişkin politika, sağlık hizmeti sunumu, sağlık sistemi yapısı, multidisipliner çalışma ile ilgili ihtiyaçların belirlenmesi ve iyileştirmesine yönelik adımlar atılması önerilmektedir.

**Anahtar kelimeler:** Diyabet, diyabet yönetimi, hastalık yönetimi.

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## Introduction

Diabetes, which is accepted as a chronic disease by the World Health Organization, negatively affects people in terms of mental, social, and physical aspects and reduces their quality of life. Diabetes poses a significant burden on health expenditures and threatens public health.

The main purposes of disease management in diabetes are to alleviate symptoms, correct associated health problems, reduce morbidity, mortality, and diabetes-related costs, provide timely intervention to prevent complications with follow-up, and increase the quality of life and productivity of the individual with diabetes (1).

Diabetes, which has become a worldwide crisis, is also a significant public health issue in Turkey. A diabetes management plan was established in Turkey for the first time in 1994, and the process continued into 2003, 2010-2014, and 2015-2020. Despite structured plans, nowadays, the diabetes rates in Turkey have an increasing trend. According to the 2013 National Burden of Disease Report, among the first 25 diseases affecting the Disability-Adjusted Life Year (DALY), diabetes in Turkey has risen from 10th in 2004 to 4th in 2013. In the results of the Turkish Health Survey 2019, in the distribution of the major health problems of individuals, it is seen that diabetes has an increasing trend at 9% in 2014, 9.1% in 2016, and 10.2% in 2019 (2). According to the World Diabetes Federation, in Turkey, the number of individuals with diabetes aged 20 to 79 would grow by 20% between 2021 and 2030 and by 48% by 2045. Likewise, total health expenditures related to diabetes will show an increase by 14% from 2021 to 2030 and by 27% until 2045. Health expenditures per capita related to diabetes will show an increase of 12% from 2021 to 2030 and 24% until 2045 (3).

In this study, it is aimed to make a qualitative assessment of the policies implemented in Turkey for the improvement of disease management in diabetes, determine the current needs in this regard and create policy recommendations in line with these needs. A comprehensive analysis is exhibited with the opinions of healthcare professionals, patients, and academics, who are stakeholders in the matter.

## Material and Method

### Sample

In this study, the snowball sampling method was used within the scope of qualitative research, and the research design was planned as a case study. Four endocrinology physicians who are experienced experts in diabetes, three diabetes nurses, six academics who have worked in the field of health management (two of them are also experts in internal medicine and family medicine), two internists, and six diabetes patients voluntarily participated in the study, and thus, a total of 21 people were interviewed. The characteristics of the participants in the sample are shown in Table 1.

Semi-structured interview forms created as a result of reviewing the relevant literature were used in the interviews. The research protocol was approved by the Üsküdar University Non-Interventional Research Ethics Committee at meeting number 15, held on December 28, 2020.

### Data Analysis

The audio recordings obtained during the interviews were transcribed verbatim in the computer environment. To check the data afterward, the audio recordings and transcripts were compared by listening and reading by the researcher. The “NVivo 12. Program” was used in the analysis of the data. All interview documents were read using the inductive method, and each of the expressions serving the purpose of the study was coded to comply with the themes in the “codes” section of the program.

**Table 1:** The characteristics of the participants in the sample.

| ID NO | File Code | Age | Gender | Occupation | Expertise | Years of Experience | Institution of Employment | Group of Patients Examined | Group in Sample |
|---|---|---|---|---|---|---|---|---|---|
| 1 | HH1 | 37 | Female | Physician | Pediatric Endocrinology | 6 | Public | Children and Adolescents | Physician/ Nurse |
| 2 | HH2 | 41 | Female | Physician | Pediatric Endocrinology | 20 | Public | Adolescents | Physician/ Nurse |
| 3 | HH3 | 39 | Female | Physician | Pediatric Endocrinology | 7 | Public | Children and Adolescents | Physician/ Nurse |
| 4 | HH4 | 47 | Female | Nurse | Diabetes | 15 | Public | Adults, Children and Adolescents | Physician/ Nurse |
| 5 | HH5 | 42 | Female | Nurse | Diabetes | 4 | Public | Adults, Children and Adolescents | Physician/ Nurse |
| 6 | HH6 | 32 | Female | Nurse | Diabetes | 5 | Private | Adults, Children and Adolescents | Physician/ Nurse |
| 7 | HH7 | 45 | Female | Physician | Adult Endocrinology | 21+ | Private | Adults | Physician/ Nurse |
| 8 | HH8 | 39 | Female | Physician | Internal Medicine | 6 | Private | Adults | Physician/ Nurse |
| 9 | YA1 | 39 | Female | Academician | Nursing | 6-10 | Non-Profit | - | Health Administrator/ Academician |
| 10 | YA2 | 55 | Male | Academician | Healthcare Management and Economics of Health | 13 | Non-Profit | - | Health Administrator/ Academician |
| 11 | YA3 | 68 | Male | Academician | Internal Medicine/ Healthcare Management | 15-20 | Non-Profit | - | Health Administrator/ Academician |
| 12 | YA4 | 60 | Male | Academician | Public Health and Family Medicine/ Healthcare Management | 11 | Non-Profit | - | Health Administrator/ Academician |
| 13 | YA5 | 61 | Male | Academician | Healthcare Management | 27 | Public | - | Health Administrator/ Academician |
| 14 | Ha1 | 44 | Male | Administrator | Sales and Marketing Director | 6-10 | Private | - | Patient |
| 15 | Ha2 | 28 | Male | Sales Representative | Sales Representative | 11-15 | Private | - | Patient |
| 16 | Ha3 | 35 | Male | Banker | Banker | 6-10 | Private | - | Patient |
| 17 | Ha4 | 30 | Male | Production Engineer | Production Engineer | 0-5 | Private | - | Patient |
| 18 | HH9 | 39 | Female | Physician | Internal Medicine | 11-15 | Private | Adults | Health Administrator/ Academician |
| 19 | Ha5 | 71 | Male | Retired | Retired | - | - | - | Hasta |
| 20 | Ha6 | 66 | Female | Homemaker | Homemaker | - | - | - | Hasta |
| 21 | YA6 | 50 | Female | Academician | Healthcare Management | 21+ | Public | - | Health Administrator/ Academician |

**Data Collection**

Within the scope of the study, interviews were conducted using semi-structured interview forms, after a literature review was conducted both to establish the theoretical background and prepare the questions. Three interview forms were prepared for each group, by taking into consideration the profiles of the groups "Physician and Nurse", "Healthcare Administrator and Academician", and "Patient". Before the interviews were held, the person to be interviewed was called and informed about the research and the interview process, and an appointment was made. When the statements of the participant started to repeat, the interview was terminated considering that data saturation was achieved.

## Results

In this study, disease management in diabetes is discussed in the context of five themes, namely Access to Information and Awareness, Communication, Multidisciplinary Structure, Quality of Life, and Health System.

The results are organized by theme and presented in the following tables: Access to Information and Awareness (Table 2), Communication (Table 3), Multidisciplinary Structure (Table 4), Quality of Life (Table 5), and Health System (Table 6).

**Access to Information and Awareness**

**Table 2:** The results under the *"*Access to Information and Awareness*"* theme.

| Explanation | Participant Expression |
|---|---|
| a. The participants stated that the lack of information of patient relatives about the diagnosis and treatment process and emergency cases affected patients negatively, and providing information is a necessity. | *a. "No, I haven't received education. ...I couldn't follow my diet completely healthily." (71, Male, Retired, Patient) "...we need to educate patient relatives through patient schools by including individuals who are always with the patients …" (61, Male, Academician, Administrator).* |
| b. The participants stated that patient education should be continuously provided. | *b. "…there are education programs on diabetes for patients at hospitals, but this education needs to be continuous" (28, Male, Sales Representative, Patient).* |
| c. It was mentioned by the participants that family and school participation and awareness regarding pediatric patients are highly important in the treatment process. | *c. "...information to be provided at schools to children and families will raise awareness even further" (39, Female, Physician, Pediatric Endocrinology).* |
| d. The participants said efforts to raise awareness in the public should be continuous. | *d. "...small public service announcements could be used to inform the public. For example, they are developed within a project, or they are issued for a year by declaring that year the year of diabetes, but they end afterward. This wouldn't work, they should be constantly on" (50, Female, Academician, Administrator).* |
| e. The participants argued that there should be checking mechanisms to prevent the possibility of information provided via mass communication tools misleading patients. | *e. "…I believe they shouldn't broadcast anything to inform people without subjecting it to a filtering process. There should be a health committee" (45, Female, Physician, Adult Endocrinology).* |

**Communication**

**Table 3:** The results of the *"*Communication*"* theme.

| Explanation | Participant Expression |
|---|---|
| f. The participants reported the absence of mechanisms through which healthcare professionals and patients would be constantly in communication outside routine follow-ups. | *f. "I ask [questions to healthcare professionals] only when my routine tests come up and when I don't feel well. There is a need for a system where patients can ask health professionals instantly and consult." (66, Female, Homemaker, Patient).* |
| g. The participants reported the absence of mechanisms through which healthcare professionals and patients would be constantly in communication outside routine follow-ups. | *g. "I ask [questions to healthcare professionals] only when my routine tests come up and when I don't feel well" (66, Female, Homemaker, Patient).* |
| h. It was stated by the participants that healthcare professionals did not periodically contact patients to follow up on them and inquire about their health status. | *h. "They don't call, no one communicates with me" (44, Male, Administrator, Patient).*<br><br>*"I don't call patients; they communicate with me via my e-mail address. Endocrinology nurses contact patients via phone calls when needed, without a periodic schedule" (37, Female, Physician, Pediatric Endocrinology).* |
| i. The participants emphasized the importance of constructive and positive communication of healthcare professionals with patients. | *i. "…negative statements such as 'your body will be damaged if you do this and that' scare me. I would be more motivated if they talked to me positively" (35, Male, Banker, Patient).* |

**Multidisciplinary Structure**

**Table 4:** The results of the *"*Multidisciplinary Structure*"* theme.

| Explanation | Participant Expression |
|---|---|
| j. The importance of family support and the creation of a treatment plan suitable for the lifestyle of the patient was brought up by the participants. | *j. "Patients need to receive support from their relatives to increase their involvement in the treatment" (41, Female, Physician, Pediatric Endocrinology).*<br><br>*"...evaluating the patient's work pattern, sleep hours, main and snack times, and exercise plan is very important for diabetes." (45, Female, Physician, Adult Endocrinology)* |
| k. The participants argued that diabetes should be followed up and treated from a multidisciplinary perspective. | *k. " Because this disease is a multidisciplinary disease, one needs to work in collaboration with all branches. We are managing this disease with endocrinology specialists, cardiologists who are experts in cardiovascular health, neurology specialists, ophthalmology physicians, and [specialists from] many other branches" (32, Female, Nurse, Diabetes Nurse).* |

| | |
|---|---|
| l. The participants thought that a multidisciplinary team could be coordinated by family medicine specialists. | *l. "…although there are physicians responsible for focusing on diabetes in the treatment process, the follow-up and monitoring of the patient should be under the coordination of the family physician" (61, Male, Academician, Administrator).* |
| m. The participants emphasized the importance of the inclusion of traditional medicine practices in the treatment process under the supervision of the physician. | *m. "...our doctors have to integrate [the treatment process] with traditional medicine. If our doctors explained which herb could be used alongside which drug, I could use them with my mind at peace" (44, Male, Administrator, Patient).* |
| n. The participants stated that the multidisciplinary team should also include psychologists and social workers. | *n. "We can notice financial hardships and sociocultural problems in patients earlier, but there should be a psychologist and a professional social worker who can work with us constantly" (41, Female, Physician, Pediatric Endocrinology).* |

**Quality of Life**

**Table 5:** The results of the "Quality of Life" theme.

| Explanation | Participant Expression |
|---|---|
| o. The participants stated that patients and their relatives need psychological support to increase their involvement in the treatment process and their quality of life. | *o. "...our patients and their relatives are in a burnout state. ...it should be easier for them to access psychological support" (41, Female, Physician, Pediatric Endocrinology).* |
| p. It was argued by the participants that state policies that will make healthy living sustainable are needed. | *p. "...there should be spaces where the person can go on a walk, ride a bicycle, perform minor exercises… Options that would allow access to the right food should be offered" (60, Male, Academician, Administrator).*<br><br>*"…to manage diabetes, there should be a healthcare program that covers the government, the cabinet of ministers, and a broad proportion of society. Intersectoral collaboration is important. Policies should be in place to provide state support and prevent the sale of unhealthy foods in grocery stores" (68, Male, Academician, Administrator).* |
| q. The participants said the compliance of the patient with their treatment plan could increase their quality of life. | *q. "...not everything goes smoothly when the person doesn't apply the treatment correctly or make changes in their lifestyle" (47, Female, Nurse, Diabetes Nurse).* |

**Health System**

**Table 6:** The results of the *"*Health System*"* theme.

| Explanation | Participant Expression |
|---|---|
| r. The participants expressed that there is a need for a coaching system for diabetic patients. | *r. "...opportunities should be provided for individuals who are well-informed enough to coach patients about diabetes. …but this shouldn't be limited to physicians and nurses only. It is very difficult for patients to communicate only with the physician when they have a question in mind. A coaching system for this may be important" (68, Male, Academician, Administrator).* |
| s. The participants asserted that diabetic patients could be followed up more easily via telemedicine practices, and more efficient services could be provided this way. | *s. "It is possible for us to do regular and continuous follow-ups via telemedicine. With the telemedicine method, we can directly transfer all these measurements to the system. The blood sugar of the patient would be under control. This would mean a decrease in the labor needed from the physician and health expenditures" (61, Male, Academician, Administrator).* |
| t. It was reported by the participants that practices and methods such as pumps and sensors for patients would increase their quality of life. | *t. "...insulin pumps can make [their] life easier. Although there are materials not covered by the state, patients with sufficient means should be explained the necessity of these materials for an increased quality of life." (39, Female, Physician, Pediatric Endocrinology).* |
| u. The participants emphasized the necessity of measuring the performance of practices regarding diabetes management and a focus on preventive healthcare services. | *u. "...the progress of diabetes-related complications and the average blood sugar levels of patients could be checked. If we allocate the resources to the right place, the education aspect, they will be used efficiently as there wouldn't be a need for the medication aspect" (39, Female, Physician, Internal Medicine).* |

## Discussion

In this study, disease management in diabetes is discussed in the context of five themes, namely Access to Information and Awareness, Communication, Multidisciplinary Structure, Quality of Life, and Health System. Under the theme of Access to Information and Awareness, which was discussed first in the study, it was stated that the experiences of patients with diabetes affected their family members psychologically, socially, financially, and medically, and the responsibility of daily disease management in diabetes belonged to both patients and their families. In this context, it was reported that only providing education to the patient may limit the management of the disease, and it was emphasized that the relatives of patients should be informed by healthcare professionals. In a previous study, 8 weeks of training was given to diabetic patients and their relatives. As a result of the training, it was stated that the patients had a 0.7% decrease in HbA1c values and an

improvement in blood pressure and cholesterol. Additionally, low-level improvements Kalwere observed in the HbA1c and blood pressure values of their family members (4).

In the findings of this study, the importance of informing school employees who spend time with students was emphasized. It was found that when employees do not have sufficient training on the subject, they are inadequate in aspects of diabetes management such as adjusting insulin doses, coping with emergencies, and balancing blood sugar (5).

In this study, the importance of the continued use of mass media to increase public awareness about diabetes was emphasized. The CDC partnered with the American Diabetes Association, the American Medical Association, and the Advertising Council to launch the first national pre-diabetes awareness campaign. Due to the continuity of public spotlights, more than 3.4 million people completed the prediabetes risk test on the website, while more than 124,000 people visited the website to find a lifestyle change program (6).

It was determined in this study that the perception of the information on mass media about diabetes as accurate caused information pollution and threatened public health. A questionnaire was applied to 513 pregnant women in a previous study. It was determined that the negative news stories published on television and other mass media against the glucose tolerance test performed during pregnancy created fear and a negative perception of pregnant women (7).

In the context of the second theme of the study, Communication, it was determined that there was a need for a structure where patients could ask their questions to healthcare professionals instantly. For example, the UK Diabetes Helpline has call center staff trained in diabetes. Employees provide information about the questions of the callers or the topics they want to support and can provide proper guidance for the difficulties experienced by patients (8).

It was determined in this study that healthcare professionals did not communicate with patients for follow-up or reminder unprompted. In a previous study, two groups were formed to reduce HA1C. It was seen that the group whose treatment process was followed by healthcare professionals by phone had improvement in HA1C values, and there was no improvement in the control group (9).

In this study, the importance of the language used by physicians and nurses in terms of the compliance and motivation of patients for the treatment was emphasized. It was previously stated that approaches that empower individuals will improve communication and relationships between patients and healthcare professionals. It was determined that giving promising messages to patients can make a difference in diabetes and the general health of individuals (10).

In this study, thirdly, it was determined that creating a diabetes management plan by understanding the lifestyles of patients with diabetes would have a positive effect on the glycemic outcomes of patients under the Multidisciplinary Structure theme. In a previous study, participants were divided into three groups involving placebo, metformin, or lifestyle change interventions. As a result of the study, it was determined that lifestyle changes were more effective than treatment with metformin (11).

In this study, it was determined that there were deficiencies in the quality and quantity of personnel needed to work with a multidisciplinary approach and in terms of team communication. In a study conducted to study the views of physicians on diabetes treatment teams, it was observed that a multidisciplinary team was important in the treatment of diabetes. Additionally, it was stated that such a team provides complementary approaches for the evaluation and treatment of patients and supports the learning of self-care among patients (12).

It was found in this study that there was no structure in which family physicians were responsible for the coordination of the multidisciplinary diabetes team, and such a structure was needed. It was previously reported that the support of family physicians

for the communication of specialists involved in the process of patients with diabetes improved patient care by facilitating interprofessional cooperation in the care of patients (13).

It was observed in this study that the involvement of patients in traditional and complementary medicine practices without being informed by healthcare professionals negatively affected their treatment and self-care. It was determined in a previous study that patients are encouraged by their families, friends, or social media to turn to traditional and complementary medicine. It was reported that only one of the patients stated their use of traditional and complementary medicine methods to their physician (14).

Moreover, the participants of this study emphasized that social workers should be a part of the multidisciplinary team to learn about the living conditions of patients with low socio-economic status and provide state support for them to access the necessary food and living conditions (15).

In the context of the fourth theme of the study, Quality of Life, it was determined that diabetes creates psychological problems in the lives of patients and their relatives. In a study in which psychological support was provided to patients and their relatives in line with bilateral psychological support, improvements were seen in the communication between patients and healthcare professionals, compliance with treatment, and blood sugar monitoring (16).

In this study, it was determined that quality of life was related to the policies and practices of state institutions. Additionally, the importance of food policies and access to safe food was determined to be in parallel with the incidence of diabetes (17).

It was found in this study that the responsibility of patients with diabetes to comply with their treatment plans and ensure their self-care belonged to them. A relationship was found in a previous study between the self-care management of patients with type 2 diabetes and their HbA1c levels, and the glycemic indicators of patients who practiced self-care were better (18).

Finally, under the theme of Health System in this study, it was determined that having health coaches trained on diabetes who can consult on the diagnosis of diabetes and will follow diabetes patients and their relatives will increase compliance with treatment and self-efficacy. In a previous study, the intervention group with type 2 diabetes was given health coaching and routine care for 6 months. The control group was provided with only the routine care. Improvements were observed in the HbA1c values, physical activity, and effectiveness of diabetes self-management in the patients in the intervention group (19).

In the present study, it was determined that patients with diabetes needed structured telemedicine systems for treatment and follow-up with health professionals. In a literature review study, it was reported that telemedicine makes drug adjustment easier and can be useful for clinical care to control HbA1c in the short term (20)

It was seen in this study that information technology infrastructures were needed to inform patients and ensure continuous communication between healthcare service providers and patients. Researchers evaluated a web-based system including patient training materials, drug information, test results, and appointments and interactions between patients and their physicians. It was found that the intervention group included in the web-based system showed a substantial improvement in blood test values compared to the control group (21).

Furthermore, it was observed in this study that physicians could not spare enough time for diabetes patients, especially in public hospitals, due to the patient load. A study was conducted on patients with type 2 diabetes who were included in a diabetes management program at a primary care community health center. After the program, it was seen that the patients had improvements in their microalbumin/creatinine measurement results (22).

It was revealed in this study that that the performance of blood glucose

measurement devices offered free of charge to patients and state payment lists for the free provision of new equipment should be evaluated. For example, in one study, it was found that in 81.1% of patients using insulin pumps, insulin pumps reduced the frequency of hyperglycemic attacks and significantly improved quality of life (23).

Finally, it was determined in this study that there is a need for measuring the performance of disease management programs in diabetes. In the relevant literature, it was stated that the results of disease management performance measurements in diabetes show the current situation (24).

## Conclusions

Specific diabetes education for family and patient relatives should be part of a diabetes education program. In the training content, diabetes, compliance with treatment, what to do in emergencies, and the role of the family and relatives of patients in the treatment process can be included.

Practices should be organized to increase the diabetes-related knowledge and awareness levels of professionals who are in constant interaction with society. For example, for children and young people with diabetes to adapt to treatment and manage emergencies appropriately, the education process of school employees should be reviewed about the subject, and diabetes education should be internalized.

From the moment patients are diagnosed, they should be given education about their disease by health professionals, covering all diabetes patients. Education, which contributes to the self-management and quality of life of patients, should be carried out continuously.

In Turkey, campaigns are organized on issues such as diabetes and the fight against obesity, which is among the risk factors of diabetes, and public service announcements are broadcast, but these are not permanent. To increase the health literacy levels of society and raise awareness about diabetes, ongoing studies on healthy living and diabetes should be carried out with mass media.

For ensuring that society receives accurate information on diabetes from reliable sources without being subjected to information pollution, communication processes should be reviewed, and new procedures should be created. For instance, a TV channel belonging to the Ministry of Health can be established, or the focus of the food programs on TV can be on healthy nutrition.

It has been determined that in terms of diabetes in Turkey, the human resource structure needs to be improved in both quality and quantity. Healthcare professionals who can take part in follow-up and education processes can be identified, and the competencies of these employees can be increased through training and task enrichment.

For healthcare professionals who provide healthcare services to diabetes patients, communication-oriented training should be planned to increase their awareness about approaching the patient, motivation and effective communication, and the risks that the patient will face in the event of not sleeping.

For patients to meet their psychological and social needs, requires the inclusion of psychologists and social workers in the multidisciplinary study system is required. Accordingly, treatment algorithms including these two branches can be utilized at the beginning and during the treatment process for the needs of patients, such as accommodation and nutrition.

It is quite important that patients are directed to traditional and complementary medicine only by healthcare professionals with an approach compatible with science. In

this context, in accordance with the Regulation on Traditional and Complementary Medicine Practices published by the Ministry of Health in 2014, traditional and complementary medicine methods can be integrated into diabetes treatment algorithms.

Although there are programs created by government institutions in Turkey that will increase the physical activity of society and ensure the availability of safe food products to manage the risk of diabetes, there is no approach where improvements and plans are made regarding the outcomes of these practices. In this context, the "Plan-Apply-Check-Take Measures" approach should be utilized with the principle of continuous improvement, and the effectuation of such practices should be revised.

There is a need for structures that will measure the effectiveness of education given to diabetes patients and monitor the compliance of patients with their care plans. In this context, patient follow-up can be provided by diabetes nurses, health professionals working in family medicine centers, or employees working in diabetes-specific centers.

A structure integrated with the existing system where diabetic patients can follow their medication administration and follow-up, specify the examinations that patients should have before their appointments, evaluate blood value measurements, and have online meetings with healthcare professionals can be built.

For healthcare professionals to monitor patient self-management and health condition, systemic structures are required. In this sense, centers that focus on patient self-management issues can be set up specifically for diabetic patients, where the main focuses required by diabetic patients are included.

The performance, variety, and cost of equipment provided by the state must be evaluated routinely. Besides, an assessment should be made so that patients can benefit from new devices that will increase their quality of life free of charge.

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