Revista ARACÊ
ISSN: 2358-2472

# NURSING CONSULTATION WITH PREGNANT WOMEN WITH GESTATIONAL DIABETES IN PRIMARY CARE: A VALIDATION STUDY

https://doi.org/10.56238/arev7n4-166

**Submitted on:** 03/15/2025 **Publication date:** 04/15/2025

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## ABSTRACT

**Objective:** To build and validate an instrument for nursing consultations aimed at pregnant women with gestational diabetes in the context of primary health care. **Method:** Methodological study carried out in the states of Ceará and the Federal District, between the months of November and December 2022, divided into three stages: 1) narrative review of the literature; 2) elaboration of care technology; and 3) validation of the content and appearance of the instrument by 20 nurses specializing in women's health. To measure the agreement among the experts in relation to the instrument evaluated, the Content Validation Index was applied. **Results:** The evaluation of the *experts* demonstrated a satisfactory overall Content Validation Index. All domains of the

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ISSN: 2358-2472

instrument obtained an index above 80%. The entire instrument had a Content Validation Index = 0.96 and p=0.292. Regarding the analysis of the clarity and relevance of the instrument, its content was considered valid, with the Content Validation Index being >0.80 and p>0.05. **Conclusion:** The process of constructing and validating the instrument for nursing consultations with pregnant women with gestational diabetes in the context of primary health care resulted in the production of a valid and consistent technology for nursing care.

**Keywords:** Pregnant women. Gestational Diabetes. Nursing Care. Primary Health Care. Nursing.

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ISSN: 2358-2472

## INTRODUCTION

Pregnancy, by itself, contributes to the increase of insulin resistance. This condition is triggered by intense changes in glycemic control mechanisms due to fetal needs, in addition to the hormonal influence characteristic of the gestational period. These changes result in a reduction in the sensitivity of placental receptors to insulin, thus favoring the development of Gestational Diabetes Mellitus (GDM) (ZUCCOLOTTO et al., 2019; FERREIRA et al., 2019; PAHO, 2016).

Thus, pregnant women who present at least one of the following altered blood glucose values at any time during pregnancy are considered to have GDM: fasting blood glucose between 92 and 125 mg/dl; Oral Glucose Tolerance Test (OGTT) with a value in the first hour greater than or equal to 180 mg/dl; or value in the second hour between 153 and 199 mg/dl (PAHO, 2016). It is important to highlight that glycemic values greater than or equal to 126 mg/dl in fasting or greater than or equal to 200 mg/dl at any time are indicative of previous diabetes mellitus.

In this context, the need to ensure access to essential diagnostic tests is highlighted, considering both the financial feasibility and the technical availability of the health system in which the pregnant woman is inserted. This effort is critical to increasing GDM detection rates and ensuring an early and appropriate approach (ZAJDENVERG et al., 2022).

The Brazilian Diabetes Society (SBD) highlights the main risk factors for the development of Gestational Diabetes Mellitus (GDM), which include: advanced maternal age, overweight and obesity, family history of diabetes in first-degree relatives, systemic arterial hypertension, excessive weight gain during pregnancy, excessive fetal growth, preeclampsia in the current pregnancy, history of fetal or neonatal death, low vitamin D levels, early menarche (before the age of 11), and poor sleep quality, especially in early pregnancy (ZAJDENVERG et al., 2022; WERNECK; QUERIES; BERTOLIN, 2019).

Gestational Diabetes Mellitus (GDM) is closely related to increased maternal and perinatal morbidity and mortality. The prevalence in the Brazilian population varies between 1% and 14%, and may differ depending on the studies carried out in the country (WERNECK; QUERIES; BERTOLIN, 2019). According to the International Diabetes Federation (2019), approximately 16% of live births in the world are generated by women with GDM.

Regarding the diagnosis of Gestational Diabetes Mellitus (GDM), a consensus has been established for the screening and diagnosis of GDM in Brazil. This standardization

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ISSN: 2358-2472

considers the increased risk of unfavorable outcomes for the maternal-fetal binomial, as well as the urgent need to reduce neonatal mortality (PAHO, 2016).

The Brazilian Diabetes Society (SBD) clarifies that the criteria for the diagnosis of Gestational Diabetes Mellitus (GDM) have been adapted to the standards of the World Health Organization (WHO), considering the particularities of the different regions of the country. The aforementioned consensus proposes alternatives for the diagnosis of GDM in contexts with limited health resources. Despite the limitations, as well as the advantages and disadvantages associated with changes in diagnostic criteria, the SBD emphasizes the relevance of applying this consensus in clinical practice. This recommendation is based on the correlation already evidenced between maternal blood glucose levels and perinatal outcomes (ZAJDENVERG et al., 2022).

The diagnosis of Gestational Diabetes Mellitus (GDM) can directly impact the quality of life of pregnant women, and should be considered a priority in prenatal care (OREM, 1991). For this, it is essential to provide information that supports self-care, defined as a "[...] action carried out by the individual with the objective of maintaining and improving his own health and well-being" (OREM, 1991. p. 117). This process should emphasize the risks associated with GDM and establish clear goals to be achieved in order to prevent unfavorable outcomes.

Complications associated with hyperglycemia during pregnancy can affect both the pregnant woman and the fetus, including: vaginal candidiasis, urinary tract infection, polyhydramnios, hypertensive syndromes, macrosomia, tocotraumatism, fetal respiratory distress, neonatal hypoglycemia, among others. The risk of developing future complications for both mother and child is also highlighted, such as the recurrence of Gestational Diabetes Mellitus (GDM) in subsequent pregnancies, in addition to the increased risk of occurrence of metabolic syndrome, DM, and hypertension in the offspring (ZAJDENVERG et al., 2022; WERNECK; QUERIES; BERTOLIN, 2019; IDF, 2019; OREM, 1991; SHAH; FERREIRA, 2021).

Given the complexity of Gestational Diabetes Mellitus (GDM), nurses play a fundamental role in direct care for pregnant women, through nursing consultations and prenatal care. This professional is responsible for strengthening the professional-patient bond, providing quality information through health education actions, rigorously supervising the therapeutic phases and their results, in addition to managing the risks associated with

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the lifestyle of these women (SANTOS; SARAT, 2008; GONÇALVES et al., 2020; ALMEIDA et al., 2019).

Pregnant women's knowledge about the concept of Gestational Diabetes Mellitus (GDM), risk factors, consequences for mother and baby, and the tests necessary for diagnosis and treatment is still insufficient, which can negatively impact measures related to self-care and disease prevention (MENSAH; VAN ROOYEN; TEN HAM-BALOYI, 2019; BRAZIL, 2019). It is necessary that the educational practices of nurses transcend simple health education, and should include an in-depth understanding of risk factors, observed needs and knowledge about the diagnosed condition (SOUSA; FERREIRA, 2021; LOPES, et al., 2019).

Thus, health education is configured, within the educational process, as a technological tool for the development of actions that sensitize the individual to participate in decision-making in the face of individual and collective situations that influence their quality of life. Therefore, it constitutes an important strategy in prevention and health promotion actions, which are intrinsically linked to Primary Health Care (PHC) practices (GONÇALVES et al., 2020).

In this context, the PHC health team plays a significant role in health promotion, considering the biopsychosocial aspects of each individual, providing comprehensive, articulated and continuous care. In this way, the user will be able to find a better solution to their problems, increasing confidence in the professionals (WERNECK; QUERIES; BERTOLIN, 2019; IDF, 2019).

However, there are several difficulties related to the management of Gestational Diabetes Mellitus (GDM) in Primary Health Care (PHC), with emphasis on the scarcity of human resources and deficiency, in addition to the lack of standardization in technical information. The primary care unit continues to be responsible for the pregnant woman, even when she is referred to another level of care, and thus the bond with the team must be maintained and the care plan established for her must be followed. The role of nurses in the diagnosis, treatment, and follow-up of pregnant women with GDM in the context of PHC is highlighted, a scenario immersed in challenges that involve both the practice and the scope of action in prenatal care (BRASIL, 2019; LOPES et al., 2019).

In this context, the need arose for an instrument that enables a directed and personalized nursing consultation for pregnant women diagnosed with GDM in the context of primary care. This technology aims to contribute to the improvement of nursing care in

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the management of GDM in primary care, promoting a technological and scientific increase in the care of pregnant women. It is believed that a targeted technology promotes improvements in PHC services for this public, in addition to reducing the rates of adverse events related to poor control of GDM and contributing to the dissemination of knowledge in the scientific community from its implementation.

The objective of this study was to construct and validate an instrument for nursing consultations for pregnant women with Gestational Diabetes Mellitus in the context of Primary Health Care.

## METHOD

This is a methodological study with a descriptive approach, carried out in November and December 2022. This type of research aims to stimulate the collection, investigation, organization and analysis of data, with the objective of developing specific tools that ensure the reliability and validation of these instruments (POLIT; BECK, 2019).

The study was divided into three stages: 1) literature review; 2) elaboration of care technology; and 3) validation of the content and appearance of the instrument by nurses specialized in the area of women's health, as well as by nurses from Primary Health Care (PHC) who provide care to pregnant women with GDM. Nurses from the states of Ceará and the Federal District participated in the study, justified by the location of the researcher's work in these two federative units (MENSAH; VAN ROOYEN; TEN HAM-BALOYI, 2019; POLIT; BECK, 2019).

The review stage gathered theoretical foundations that sought to answer and support the development of care technology for pregnant women with Gestational Diabetes Mellitus. The search was carried out using the PubMed/Medical Literature Analysis and Retrieval System Online (MEDLINE), Cumulative Index for Nursing and Allied Health Literature (CINAHL), Latin American and Caribbean Literature on Health Sciences (LILACS) and Scientific Electronic Library Online (SciELO) databases.

The review survey was carried out without a time frame, using the Health Sciences Descriptors (DeCS) and the Medical Subject Headings (MeSH), according to the following terms: Pregnant women; Pregnant Women; Gestational Diabetes; Diabetes, Gestational; Nursing Care; Nursing Care; Primary Health Care; Primary Health Care, being used in combination through the Boolean operator AND.

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The technology construction phase occurred through three stages: survey of the nursing history, identification of nursing diagnoses according to NANDA-I, and use of nursing interventions based on the Nursing Intervention Classification (NIC) (COFEN, 2009). The present study addressed self-care in the context of GDM, with unstable blood glucose as a guiding diagnosis, due to the risks of metabolic uncontrol inherent to the disease and its repercussions.

The consultation instrument included the nursing history stage through data collection (subjective and objective), evaluation of vital signs and laboratory data, identification of nursing diagnoses (ND), and nursing interventions based on the NIC, to guide the care/treatment plan.

The process of validating the content of the technology was conducted by judges with expertise in nursing care for women's health and/or primary care. The judges were selected based on criteria that provide guidance on the knowledge and skills needed in clinical practice in a specific area (JASPER, 1994). The Lattes curriculum was used to identify the professionals, adopting the technique of non-probabilistic snowball sampling. Thus, when identifying a participant eligible for the research, he was asked to indicate other possible participants (LOPES et al., 2019).

To define the number of judges, criteria were used that recommend a number between six and 20 experts (PASQUALI, 2013; ROCHA, 2021).

In the present study, a described and adapted judge classification system was adopted (JASPER, 1994). This classification system was adjusted for the context of this study, with the selection of judges who achieved a minimum score of five points, according to professional practice and training. Subjects who did not meet the criteria established in the evaluation process were automatically excluded from the sample.

To facilitate access to the evaluators, an instrument was developed in Google Forms® and a link was sent via WhatsApp and e-mail, containing the Invitation Letter, with emphasis on the justification and objective of the study, in addition to the Informed Consent Form (ICF) to be signed in case of acceptance. Google Forms® also contained assistive technology and the technology validation instrument (POLIT; BECK, 2019; BRAZIL, 2012).

The validation instrument included the following items: characterization of the experts; Goals; structure, presentation and relevance. The answer options were based on a Likert scale, consisting of: 1- TA (Totally adequate); 2- A (Adequate); 3- PA (Partially adequate); 4- I (Inadequate). Items that received scores of "1" and "2" were revised or

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eliminated. For each item analyzed, the judges were asked to describe their considerations. This method allowed reflection on different points of view (POLIT; BECK, 2019; JASPER, 1994; PASQUALI, 2013).

To assess the appearance, clarity and relevance of the consultation instrument, an adapted instrument was used (JASPER, 1994). For each item of the instrument (history, nursing diagnosis and nursing interventions), the answer options were: "yes", "no", "in part". After the analysis, the suggestions presented by the judges during the validation process were considered, resulting in the construction of a new version of the technology.

The data were analyzed through the application of the Content Validation Index (CVI), which measured the proportion of agreement among the judges in relation to each item evaluated (POLIT; BECK, 2019). The calculation of the CVI is based on the sum of responses 1 and 2 from the participants, followed by dividing the result by the total number of responses. Then, each item was analyzed in relation to the averages obtained, and when the averages were below 80%, the items were modified. For the qualitative analysis of the same instrument, the comments and suggestions of each block were analyzed and used to improve the technological artifact of the application type (POLIT; BECK, 2019). For some authors, obtaining a validity coefficient equal to or greater than 80% (0.80) is considered sufficient (PASQUALI, 2013).

Descriptive statistics were used to analyze the following characteristics of the responding judges: age group, gender, whether they were professors, professional experience, year of graduation, whether they had a specialization, master's or doctorate, current occupation, place of work, function/position in the institution, workload, teaching experience, and supervision of thesis, dissertation, specialization or monograph in the area of study. Numerical variables were described using simple and relative frequencies.

An item whose agreement between the judges was greater than or equal to 0.80 was considered valid (ROCHA, 2021). To verify the agreement between the judges, the binomial test was used, considering that there was agreement among the judges when $p > 0.05$. The analyses were performed using the SPSS® version 23 software.

The observations of the expert judges were evaluated and appropriately accepted. A table containing summaries of the evaluators' suggestions was made available, with the identification of the experts by letters, following the numerical sequence of the answers on the form. The instrument was reformulated according to the pertinent suggestions.

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The study obtained a favorable opinion from the Human Research Ethics Committee (COÉTICA) of the University of Fortaleza (UNIFOR), under number 5.266.585 and CAAE number 55873822.8.0000.5052, in accordance with Resolution No. 466, of December 12, 2012, regarding research involving human beings (BRASIL, 2012).

## RESULTS

A total of 20 judges participated in the study, 90% (n=18) of whom were female; 50% (n=10) aged between 31 and 40 years; 25% (n=5) with teaching experience; 30% (n=6) with professional experience of 6 to 10 years; and 65% (n=13) had completed the course as of 2010. Most worked in the state of Ceará (65%; n=13). Regarding the federation unit, 65% (n=13) of the judges were from Ceará and 35% (n=7) from the Federal District.

Regarding the characterization of the judges (FERREIRA et al., 2019; BEDIN et al., 2022), all had a specialization, 35% (n=7) had a master's degree, and one participant had completed a doctorate. The current occupation in care was reported by 75% (n=15), and 79% stated that the weekly workload was between 31 and 40 hours. In addition, 15% (n=3) supervised theses or dissertations in the area of women's health, PHC, construction and/or validation of technologies/instruments in the area of health. A total of 40% (n=8) of the judges advised specialization in this area, and 25% (n=5) supervised monographs.

When evaluating the Content Validation Index (CVI) of each of the items of the instrument, it was identified that all of them were considered validated, as CVI > 0.80 and p > 0.05. Regarding the analysis by domain, the "objective" domain had CVI = 0.97 (95%CI: 0.93 – 0.99) and p = 0.166; "structure and presentation" had CVI = 0.96 (95%CI: 0.93 – 0.98) and p = 0.328; and the "relevance" domain obtained CVI = 0.92 (95%CI: 0.82 – 0.97) and p = 0.415. The entire instrument had CVI = 0.96 (95%CI: 0.93 – 0.97) and p = 0.292.

When the binomial test was performed to identify the agreement between the evaluators, it was observed that, when a minimum agreement of 80% was stipulated, all the items of the instrument presented agreement greater than or equal to 80% in the answers (Table 1).

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**Table 1.** Validation of the instrument items, with calculation of the individual CVI, by domain and total. Fortaleza, Ceará, Brazil, 2022.

| Evaluated Domains | IVC | p-value |
|---|---|---|
| **1 Objectives** | 0,97 | 0,166 |
| 1.1 The data collection instrument is presented as an appropriate tool for what it proposes. | 1,00 | 0,059 |
| 1.2 The information/content is adequate for the guidance of professionals regarding the follow-up of women with GDM in PHC. | 0,95 | 0,176 |
| 1.3 The data collection instrument covers the area of care it proposes. | 1,00 | 0,059 |
| It causes a change in behavior and attitudes. | 0,90 | 0,405 |
| 1.4. The content answers doubts, clarifies professionals about practices and guidelines regarding the monitoring of women with GDM in PHC. | 0,95 | 0,176 |
| 1.5 It allows nurses to have access to relevant information to describe the patient's characteristics and their responses to their health status. | 1,00 | 0,059 |
| 1.6 It can circulate in the scientific environment of the area of women's health, primary health care, construction and/or validation of technologies/instruments in the area of health. | 1,00 | 0,059 |
| **2 Structure and Presentation** | 0,96 | 0,328 |
| 2.1 The instrument can be used in the practice of nurses. | 0,95 | 0,176 |
| 2.2 The information covered in the items is clear and objective. | 1,00 | 0,059 |
| The material is appropriate to the sociocultural level of the proposed target audience. | 0,95 | 0,176 |
| There is a logical sequence of the proposed content. | 1,00 | 0,059 |
| 2.3 The writing used is attractive. | 0,95 | 0,176 |
| 2.4 The language is clear and objective. | 1,00 | 0,059 |
| 2.5 The size of the instrument is suitable. | 0,70 | 0,067 |
| 2.6 The instrument is easy to read and understand. | 1,00 | 0,039 |
| 2.7 The information directed to the object of interest is sufficient and adequate. | 1,00 | 0,039 |
| 2.10 The size of the letters of the titles, subtitles and text is adequate. | 0,95 | 0,176 |
| 2.11 The font used makes it easier to read. | 1,00 | 0,059 |
| 2.12 The amount of information contained in the technology is adequate. | 1,00 | 0,059 |
| **3 Relevance** | 0,92 | 0,415 |
| 3.1 The material proposes that nurses acquire knowledge that helps to maintain favorable attitudes during the follow-up of women with GDM in PHC. | 0,95 | 0,176 |
| 3.2 The material addresses the issues necessary for the orientation of professionals regarding the follow-up of women with GDM in PHC. | 0,95 | 0,176 |
| 3.3 The material is suitable for use by health professionals. | 0,85 | 0,595 |
| **Complete instrument** | 0,96 | 0,292 |

**Source:** Prepared by the author.

In the context of health care for pregnant women with GDM, the collection of accurate and systematic information is significant for the development of a comprehensive nursing history, which facilitates identification, care and intervention measures, as expressed in Chart 1.

The Form for the construction of the nursing history expressed in Chart 1 allows the identification of the patient, clinical and obstetric history, risk factors, information about the current pregnancy, health behaviors and data related to GDM treatment. This instrument aims to facilitate the organization of information and support the nursing team in the development of targeted and personalized care strategies for the situation diagnosed in

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evidence. Thus, contributing to a better management of gestational diabetes within the scope of PHC, promoting the health of the pregnant woman and the fetus.

**Chart 1 -** Nursing history form

| | |
|---|---|
| **1. Nursing History** | |
| **1.1. Patient Identification** | |
| Name:__ Date of Birth: _/_/_ Address:__ Telephone:__ Place of birth:__ Profession:__. Monthly household income:__ Religion: __<br>Race: ( ) white ( ) black ( ) brown ( ) yellow ( ) indigenous. Marital status: ( ) single ( ) married ( ) widow ( ) separated ( ) stable union.<br>Education: ( ) illiterate ( ) elementary school ( ) high school ( ) higher education | |
| **1.2. Obstetric History: identifying risk factors** | |
| No. of Pregnancies:__ No. of deliveries: Vaginal _ Cesarean section _ No. of Abortions: _Diagnóstico of GDM in the previous pregnancy? ( ) yes ( ) no<br>Were there any other complications in the previous pregnancy? ( ) Yes ( ) No. If so, which one? __ Date of last delivery: _/_/_<br>Where did you have your last prenatal care? ( ) Health Center, only ( ) Polyclinic/Hospital, only ( ) Health Center and Polyclinic/Hospital, shared. Place of last delivery: Route of last delivery: ( ) vaginal ( ) cesarean section.<br>Use of vacuum extractor/forceps? ( ) Yes ( ) No. Newborn weight at birth:_ Was there an intercurrence with the newborn after birth? ( ) Yes ( ) No. If so, which one? | |
| **1.3. Current pregnancy: approach to Gestational Diabetes *Mellitus* (GDM)** | |
| Gestational age (GA) at prenatal onset:__ GA who was diagnosed with GDM:__<br>Through which screening test was the diagnosis of GDM made? ( ) Fasting Glucose ( ) Oral Glucose Tolerance Test (OGTT) Values found in the screening test: _____ What is your previous knowledge about GDM? ____<br>What are your main questions and concerns about DMG? _____ | |
| **1.4. Daily Lifestyle: A Look at Self-Care** | |
| How is the quality of your sleep? __ How is your diet? _ Describe your eating routine:__ Breakfast:__<br>Lunch: ___ Snack: __ Dinner: __ Was there an appointment with a Nutritionist? ( ) Yes ( ) No.<br>Do you practice physical activity? ( ) Yes ( ) No. If so, which one? __ How many times a week? _ Have you received guidance on the practice of physical activity from any health professional? ( ) Yes ( ) No. **Suggestions for safe physical activities during pregnancy: walking*, running, pilates, low-impact aerobics, strength training, among others. *accessible, low cost, understandable and easy to apply (BRASIL, 2019).** What are your leisure options? __ Do you use alcohol/tobacco/other drugs? ( ) Yes ( ) No.<br>If so, which one(s)? _____ How often? _____ | |
| **2. Prenatal Care: Management of GDM** | |
| **2.1. Therapeutics used** | |
| In view of the diagnosis, which therapy was/will be adopted?<br>( ) Lifestyle change with adaptation of diet and regular physical activity<br>( ) Lifestyle change + Pharmacological therapy with the use of insulin or oral antidiabetic drugs<br>If drug therapy is adopted, perform *a Checklist* for guidance on the handling, administration and storage of insulin: a) Storage and transport of insulin ( ) yes ( ) no. b) Insulin preparation ( ) yes ( ) no. c) Places of application ( ) yes ( ) no. d) Application technique according to the size of the needles ( ) yes ( ) no. (e)Other guidelines:_____ | |
| **2.2. Blood Glucose Monitoring** | |
| Do you know, have you used or use the glucometer? ( ) Yes ( ) No. What are your questions about this device? _____<br>Does the health service provide/made available the supplies for self-monitoring of capillary glucose (glucometer, strips and lancets)? ( ) Yes ( ) No. If yes, when were the inputs made available: ____/____/____<br>In view of the clinical judgment, is the pregnant woman able to perform blood glucose monitoring at home? ( ) yes ( ) no<br>If not, why? _____ | |
| Nurse's notes and considerations: ____ | |
| Date:___/____/____ | Signature and Stamp |

**Source**: Prepared by the author.

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ISSN: 2358-2472

To ensure effective and safe care for pregnant women with gestational diabetes, it is essential that the nursing team implements a comprehensive monitoring system. The form presented below was developed to assist nurses in the continuous control of several relevant parameters, including glycemic mapping, Body Mass Index (BMI) monitoring, physical activity supervision, and management of insulin and metformin use. In addition, the form includes a table with the main nursing diagnoses according to NANDA, as well as the nursing interventions recommended by the NIC. This instrument aims not only to facilitate data collection and analysis, but also to provide systematic support for clinical decision-making, thus promoting more effective and individualized care for pregnant women.

**Chart 2 -** Form for monitoring the pregnant woman by the nurse

**Prenatal Care: Continuity of Care**

Name: ___ Date of consultation: __/_/_ Gestational age: _ Complaint/doubt brought to the consultation: _
Current therapeutics: ( ) Non-pharmacological measures ( ) Pharmacological measures

**1.1 Blood Glucose Monitoring Map (mg/dL)**

| Date | Fasting | 1h post-coffee | Before lunch | 1h post-lunch | Before dinner | 1h post-dinner | Notes/Conduct |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

*Total Financial Feasibility and Technical Availability: 4-point daily profile in patients treated with non-pharmacological measures; Partial Financial and Technical Feasibility: 4-point profile 3x per week in patients treated with non-pharmacological measures. (ZAJDENVERG et al., 2022)*

*Capillary glucose targets during pregnancy in women with diabetes: Fasting: >65 and 95 mg/dL; 1 hour after meals <140 mg/dL; 2 hours after meals: <120 mg/dL. (ZAJDENVERG et al., 2022)*

**1.2 Nutritional Monitoring**

**Calculation of Body Mass Index (BMI) (pre-pregnancy)**

| Date | IG | BMI Rating | Gain weight | GI Suitable | Not suitable for GI | Notes/Conduct |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

[1] Perform an assessment according to the reference values below, based on pre-pregnancy BMI:

| Pre-pregnancy BMI (kg/m²) | Total weight gain (kg) at 14th week | Weekly weight gain (kg) in the 2nd and 3rd trimesters (from the 14th week onwards) | Total weight gain (kg) during pregnancy |
|---|---|---|---|
| Low Weight < 18.5 | 1,0 – 3,0 | 0,51 (0,44 – 0,58) | 12,5 – 18,0 |

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| | | | |
|---|---|---|---|
| Suitable between 18.5 and 24.9 | 1,0 – 3,0 | 0,42 (0,35 – 0,58) | 11,5 – 16,0 |
| Overweight between 25.0 and 29.9 | 1,0 – 3,0 | 0,28 (0,23 – 0,33) | 7,0 – 11,5 |
| Obesity ≥ 30.0 | 0,2 – 2,0 | 0,22 (0,17 – 0,27) | 5,0 – 9,0 |

Source: Brazil (2019).

No. of meals:_____Meal times: Breakfast _____Lunch: _____Snack: Dinner:____Water intake (L/day):_____ Questions/complaints about food:

**3. Physical activity**

What physical activity(s) are you practicing? _____. How is the physical activity routine?_____
Is there an obstetric contraindication? ( ) yes ( ) no ( ) Which one?

**Physical activity diary**

| Date | Week Day | Timetable | Exercise duration | Hydration | Food | How did you feel? | Notes/Conduct |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

**4. Drug treatment: Use of Insulin**

Date of initiation of insulin use: _____/____/____What is the prescribed dose and use schedule?

_____

| Insulin | Breakfast | Warm | Dinner | Bedtime |
|---|---|---|---|---|
| NPH | | | | |
| REGULAR | | | | |
| OTHER: | | | | |

Any questions about the treatment?

**5. Drug treatment: Use of Metformin**

Date of initiation of Metformin use: _____/____/_____ Dose and prescribed use schedule?

| | Breakfast | Lunch | Dinner |
|---|---|---|---|
| METFORMIN A | | | |

Any questions about the treatment?

**6. Nursing Diagnoses according to Taxonomy II of NANDA I for Pregnant Women with Gestational Diabetes Mellitus**

| Name: | Date of birth: /____/ | Team: | Month/year |
|---|---|---|---|
| | | | |

**Date of consultation: ____/____/**

**Legend: I: Diagnosis initially identified A: Diagnosis in follow-up R: Diagnosis resolved**
**S: Diagnosis suspended M: Diagnosis modified**

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| | | | | | | |
|---|---|---|---|---|---|---|
| Risk of unstable blood glucose associated with: ☐ knowledge about the disease; ☐ excessive weight gain; ☐Inadequate monitoring blood glucose; ☐diabetes mellitus | | | | | | |
| Overweight associated with: ☐ inadequate knowledge about modifiable factors; ☐ Abnormal patterns of behavior feed; ☐ Average daily physical activity lower than recommended | | | | | | |
| Obesity associated with: ☐ inadequate knowledge about modifiable factors; ☐ Abnormal patterns of behavior average ☐ daily physical activity lower than recommended | | | | | | |
| Sedentary lifestyle associated with: ☐ inadequate knowledge of the consequences of a sedentary lifestyle; ☐ Negative emotion in relation to physical activity; ☐ impaired physical mobility | | | | | | |
| Willingness to engage in exercise Improved Evidenced by: ☐Expresses the desire to maintain physical well-being through physical ☐ activity Expresses the desire to improve knowledge about the need for physical activity; | | | | | | |
| Ineffective health self-management related to: ☐ limited ability to perform aspects of the treatment regimen; ☐ inadequate commitment to an action plan; ☐ inadequate social support; ☐ cognitive dysfunction; | | | | | | |
| Decreased activity tolerance related to: ☐ sedentary lifestyle; ☐ inexperience with an activity; ☐ pain; | | | | | | |
| Willingness to Improve Knowledge evidenced by: ☐ expresses a desire to improve learning; | | | | | | |
| Willingness to improve self-care evidenced by: ☐ expressed desire to improve health independence; ☐ expresses a desire to improve knowledge about self-care strategies; | | | | | | |
| Willingness to perform improved physical activity evidenced by: ☐ reports liking to do physical activity; ☐ willingness to insert oneself into activity | | | | | | |
| Fear related to: ☐ reaction to a phobic stimulus; evidenced by: ☐ nervousness ☐ intense ☐ fear expresses fear; | | | | | | |

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| | | | | | | |
|---|---|---|---|---|---|---|
| Deficient knowledge related to: ☐ inadequate participation in care planning; ☐ Cognitive dysfunction; ☐ depressive symptoms | | | | | | |
| Anxiety related to: ☐ stressors; ☐ non-familial situation; evidenced by: ☐ reports altered sleep-wake cycle; | | | | | | |
| **Other ED identified:** | | | | | | |

| **7. Nursing Interventions (NIC)** | | |
|---|---|---|
| **FROM** | **NIC** | **Evaluation** |
| **Risk of unstable blood glucose** | Monitor blood glucose levels as directed | |
| | Encourage self-monitoring of blood glucose levels | |
| | Assist the patient in interpreting blood glucose values | |
| | Facilitate adherence to the diet and exercise | |
| | Review glucose recording levels with the patient/family | |
| **Overweight and obesity** | Establish a relationship of trust and respect | |
| | Facilitate the identification of eating behaviors to be modified | |
| | Discuss the patient's perception of diet/recommendation | |
| | Encourage the practice of physical activity, as directed | |
| **Sedentary lifestyle** | Investigate barriers to exercise | |
| | Encourage expressions of feelings about exercise and the need for it | |
| | Encourage the patient to start physical activity | |
| | Advise the patient on injury prevention during exercise | |
| | Monitor individual responses to physical activity | |
| **Fear and anxiety** | Use a calm and reassuring approach | |
| | Offer information on the diagnosis, treatment, and prognosis of the condition faced | |
| | Encourage family support | |

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| | | |
|---|---|---|
| | Determine the patient's ability to make decisions | |
| **Ineffective health self-management** | Hold the patient accountable for their own behavior | |
| | Discuss the consequences of not dealing with one's responsibilities | |
| | Determine if the patient has appropriate knowledge to perform the necessary activities | |
| | Encourage the patient to be the protagonist of her treatment | |
| **Other Nursing Interventions** | | |

**Source:** Prepared by the author.

Effective management of gestational diabetes is crucial for the health of the pregnant woman and the baby, and the active participation of the pregnant woman in this process is essential. The following form is designed to allow pregnant women to monitor their health parameters at home, promoting greater autonomy and control over their condition. This instrument includes a glycemic map, Body Mass Index (BMI) recording, a physical activity and diet diary, as well as a table to control the use of insulin and metformin. By using this form, pregnant women will be able to track their metrics in a systematic and organized way, facilitating the discussion of this data during follow-up appointments and contributing to a more effective management of gestational diabetes.

**Chart 3 -** Form for monitoring gestational diabetes mellitus by pregnant women

**1. Prenatal Care: Continuity of Care**

Name:

**1.1. Blood Glucose Monitoring Map (mg/dL)**

| Date | Fasting | 1h post-coffee | Before lunch | 1h after lunch | Before dinner | 1h post-dinner | Notes/Conduct |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

*Capillary glucose targets during pregnancy in women with diabetes: Fasting: >65 and 95 mg/dL; 1 hour after meals <140 mg/dL; 2 hours after meals: <120 mg/dL4*

**1.2. Nutritional Monitoring**

**Calculation of Body Mass Index (BMI) (pre-pregnancy)**

| Date | IG | BMI Rating | Weight gain | GI Suitable | Not suitable for GI | Notes/ Conduct |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

Number of meals:___ Meal times: __ Breakfast ___ Lunch: ___Lanche: __ Dinner: _ Water intake (L/day):_
Questions/complaints about food:

**1.3. Physical activity**

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| Physical activity diary | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Date** | **Day of the week** | **Timetable** | **Exercise duration** | **Hydration** | **Feeding** | **How did you feel?** | **Notes/ Conduct** |
| | | | | | | | |
| | | | | | | | |

| **1.4. Drug treatment: Use of Insulin** | | | | |
|---|---|---|---|---|
| **Insulin** | **Breakfast** | **Lunch** | **Dinner** | **Bedtime** |
| NPH | | | | |
| REGULAR | | | | |
| OTHER: | | | | |

| **1.5. Drug treatment: Use of Metformin** | | | |
|---|---|---|---|
| | **Breakfast** | **Lunch** | **Dinner** |
| METFORMIN | | | |

**Source:** Prepared by the author.

## DISCUSSION

The gestational health care provided by nurses has been widely recognized and consolidated over the years, being characterized by effective care practices and the promotion of public health policies. Nursing consultations and prenatal care are among the fundamental activities carried out in Primary Health Care, and, when performed assertively, promote improvements in the health status of pregnant women (PAHO, 2016; OREM, 1991; BRAZIL, 2012).

The instruments used in care practice, when used in a systematic manner and based on a concise and in-depth data collection, can guide clinical practice. In this way, they become tools capable of promoting assertive care directed to the patient's needs (RETONDE et al., 2022).

The validity of an instrument is related to its ability to measure and evaluate the results proposed for a given purpose, thus defining the degree of consistency it presents in relation to the objective for which it was created (TOLENTINO; BETTENCOURT; FONSECA, 2019; FILGUEIRAS et al., 2019).

In nursing care practice, validating instruments that guide professional conduct represents a significant technological advance in the health area. A validated instrument allows nurses to direct nursing care based on the particularities and specific needs of each individual (AMESTOY et al., 2021). The nursing consultation is an appropriate space for carrying out educational practices focused on health promotion and the patient's awakening to their own self-care, providing them with autonomy and interest in the treatment and quality of their life (FILGUEIRAS et al., 2019).

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In this context, the importance of nurses in primary care services and outpatient clinics as educators and health promoters is highlighted, working on several fronts, with emphasis on three main axes of action: awareness, education and monitoring. This role contributes to increasing knowledge about the disease and, consequently, to a better response of the patient to the care of their health (AMESTOY et al., 2021).

The validation of an instrument for nursing care with pregnant women with gestational diabetes represents a significant advance, highlighting the importance of nurses in the screening and treatment of this condition. In this sense, it enables guidance aimed at changing lifestyle, a crucial factor for the prognosis of the disease, such as: changing the eating pattern, regular practice of physical activity, correct use of drug therapy, and support in the rigorous monitoring of glycemic levels (LOPES et al., 2020; TAVARES et al., 2020).

In this context, an individual's professional experience can be a relevant factor in the validation of an assessment tool, according to the type of instrument and the application environment, which highlights the need for expertise. The title, as well as the time of practical performance, are elements that give judges expertise in the analysis of technology, allowing the development of a more effective tool, which meets the needs of the target audience that will use it (TOLENTINO; BETTENCOURT; FONSECA, 2019). Thus, the importance of balancing technical and academic experience in the selection of specialists is highlighted (JASPER, 1994; FERREIRA et al., 2019).

The analysis of technologies in the area of health during the process of construction and/or validation is crucial to provide essential data to decision-makers, enabling a prudent distribution of resources in the area of women's health within the scope of Primary Health Care (PHC) (PASQUALI, 2013; BRAZIL, 2012). This data corroborates a study that demonstrates nurses' quest to integrate research with care practice, with participation in research groups being a fundamental aspect for the development of strategies that promote gains in the health of pregnant women with diabetes (ROCHA, 2021; BRAZIL, 2022).

A study carried out in Ceará, in 2019 (TAVARES et al., 2019), built and validated an instrument to assist in the nursing consultation of pregnant women with diabetes, and presented some divergences in relation to the present study regarding the characterization found among the judges, such as: fewer evaluators (n=6) and greater number of PhDs in the evaluation of the instrument (n=2). Regarding data on participation in research groups,

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supervision of scientific work in the area of women's health and related areas, and length of professional experience, the results were similar to those of the present study.

The results related to content and appearance validation found in the present study corroborate the previous validation research of the nursing consultation instrument for pregnant women with GDM (BRASIL, 2022). In this study, the instrument was satisfactorily evaluated, with an overall CVI greater than 85.0%, and an individual CVI greater than 80.0% in most items (LOPES et al., 2020).

The number of suggestions accepted by the judges in the present study converged with the results of another relevant study. Regarding the content of the suggestions, (n=2) they were related to the "Nursing History", in which the inclusion of a history of gestational diabetes in the obstetric history was requested, as well as neonatal hospitalization for hypoglycemia (TAVARES et al., 2019).

The relevance of reinforcing the identification of the disease in previous pregnancies is related to the fact that it constitutes a strong risk factor for the development of the disease in the current pregnancy (LOPES et al., 2020). As for the suggestion to include research on neonatal hospitalization due to hypoglycemia, it was not accepted, as it was already included in the instrument through the investigation of complications with the newborn after delivery.

The findings expressed in this study in the category "Prenatal Care" are related to the insertion of suggestions for physical activities accessible to the less favored population and the inclusion of a co-responsibility term GONÇALVES et al., 2020). These findings corroborate the literature regarding the relevance of conducting GDM in Primary Health Care, in order to reach the population in vulnerable situations, in addition to favoring a self-care environment. Among the safe physical activities during pregnancy, walking stands out as an accessible, easy-to-understand, and low-cost activity (RETONDE et al., 2022; BRAZIL, 2022).

The term of co-responsibility seeks to encourage the active and responsible participation of the pregnant woman in the therapeutic process, as provided for in article 6 of the Charter of Rights of Health Users, which emphasizes the responsibility of the user in relation to his or her treatment (Brasil, 2011).

In relation to the categories "Nursing Diagnoses" and "Nursing Interventions", the suggestions were directed to two fronts: the feasibility of the execution of the nursing process in the context of Primary Health Care and the inclusion of a space for new

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diagnoses and their respective interventions, which could be identified during the follow-up. Only the second suggestion was accepted, in accordance with COFEN Resolution No. 358 of 2009, which regulates the application of the nursing process in all environments where nursing is performed, whether in the public or private service (COFEN, 2009).

It is crucial that nurses are able to assess clinical conditions in a systematic, continuous and dynamic way, using developed and validated instruments, supported by scientific evidence that strategically guide the results that are intended to be achieved, ensuring self-care and preventing future problems that may affect the lives of mothers and babies. This allows a holistic approach to pregnant women with GDM, as well as the identification of better strategies for nursing action in this scenario (MENSAH; VAN ROOYEN; TEN HAM-BALOYI, 2019; FILGUEIRAS et al., 2019; BRAZIL, 2022).

It is worth noting that the study had some limitations. The judges came from two federative units of the country, which requires caution in generalizing the results. The instrument was also not submitted to a new round of evaluation, an important step to verify that the suggestions were satisfactorily accepted. In addition, the usability of the instrument with the target audience was not evaluated, and it is recommended that this stage be included in further studies.

## CONCLUSION

The creation of a tool that guides nursing consultations for pregnant women with diabetes mellitus represents a significant technology for health education, offering support to professionals. It facilitates the improvement of communicative processes between nurses and pregnant women, in addition to encouraging the practice of self-care and the adoption of new life habits, also considering the biopsychosocial factors that can affect pregnancy.

The instrument for nursing consultations with pregnant women with gestational diabetes in primary care was validated according to the criteria of objective, structure, presentation and relevance. The experts' evaluation demonstrated a satisfactory overall CVI. All areas of the instrument obtained a CVI above 80%. The complete instrument presented CVI=0.96 (95%CI: 0.93 – 0.97) and p=0.292. Regarding the analysis of clarity and relevance, the content of the instrument was considered valid.

However, it is emphasized that the simple use of the instrument does not guarantee changes in the care provided, and it is important to consider other resources that facilitate

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comprehensive care, such as infrastructure, continuing education actions and articulation in care networks. The instrument will undoubtedly qualify the care provided to pregnant women with GDM during prenatal care, being an important technology to integrate scientific knowledge into nursing care in PHC, offering greater visibility to the work of nurses, in addition to contributing to the reduction of adverse events caused by inadequate management of this disease.

**ACKNOWLEDGMENTS**

To the Coordination for the Improvement of Higher Education Personnel (CAPES)/Federal Council of Nursing (COFEN) Agreement, for the opportunity and investment in Nursing training.

To the University of Fortaleza (UNIFOR), a University of excellence, for providing its students with a state-of-the-art infrastructure through active methodologies and spectacular professors.

To all professors of the Professional Master's Degree in Technology and Innovation in Nursing (MPTIE).

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