

# The experiences in the self-management of gestational diabetes: A qualitative study based on pender's health promotion model

Nuran Nur Aypar Akbağ<sup>1</sup>, Merlinda Aluș Tokat<sup>2</sup>

<sup>1</sup>Midwifery Department, Faculty of Health Sciences, Sinop University, Sinop, Turkey

<sup>2</sup>Obstetric and Gynecologic Nursing Department, Faculty of Nursing, Dokuz Eylül University, İzmir, Turkey

Received: 2023-07-14.

Accepted: 2023-08-20



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J Clin Med Kaz 2023; 20(5):22-30

Corresponding author:

Nuran Nur Aypar Akbağ.

E-mail: [nuraypar@gmail.com](mailto:nuraypar@gmail.com);

ORCID: 0000-0002-4693-2896

## Abstract

**Aim:** Cultural differences, facilitators or barriers affect lifestyle changes in women with GDM. This descriptive qualitative study examined experiences in self-management of Gestational Diabetes Mellitus (GDM) through Pender's Health Promotion Model (HPM) of the nursing theories that develop cultural care models.

**Material and methods:** The qualitative descriptive research was designed based on a deductive qualitative content analysis, within the framework of the Health Promotion Model. A total of 23 women, who were diagnosed with GDM, participated in semi-structured interviews. Data were analyzed a deductive qualitative directed content analysis.

**Results:** Three themes that reflected "Behavior-specific cognitions and affect" component of HPM were obtained: perceptual changes, emotional changes, and changes in the support system. Sub-themes such as believing in the benefit of implementation and succeeding, monitoring the implementation, positive support were determined as the facilitating sub-themes. The difficulty of implementations, serious dimension in treatment, believing in failing, fear, stress, sadness, confusion and negative support were identified as barriers in GDM self-management.

**Conclusion:** This study highlighted on the value of the intervention based on Pender's Model shall guide healthcare professionals in improving and to perform individualized GDM self-management. Also, the educational based on nursing models can increase self-efficacy and motivation in women.

**Key words:** gestational diabetes mellitus, health promotion, nursing care, qualitative study, content analysis

## Introduction

Gestational Diabetes Mellitus (GDM) is defined as diabetes that occurs for the first time in the second or third trimester of pregnancy [1]. International Diabetes Federation (IDF) is reported (2019) that 129.5 million pregnant women worldwide were affected by hyperglycemia as the 83.6% of these pregnant women were diagnosed with GDM [2]. The prevalence of gestational diabetes was estimated to be 7.7% in Turkey (2019). The prevalence of diabetes in different regions of Turkey varies from 5.1% to 17.6% [3].

The diabetes foundations in the world recommend medical treatment, medical nutrition therapy, exercise, and applying health behavior changes for the proper

management of gestational diabetes in antepartum and postpartum periods. This treatment planning positively influences mother and baby's health in antenatal and postnatal periods [1,4]. The pregnancy period is particularly important in acquiring health behaviors that affects women's entire life. Because it offers enough time for change in behaviors and facilitates implementation to the process through consideration of the baby's health.

However, literature in our country and the World indicates that women with GDM still face problems in initiating and maintaining health behavior changes despite the education and supervision provided in antepartum and postpartum periods [5-8]. The main reason for this situation is that although women mostly

consult health personnel as a source of information since the diagnosis of GDM, a significant part of them also benefit from different sources. In addition to the mass media, it has been determined that family elders and friends are used as a source of information in health [9].

Background

The other studies in the world focus on the life experiences that play an important role in increasing or decreasing self-efficacy of women with gestational diabetes and facilitators and barriers factors [10,11]. It is stated that at the beginning of facilitator factors, caring about the health of the baby and evaluating it as an opportunity to reduce the risk of Type 2 DM will have a facilitating effect for lifestyle change [12,13]. Similarly, it is stated that receiving social and professional support will contribute positively to the lifestyle changes of pregnant women [13,14].

In the different nations, it is seen that there are many barriers' factors in the management of GDM. Studies conducted in developed countries reported nutritional regulation of the meals and having no time for blood glucose measurements as factors that prevent GDM management [12,13]. Additional problems were reported as experiencing anxiety and pain in the blood glucose monitoring [15], and physical and social limitations in exercise planning [13]. The studies conducted with South Asian women in Australia and women of Mexican origin in a United States border region stated that women did not prefer diet, believing that eating plan has a negative impact on the babies' development [10,12]. Similarly, another study revealed that although considering a healthy diet, women with GDM were socially isolated since they had to eat alone [12,16]. It was also stated that inadequate social and professional support during the treatment negatively affected the process [13,17].

Current study

Due to the difficulties in obtaining and maintaining health-promoting behaviors, some behavior change theories and models are used by researchers as guidelines [18,19]. Pender's Health Promotion Model is one of the comprehensive models used to implement health promotion behaviors and is used frequently [20]. This model is a guide to evaluate the complex biological-psychological processes of individuals to improve their health behaviors and reveals their decisions about their health promoting behaviors [18,21]. In this direction, it is thought that this model shall contribute to the self-management of GDM, develop culture-oriented nursing care, individualize it and increase effectiveness. Therefore, the aim of this study was to elaborate GDM self-management experiences among pregnant women with GDM through Pender's Health Promotion Model.

Theoretical framework

The Health Promotion Model (HPM) developed by Nola Pender aims to form the basis for structuring nursing initiatives and develop and maintain a health behavior. Pender's HPM consists of components that include individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes [22,23].

Individual characteristics and experiences

It is emphasized that behaviors are affected by individual characteristics and experiences. Experiences are explained as events that leave an impression/effect on someone. Individual

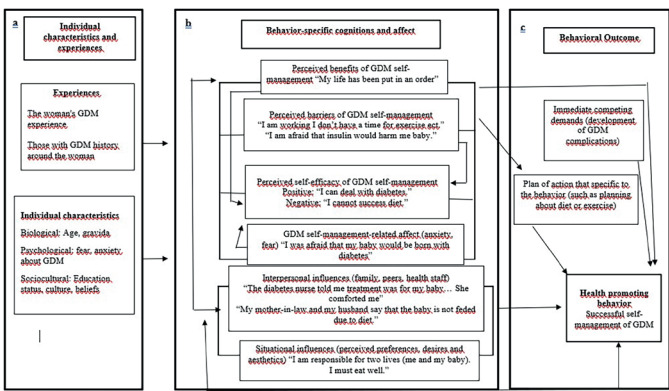


Figure 1 - The Experiences in GDM Self-Management Based on Pender's Health Promotion Model. a) The component presents examples of individual characteristics and experiences. b) In the area Behavior-specific cognitions and affect in showing examples of facilitators and barriers factors in GDM management. c) It is the part that shows whether GDM is successfully managed. According to the results in this area, re-planning is done to obtain or maintain health behavior.

characteristics are classified as biological, psychological and socio-cultural. The biological features include age, gender, number of births given, while psychological features include self-motivation and perceived health status. Ethnic group, education, and socioeconomic features are included in the socio-cultural features (Figure 1a) [22,23].

Behavior-specific cognitions and affect

These parts affect the motivation required to gain and maintain behaviors. It makes up a significant component and includes Perceived Benefits of Action, Perceived Barriers to Action, Perceived Self-Efficacy, Activity-Related Affect, Interpersonal Influences and Situational Influences (Figure 1b) [22,23].

Perceived benefits of action

It should be easier to gain a behavior if an individual believes that it is beneficial. For example, if a pregnant woman believes that GDM management practices (such as diet, exercise, blood glucose monitoring etc.) is going to reduce the risks for herself and her baby, she will make an effort for the implementations (Figure 1b) [12].

Perceived barriers to action

If insulin therapy used in the treatment of GDM is perceived as a bad condition or a serious dimension of treatment, a woman may experience difficulties in carrying out the insulin treatment properly and regularly (Figure 1b) [17].

Perceived self-efficacy

Perceived self-efficacy is the self-belief that a woman has the capability and power to apply practices in GDM management and health promotion behaviors (Figure 1b) [24].

Activity-related affect

Emotions that occur before, during and after the behavior affect individuals perceived self-efficacy and the continuation or repetition of a behavior. Repeating insulin therapy and blood glucose measurement used in GDM management at certain intervals during the day may develop negative feelings in woman and adversely affect treatment engagement (Figure 1b) [15].

Interpersonal influences (family, peers, health staff)

The support given to an individual by the individuals around for gaining the desired behaviors. The positive support (for housework, child care, nutrition, exercise) provided by the spouse, family and friends for the pregnant woman with GDM during the treatment process is a factor that increases her implementation and success (Figure 1b) [13,17].

Situational influences

Factors such as perceived preferences, desires and aesthetics may affect GDM management in both ways. Some examples of situational effects are the beliefs such as “The diet treatment prevents the growth of the baby.” and “A pregnant woman eats more.” (Figure 1b) [10].

Behavioral outcome

The outcome of whether a woman with GDM can perform the desired behaviors during disease management and achieve behavioral change. Immediate competing demands (development of GDM complications) or whether the individual has made an action plan specific to the desired behavior (such as planning about diet or exercise) affects behavioral output. When making an action plan, individual characteristics, experiences, behavior-specific cognitions, and their affect are very important for women to succeed. As the engagement in the action plan increases, the change in health-promoting behavior remains for a long time (Figure 1c) [22,23].

Material and methods  
Study design

This study was performed deductively using directed qualitative content analysis according to Hsieh and Shannon’s approach [25]. The analysis was guided by HPM as a framework in order to assume that experiences are formed in human consciousness, and it was selected to better understand the experiences of pregnant women with GDM with in their circumstances. The study report was also prepared in parallel to the Consolidated Criteria for Reporting Qualitative Research (COREQ) [26].

Participant selection

Data were collected between January 2018 and January 2019 in the obstetric outpatient clinics of two university hospitals in Turkey. The pregnant women were selected through the purposeful sampling method. All pregnant women with GDM who met the inclusion criteria were invited to participate in the study. Informed consent (both orally and in writing) was obtained from those who were interested in the study, and were informed about the aims and methods. They were assured that the recorded interviews would remain confidential.

The in-depth interviews with the participants were continued until the data saturation point (the answers/opinions start to repeat each other) was reached [27]. The interviews were conducted with 23 women. The inclusion criteria were as follows: being 18 years old and over, diagnosed with GDM and being in the 36th gestational week or over (Pregnant women who diagnosed with GDM at the 28th gestational week were expected to experience at least 8 weeks of treatment.). Exclusion criteria were having type 1 or type 2 diabetes, any psychiatric diagnosis, vision, hearing, perception and physical obstacles.

Data collection

Semi-structured interview technique was used. After obtaining their consent, we decided on a mutually convenient time and venue for the interview. The interviews were conducted in a suitable and quiet interview rooms with good lighting in the hospital’s relevant unit. All of the participants were interviewed individually and in-person. The interviews were made by the same researcher (who had taken qualitative research courses during PhD and she is research assistant at the obstetrics and gynecology nursing department in X University), and the same voice recorder and interview form were used. Before interviews the introduction form that included sociodemographic and obstetric data such as age, educational status of the pregnant woman, educational status of the husband, occupation, gestational week, obstetrical story, and current treatment was performed. Subsequently, interviews were conducted with a semi-structured interview form prepared based on HPM (Table 1). Semi-structured interview form was evaluated by three experts with PhD degrees who previously used the HPM. During the interview process, additional questions were asked according to the responses from women. Each interview was audio-recorded that lasted between 28 to 43 minutes.

Table 1 Semi-Structured Interview Questions

Interview questions of individuals	Components of Pender’s Health Promotion Model
What did you feel when this disease was diagnosed?	Behavior-specific cognitions
What has changed in your life since you were diagnosed with this disease?	Behavior-specific experiences, Activity-related affect
Could you please describe your life with gestational diabetes?	Behavior-specific experiences, Activity-related affect, Perceived self-efficacy
How do you feel about the treatment/exercise diet?	Behavior-specific cognitions and affect
How do you feel when your blood sugar is measured several times a day or insulin injection is applied?	Behavior-specific cognitions and affect
What barriers do you face in managing your gestational diabetes?	Perceived barriers to action, Interpersonal influences, Situational influences
What facilitators do you face in managing your gestational diabetes?	Perceived benefits of action, Interpersonal influences, Situational influences
How do you evaluate yourself in Gestational Diabetes Mellitus management?	Perceived self-efficacy

Data analysis

According to the recommendations of Hsieh and Shannon, directed content analysis was made [25]. First, the researcher transcribed each recorded interview separately. Secondly, transcripts re-read several times by the researchers, it was ensured that the participants' experiences were understood as a whole. Thirdly, highlighted areas were coded using the predetermined categorization. Subsequently, that the codes were examined in terms of their relations with each other and the themes and subthemes were determined. The identified themes were discussed in the context of the 'Behavior-Specific Concepts and Effects' component of Pender's Health Promotion Model.'

Rigor

The qualitative data reliability was ensured through certain procedures such as credibility, dependability, transferability, and verifiability [28].

In terms of credibility, the interviews were made by the same coder (the first coder who had taken qualitative research courses during PhD), and the same voice recorder and interview form were used. The interviews were analyzed by the two coders independently. No contact was made between the interviewees and the interviewer before the interviews. The in-depth interviews with the participants were continued until the data saturation point was reached. It was ensured that results were presented to an expert to provide dependability and by frequent meetings of the authors to discuss data analysis. Inclusion criteria and purposive sampling method were used to ensure

transferability. The list of themes and quotations were sent back to available eleven women (others refused to interview because they had no time) on the mail to represent the true meanings. Confirmations were gained after the interviews. This way was ensured to enhance verifiability.

Results

The average age (±SD) of participants was 32.3 (±6.3). Of the pregnant women, 30.4% had GDM in a previous pregnancy. Furthermore, 56.5% of them were receiving insulin treatment. The majority of participants were housewives (69.6%) (Table 2).

The thematic analysis revealed fifty-three codes and eleven sub-themes. Three themes, which reflected “Behavior-specific cognitions and affect” component of Pender’s HPM, were obtained from the coded data (Table 3).

Theme 1: Perceptual changes

The theme ‘Perceptual changes’ reflects Perceived Benefits of Action, Perceived Self-Efficacy, Perceived Barriers to Action and Perceived Self-Efficacy, which are the factors of ‘Behavior-specific cognitions and affect’ component.

*Sub-theme: Believing in the benefit of implementation and succeeding:* The participants expressed that they applied blood glucose monitoring, diet, insulin treatments and physical activity because they believed that it was beneficial. Also, women, who believe they can be successful, expressed that they were more in control of behavioral change.

Table 2 Demographic Characteristics of Participants

Participant no	Age	Education status	Occupation	Educational status of spouse	Gestational week	Gravida	GDM history	Current treatment
P1	33	Primary School	Housewife	Primary School	37	3	No	Insulin
P2	33	High School	Housewife	High School	36	3	No	Diet
P3	43	Middle school	Worker	University	36	2	No	Insulin
P4	37	Middle school	Housewife	Middle school	38	6	Yes	Insulin
P5	45	University	Worker	High School	36	7	No	Insulin
P6	32	High School	Housewife	Middle school	38	4	No	Diet
P7	45	Primary School	Housewife	Middle school	36	3	Yes	Insulin
P8	24	High School	Housewife	High School	36	1	No	Insulin
P9	26	High School	Housewife	High School	37	1	No	Diet
P10	28	Middle school	Housewife	High School	38	1	No	Diet
P11	28	Middle school	Worker	Middle school	36	3	Yes	Insulin
P12	35	Primary School	Worker	Primary School	37	2	No	Insulin
P13	30	Middle school	Housewife	Middle school	38	2	Yes	Diet
P14	28	University	Worker	High School	38	2	No	Diet
P15	36	Primary School	Housewife	Middle school	36	3	Yes	Insulin
P16	22	High School	Housewife	High School	36	1	No	Insulin
P17	32	High School	Housewife	High School	37	3	Yes	Diet
P18	28	University	Worker	High School	39	1	No	Diet
P19	29	Primary School	Housewife	Primary School	36	2	No	Insulin
P20	38	High School	Housewife	University	37	4	No	Diet
P21	25	High School	Worker	High School	37	1	No	Diet
P22	34	Primary School	Housewife	Middle school	36	2	Yes	Insulin
P23	32	Primary School	Housewife	Primary School	38	3	No	Insulin



Table 3		Themes, Sub-Themes, Codes and "Behavior-Specific Cognitions and Affect" Component of Pender's Health Promotion Model	
Theme	Sub-theme	Code	"Behavior-specific cognitions and affect" component of HPM
Perceptual changes	Believing in the benefit of application and succeeding	-Thinking about the baby's health -Turning it into a habit -Thinking that it's temporary -Taking precautions due to diabetes in the family history	Perceived Benefits of Action and Perceived Self-Efficacy
	Monitoring the application	-Considering it as a duty -Turning it into a habit -Thinking that the physician will control -Providing experience -Organizing life	
	Difficulty of applications	-Feeling bad -Finding applications boring -Boredom -Despair -Hurting needles -Feeling lazy -Difficulty in living under control -Feeling of hunger -Thinking that prohibitions are attractive -Weakness -Difficulty in timing main and snack meals -Having different responsibilities -Preparing separate meals for everyone in the house	Perceived Barriers to Action
	Serious dimension in treatment	-Having prohibited food and drinks on the table -Ignoring the risk of diabetes -Thinking that the treatment is getting serious -Being happy when seeing the desired results -Belief in living with the current situation	Perceived Barriers to Action
	Belief in failing	-Failure to balance -Inability to plan a meal -To giving up quickly	Perceived Self-Efficacy
Emotional changes	Fear	-Fear of being persistent -Fear of transmitting diabetes to the baby -Fear of losing the baby -Fear that insulin will become addictive -Not being satisfied with the given training	Activity-Related Affect and Situational influences
	Stress	-Having ongoing and different responsibilities -Difficulty in living a regular life -Having diabetes in the family history	
	Sadness	-Despair -Crying for reaction -Refusing to communicate -Frustration	
	Confuse	-Wonder -Confusion -Perception of overfeeding pregnant women in the society -The thought that the baby cannot be fed during the diet	
Changes in the support system	Positive support (family, spouse, close environment and health professional) Negative support (family, spouse, close environment and health professional)	-Getting the support of the husband -Getting the support of the kids -Getting the support of the mother-in-law -Positive approaches of the diabetes nurses -Receiving no support from the husband -Husband's inaccurate knowledge -Hearing startling expressions from the physician	Interpersonal Influences

“... I have to do it even if there are obstacles. I have an obligation to do it on time... If I do not have a diet, my baby is in danger. I believe that I will cope with diabetes.” (P4, Housewife, Insulin treatment)

Sub-theme: Control of the implementations: Pregnant women stated that they performed treatment implementations more quickly when checked by a physician or diabetes nurse. They stated that their lives were regulated in this way.

“How can I describe this feeling? I think of the implementations like a homework given by the teacher. I measure my blood sugar every day... At first, I felt bad, but afterwards, it became a habit, I feel better. My life has been put in an order.”

(P14, Worker, Diet treatment)

Sub-theme: Difficulty of implementations: Practices such as diet, exercise, insulin etc. caused negative perceptions in women. Most women stated that they had several responsibilities in their daily practices such as housework, child care, and working life.

“I cannot promise to exercise, it is not possible, I don't have time, the person who is already working never has time, but of course I can adapt to a diet. However, preparing food according to my own diet plan is a challenge. You are cooking a different meal for your partner, and a different one for your children...” (P3, Worker; Insulin treatment)

“For example, when I have a guests, go to a bazaar or

somewhere else... sometimes I have difficulty in measuring it on time. Besides, I cannot go out with my other child for exercises due to the cold weather.” (P19, Housewife, Insulin treatment)

**Sub-theme: Serious dimension in treatment:** Some women believed that insulin was insistent, and spouses also had inadequate knowledge about insulin treatment. They also mentioned that they started to think that treatment became serious when the insulin treatment was started.

“...When I learned that I must start insulin treatment, I cried on the way to the hospital... I felt so bad. I thought it was a more serious stage. My husband was concerned that the insulin might be harmful for our baby. I started insulin treatment, but I could not cope with it, and ultimately quit.” (P22, Housewife, Insulin treatment)

**Sub-theme: Belief in failing:** Women who experienced GDM management difficulties reported that they felt unsuccessful and quickly gave up. “I tried to plan my meals. But I could not... I am a person who gives up very quickly... I am anxious because I cannot comply with the treatment. I cannot, I cannot success... I’m angry with myself, why can’t I? Why I can’t be patient for my baby?” (P20, Housewife, Diet treatment)

## Theme 2: Emotional changes

The theme ‘Emotional changes’ reflects Activity-Related Affect and Situational influences, which are the factors of ‘Behavior-specific cognitions and affect’ component.

**Sub-theme: Fear:** “Fear” was defined as the most common feeling after being diagnosed with GDM. Women primarily get concerned about harming their babies. During the treatment process, they stated that they were afraid that the baby would suffer malnutrition during the diet and that insulin would harm the baby.

“The physician and the nurse told me, but I am not satisfied... They said, “You will use insulin for 3 months”. But I did not want to use insulin. Maybe if they said that insulin was not going to necessary after birth, I would have accepted. When the physician said, “we would increase the dose”, I gave up... I thought it would be permanent, I was quite afraid... I was afraid that my baby would be born with diabetes...” (P1, Housewife, Insulin treatment)

**Sub-theme: Stress:** Women state that they are experiencing stress in health behavior changes and GDM complications.

“My physician said that if my blood glucose is too high, there is a risk of transmitting that to the baby and that I have to pay attention from the start. I almost fainted when they told me that my baby could be larger, so the birth could be challenging. I had a hysterical fit. I am quite stressed. Thus, my blood sugar level is always measured high in the tests. I cannot soothe myself.” (P17, Housewife, Diet treatment)

**Sub-theme: Sadness:** Some women expressed sadness after receiving the GDM diagnosis.

“I’m sad... Because I wasn’t expecting it. I had diabetes in my first pregnancy, but I thought this would not happen in this pregnancy. I am not comfortable in my pregnancies. It’s hard for me to inject that needle. I am sad.” (P11, Worker, Insulin treatment)

**Sub-theme: Confuse:** Women expressed confusion expressions such as “What will I do? How will I cope with it?”

“I was confused. I have a lot of questions... Why did this happen? How is the process works? Will it be treated? Different questions in my mind... first about the baby, and the pregnancy period. I had questions about myself. How long can I endure after all?” (P10, Housewife, Diet treatment)

## Theme 3: Changes in The Support System

The theme ‘Changes in the support system’ reflects Interpersonal Influences, which is the factor of ‘Behavior-specific cognitions and affect’ component.

**Sub-theme: Positive support:** The pregnant women expressed that her spouse and child provided the highest level of support, encouraging diet treatment and exercise. It was also expressed that the participants who communicated positively with the diabetes nurse, better adapted to the insulin treatment process.

“... she (the diabetes nurse) told me it was for my baby. She explained that the insulin was not going to get transferred to my baby... She expressed that maybe after the pregnancy, diabetes will be cured and there will be no need for insulin. She comforted me a little. My husband has been a solid supporter in this period. He had the diet with me. He kept reminding me to measure my blood sugar.” (P10, Housewife, Diet treatment)

**Sub-theme: Negative support:** Some women’s support systems were negatively affected from certain factors such as having inaccurate information in the family, negative expressions uttered by the healthcare professionals, and negative communication with them.

“A close friend also had diabetes. She shared her experience, which got me even more concerned. Her baby was quite large and she had to use insulin after birth. Also, physician and nurse said that I was going to use it for three months (insulin treatment) and they did not give any other explanation. But I did not want to use it... My husband said that we didn’t want to use insulin. We were anxious that it would be permanent.” (P2, Housewife, Diet treatment)

## Discussion

This study revealed that the experiences, perceptions, feelings of pregnant women and their support systems affected the health behavior changes in GDM management. Moreover, nursing theories assume that behavioral changes do not occur or old behaviors are maintained due to the lack of necessary care and education. Therefore, identifying the problems through nursing theories and planning appropriate education and care programs are considered substantial to ensure and maintain behavioral change in GDM self-management. The discussion section of this study presents the themes separately.

### Perceptual changes

The expressions showed that some participants easily adapted to the health behavior changes as they perceived the benefits. Moreover, it has been revealed that the belief of making behavior changes can motivate women. Women have individual responsibilities to manage the GDM, and the first of the responsibilities is to protect their infants [10]. It was reported that pregnant women in Thailand tolerated the finger-piercing pain for their babies [15]. On the other hand, Carolan-Olah et al., (2017) reported that women are motivated by avoiding foods that they are prohibited for babies and believing that they protect their babies’ health [12]. The motivation of the individuals who have the energy to succeed is increasing. Protecting the baby’s health is the basis of required belief and motivation for a successful process [12]. Pregnant women take responsibility for caring themselves to provide a healthy start for their baby. It was stated that women search for the knowledge to reach the level of optimal health for themselves and their babies, and control and plan their daily lives. It is essential to raise awareness in pregnant women to contribute their self-confidence and motivate them

for the health behavior changes, particularly in the antepartum period. Furthermore, it is also necessary that health staff further increase the energy of pregnant women, who already have certain motivation level, and should embrace a strengthening approach for those, who need motivation.

It was expressed that some women have the motherhood role and different responsibilities in their lives which create difficulties in treatment compliance. Previous study reported that cooking two different sets of meals for children and spouses, which was very time-consuming, and was the biggest challenge [17]. Moreover, it was reported that women with GDM were negatively affected by multiple responsibilities such as shopping, cooking, looking after other children, and coping with occupational responsibilities [13,16]. Therefore, similar concerns may be experienced in different societies worldwide. It was mainly observed that women keep themselves in the background and prioritize the preferences of their spouse and child, like in the cooking case. The possible motives behind this behavior might be the fact that motherhood role-model used by pregnant women to motivate themselves in some cultures, as women devote themselves to their spouse and children in Turkish culture. Furthermore, some participants believed that insulin was permanent, and spouses opposed insulin treatment. It was also determined that pregnant women and their relatives, who were misinformed that insulin treatment was permanent, refused the treatment.

Similarly, the transition to insulin treatment in non-Western ethnic minority pregnant women in Denmark made women think their situation was critical and that the baby's health was in great danger [17]. In study was conducted by Hjelm et al. (2018), it was expressed that most women expressed worries about not being able to live a normal life and the need for insulin injections [11]. These misunderstandings should be resolved in women who have different cultural backgrounds. It can be effective to emphasize that every treatment performed is purposeful to protect the health of both the mother and the baby.

## Emotional changes

The study participants experienced certain emotional changes such as fear, stress, sadness, and confusion. In a qualitative study conducted in different countries (United Kingdom, Thailand and South Asian), it was stated that women experienced feelings such as sadness, shock, frustration, fear, tearfulness, insecurity, and confusion after GDM diagnosis [15]. Among the fears that women focus on were well-being of babies and their future health status [10,12,29]. It was shown that women from different cultures experienced similar emotions after the GDM diagnosis. These emotional reactions can affect women's motivation levels.

Some participants stated that they could not comply with the diet treatment because they thought that their babies' growth would be hindered, as in other studies [10,12]. This indicates that women are confused on this matter. In our culture, fatter babies are considered by some as healthy and cute. Since the increase in the mother's weight during pregnancy reflects the growth of the baby, women gain more weight in pregnancy which is accepted as a positive development for some rural parts of our society. This is usually explained by the social norms, summarized by the often-used expression 'eating for two' [30].

## Changes in the support system

The findings suggest that having adequate positive support (social support and professional support) was a significant advantage in balancing daily life and managing the GDM

process in pregnancy. In the study conducted by Carolan-Olah et al. (2017) on Australian pregnant women with GDM, it was found that the spouses and the immediate environment encourage women and provide emotional support for exercise, diet, and insulin therapy [12]. Other studies also emphasized that women needed social support and professional support provided by the health professionals [11,13,17]. Social support usually makes life more manageable for women.

However, this study revealed that family members with a traditional approach made it difficult for women to adapt to treatment. Certain misbeliefs such as "the baby cannot receive adequate nutrition" and "the mother will be addicted to insulin" showed that social support was incorrectly applied. Also, in the study on women with different ethnic, it was expressed that felt that the time with the dietician was limited, not personalized enough [13]. Therefore, it is crucial to detect the support level of each pregnant woman. If the spouse or family has inadequate GDM management knowledge, or if they govern the process from a traditional viewpoint, the treatment process may be impeded. It should not be forgotten that social support provided by conscious family members makes it easier for women to take responsibility and manage the GDM process. However, an overprotective approach might complicate self-management for pregnant women. The excessive concern and dissatisfaction of family members might cause the women to lose self-confidence, feel sick, give rise to excessive attachment to family, and discourage them in performing their daily activities. Therefore, it is critical to inform the families about the over-protective approach that is often encountered in Turkey.

## Limitations of the study

Some limitations are unavoidable, when interpreting the findings from the qualitative studies. As the study has a qualitative nature, the findings cannot be generalized to all women with GDM. Also, the measures taken to support the robustness of this qualitative study, it constitutes an important step for further studies on GDM management due to the cross-sectional nature of the interviews.

## Conclusion

In this study, the researchers focused on women's experiences during all GDM self-management stages.

It was found that when the practices in GDM management were perceived as beneficial for the baby and the mother, they easily adapted to the treatment. However, based on the expressions of some participants, it was determined that GDM management has a significant effect on women's life. It was defined that having an occupation, another child, and intense housework had negative effects on GDM management. Despite the barriers, some women displayed a great effort to protect the health of both their babies and themselves.

As Turkish society has a patriarchal system, it was stated that women are under more pressure about governing their health and that of their babies. It was observed that particularly those, who did not have social and professional support, could not succeed in GDM management.

**Disclosures:** There is no conflict of interest for all authors.

**Acknowledgements:** None.

**Funding:** None.



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