

## RESEARCH ARTICLE

# Postdischarge coping difficulties and influencing factors of pregnant women with gestational diabetes mellitus: A cross-sectional study

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**Abstract**

**Aims and objectives:** To identify coping difficulties after discharge and influencing factors of pregnant women with gestational diabetes mellitus.

**Design:** A cross-sectional descriptive survey was conducted with gestational diabetes mellitus women from four tertiary hospitals in the Shandong Peninsula in China.

**Methods:** The study consists of 252 gestational diabetes mellitus women. Survey measures included demographic information, quality of discharge teaching scale, readiness for hospital discharge scale and postdischarge coping difficulty scale. Multiple linear regression analysis was used to explore the factors of coping difficulties after discharge.

**Results:** The situation of coping difficulties in pregnant women with gestational diabetes mellitus after discharge is not optimistic. Age, education level, type of birth, parity, quality of discharge teaching and discharge readiness are six factors that significantly influence postdischarge coping difficulties.

**KEYWORDS**

influencing factors, postdischarge coping difficulties, puerpera with gestational diabetes mellitus

## 1 | INTRODUCTION

Gestational diabetes mellitus (GDM) is considered a significant social and medical problem due to its severe complications. They refer to the elevated blood sugar, which has reached the diagnostic criteria for diabetes abnormal glucose metabolism at first found during pregnancy (Huixia, 2014). GDM is clinically a high-risk pregnancy. If the condition of pregnant women is not well controlled, it will bring serious outcomes to mothers and infants. Most women with abnormal postpartum glucose metabolism could return to normal, but 40%–60% of them are converted to type 2 diabetes after 5–10 years. It has also been shown that women with GDM have seven times the

risk of developing type 2 diabetes after delivery compared to normal mothers (Moon et al., 2017). However, at present, due to the shortage of medical resources and the gradual shortening of maternal hospitalization time, pregnant women with GDM need to strengthen nursing after discharge to reduce the incidence of complications (Jing et al., 2016).

The postdischarge coping difficulty refers to the difficulties faced by mothers after discharge. The study shows that the transition period from hospital to the family is a critical period for maternal recovery and adaptation (Huan et al., 2017). At this time, the guidance of nurses and the preparation of maternal discharge often affect the coping difficulties and readmission rate after discharge. In this study,

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we expanded the research focus to understand the current situation of coping difficulties of GDM pregnant women in mainland China after discharge and explore related influencing factors.

## 2 | BACKGROUND

The incidence of GDM varies worldwide. On average, the global prevalence of GDM is 8%, with a varied range of 1%–14% from different populations, regions and diagnostic criteria (Du et al., 2017). Among them, the incidence of gestational diabetes mellitus among pregnant women in the United States is about 14%, that in Canada is about 1.23%, that in Russia is about 4.03%, that in Mexico is about 2.12% and that in the Mediterranean is about 9%. However, the prevalence rate of GDM in China is 5.12% to 33.3%, which is much higher than the world average (Baohua, 2019).

Once a woman is diagnosed with gestational diabetes mellitus, she will face many risks. At first, GDM not only endangers pregnant women and fetuses, but also has adverse effects on pregnancy outcomes. On the one hand, for pregnant women, it is easy to cause pregnancy-induced hypertension syndrome, premature delivery, caesarean section, postpartum haemorrhage, infection, etc. On the other hand, for the foetus, GDM will increase the probability of foetal and neonatal respiratory distress syndrome, jaundice, hypocalcaemia, hypoglycaemia, increased blood cells, etc. Secondly, GDM can also cause psychological discomfort to the mother. One study showed that the incidence of pregnancy-related anxiety in GDM women was 43.1%, which was much higher than that in normal pregnant women. Educational background, previous history of adverse pregnancy and susceptibility personality were risk factors for pregnancy-related anxiety (Mengjun, 2018). Postpartum depression will make pregnant women feel ill-adapted, difficult to cope with it and cause interpersonal barriers. It is also more common to produce self-injury or infant injury ideas. At the same time, it will increase the risk of recurrence of depressive symptoms in the next 5 years (Edmond, 2017).

Therefore, compared with ordinary pregnant women, postpartum women with GDM have more difficulties to deal with. The post-discharge coping difficulty mainly includes postnatal rehabilitation, baby care, baby feeding and so on. Firstly, studying the influencing factors of coping difficulties in GDM parturient after discharge can improve the ability of pregnant women to deal with health problems after discharge (Yanikkerem et al., 2018). Secondly, pre-assessment of potential difficulties in the puerperium for women with GDM and timely and appropriate interventions can reduce or even avoid puerperal illnesses and complications and reduce readmission rates to save medical resources (Oppen et al., 2019).

For the study of GDM postdischarge coping difficulties, the United States started relatively early and mature compared with other countries and developed a specific evaluation tool. However, in China, the research on GDM has mainly focused on the effect comparison of different continuous nursing intervention methods. A search revealed no research on the postdischarge coping difficulty

### What does this paper contribute to the wider global clinical community?

- The existing studies only show the difficulties of mothers returning home after discharge, there is no investigation on specific populations. This study used specific research tools to identify specific difficulties faced by pregnant women with gestational diabetes after discharge from home.
- This study reveals that age, education level, type of birth, parity, the quality of discharge teaching, and readiness for hospital discharge are the influencing factors that provide the basis for resolving specific difficulties in the future.

with GDM, or even an appropriate assessment tool. Therefore, this study aimed to describe the status of postdischarge coping difficulties for a parturient with GDM and analyse its influencing factors to provide a basis for clinical nursing intervention.

## 3 | METHODS

### 3.1 | Study design

This was a multicentre cross-sectional study, reported based on the STROBE checklist (see Supplementary File S1).

### 3.2 | Participants and setting

Convenient sampling was used to recruit participants (pregnant women with gestational diabetes mellitus) in the maternity ward of four tertiary hospitals in the Shandong peninsula. A total of 252 pregnant women were selected as patients from June to October 2020.

The following inclusion and exclusion criteria were applied during the recruitment. Inclusion criteria: (a) being diagnosed with GDM by an obstetrician according to internationally recognized diagnostic criteria (Dong et al., 2020); (b) being native Chinese speaking; (c) being able to read and understand the questionnaire and (d) providing informed consent and participating voluntarily. Exclusion criteria: (a) with other concomitants severe disease (e.g. severe heart, brain or kidney diseases) and (b) patients had communication problems (e.g. serious hearing or cognitive impairment).

### 3.3 | Measures

This study used Melesis' transition theory as a guiding framework to identify the relevant research variables. The theory states that

discharge from the hospital is a process of transition which includes the nature of the transition, the conditions of the transition, the treatment of care and the response patterns. Therefore, variables related to demographic characteristics, quality of discharge teaching, readiness for hospital discharge and postdischarge coping difficulties were selected as research variables in this study.

Socio-demographic characteristics included age, education, current place of residence, occupation, total monthly income of the family, ways of payment, self-monitor of blood sugar, primary caregiver during hospitalization, whether hired a maternity nanny after leaving the hospital, the participation in pregnant women's school provided by hospitals, if received health education about GDM, etc. GDM disease characteristics included pre-term birth, history of poor pregnancy, history of GDM, family history of diabetes, whether insulin is used, pregnancy complications, delivery method, parity, multiple pregnancies, hospitalization length, etc.

In addition, three measures were also applied. All of them had been validated to Chinese, presented adequate reliability and validity values and were open access or authors had the permission to use them. The applied measures were the following.

### 3.3.1 | Quality of Discharge Teaching Scale

The Quality of Discharge Teaching scale (OB-QDTS) was used to evaluate discharge teaching's quality before discharge which was developed by Weiss and other American scholars in 2007 (Weiss et al., 2007). It was widely used to evaluate the quality of discharge teaching for maternal.

The Chinese version of the scale was used to evaluate the quality of discharge teaching in three areas: the contents of the pregnant women need to be obtained before discharge, the actual contents of the items before discharge and guidance skills and effects. Each item is rated on a range of 0 (completely impossible/not at all) to 10 (completely/very many). The total score of the scale has calculated the sum of "obtained content" and "guidance skills and effects," then divide the total score by the number of items, <7.0 represent the low quality of discharge guidance, 7.0–7.9 represent the medium quality of discharge guidance, 8.0–8.9 represent the pretty high quality of discharge guidance and 9.0–10.0 represent the highest quality of discharge guidance (Weiss et al., 2014). To ensure the rigor of the study, we used instruments with good reliability and validity verified in the Chinese population. The Cronbach's  $\alpha$  coefficient for the Chinese version of the OB-QDTS was verified to be 0.953 (Wen et al., 2021).

### 3.3.2 | Readiness for Hospital Discharge Scale

The Readiness for Hospital Discharge Study–New Mother Form (OB-RHDS) was used to measure maternal discharge preparation. It was a self-assessment scale, which was adapted by Weiss and

other scholars in 2009 (Weiss & Piacentine, 2006) based on the discharge readiness scale. It has been used in many countries such as the United States (Malagon-Maldonado et al., 2017) and the Turkey (Kaya Şenol et al., 2017).

This study used the Chinese vision OB-RHDS which was translated by Chen Xing (Xing et al., 2020). It was a 19-item scale with four domains: self-situation, disease knowledge, postdischarge coping ability and availability of social support. But the first item is a true or false question, not included in the total score. The score for each item varies from 0 (not ready/able) to 10 (totally ready/able). The total score for the domains and the whole scale can be obtained by the sum of the corresponding items' scores. The higher the score, the higher the maternal readiness to discharge. The Chinese version of the OB-RHDS Cronbach's  $\alpha$  coefficient of 0.901 (Xing et al., 2020).

### 3.3.3 | Post-Discharge Coping Difficulty Scale

The Post-Discharge Coping Difficulty Scale–New Mother Form (OB-PDCDS) was used to evaluate the maternal coping difficulties after discharge. The OB-PDCDS was compiled by Weiss and other scholars in 2009 based on the postdischarge coping difficulty scale for adult patients (Weiss & Lokken, 2009).

It is a self-reported 10-item questionnaire, each item scored from 0 (none at all) to 10 (a great deal), and items 8–10 is reverse scoring. The total score of the scale is the sum of each item score and then divided by the number of items. The higher the score is, the more difficulties the parturient would face after discharge. The Chinese version of the OB-PDCDS Cronbach's  $\alpha$  coefficient is 0.974 (Wen et al., 2021).

## 3.4 | Data collection

Firstly, the research got the agreement of leaders in the nursing department, and then the participants were selected according to the inclusion and exclusion criteria. Pregnant women with GDM were interviewed on the day of discharge from June to October 2020. The demographic questionnaire, discharge teaching quality scale and discharge readiness scale were sent out in 4 hr before discharge. And the postdischarge difficulties scale was issued at the time of outpatient review on the 42nd days since delivery. The average time to complete the self-reported scales was 20 min.

## 3.5 | Ethical considerations

The study was approved by the Institutional Review Board of Hospital (IRB No.: QYFY WZLL 25659). All patients voluntarily participated in the study and signed informed consent. Data are processed confidentially and the participant's personal information will not be disclosed through subsequent studies using numbers.

### 3.6 | Date analysis

After the questionnaires were collected, we checked the data first, then entered it into the Excel database. The data were analysed with SPSS 22.0 software. Descriptive statistics (frequency and constituent ratio) were used to determine the socio-demographic and disease-related factors of the participants. The correlation among discharge teaching quality, discharge readiness degree and post-discharge coping difficulty was analysed by Spearman because the distribution of scores from the main variables was abnormal. Multivariate linear regression analysis was used to analyse the influencing factors of coping difficulties after discharge. We specified significance level at  $\alpha = 0.05$ ;  $p < .05$  indicated that the difference was statistically significant.

## 4 | RESULTS

### 4.1 | Participant characteristics

A total of 262 questionnaires were distributed and 252 questionnaires were recycled. Socio-demographic and GDM-related characteristics of the sample are shown in Table 1. Most of the women in the sample are college or above, live in cities, have regular self-monitoring of blood glucose and have received health education for gestational diabetes. In the disease data of the subjects, more than half of the mothers had a history of adverse pregnancy and childbirth (53.17%) and the main type of birth was caesarean section (74.60%). Most of the mothers did not give birth for the first time (46.03%) and most of them were hospitalized for 5–8 days (53.97%).

### 4.2 | Current analysis of postdischarge coping difficulties in women with gestational diabetes mellitus

The total average score of GDM maternal coping difficulties scale after discharge was  $5.22 \pm 0.97$  points. The top three items are as follows: "How much emotional support have you needed?"; "How much help have you needed with caring for your baby?" and "How difficult has the time been for your family members or other close persons?"

### 4.3 | Current status of maternal factor variables in gestational diabetes mellitus

The median total score of the Quality of Discharge Guidance Scale for women with gestational diabetes was 8.38 and the median total score of the Readiness for Discharge Scale was 8.11. Details of the findings and the scores of each dimension are shown in Table 2.

### 4.4 | Correlation analysis among variables

According to the correlation coefficient values, there was a strong negative association between OB-QDTS and OB-PDCDS ( $r = -.840$ ). OB-RHDS also showed a strong negative correlation ( $r = -.734$ ) with OB-PDCDS total score. All these correlations were significant ( $p < .001$ ), see Table 3 for more details.

### 4.5 | Multiple linear regression analysis of influencing factors

Table 4 shows the results of the multivariate linear regression analysis. Age, education level, type of birth, parity, quality of discharge teaching and discharge readiness showed a significant and independent influence on the process of postdischarge coping difficulty (OB-PDCDS), which could explain 69.0% of the variation in postdischarge coping difficulty. Specifically, the older the mother, the more difficulties they faced after discharge; the higher the level of education, the lower the mother's postdischarge coping difficulties score; women with GDM whose type of birth was caesarean had higher postdischarge coping difficulties scores than those who had a normal delivery; the score of OB-PDCDS of primipara was higher than those of pluripara; the higher the quality of discharge instructions, the lower the postdischarge coping difficulties score and the better prepared a woman is for discharge, the less difficulty she will have in coping with it afterward.

## 5 | DISCUSSION

### 5.1 | Current status of postdischarge coping difficulties in women with gestational diabetes mellitus

The results of this study showed that the postdischarge coping difficulties score for women with GDM was  $5.22 \pm 0.97$  which was higher than the findings of Weiss (Weiss & Lokken, 2009). The analysis of the reasons may be related to the cultural differences and the difference in the study population at home and abroad. The three items with higher scores are emotional support, the need to help take care of the baby and the degree of difficulty for family or other close relationships. Firstly, during the puerperium, women become very sensitive because of hormonal, psychological and social changes and also the need to adapt to new roles (i.e. to be mothers), and therefore need more emotional support. In addition, the disease characteristics of gestational diabetes determine that women with GDM have a higher risk of postpartum conversion to type 2 diabetes than normal women, so self-management in terms of lifestyle modification and blood glucose monitoring is also required after delivery. Studies have shown that the support of family members can have the most powerful positive impact on the self-management behaviour of GDM pregnant women

TABLE 1 Characteristics of the sample (*n* = 252)

Characteristics of the sample	Response options	Number of cases	Constituent ratio (%)
Age	—	33.79 ± 5.05 years (range:21–46 years)	
Education	Junior high school and below	38	15.08
	Secondary	52	20.64
	College	64	25.40
	Bachelor degree	78	30.95
	Graduate and above	20	7.93
Current place of residence	Rural	38	15.08
	Towns	60	23.81
	Urban	154	61.11
Occupation	Unemployed	52	20.64
	Farmer	12	4.76
	Worker/Staff	144	57.14
	Self-employed	26	10.32
	Other	18	7.14
Total monthly income of the family	<5000 rmb	28	11.11
	5000–10,000 rmb	116	46.03
	10,001–15,000 rmb	50	19.84
	15,001–20,000 rmb	56	22.22
	>20000 rmb	2	0.79
Ways of payment	Social health insurance	198	78.57
	New rural cooperative medical service	36	14.29
	Full Self-financing	14	5.56
	Other	4	1.59
Regular self-monitor of blood sugar	Yes	154	61.11
	No	98	38.89
Primary caregivers during hospitalization	Parents/spouses	212	84.13
	Maternity nanny	40	15.87
Whether to hire a maternity nanny after leave hospital	Yes	118	46.83
	No	134	53.17
Situation of participation in pregnant women's school	Full participation	20	7.93
	Partial participation	42	16.67
	Less participation	42	16.67
	Never participation	148	58.73
Whether receive health education about GDM	Yes	190	75.40
	No	62	24.60
Pre-term birth	Yes	34	13.49
	No	218	86.51
History of poor pregnancy	Yes	134	53.17
	No	118	46.83
History of GDM	Yes	64	25.40
	No	188	74.60
Family history of diabetes	Yes	42	16.67
	No	210	83.33

(Continues)

TABLE 1 (Continued)

Characteristics of the sample	Response options	Number of cases	Constituent ratio (%)
Use insulin	Yes	8	3.17
	No	244	96.83
Pregnancy complications	Yes	126	50.00
	No	126	50.00
Type of birth	Vaginal birth	64	25.40
	Caesarean section	188	74.60
Parity	First child	116	46.03
	Second child	108	42.86
	Third child and over	28	11.11
Multiple pregnancy	Yes	8	3.17
	No	244	96.83
Hospitalization days	≤4	84	33.33
	5–8	136	53.97
	9–12	20	7.94
	13–17	6	2.38
	>18	6	2.38

TABLE 2 Maternal scores for each factor variable in gestational diabetes (n = 252)

Variables	Dimensions	Scoring range	Average score ( $\bar{x} \pm s$ )	M (Q <sub>L</sub> , Q <sub>U</sub> )
OB-QDTS	Total score	4.15–9.55	—	8.38 (8.00, 8.95)
	Obtained content	11–70	—	56.00 (51.00, 60.00)
	Guidance skills and effects	67–130	—	114.00 (104.00, 120.00)
OB-RHDS	Total score	3.89–9.61	—	8.11 (7.39, 8.67)
	Self-condition	13–40	30.04 ± 0.36	—
	Disease knowledge	13–70	—	54.00 (48.00, 59.00)
	Postdischarge coping ability	6–30	—	24.50 (22.00, 27.00)
	Available social support	24–40	—	37.00 (34.00, 40.00)

TABLE 3 OB-PDCDS correlations with other scales (n = 252)

Variables	Dimensions	$r_s$	p-value
OB-QDTS	Total score	-0.840	<.001
	Obtained content	-0.470	<.001
	Guidance skills and effects	-0.730	<.001
OB-RHDS	Total score	-0.734	<.001
	Self-condition	-0.387	<.001
	Disease knowledge	-0.620	<.001
	Postdischarge coping ability	-0.612	<.001
	Available social support	-0.325	<.001

(Mendez-Luck et al., 2016; Moses & Olenik, 2019). Because the participation of family members can make GDM mothers feel the encouragement and support from their families, it helps them to

face the disease together with the company, care and support of their families.

Secondly, the average age of the subjects was 33.79 ± 5.04 years; the women in this age group were in a golden age of career development. They usually work busily and have more pressure, so they need parents or maternity nanny to help take care of the baby. According to the survey of the demand of sister-in-law industry, it is found that 45.36% of pregnant women are willing to hire sister-in-law after delivery (Su et al., 2018), indicating that puerperal women need more help to take care of their babies, which is consistent with the results of this study.

With the emergence of the first generation of the only children in China who has entered the childbearing age and the phenomenon of late marriage and late childbearing, when the only child is in the puerperium and needs to be taken care of by parents, the parent's ability to take care of puerperal women decreases because of their

**TABLE 4** GDM multivariate linear regression analysis of maternal coping difficulties after discharge ( $n = 252$ )

	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i> -value
Constant term	13.040	0.411	–	31.705	<.001
Discharge teaching quality	-0.492	0.046	-0.485	-10.728	<.001
Discharge readiness	-0.392	0.045	-0.377	-8.767	<.001
Parity	-0.202	0.059	-0.139	-3.420	.001
Age	-0.123	0.038	-0.133	-3.205	.002
Education level	-0.070	0.031	-0.087	-2.297	.022
Type of birth	0.177	0.082	0.079	2.151	.032

Note:  $R^2 = .697$ , adjusted  $R^2 = .690$ ,  $F = 94.060$ ,  $p < .001$ .

age (Yeh et al., 2017). Therefore, this period of time is more difficult for parents.

## 5.2 | Analysis of factors influencing postdischarge coping difficulties in women with gestational diabetes mellitus

### 5.2.1 | Age

According to the analysis results of socio-demographic data, age was important factor of postdischarge coping difficulty. With the adjustment of China's fertility policy, the number of older pregnant women increased from 7.76% to 29.10% gradually (Baohua, 2019). The incidence of GDM in older women was significantly higher than that in age-appropriate women (Chen et al., 2017). The results of this study showed that 34.13% of the older pregnant women were with GDM, and the older they were, the more difficulties they faced after discharge. The reasons are older GDM parturient in the perinatal period often control their blood sugar badly, and postpartum recovery is slow. At the same time, parturient women are prone to be anxious, restless and emotional (Yuedong, 2019), which affect their mental health, so the older parturient in the postdischarge exhibited increased coping difficulty.

### 5.2.2 | Education level

The results of multiple linear regression analysis showed that education level was an influential factor in the difficulty of postdischarge coping in women with GDM. In the general data, GDM mothers with bachelor's degrees had the lowest postdischarge coping difficulties score. On the one hand, the reasons may be as follows: GDM pregnant women with high education levels have better thinking mode and understanding ability. They can quickly understand and master the related GDM disease knowledge, self-care and infant care skills when they are guided by nurses. On the other hand, the reasons may be: GDM women with high educational levels have strong learning ability and knowledge acquisition ability. They often learn gestational diabetes-related knowledge through various ways or channels, such as WeChat

public account, maternal APP and online courses in various maternal and child institutions. This suggests that medical staff should pay more attention to pregnant women with low educational levels and choose a simple and easy way to explain when guiding GDM pregnant women. In addition, nurses can also recommend some practical and interesting APP software or public number to them, broaden their access to health knowledge and seek help from multiple channels when they encounter problems in the puerperium, to reduce the difficulties in coping after discharge.

### 5.2.3 | Type of birth

This study showed that women with GDM whose type of birth was caesarean had higher postdischarge coping difficulties scores than those who had a normal delivery. Since the caesarean section is an invasive operation, it may cause a variety of complications such as uterine damage, abdominal organ adhesions and postoperative infections (He Ping & Guangping, 2015). Combined with GDM, maternal blood glucose is higher than the normal range; high glucose environment in the body also increases the difficulty of postpartum recovery. In contrast, women who have a normal delivery recover faster and have fewer complications after delivery. Therefore, women with GDM who deliver by caesarean section have more difficulty coping after discharge than those who deliver by normal delivery. This suggests that healthcare workers should provide targeted discharge instructions according to the different modes of delivery, especially for women with GDM who delivered by caesarean section need to increase instructions related to pain management and incisional care, actively guide family members to participate in care and provide all-round emotional support for women as much as possible to help them control their blood glucose levels. Thus, reducing the occurrence of complications and readmission rates.

### 5.2.4 | Parity

Delivery experience is another factor. This study showed that the score of OB-PDCDS of primipara was higher than those of pluripara. This may be related to the lack of gestation experience. Although most hospitals, maternal and child health institutions continue to improve



the coverage of antenatal care and prenatal health education, primipara still easily suffer from poor puerperium recovery, puerperal infection, late postpartum haemorrhage, urinary retention, postpartum depression and other physical and mental health problems (Hui, 2017). But because pluripara have certain gestation experience, the postdischarge coping difficulty was less than the primipara. This suggests that medical and nursing staff should pay more attention to primipara with GDM in future discharge guidance, help correct their inherent misconceptions, increase education on puerperal health knowledge and knowledge related to blood glucose management and conduct self-care skills training through multiple channels.

### 5.2.5 | Quality of discharge teaching

Correlation analysis showed that the quality of discharge teaching of GDM pregnant women was negatively correlated with postdischarge coping difficulties. The results of multiple regression analysis also showed that the quality of discharge guidance was an important factor affecting postdischarge coping difficulties, which was consistent with most research results (Weiss et al., 2014; Weiss Marianne et al., 2011). This suggests that the more effective the quality of discharge instructions, less difficulty in coping after discharge. Before discharge, nurses should provide knowledge of maternal and childcare in puerperium for GDM mothers and their families, including breastfeeding guidance, blood sugar monitoring, postpartum wound recovery and pelvic floor muscle function exercise methods, so that the maternal full learns of self-care reduce uncertainty, enhance the confidence and ability to deal with various problems after discharge. Besides GDM, the knowledge of umbilical cord disinfection, feeding time, feeding quantity and sleep regularity of the newborn can help to strengthen the skills of neonatal nursing, improve the preparation of discharge and then reduce the postdischarge coping difficulty. Therefore, it is suggested that obstetrical nursing staff should use the needs in the quality scale of discharge teaching needs of parturient in advance, guide teaching, formulate discharge plans and carry out corresponding health education to family members, improve social support and prepare for discharge, thus reducing the difficulties after returning home.

### 5.2.6 | Readiness for hospital discharge

The results of the correlation analysis showed that hospital discharge readiness in GDM was negatively correlated with postdischarge coping difficulties, i.e. the higher the discharge readiness, the lower the postdischarge coping difficulties, which is consistent with the results of other observational studies (Weiss et al., 2019). According to the results of this study, the impact of discharge readiness on postdischarge coping difficulties was second only to the quality of discharge teaching. The "disease knowledge" dimension has the highest correlation with the total score of coping difficulties after discharge. Analysis of the reasons may be related to the lack of knowledge related to postpartum glucose monitoring in women with GDM after

delivery. Although prenatal GDM mothers have received gestational diabetes-related health education through various channels, they do not know about the monitoring of blood glucose and whether it can return to normal levels after delivery and they are overly concerned about their health, the growth and development of their newborn and whether they will develop type 2 diabetes later in life (Yuying, 2020). Thus, they are not prepared to be discharged from the hospital, causing increased difficulties upon returning home. This suggests that we should develop individualized guidance programmes for GDM women before discharge according to the characteristics of gestational diabetes mellitus, including the timing of blood glucose monitoring, a proper diet and exercise regimen, the timing of follow-up appointments and the timing and manner of feeding the newborn.

## 6 | LIMITATION

The research sites selected in this study are relatively limited due to external conditions, including time and space constraints. Only four tertiary hospitals in two cities of Shandong Peninsula were selected. In addition, we were not following non-random sampling methods. Therefore, future research should add the type of non-random sampling and expand the research site to the community and maternal and child healthcare hospitals to explore the influencing factors of coping difficulties of GDM mothers after discharge.

## 7 | CONCLUSIONS

The study allowed us to identify the main difficulties faced by women with GDM after discharge from hospitals, as well as the main influencing factors. This can help nurses to identify the appropriate difficulties early and intervene in advance to reduce complications. This study showed that the postdischarge coping difficulties of GDM mothers need attention, the knowledge of gestational diabetes health education is insufficient and the quality of discharge teaching and the preparation degree of discharge are the important factors to deal with the difficulties after discharge. In addition, age, education level, type of birth and parity will aggravate the coping difficulties of GDM parturient after discharge. Therefore, medical staff should pay attention to GDM mothers with advanced age, low education, primipara and caesarean section, choose targeted measures and actively educate them about health knowledge during the delivery and hospitalization period to improve the discharge preparation level of parturient, to alleviate the coping difficulties and make them quickly adapt to the brand new postpartum life condition.

## 8 | RELEVANCE TO CLINICAL PRACTICE

To reduce the difficulties in coping with the maternal discharge with gestational diabetes, the quality of discharge instructions and



readiness for discharge are important pathways. Health professionals should focus on advanced age, low-level education, primipara and caesarean section puerpera with gestational diabetes mellitus, strengthen health education, improve the quality of discharge teaching and discharge readiness to reduce the level of difficulties after discharge.

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## CONFLICT OF INTEREST

The authors have declared that there is no conflict of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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