# A Model of Factors Influencing Glycemic Control Behavior among Pregnant Women with Gestational Diabetes Mellitus A1

*Vorrapun Phadungyotee, Srisamorn Phumonsakul,* Natkamol Chansatitporn, Noppawan Piaseu*

**Abstract:** Gestational diabetes mellitus is glucose intolerance during pregnancy, increasing health risk in the mothers, feti, and subsequent children. Understanding the factors influencing glycemic control behaviors is necessary to control plasma glucose levels. This study developed and tested the Model of Factors Influencing Glycemic Control Behavior among Pregnant Women with Gestational Diabetes Mellitus A1. The Theory of Planned Behavior was used as a conceptual framework to guide the study. The participants were 252 pregnant women with the condition from two tertiary hospitals in Thailand, and whose blood glucose could be controlled by exercise and diet. Data were collected using a demographic data form and five scales on attitude, subjective norm, belief in self-control behavior, intention, and glycemic control behavior. Statistical analysis was conducted using SPSS version 18.0 and the Mplus statistical package version 7.0.

Results showed that the modified model fitted with the empirical data and accounted for 51.8% of the variance of glycemic control behavior. Intention and belief in self-control behavior directly affected glycemic control behavior. Attitude, subjective norm and belief in self-control behavior indirectly affected glycemic control behavior via intention. Among these factors, intention had the most substantial effect on glycemic control behavior. These findings suggest that nursing interventions should enhance intention by reinforcing positive attitudes, belief in self-control behavior, and support from subjective norms to promote glycemic control behavior. This model needs to be applied and tested for effectiveness in clinical practice.

**Keywords:** Attitude, Belief, Gestational diabetes mellitus, Glycemic control behavior, Intention, Pregnancy, Self-control behavior, Subjective norm

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## Introduction

Gestational diabetes mellitus (GDM), glucose intolerance initially detected during pregnancy, usually happens during the second trimester of pregnancy and resolves after delivery or becomes diabetes mellitus later in women who cannot control glucose level.[1-3] Nowadays, the incidence of GDM appears to be increasing worldwide, with reports of approximately



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1.4% to 15% of all pregnancies, depending on the population screened and the diagnostic criteria used.[4-7] Evidence showed that GDM is associated with severe complications during pregnancy, such as preeclampsia, polyhydramnios, and infection.[1,3,8,9] For mothers with uncontrolled blood glucose levels, a severe problem is diabetic ketoacidosis (DKA). Additionally, recent evidence has underlined that GDM plays a significant role in increasing the risk of poor health outcomes in fetuses, with a five-fold higher risk of stillbirth and a two-fold higher risk of congenital disabilities compared to normal pregnancy.[10-15] Notably, babies born with maternal GDM potentially develop childhood obesity and adolescent type II diabetes mellitus in the future.[1,3,13] Unquestionably, pregnant women with GDM should be effectively managed to avoid adverse complications.

Generally, the screening for GDM is based on a two-step strategy. A 50-gram oral glucose challenge test identified GDM. If the result exceeds 140 mg/dl, administer a 3-hour 100-gram oral glucose tolerance test after 8 hours overnight fast. GDM is detected if two or more values of blood glucose are exceeded. Fasting blood glucose greater than 105 mg/dl, 1-hour glucose greater than 190 mg/dl, 2 hours glucose greater than 165 mg/dl, 3- hours glucose greater than 145 mg/dl.[4] After being diagnosed with GDM, they would be on diet control for two weeks. Then, they would recheck blood glucose levels. The type A1 gestational diabetes mellitus (GDMA1) can be diagnosed when the fasting blood glucose is lower than 105 mg/dl, and the 2-hour postprandial blood glucose is lower than 120 mg/dl. On the other hand, The type A2 gestational diabetes mellitus (GDMA2) is characterized by fasting blood glucose levels exceeding 105 mg/dl and 2-hour postprandial blood glucose levels exceeding 120 mg/dl.[1,4] Notably, GDMA1 can managed blood glucose through exercise and diet control, while GDMA2 needs both and insulin.[1,3,4] Therefore, the glycemic control behavior of pregnant women with GDMA1 is enhanced exercise and dietary behaviors. Performing dietary control behaviors can prevent ketosis, achieve normal blood glucose levels, improve fetal well-being, and achieve adequate weight gain.[1,3]

Physical activity is well recognized for its role in improving glucose homeostasis.[12,13] It has indirect effects on glucose disposal by exerting long-term effects on improvement in insulin sensitivity.[12-14] Moreover, exercise or physical activity can induce insulin production and improve cellular glucose uptake, helping prevent excessive plasma glucose levels.[15-19] The World Health Organization[16] recommends 150 minutes of moderate-intensity physical activity throughout the week for pregnant women.[16]

Most previous studies on modifying dietary and exercise behaviors have usually been based on the Theory of Planned Behavior (TPB), which states that various factors are associated with an individual's decision to perform health behavior.[20-27] These individual factors (attitude, belief in self-control behavior, and intention) and social factors (subjective norm) affect a person's behavior. For pregnant women with GDM, a few studies focus on the relationship between variables.[26] Several quasi-experimental studies comparing modification of those factors strategies to improve glycemic control behavior in pregnant women with GDMA1 have shown that, although blood glucose levels in the intervention group appeared to decrease more than in the control group, pregnant women who did not receive such methods were able to control their blood glucose levels within the normal range.[28-32] Thus, it is necessary to reconsider and understand the contributing factors of dietary control and exercise behavior of pregnant women with GDMA1 in controlling the blood glucose level. Therefore, this study aimed to develop and test a model to explain factors affecting glycemic control behavior among pregnant women with GDMA1.

## Conceptual Framework and Literature Review

The study employed the Theory of Planned Behavior, which Ajzen[33-34] developed as an extension

of the theory of reasoned action. Alongside the TPB, a thorough literature review was conducted to provide a comprehensive conceptual framework of factors: negative or positive evaluation of the behavior (attitude), belief competence to do the behavior (belief in self-control behavior), and belief in social pressure to do or not do the behavior (subjective norm). Together, attitude, belief in self-control behavior, and subjective norm guide the formation of intention and behavior actions in consequence.[33-34]

According to TPB, attitude toward a behavior is the level to which a person has a negative or positive appraisal of that behavior.[33-34] For attitude towards glycemic control behavior, it could be explained that pregnant women with a salient belief about glycemic control behaviors could improve their pregnancy outcomes. Generally, pregnant women assess those behaviors that enable them to avoid developing any GDM complication or achieve a favorable pregnancy outcome. Once pregnant women have a positive idea toward glycemic control behaviors, they will be more motivated to regulate their blood glucose levels and engage in healthful behaviors that aim to keep them within the normal range.[23-25]

Subjective norms pertain to an individual's perception of how their significant others or surrounding people expect them to perform or refrain from a particular behavior.[34] For pregnant women with GDM, without anticipating any rewards or punishments, their subjective norms are their perceptions of what their significant others (partner, parents, relatives, friends, physicians, or nurses) desire or expect them to do or refrain from doing the healthful behavior for controlling blood glucose levels. Assuming that subjective norms are associated with glycemic control practices; consequently, they will gain more intention to control their blood glucose levels and engage in actions that facilitate effective blood glucose management to attain normal limits.[23-25]

Belief in self-control behavior refers to an individual's subjective evaluation of the level of ease or difficulty associated with enacting a particular activity of personal interest. It should be noted that belief in self-control behavior varies depending on situations and actions. Consequently, an individual's belief in behavioral control may differ profoundly from situation to situation.[33-34] Pregnant women who demonstrate belief in glycemic self-control behavior should have access to the available knowledge, skills, opportunities, and other support resources required to engage in glycemic control practices. Furthermore, individuals should also consider any possible obstacles they may face while pursuing their goals. When pregnant women believe that healthy behaviors are manageable, they are more likely to be motivated to actively monitor and regulate their blood glucose levels within a healthy range.[23-25]

Promoting healthy behavior or altering an individual's behavior presents considerable challenges for health professionals. Numerous studies have emphasized the critical role of individual intention in promoting health and fostering positive changes in healthy behavior.[33-34] To enhance healthy behavior, it would be more beneficial to prioritize the promotion of an individual's intentions by considering three conceptual variables: attitude towards the conduct, subjective norm, and belief in self-control behavior, as mentioned in the preceding information. However, the gaps in care have remained, particularly in women with GDM. So far, little consideration has been paid to the complex relationship that influences an individual's intention in performing healthy behavior practices for controlling blood glucose levels. Therefore, applying the TPB framework integrated with a literature review to explain these nexus relationships would be beneficial in strengthening care quality and promoting the quality of life in this population. A Model of Factors Influencing Glycemic Control Behavior among Pregnant Women with GDMA1 was developed, which depicted the direction of relationships among attitude, subjective norm, belief in self-control behavior, and intention to explain glycemic control behavior among pregnant

women with GDMA1 (**Figure 1**). The following hypotheses were set; the findings from this study will guide the development of nursing strategies for pregnant women with GDM to encourage behaviors that promote glycemic control and ultimately lead to achieving normal levels of plasma glucose. These, in turn, will aid in reducing complications associated with GDM.

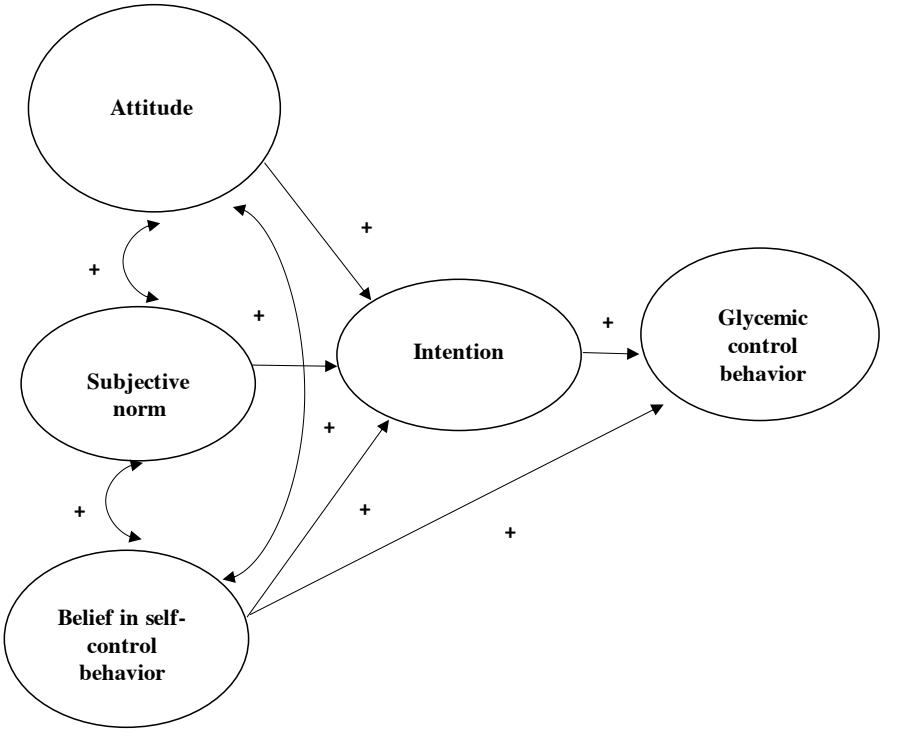


**Figure 1**: The hypothesized model of factor influencing glycemic control behavior among pregnant women with gestational diabetes mellitus A1

## Methods

**Design:** This study utilized a cross-sectional design. This report followed the STROBE guideline for cross-sectional studies.

**Sample and Setting:** The purposive sampling method was applied in this study. The sample was pregnant women diagnosed with GDMA1 (fasting blood glucose is lower than 105 mg/dl, and the 2-hour postprandial blood glucose is lower than 120 mg/dl) from two conveniently selected tertiary hospitals in the Bangkok Metropolitan Region of Thailand. The inclusion criteria were: gestational age between 20-32 weeks, living with husband, singleton fetus, and having no chronic disease. The estimated sample size was estimated according to Hair et al.,[35] and calculated using estimated parameters. The ratio of 10-20 respondents per parameter was recommended for a calculation of structural equation modeling. There were 19 estimated parameters in this study, so the required sample size was at least 190. However, an attrition rate of 10% was added based on the study design. During data collection, the number of participants enrolled was higher than estimated, which was more favorable for the generalization of findings. Therefore, the total sample size was 252.

**Ethical Considerations:** This study was approved by the Institutional Review Board of the Faculty of Medicine Ramathibodi Hospital, Mahidol University

(COA, MURA2020/180) and the research ethics committee of the hospital that served as the study site (Approval no.Oq 0363). All eligible participants were informed about the study's aim and procedures, the time requirement for completing the questionnaires, and their right to deny participation without any effect on the health care services they would receive in the hospital. All participants signed a consent form before the beginning of data collection and guaranteed that their identity would not be exposed and information would be kept confidential. Anonymity was safeguarded through the coding of questionnaires. Names were not attached to the instruments.

**Instruments:** Six instruments were developed by the primary investigator (PI) in Thai. These comprised a demographic data form, and five scales that were self-report questionnaires based on the variables of attitude, subjective norm, belief in self-control behavior, intention, and glycemic control behavior. The five instruments were based on the work of Ajzen[33-34] and a literature review. The variables under consideration were culturally norm specific as Ajzen[33-34] recommended tailoring each instrument to the particular population and culture. All instruments were evaluated for content validity by a panel of five experts in nursing. Three of these were proficient in TPB, whereas two had a special skill in caring for pregnant women with diabetes mellitus. The instruments were modified according to the expert's suggestion to improve the clarity and appropriate order of the questions. The CVI and reliability of both the pilot and main study are shown in **Table 1.** For CFA, all instruments were fitted with the measurement model, reflecting construct validity. The instruments for data collection were:

**Table 1.** Content validity index and Cronbach's alpha coefficients of instruments

| Instruments | CVI | Cronbach's alpha coefficients | |
|---|---|---|---|
| | | Pilot study (N = 30) | Actual study (N = 252) |
| Attitude | 0.77 | 0.82 | 0.88 |
| Subjective norm | 1 | 0.93 | 0.94 |
| Belief in self-control behavior | 1 | 0.72 | 0.69 |
| Intention | 0.80 | 0.94 | 0.91 |
| Glycemic control behavior | 0.91 | 0.84 | 0.85 |

*The Demographic data form* consists of six items about participants' age, gestational age, number of pregnancies, educational level, family income, and occupation.

*The Attitude toward Glycemic Control Behavior Scale* assesses behavior beliefs multiplied by outcome evaluations. The scale consists of 14 items with two components: nutrition and exercise. Each item asks about beliefs concerning the effects of glycemic control behavior and the outcomes evaluation of doing that behavior. An example item of behavioral beliefs is "I choose to eat food that is cooked by boiling instead of frying. It keeps my blood glucose level within normal limits." An example item of outcome evaluations is "My blood glucose is within normal limits due to me choosing to eat food that is cooked by boiling instead of frying." The response choice is a 5-point Likert scale ranging from 1 = very unlikely to 5 = very likely for control behavior and a 5-point Likert scale ranging from 1 = very unimportant to 5 = very important for outcome evaluation. The multiplied score ranges from 14-350, with higher scores indicating a higher positive attitude toward glycemic control behavior.

*The Subjective Norm Scale* was measured normative beliefs multiplied by the motivation to comply. The scale comprises 15 items from three normative components: husband, parent, and physician/nurse. Each item asks about perceptions of the strength of significant others' beliefs about whether pregnant women should control blood glucose levels during

pregnancy and their motivation to meet any considerable needs about controlling blood glucose levels. An example of normative beliefs is, "My husband thought I should control my diet." An example of motivation to comply is, "If my husband wants me to control my diet, I want to do it." The response choices are a 5-point Likert scale ranging from 1 = definitely not true to 5 = definitely true for normative beliefs, and a 5-point Likert scale ranging from 1 = not at all to 5 = very much for motivation to comply. The multiplied score ranges from 15-375, with higher scores indicating the subjective norm of changing behavior influenced by the beliefs of the respondents' significant person.

*The Belief in Glycemic Self-Control Behavior Scale* assesses control beliefs multiplied by perceived power. The scale consists of 10 items with two components of nutrition and exercise. Each item asks about the beliefs of pregnant women with GDM concerning self-control in doing the glycemic control behavior and their perception of undertaking glycemic control behavior. An example of control beliefs is "Using food exchange allows me to control my daily food intake," and an example of perceived power is "Food exchange made me control my daily food intake." The response choices are on a 5-point Likert scale ranging from 1 = very difficult to 5 = very easy for control beliefs and a 5-point Likert scale ranging from 1 = very unlikely to 5 = very likely for perceived power. In the perceived power items, there are five negative items (nos. 1,2,4,7,10). All these items had their scores reviewed before calculating. The multiplied score ranges from 10 – 250, with higher scores indicating a stronger belief in controlling blood glucose levels.

*The Intention to Glycemic Control Behavior Scale* consisted of ten items with two components: nutrition and exercise. Each item asks about the desire to accomplish glycemic control behavior of pregnant women with GDM. An example item of this intention is, "I intend to exercise during pregnancy." The response choice is on a 5-point Likert scale ranging from 1 = do not to 5 = definitely do; and 1 = not true to 5 = true. Then, after the score is summated, the total score ranges from 10 – 50, with higher scores indicating greater intention to perform glycemic control behaviors.

Finally, the *Glycemic Control Behavior Scale* consists of 16 items with two components: nutrition and exercise. Each item asks respondents about their performing behaviors for controlling blood glucose levels. An example item is, "I exercise during pregnancy." The response choice is on a 4-point Likert scale ranging from 1 = never to 4 = always. After the score is summated, the total score ranges from 16-64, with a higher score indicating good practice of glycemic control behavior.

**Data Collection:** After obtaining ethical approval, the primary investigator (PI) contacted the head nurses of two settings to explain the purpose and process of the study. The participants were recruited by the PI after being assessed as meeting the inclusion criteria using their medical records. The participants received explanations about the instruments. Five instruments took participants around 30-40 minutes to complete. The Glycemic Control Behavior Scale was administered on the day of the doctor's visit at least one month after diagnosis and took participants around 5-10 minutes to complete. Data were collected over five months, from September 2020 to January 2021.

**Data Analysis:** Descriptive statistics were analyzed using SPSS application version 18.0 to describe the sample's demographic characteristics. Confirmatory factor analysis (CFA) was employed through the Mplus program version 7 to test the construct validity of the latent variables for this study. The structural equation model (SEM) using the Mplus program version 7 was used to answer the research questions and test the hypothesized model. The level of significance was set at 0.05.

## Results

A glucose tolerance test screened all participants, who were diagnosed with GDMA1. Most participants

(57.14%) were aged 31 - 40, averaging 32 years (SD = 5.81). Approximately 34.12% had a gestational age of 25-29 weeks. One-third were primigravida and nearly half (49.6%) had graduated with secondary education. About 40% worked as laborers, while 43% reported a monthly family income of less than 20,000 baht (560 USD). The range, mean, and standard deviation for study variables are demonstrated in **Table 2.**

**Table 2.** Descriptive statistics of variables (n = 252)

| Variables | Possible range | Actual range | Mean | SD |
|---|---|---|---|---|
| Attitude | 14-350 | 101-350 | 224.22 | 54.26 |
| Subjective norm | 15-375 | 111-375 | 262.42 | 58.54 |
| Belief in self-control behavior | 10-250 | 44-250 | 135.16 | 33.21 |
| Intention | 10-50 | 20-50 | 39.17 | 5.61 |
| Glycemic control behavior | 16-64 | 33-64 | 48.67 | 6.59 |

The researchers employed Mplus version 7 software to conduct model testing and utilized structural equation modeling (SEM) analysis. The primary aim was to examine the causal relationships among the variables under investigation and describe a hypothesized model. It is important to note that no evidence of assumption violation such as outlier, normality, homoscedasticity, or multicollinearity in the variables was found during the preliminary analysis. The findings are demonstrated in **Table 3.** For model testing, the findings revealed that the hypothesized model demonstrated the statistical fit indices ($\chi^2$ = 185.74, *df* = 37, p-value < 0.001, $\chi^2/df$ = 5.02, CFI = 0.89, TLI = 0.84, RMSEA = 0.12, SRMR = 0.10). Adjustments were made to the hypothesized model by modifying the model indices to evaluate the model. The results indicated that the modified model exhibited a satisfactory level of statistical fit, thereby supporting its acceptance ($\chi^2$ = 68.06, *df* = 27, p-value < 0.001, $\chi^2/df$ = 2.52, CFI = 0.97, TLI = 0.94, RMSEA = 0.07, and SRMR = 0.08).

**Table 3.** Correlation matrix of variables (n = 252)

| | ATT | SN | BSC | INT | GB |
|---|---|---|---|---|---|
| **ATT** | 1 | | | | |
| **SN** | .73** | 1 | | | |
| **BSC** | .58** | .59** | 1 | | |
| **INT** | .63** | .71** | .67** | 1 | |
| **GB** | .45** | .45** | .54** | .52** | 1 |

*p < 0.05, ** p < 0.01

ATT = Attitude, SN = Subjective norm, BSC = Belief in self-control behavior
INT = Intention, GB = Glycemic control behavior

The overall goodness of fit statistics indicated that the final Model of Factors Influencing Glycemic Control Behavior among Pregnant Women with GDMA1 adequately fitted the empirical data and explained 75.9% ($R^2$ = 0.759) of the variance in intention, and 51.8% ($R^2$ = 0.518) of the variance in glycemic control behavior. The result of the modified model is presented in **Figure 2.** This showed that attitude, subjective norm, and belief in self-control behavior, positively and indirectly affect glycemic control behavior via intention ($\beta$ = 0.14, 0.22, 0.15, p < 0.001, respectively), while the intention has a direct effect on glycemic control behavior ($\beta$ = 0.51, p < 0.001) (**Table 4**).

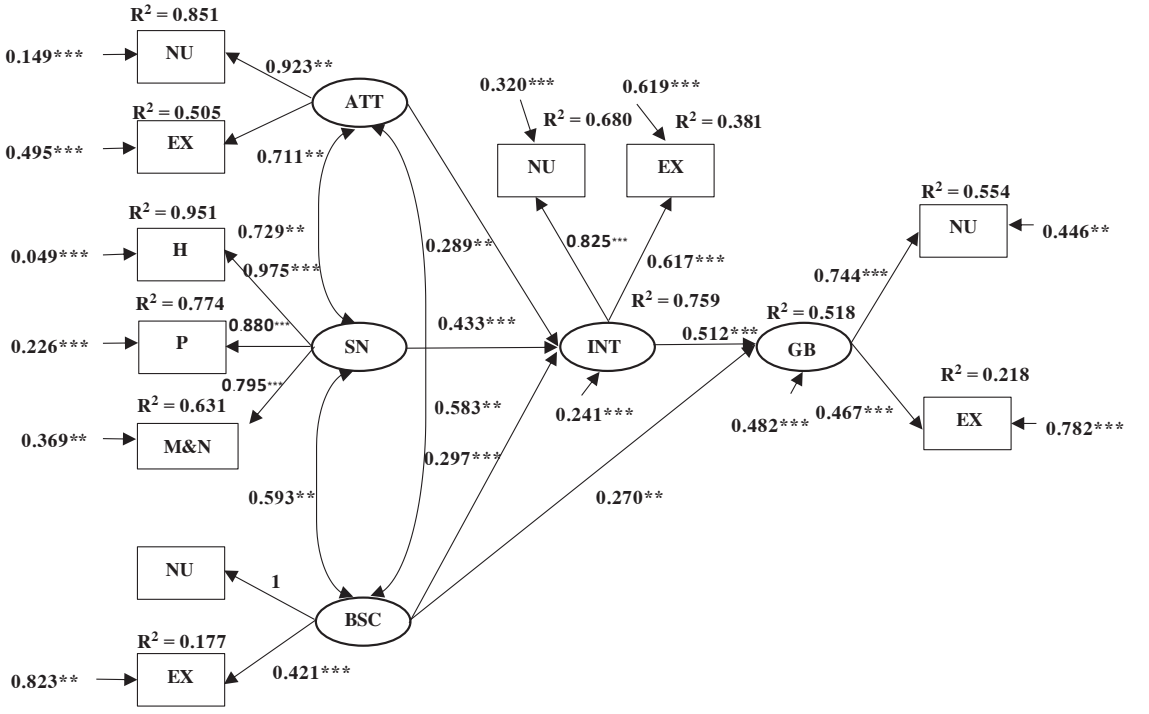


**Figure 2.** The modified model of factor influencing glycemic control behavior among pregnant women with gestational diabetes mellitus A1

ATT = Attitude, SN = Subjective norm, BSC = Belief in self-control behavior

INT= Intention, GB = Glycemic control behavior, NU= Nutrition, EX= Exercise

H =Husband, P= Parent, M&N = Medicine and nurse

**Table 4.** Total, direct, and indirect effects of causal variables on influenced variables of the modified model

| Causal variables | Influenced variables | | | | | |
|---|---|---|---|---|---|---|
| | Intention | | | Glycemic control behavior | | |
| | TE | IE | DE | TE | IE | DE |
| ATT | 0.28** | - | 0.28** | 0.14*** | 0.14*** | - |
| SN | 0.43*** | - | 0.43*** | 0.22*** | 0.22*** | - |
| BSC | 0.29*** | - | 0.29*** | 0.42*** | 0.15*** | 0.27*** |
| INT | - | - | - | 0.51*** | - | 0.51*** |

** $p < 0.01$, *** $p < 0.001$

TE = Total effect, DE= Direct effect, IE = Indirect effect, ATT = Attitude

SN = Subjective norm, BSC = Belief in self-control behavior, INT = Intention

## Discussion

The findings of this study underline that attitude has a positive indirect effect on glycemic control behavior via intention. A possible explanation for this might be that most study participants were adults and had graduated with secondary education; hence, those individuals demonstrated a capacity to adjust to diverse circumstances

and exhibited self-accountability, encompassing the obligation for healthcare while also exhibiting discrimination against favorable self-care practices.[36-38] Similar to earlier evidence, at least two studies have indicated that adult pregnant women have maturity in terms of physical, mental, and emotional better than adolescent pregnant women.[37-38]

Subjective norm was found to have a positive indirect effect on glycemic control behavior via intention. This study presented subjective norms in three aspects: husband, parents, and physician/nurse. These findings provide tentative initial evidence regarding integrating significant people (such as husbands, parents, or healthcare teams) into the promotion of healthy behavior in controlling blood glucose levels and enhancing treatment adherence in pregnant women with GDM. Identifying significant people or initiating personal resources for pregnant women with GDM may be a challenge to provide better care for this population since studies have underlined that subjective norms may differ across various cultures or individual circumstances.[26-27]

Another important finding was that the belief in self-control behavior positively and indirectly affects glycemic control behavior via intention. Regarding individual attention, the findings showed that intention directly affects glycemic control behavior. This finding is similar to other research, which indicated that an individual's intention was the strongest predictor of behavior.[25-26] An increase in individuals' attention to glycemic control behavior could be attributed to their perception of obtaining sufficient information to enhance health and mitigate complications during pregnancy. The aim of management in pregnant women with GDM is to accomplish the favorable blood glucose levels while avoiding the health problem of hypoglycemia to ensure maternal and fetal safety. As aforementioned, prior studies have demonstrated that exercise and diet control are the key to controlling blood glucose levels.[36-38] Diet control methods include a well-balanced eating diet and a plan for controlling blood glucose levels, which are beneficial in GDMA1. Similarly, exercise during pregnancy can increase insulin sensitivity, improved insulin-sensitive glucose transporters and glycogen synthesis activity, which work to decrease blood glucose levels.[30,32] Once pregnant women with GDM pay good attention to modifying or changing behaviors, including performing dietary control and exercising more regularly, plausible health outcomes in controlling blood glucose levels occur, resulting in a higher motivation for continuing healthy behavior practices. An implication of these findings is the possibility that improving healthy behavior requires a multifaceted approach. Enhancing motivation for behavior change can be achieved by implementing educational and support initiatives targeting the needs of women with GDM.

## Limitations

While the study has demonstrated some positive outcomes, several limitations need to be considered. Firstly, because of the purposive sampling used in this study, the results may not be generalized to all pregnant women diagnosed with GDMA1 populations. Secondly, given the cross-sectional nature of the study design, it is essential to consider potential confounding variables such as depression, anxiety, income, and level of education, which may influence health behavior within this particular population. Lastly, another limitation of this study may be due to its reliance on a specific location; hence, the generalizability of the study's findings across other healthcare settings and cultures may be limited.

## Conclusion and Implications

The findings of this study showed causal pathways of factors influencing glycemic control behavior among pregnant women with GDMA1. The modified model fitted with the empirical data and accounted for 51.8% of the variance in glycemic control behavior. Attitude, subjective norm, and belief in self- control behavior indirectly affected glycemic

control behavior via intention. Additionally, intention and belief in self-control behavior directly affected glycemic control behavior. Among these factors, intention had the strongest effect on glycemic control behavior. According to research findings, nurses need to motivate pregnant women diagnosed with GDMA1 who can control their level of blood glucose to share their beliefs regarding the consequences of their given behavior with other pregnant women with GDMA1. Furthermore, this study's findings indicated that pregnant women with GDMA1 have considerable trust and reliance on their significant individuals, particularly their spouses and parents. In doing so, nurses should promote the engagement of husbands and parents of pregnant women with GDM to participate in a tailored intervention program focusing on empowering the women to manage their blood glucose levels during pregnancy. Moreover, promoting a multidisciplinary approach involving healthcare providers from various specialties can lead to better outcomes in managing GDMA1. Encouraging such collaboration will help provide comprehensive care to such women. In further study the model needs to be applied and tested with different groups of samples for effectiveness in clinical practice.

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# โมเดลปัจจัยที่มีผลต่อพฤติกรรมการคุมระดับน้ำตาลของสตรีที่เป็นโรคเบาหวานขณะตั้งครรภ์ชนิดเอวัน

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**บทคัดย่อ:** โรคเบาหวานขณะตั้งครรภ์เป็นภาวะที่ความทนต่อกลูโคสผิดปกติขณะตั้งครรภ์ ซึ่งเพิ่มความเสี่ยงต่อภาวะสุขภาพของมารดาและทารก การเข้าใจถึงปัจจัยที่มีผลต่อพฤติกรรมการคุมระดับน้ำตาลจึงเป็นสิ่งจำเป็นต่อการคุมระดับน้ำตาลในเลือด การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบโมเดลปัจจัยที่มีผลต่อพฤติกรรมการคุมระดับน้ำตาลของสตรีที่เป็นโรคเบาหวานขณะตั้งครรภ์ชนิดเอวัน โดยใช้ทฤษฎีพฤติกรรมตามแผนเป็นกรอบแนวคิดในการศึกษา กลุ่มตัวอย่างประกอบด้วยสตรีที่เป็นโรคเบาหวานขณะตั้งครรภ์ ซึ่งคุมระดับน้ำตาลโดยการออกกำลังกายและการควบคุมอาหาร จำนวน 252 ราย จากโรงพยาบาลระดับตติยภูมิ 2 แห่งในประเทศไทย เก็บรวบรวมข้อมูลจากแบบสอบถามข้อมูลส่วนบุคคล แบบประเมินทัศนคติ แบบประเมินการคล้อยตามกลุ่มอ้างอิง แบบประเมินความเชื่อในการควบคุมพฤติกรรม แบบประเมินความตั้งใจ และแบบประเมินพฤติกรรมการคุมระดับน้ำตาล วิเคราะห์ข้อมูลโดยใช้โปรแกรม SPSS 18.0 และ โปรแกรม Mplus 7.0

ผลการศึกษาพบความสอดคล้องของโมเดลกับข้อมูลเชิงประจักษ์ โดยสามารถทำนายความผันแปรของพฤติกรรมการคุมระดับน้ำตาลได้ร้อยละ 51.8 โดยความตั้งใจและความเชื่อในการคุมพฤติกรรมมีอิทธิพลโดยตรงต่อพฤติกรรมการคุมระดับน้ำตาล ทัศนคติ การคล้อยตามกลุ่มอ้างอิง และความเชื่อในการคุมพฤติกรรมมีอิทธิพลโดยอ้อมต่อพฤติกรรมการคุมระดับน้ำตาลผ่านความตั้งใจ ภายใต้ปัจจัยเหล่านี้ความตั้งใจมีอิทธิพลสูงสุดต่อพฤติกรรมการคุมระดับน้ำตาล ผลการศึกษาครั้งนี้ สามารถนำไปพัฒนารูปแบบการดูแลให้สตรีที่เป็นโรคเบาหวานขณะตั้งครรภ์ เกิดความตั้งใจในการปฏิบัติพฤติกรรมการคุมระดับน้ำตาล โดยสร้างเสริมทัศนคติทางบวก ความเชื่อในการคุมพฤติกรรม และแรงสนับสนุนจากกลุ่มอ้างอิง เพื่อส่งเสริมพฤติกรรมการควบคุมระดับน้ำตาล และนำรูปแบบการดูแลไปทดสอบและปรับใช้เพื่อให้การดูแลมีประสิทธิภาพ

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