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Experiences of adults with type 2 diabetes mellitus with low socioeconomic status: a qualitative study

Vahide Semerçi Çakmak^{1*} , Ebru Sönmez Sarı² and Serap Çetinkaya Özdemir³

Abstract

Background Adults with diabetes encounter various challenges related to managing their condition. In this study, we explored the experiences of adults with type 2 diabetes mellitus with low socioeconomic status in Türkiye.

Methods This study was conducted as a phenomenological qualitative research. The purposive sampling method was used to select adults with type 2 diabetes. Data saturation was achieved with 20 patients. The data were collected through a demographic information form and a semi-structured questionnaire. The participants were interviewed by phone. The interviews were conducted in a quiet environment where the participants could respond comfortably. During the data analysis process, the content analysis approach suggested by Graneheim and Lundman (2004) was used. This method involves identifying meaningful units within the text, coding these units, and developing sub-themes and main themes. The MAXQDA 20 software was used for data management.

Results The participants were between 41 and 71 years old. Four main themes and ten subthemes were identified in the analysis. Themes: The identified themes included difficulties with dietary management of diabetes, individual difficulties, difficulties with self-management in diabetes, and coping strategies. According to Theme 1, it was observed that the participants experienced difficulties in managing nutrition in diabetes due to the economic aspect of diet and the inability to adapt to the diet. According to Theme 2, it was observed that the participants faced physical, psychological, and social difficulties. According to Theme 3, it was observed that the participants faced difficulties related to diabetes self-management, including blood glucose monitoring, insulin injection administration, and maintaining glycemic control. According to Theme 4, it was observed that the participants attempted to cope with diabetes-related difficulties through healthy lifestyle habits and family support.

Conclusion Our findings indicate that adults with type 2 diabetes in low socioeconomic status face challenges related to biopsychosocial factors, nutrition, and diabetes self-management. However, these individuals managed their difficulties by adopting healthy lifestyle behaviors and relying on family support. The challenges faced by adults with diabetes may be alleviated through awareness training on dietary management and glycemic control.

Keywords Adults with diabetes, Diabetes, Difficulty, Qualitative study, Socioeconomic status

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Background

Type 2 diabetes mellitus (T2DM) is a chronic disease characterized by hyperglycemia resulting from impaired carbohydrate, protein, and lipid metabolism [1]. Approximately 537 million adults suffer from diabetes worldwide [2]. In Türkiye, the prevalence of diabetes mellitus was 8.1% in 2011 and 14.5% in 2021 [2]. T2DM is a public health concern that strongly affects people in low-income and middle-income countries [3]. Diabetes mellitus significantly increases the economic burden on families and society due to the high cost of medications and the occurrence of acute and chronic complications [4].

Adults with diabetes have difficulty balancing daily activities and often experience difficulties while performing self-management of diabetes [5, 6]. They experience several individual and psychosocial difficulties related to diabetes management [5, 7, 8]. Patients may face challenges in managing daily tasks that require changes to their routine, such as diet and exercise, insulin injections, home blood glucose monitoring, and medication adherence [5]. A study conducted in Mexico found that adults with T2DM face personal challenges, including cultural beliefs, limited resources, difficulties in lifestyle changes, lack of family support, and mental health issues [8]. According to a study conducted in Türkiye, individuals with diabetes who have a low economic level and a high HbA1C level (≥ 7.1) do not benefit adequately from healthcare services. Low income restricts these individuals' access to healthcare services and disrupts their treatment processes. This situation leads to an inability to control blood glucose levels, ultimately resulting in high HbA1C levels [9].

Socioeconomic status directly influences the maintenance of health-protective behaviors and access to treatment options [10]. Individuals with low socioeconomic status face higher health risks and experience illness more frequently [9]. T2DM imposes a serious economic burden on individuals and their families as insulin and other important medications are expensive [2, 11]. Adults with type 2 diabetes experience various difficulties because of their disease [6, 7]. A lack of access to resources hinders optimal diabetes management. A lack of access to healthy foods, medicines, and supplies such as glucometers makes it difficult to manage diabetes, as reported by individuals living with diabetes. They also find healthy eating to be expensive [8]. Only a few studies have investigated the difficulties experienced by adults with T2DM in Türkiye [12]. Diabetes mellitus is a chronic disease with expensive care and treatment [11]. Additionally, studies have reported that individuals with diabetes face many challenges [7, 8]. However, it has not been fully explained how and in what way low economic status affects the management of diabetes mellitus. This qualitative study aims to explore the difficulties experienced by

individuals with diabetes who have a low economic status. Therefore, in-depth interviews were conducted with individuals living with diabetes. The challenges faced by individuals with diabetes in low socioeconomic status may impact their treatment and self-management of the condition. Therefore, it is important to explore the challenges faced by these individuals. The information gathered can be used by healthcare professionals to develop interventions aimed at reducing the challenges faced by individuals living with diabetes.

Methods

Aim

This study explored the experiences of adults with type 2 diabetes mellitus with low socioeconomic status in Türkiye.

Study design

This study was designed as a phenomenological qualitative research. Phenomenological research is an approach aimed at exploring in depth how participants perceive and make sense of a particular experience [13]. This study focuses on the experiences of individuals living with diabetes and the impact of these experiences on their daily lives.

Participants

This study was conducted with individuals living with diabetes in Türkiye. Purposive sampling was used to select the participants. Purposive sampling is a method in which individuals who can provide the most information about the research topic are selected for a specific purpose [13]. Data saturation was achieved with 20 participants. Qualitative interviews were transcribed on the same day they were conducted. Interviews with the participants continued until new codes emerged. In case no new codes emerged, i.e., data saturation was reached, the interviews were terminated [14]. The inclusion criteria were as follows: participants who were more than 18 years old, diagnosed with diabetes at least one year ago, had no communication problems, had a low income, and volunteered to participate in the study. The diagnosis of diabetes mellitus being made at least one year prior was preferred to ensure that the participants have sufficient experience in disease management. Individuals with cognitive or mental health issues that might hinder their understanding of the questions or the ability to provide consistent answers were excluded.

Data collection tools

Two forms were used together during the data collection process. These forms were the demographic information form and a semi-structured questionnaire.

Demographic information form: This form included descriptive information on participants' age, gender, marital status, education, income, and diabetes history.

Semi-structured questionnaire: The researchers prepared this form based on previous studies [6–9]. The interview questionnaire was developed specifically for this study and has not been published elsewhere. See Additional File 1: Study Questionnaire. To ensure the form's clarity, it was sent to experts in qualitative research and diabetes for review. The form was updated based on feedback from the experts. Additionally, a pilot study was conducted with two individuals living with diabetes, and their responses indicated that no changes were needed to the form. The participants in the pilot study were included in the main study. The form consisted of five open-ended questions, listed as follows: "What is it like to live with diabetes?", "How does diabetes affect your daily life?", "What kind of difficulties do you experience while managing your diabetes?", "How does your family support you in diabetes management?", "How do you cope with difficulties related to diabetes?". Open-ended follow-up questions were used to gather detailed explanations. For example, the participants were asked, 'Please tell me more about this' to encourage a deeper discussion.

Data collection

Interviews were conducted from September 1st to 25th, 2023. The data were collected by conducting interviews over the telephone using a demographic information form and a semi-structured questionnaire. The aim of the study was explained to the participants, their consent was obtained, and they were informed that they could leave the study at any time. The participants were contacted by telephone prior to the interview, and the interviews were scheduled at times that were convenient for them. The interviews were conducted in a quiet environment. To ensure a comfortable environment for the participant during the phone calls, each participant was asked if they were in a suitable and quiet location for the interview. Once the participants confirmed that the environment was quiet and suitable, the interview was conducted. Additionally, during the interview, the researcher monitored whether there were any noises or distractions and asked the participants if they felt comfortable continuing. They were informed that the interview would be audio recorded and that their personal information would remain confidential and not be shared with third parties. Additionally, the participants were asked for permission to record the interviews. Twenty-two individuals were initially approached to participate in the study. Of these, 20 agreed to participate, resulting in a response rate of 90.9%. Two participants indicated that they were unavailable, and thus interviews could not be conducted

with them. Detailed interviews were conducted with 20 participants. At the beginning of the interview, a demographic information form was filled out. The interviews lasted approximately 30 min. The research team consists of three researchers with qualitative research experience. The data were collected by one of the researchers with qualitative research experience. There was no relationship between the researcher and the participants that could introduce bias. The researchers conducted the data collection process with an impartial approach. Considering the researchers' personal characteristics, their relationships with participants, and the potential impact on the data collection process, reflexivity was taken into account, ensuring objectivity at every stage of the study. Ethical principles were upheld in the relationships established with the participants. All data were stored in password-protected computer files to ensure security.

Data analysis

The analysis was conducted according to Graneheim and Lundman (2004) [15]. The audio recordings from the interviews were transcribed by two researchers within 24 h of the interviews' completion. They were then analyzed for verbatim accuracy by the interviewers. Each participant was designated as P1 (Participant 1), P2, P3, etc. The traditional content analysis method of Graneheim and Lundman (2004) was used to analyze the interviews. Content analysis is performed to identify commonalities of experiences in a population. This method involves identifying meaningful units within the text, coding these units, and developing sub-themes and main themes [15]. The researchers identified codes by carefully reading the raw data multiple times. Subsequently, these codes were reviewed and linked to reveal the sub-themes. In the final stage, sub-themes were combined to form main themes. Throughout the process, the analysis was elaborated with continuous feedback and the consistency of the themes was meticulously ensured. The themes and sub-themes were presented to a consultant specializing in qualitative research, and their feedback was obtained. MAXQDA software-20 was used for data management. A consolidated criteria for reporting qualitative research (COREQ) checklist was followed to conduct the study.

Trustworthiness

We assessed the accuracy and reliability of the data using the criteria of credibility, confirmability, dependability, and transferability, as described by Lincoln and Guba [16]. To ensure credibility, a third-party expert was consulted to review the themes and sub-themes derived from the collected data. For confirmability, the data collection forms, audio recordings, raw data, and coding data were stored on a password-protected computer [17].

To ensure dependability, the interviews were conducted by the same researcher and recorded using an audio recording device. The data were analyzed independently by two researchers. We aimed to ensure the reliability of the findings through continuous revisions by experts. To ensure transferability, the researchers thoroughly presented the study's context and the participants' perspectives [16, 17]. According to the principles of Graneheim and Lundman (2004), the data were carefully read repeatedly to identify the codes. Subsequently, these codes were reviewed and linked to form sub-themes and themes [15].

Ethical considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki. Approval was granted by the Bayburt University of Ethics Committee (Date:14.09.2023/No:20–4). Informed consent, either written or verbal, was obtained from all participants or their legal guardians prior to enrollment. All participants were informed about the aims of the study, and their consent was obtained. The participants were assured that the information would be kept confidential. They were also allowed to interrupt the interview at any time. The participants were asked for permission to record the interviews. The participants were informed that the audio recordings would be used solely for the purposes of the

study, their personal information would not be shared with third parties, and each participant would be anonymized with codes (e.g., P1, P2). The security of the data was ensured by storing it in password-protected files.

Findings

The sociodemographic characteristics of the participants are presented in Table 1.

The data obtained from semi-structured interviews were grouped under four main themes (Fig. 1).

Theme 1. Difficulties with dietary management of diabetes

We found that the sub-themes of the main theme of Difficulties with dietary management of diabetes were the “Economic aspect of nutrition” and the “Inability to adapt to the diet”.

Sub-theme 1. Economic aspects of nutrition

The participants stated that they had financial problems due to low-income levels and the high cost of healthy food. These statements indicate that the economic conditions of low-income adults with diabetes severely restrict their access to healthy nutrition. Low economic status stands out as an important factor that hinders the ability to maintain a healthy diet.

Table 1 Sociodemographic characteristics of the participants

	Age	Gender	Marital status	Educational status	Fasting blood sugar (mg/dL)	HbA1C (%)	Duration of diabetes (year)	Method of Treatment
P1	66	Female	Married	Primary education	191	10.6	20	Oral antidiabetic + Nutritional
P2	49	Female	Married	Primary education	114	6.3	8	Oral antidiabetic
P3	48	Female	Married	Primary education	156	8.0	18	Oral antidiabetic
P4	60	Female	Single	Literate	270	11.6	8	Oral antidiabetic + Insulin
P5	52	Female	Married	Primary education	188	8.0	12	Oral antidiabetic + Nutritional
P6	68	Male	Married	Primary education	314	11.0	13	Oral antidiabetic + Insulin
P7	58	Female	Married	Primary education	202	10.6	4	Oral antidiabetic + Nutritional
P8	41	Female	Married	Primary education	146	8.6	22	Insulin
P9	47	Female	Married	Primary education	132	7.2	3	Oral antidiabetic
P10	57	Male	Married	Primary education	219	9.9	3	Oral antidiabetic
P11	57	Male	Married	Secondary School	353	11.6	3	Not using
P12	59	Male	Married	Primary education	342	10.7	10	Oral antidiabetic
P13	69	Female	Married	Primary education	306	10.8	25	Oral antidiabetic
P14	63	Female	Married	Literate	204	10.0	8	Oral antidiabetic + Insulin
P15	54	Male	Single	Secondary School	267	8.4	8	Oral antidiabetic + Insulin
P16	71	Male	Married	Primary education	232	10.7	12	Oral antidiabetic
P17	49	Male	Married	Primary education	200	9.7	4	Oral antidiabetic
P18	54	Male	Married	Secondary School	176	9.2	15	Oral antidiabetic
P19	68	Male	Married	Primary education	161	8.2	15	Oral antidiabetic + Insulin
P20	52	Male	Married	Primary education	341	11.7	10	Oral antidiabetic

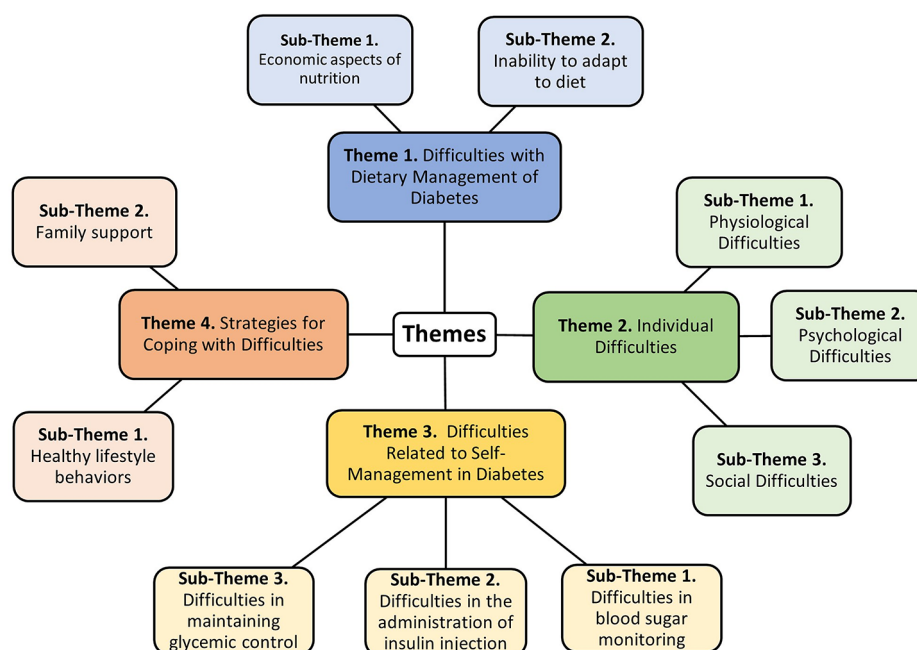


Fig. 1 Hierarchy of themes and subthemes

*"I have difficulty buying the food the doctor says... I get a low salary. I can buy healthy food once a month... Pasta is the food of the poor..." (P6).
"...healthy food is very expensive. My economic situation affects my health..." (P11).*

Sub-theme 2. Inability to adapt to diet

The participants stated that they had food-related difficulties because of diabetes. The participants stated that diabetes makes it difficult to maintain eating habits and that they feel powerless due to dietary restrictions. Adults with diabetes have difficulty adhering to a healthy diet.

*"It is very difficult to live with this disease. Everything is forbidden. You cannot eat what you want. You are weak because you cannot eat..." (P4).
"Eating a diet of greens makes me weak. It makes me feel like grass. Therefore, I also eat rice, bread, and sugar, but recently I have reduced them a little" (P16).*

Theme 2. Individual difficulties

The sub-themes of the main theme of Individual Difficulties were found to be "Physiological Difficulties", "Psychological Difficulties", and "Social Difficulties".

Sub-theme 1. Physiological difficulties

The participants stated that they experienced physiological difficulties related to diabetes, such as dry mouth,

frequent urination, fatigue, and problems related to appetite and sleep. Additionally, they have stated that these situations negatively affect their sleep patterns, making their daily lives more difficult.

"This disease makes me eat a lot...I eat whatever I can find..." (P1).

"I experience dry mouth at night... I drink a lot of water, so I urinate a lot at night. It makes me sleepless..." (P19).

"Diabetes makes me very weak... I get tired very quickly. I feel tired" (P13).

Sub-theme 2. Psychological difficulties

The participants stated that they experienced nervousness and fear. The participants expressed that they were afraid of using insulin and that diabetes made them irritable. Adults with diabetes experience psychological difficulties.

"This disease is difficult... I do not use insulin. I am afraid of using insulin" (P1).

"Diabetes makes you an irritable person. I get angry very quickly. My husband has diabetes; when I say something, he also gets angry very quickly..." (P14).

Sub-theme 3. Social difficulties

The participants stated that diabetes affects social life, family responsibilities, and religious practices. Adults

with diabetes face restrictions on religious practices and spending time outdoors due to their illness. Additionally, adults with diabetes are unable to fully fulfill their family responsibilities.

"I cannot go out in case my sugar drops. I am usually at home..." (P6).

"This disease restricts people... It affects our going out, we need to go out cautiously, and this causes distress" (P17).

"I want to fast but I cannot. I had a lot of difficulty when I fasted last Ramadan" (P9).

"I am very exhausted because of my illness; I cannot take adequate care of my children..." (P8).

Theme 3. Difficulties related to self-management in diabetes

The main theme of difficulties related to self-management in diabetes includes three sub-themes: 'Difficulties in blood glucose monitoring,' 'Difficulties in insulin injection practice,' and 'Difficulties in maintaining glycemic control.'

Sub-theme 1. Difficulties in blood sugar monitoring

The participants stated that they had difficulty measuring blood glucose or did not want to measure it. The participants find blood sugar measurement difficult and uncomfortable, so they avoid regular measurement. Seeing high blood glucose levels in particular has a psychologically negative impact on them.

"My fingertips were riddled with holes and hardened because I was frequently measuring my blood sugar levels... That is why I find it difficult to measure my blood sugar" (P8).

"I have a device at home to measure my blood sugar. But finding high blood sugar levels affects me. That is why I do not use it..." (P17).

Sub-theme 2. Difficulties in the administration of insulin injection

Participants reported difficulties in adjusting the insulin dose and timing, as well as in administering insulin injections. This situation creates a difficulty for the participants, particularly affecting their daily lives.

"I have to administer insulin in the morning and evening... It is very difficult to adjust the time and dose... Additionally, I administer insulin through my navel... Pricking my body with a needle affects me..." (P17).

"I live in the village... I am engaged in gardening... It is difficult for me to deal with insulin. I wonder how this happened to me..." (P14).

Sub-theme 3. Difficulties in maintaining glycemic control

The participants stated that they had difficulties adjusting their diet and insulin doses while maintaining glycemic control. As a result of the difficulties experienced by the participants, glycemic control cannot be achieved, and their quality of life can be negatively affected.

"It is difficult when blood sugar levels rise and fall... You need to pay attention to what you eat all the time. It is a difficult situation..." (P5).

"If I slightly overdose the insulin and eat less, my blood sugar drops immediately. If I eat slightly more, my blood sugar rises... I have great difficulty in balancing..." (P8).

Theme 4. Strategies for coping with difficulties

We found that the sub-themes of the main theme of coping strategies with difficulties were "Healthy lifestyle behaviors" and "Family support".

Sub-theme 1. Healthy lifestyle behaviors

The participants stated that they could cope with the difficulties they experienced by following their diet, avoiding stress, and through their beliefs. Participants try to cope with the difficulties related to their diabetes by adopting healthy living habits.

"I do not eat anything forbidden that will raise my sugar level... I consume plenty of greens. I do not neglect milk in snacks... It is a disease from God, what can you do if you do not deal with it..." (P4).

"I watch my portions... I do not eat sweets... I do not think about anything, I stay away from stress..." (p12).

Sub-theme 2. Family support

The participants stated that their spouses and children supported them in coping with the difficulties of diabetes. Family support plays an important role in the treatment adherence process and daily activities of adults with diabetes.

"I cannot follow my medication; my husband supports me. He follows my medication schedule and prepares meals according to my needs..." (P17).

"... my daughters help me a lot in coping with this disease... My daughter is a nurse... She helps me a lot..." (P9).

Discussion of findings

In this study, we explored the experiences of adults with T2DM in low socioeconomic status in Türkiye. The themes obtained from this study included difficulties with dietary management of diabetes, individual difficulties, difficulties related to self-management in diabetes and coping strategies.

Discussion of theme 1 findings: Difficulties with dietary management of diabetes

Adults with diabetes frequently encounter difficulties such as financial constraints and non-adherence in following dietary guidelines. In line with our findings, a study conducted in Iran reported that low socioeconomic status significantly hinders self-management of diabetes in adults with T2DM [18]. Similarly, a study conducted on homeless diabetes patients in Toronto noted that these patients had difficulty adhering to the recommended diets. Especially, socioeconomically disadvantaged groups face limitations in determining suitable food types and dietary options for diabetes management [19]. These studies emphasize the critical role of socioeconomic factors in shaping dietary behaviors in adults with diabetes and largely align with our findings.

Discussion of theme 2 findings: individual difficulties

Frequent urination at night, excessive thirst, excessive hunger, and extreme fatigue are known as the general symptoms of T2DM [20]. In our study, the participants reported experiencing dry mouth, frequent urination, fatigue, and loss of appetite. In addition, the participants stated that they had problems with sleep. The literature shows that insomnia is common among individuals living with diabetes and that sleep quality is generally low [21–22]. Diabetes-induced nocturia is one of the main causes of these sleep problems. Our findings reveal that diabetes is not limited to physical symptoms but is also associated with sleep disorders that negatively impact individuals' quality of life.

Diabetes mellitus has adverse psychological effects on individuals [23]. In this study, the participants stated that they were unnecessarily angry and afraid of using insulin. Kolbasovsky's (2004) study found that individuals with diabetes reported higher levels of anger, although the underlying reasons for this were not explained [24]. It is possible that the burden of diabetes care, stress related to the disease, or fluctuations in blood sugar levels may contribute to feelings of anger. Çelik and Pınar (2014) reported that individuals living with diabetes experienced

fear of insulin injection and finger pricking [25]. Fear of insulin administration may cause poor glycemic control in individuals living with diabetes and increase complications and mortality risk [26].

In this study, it was found that the participants experienced social isolation due to fear of experiencing hypoglycemia. In the literature, it is stated that social isolation is more common among elderly individuals with diabetes [27–28]. A study emphasized that glycemic fluctuations, changes in lifestyle habits and inadequate self-management were among the causes of social isolation [27]. Considering that most of the participants in our study are elderly individuals, this result is expected. However, our findings suggest that social isolation may be related not only to aging but also to psychological factors such as fear of hypoglycemia.

In our study, it was observed that the participants had difficulty fulfilling their religious duties, such as fasting. In the literature, it is stated that Muslim individuals with T2DM living in other countries also face similar challenges [12, 29, 30]. Especially, the fear of hypoglycemia and the social aspect of fasting can negatively affect the dietary management of adults with T2DM [30]. Our study shows that these findings are consistent with the existing literature.

Discussion of theme 3 findings: difficulties related to self-management in diabetes

In this study, the participants experienced difficulties with diabetes self-management, specifically in the areas of blood glucose monitoring, insulin administration, and glycemic control. The difficulties experienced in blood glucose monitoring involve the puncturing of the fingers and the distress experienced due to high blood glucose levels. A study found that the pain from continuous finger pricking and the discomfort during blood glucose measurement made monitoring difficult for patients with diabetes [31]. Another study found that barriers to self-monitoring of blood glucose included frustration over high readings and fear of needles and pain [32]. Our findings were similar to those of other studies. The participants experienced pain while injecting insulin. Additionally, the participants reported that they experienced difficulties related to nutrition, insulin injection, and adjusting the dose and time of insulin while maintaining glycemic control. In one study, the participants reported that the pain they experienced due to insulin injection negatively affected treatment adherence [33]. In a study conducted on adults with T2DM from 12 countries, 24% of patients stated that they never followed the instructions regarding the timing of insulin administration [34]. Another study found that individuals with diabetes experienced pain during insulin administration and had difficulty adjusting the insulin dose [6]. Some studies

reported that adults with diabetes experience difficulties related to nutrition while maintaining glycemic control [19, 35]. Thus, the difficulties experienced by adults with diabetes negatively affect diabetes self-management.

Discussion of theme 4 findings: strategies for coping with difficulties

In this study, we found that the participants used different strategies to cope with the difficulties related to diabetes. Most of the participants coped with the difficulties by following their diet, avoiding stress, practicing religious beliefs, and receiving family support. Nutrition is the cornerstone of diabetes management and is important in ensuring glycemic control [36]. In our study, the participants coped with diabetes by maintaining a strict diet. Stress can increase blood glucose levels in adults with diabetes [37]. Additionally, stress also affects adherence to treatment in diabetes management. Stress management is considered a key strategy for coping with the difficulties associated with diabetes [38]. Studies have shown that the religious beliefs of individuals with diabetes can support their self-management of the condition [18, 39]. The findings of our study align with those reported in previous studies. Healthcare providers should recognize the role of religion in the lives of individuals managing diabetes and integrate religious considerations into personalized care plans [39]. Strong family support enhances the quality of life for individuals living with diabetes [40]. In a study, adults with diabetes stated that they received support from their families in all aspects [41], which was also found in our study. Family support is important in diabetes self-management. Therefore, families should also be trained while providing education to patients about diabetes.

Limitations

Our study had several limitations. The results of this study were specific to Turkish society and culture. The study was conducted with a few individuals living with diabetes. Therefore, the results of this study cannot be generalized. Another limitation is that the participants were interviewed over the telephone. The socioeconomic status of the participants was determined based on their self-reports of whether their income was lower, equal, or higher than their expenses, and this method is one of the limitations of the study. Additionally, this study aimed to understand the difficulties of living with type 2 diabetes, particularly among individuals with lower socioeconomic status. However, the lack of examination of age-related differences is among the limitations of the study. Future studies with narrower age groups may allow for a more detailed evaluation of these differences.

Conclusions

The results of this qualitative study showed that adults with diabetes in low socioeconomic status experience difficulties related to biopsychosocial aspects, dietary, and diabetes self-management. They were also found to cope with their difficulties by adopting healthy lifestyle behaviors and through family support. However, further studies are needed to confirm our findings.

Exploring the difficulties experienced by adults with diabetes in low socioeconomic status might provide important information for updating the diabetes education content to be offered to the patients. The results of this study may also help all members of the multispecialty diabetes care team take better care of adults with diabetes in low socioeconomic status.

To reduce the difficulties experienced during insulin administration, it is important to develop less painful needles and materials, provide ongoing training on insulin dosing, and enhance the content of the training. Health professionals should emphasize the importance of nutrition in blood sugar regulation, and they should involve the patient while making a nutrition plan to minimize the economic burden.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12889-025-21582-1>.

Additional File 1: Study questionnaire. This file contains the full questionnaire used in the study.

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Author contributions

"V.S.Ç., E.S.S. and S.Ç.Ö. contributed to the conception of the article. V.S.Ç. and S.Ç.Ö. contributed to the data acquisition and preparation. V.S.Ç. and E.S.S. contributed to the data analysis and figures. V.S.Ç., E.S.S. and S.Ç.Ö. contributed to the interpretation of results. V.S.Ç., E.S.S. and S.Ç.Ö. contributed to the manuscript drafting and revisions. V.S.Ç., E.S.S. and S.Ç.Ö. had the opportunity to access and verify the data. All authors contributed to the study conception and design."

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Data availability

The datasets generated and analyzed during the current study are not publicly available but are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the principles of the Declaration of Helsinki. Approval was granted by the Bayburt University of Ethics Committee (Date:14.09.2023/No:20 – 4). Informed consent, either written or verbal, was obtained from all participants or their legal guardians prior to enrollment. All participants were informed about the aims of the study, and their consent was obtained. The participants were assured that the

information would be kept confidential. They were also allowed to interrupt the interview at any time. The participants were asked for permission to record the interviews. In addition, the participants were informed that the audio recordings would be used solely for the purposes of the study, their personal information would not be shared with third parties, and each participant would be anonymized with codes (e.g., P1, P2). The security of the data was ensured by storing it in password-protected files.

Consent for publication

Not Applicable.

Competing interests

The authors declare no competing interests.

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