

Salient Beliefs in the Intention for Self-Care Behaviors when Facing Hypertensive Disorders in Pregnant Women

✉ **Iliana Milena Ulloa Sabogal**

<https://orcid.org/0000-0003-1605-6837>
Universidad de Antioquia, Colombia
iliana.ulloa@udea.edu.co

Edier Mauricio Arias Rojas

<https://orcid.org/0000-0003-2096-1792>
Universidad de Antioquia, Colombia
emaurocio.arias@udea.edu.co

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Theme: Promotion and prevention

Contribution to the subject: The behavioral, normative, and control salient beliefs represent indirect measures that will act on the previous determinants in the behavioral intention. Consequently, identifying women's salient beliefs about self-care behaviors when facing hypertensive disorders in pregnancy allows knowing the factors that exert positive and negative influences on maternal care and for which nursing actions should be strengthened during prenatal care. In addition, it contributes to the elaboration of measuring instruments that allow assessing the impact of health interventions targeted at preventing and reducing the risk of this obstetric complication based on theoretical constructs.

Abstract

Introduction: Hypertensive disorders of pregnancy represent a maternal and perinatal health problem. Therefore, it is important to identify the beliefs preceding the determinants of health behaviors during pregnancy. **Objective:** To identify the salient beliefs in the intention for self-care behaviors when facing hypertensive disorders in pregnant women. **Materials and Methods:** A descriptive study with a quantitative approach guided by the Theory of Planned Behavior. Each questionnaire was designed and its semantic validity was assessed. The sample was convenience one and included 114 pregnant women enrolled in prenatal control at a health institution from Piedecuesta, Santander, who answered the questionnaire via telephone calls between January and February of 2022. Data analysis was descriptive, resorting to absolute and relative frequencies. **Results:** The positive behavioral beliefs were focused on the mother's proper nutrition, the baby's healthy growth and development, disease prevention and control during pregnancy, the mother's relaxation and peace of mind, and blood pressure control and monitoring. Regarding normative beliefs, health personnel, mothers, husbands, and family members exert positive influences on each behavior. The following were acknowledged among the control beliefs: visiting family members promotes the practice of physical exercises; at the nutritional level, there is a habit of preferring low-salt preparations; both family and social support and habit and preference favor the consumption of fruit, vegetables, legumes and meats; lack of habit avoids the consumption of fats, flours, sugars, caffeine, alcohol, and cigarettes; purchase power favors calcium intake; taking a previous shower promotes rest and sleep, and going to pharmacies allows controlling blood pressure. **Conclusions:** Identifying the salient beliefs allowed determining those that need to be reinforced, negotiated, or restructured in achieving self-care behaviors when facing hypertensive disorders in pregnancy.

Keywords (Fonte: DeCS)

Self-care; beliefs; maternal health; health behaviors; hypertension, pregnancy-induced; intention; pregnant women; social theory.

4 Creencias salientes en la intención de comportamientos de autocuidado ante los trastornos hipertensivos en mujeres embarazadas

Resumen

Introducción: los trastornos hipertensivos del embarazo representan un problema en la salud materna y perinatal. Por lo tanto, es importante identificar las creencias que preceden a los determinantes de los comportamientos en salud durante el embarazo. **Objetivo:** identificar las creencias salientes en la intención de comportamientos de autocuidado ante los trastornos hipertensivos por parte de la mujer embarazada. **Materiales y métodos:** estudio descriptivo de enfoque cuantitativo guiado por la teoría del comportamiento planificado. Se diseñó y evaluó la validez semántica de cada cuestionario. La muestra por conveniencia fue de 114 embarazadas inscritas en el control prenatal de una institución de salud de Piedecuesta, Santander, las cuales respondieron el cuestionario a través de entrevista telefónica, entre enero y febrero de 2022. El análisis de los datos fue descriptivo, utilizando frecuencias absolutas y relativas. **Resultados:** las creencias conductuales positivas se enfocaron en la adecuada nutrición de la madre; en el sano crecimiento y desarrollo del bebé; la prevención y control de enfermedades durante el embarazo; la relajación y la tranquilidad de la madre; y el control y seguimiento de la presión arterial. En las creencias normativas, el personal de salud, la madre, el esposo y familiares influyen positivamente en cada comportamiento. Entre las creencias de control, se admite que: visitar familiares promueve la práctica del ejercicio; a nivel nutricional existe el hábito por preparaciones bajas en sal; tanto el apoyo familiar y social como el hábito y el gusto favorecen el consumo de frutas, verduras, legumbres y carnes; la falta de hábito evita el consumo de grasas, harinas, azúcares, cafeína, alcohol o cigarrillo; la capacidad económica favorece la ingesta del calcio; tomar una ducha previa promueve el sueño y descanso; y asistir a farmacias permite el control de la presión arterial. **Conclusiones:** la identificación de las creencias salientes permitió demostrar aquellas que necesitan ser reforzadas, negociadas o reestructuradas en el logro de comportamientos de autocuidado ante los trastornos hipertensivos del embarazo.

Palabras clave (Fuente: DeCS)

Autocuidado; creencias; cultura; salud materna; comportamientos relacionados con la salud; hipertensión inducida en el embarazo; intención; mujeres embarazadas; teoría social.

Crenças relevantes na intenção de comportamentos de autocuidado para síndromes hipertensivas gestacionais

Resumo

Introdução: as síndromes hipertensivas gestacionais representam um problema na saúde materna e perinatal. Portanto, é importante identificar as crenças que precedem os determinantes dos comportamentos de saúde durante a gravidez. **Objetivo:** identificar as crenças relevantes na intenção de comportamentos de autocuidado diante de distúrbios hipertensivos por parte das gestantes. **Materiais e método:** estudo descritivo com abordagem quantitativa orientada pela teoria do comportamento planejado. A validade semântica de cada questionário foi elaborada e avaliada. A amostra de conveniência foi composta de 114 gestantes inscritas no pré-natal de uma instituição de saúde em Piedecuesta, Santander (Colômbia), que responderam ao questionário por meio de entrevista telefônica entre janeiro e fevereiro de 2022. A análise dos dados foi descritiva, usando frequências absolutas e relativas. **Resultados:** as crenças comportamentais positivas se concentraram em nutrição adequada para a mãe; crescimento e desenvolvimento saudáveis do bebê; prevenção e controle de doenças durante a gravidez; relaxamento e tranquilidade para a mãe; e controle e monitoramento da pressão arterial. Nas crenças normativas, a equipe de saúde, a mãe, o companheiro e os membros da família influenciam positivamente cada comportamento. Entre as crenças de controle, admite-se que visitar parentes promove a prática de exercícios; no nível nutricional, há o hábito de preparações com pouco sal; tanto o apoio familiar e social quanto o hábito e o gosto favorecem o consumo de frutas, verduras, legumes e carnes; a falta de hábito evita o consumo de gorduras, farinhas, açúcares, cafeína, álcool ou cigarros; a capacidade econômica favorece a ingestão de cálcio; tomar banho antes da gravidez promove o sono e o descanso; e ir a farmácias permite o controle da pressão arterial. **Conclusões:** a identificação das crenças relevantes nos permitiu demonstrar aquelas que precisam ser reforçadas, negociadas ou reestruturadas na obtenção de comportamentos de autocuidado diante de síndromes hipertensivas gestacionais.

Palavras-chave (Fonte DeCS)

Autocuidado; crenças; cultura; saúde materna; comportamentos relacionados com a saúde; hipertensão induzida pela gravidez; intenção; gestantes; teoria social.

Introduction

Hypertensive disorders in pregnancy (HDP) are one of the main causes of maternal and fetal morbidity and mortality (1), especially in low- and middle-income countries (2). They affect approximately 10 % of all pregnancies and represent 14 % of all maternal deaths, which is why they are still an important public health problem globally (3). In Latin America and the Caribbean, HDP represents 25.7 % of all maternal deaths (4) and, in 2021, they were the leading direct cause of maternal death in Colombia, with 14.6 % (5).

Studies conducted in different parts of the world have sought to establish the exact etiology of HDP; however, it is still unknown (3) and, therefore, both their prediction and prevention represent a major challenge (6). In this sense, at the international (6-9) and national (10) levels, guides for the clinical practice targeted at HDP prevention, detection, and treatment have been issued. Among the preventive measures, calcium supplementation is established as the indication with the highest level of evidence and recommendation degree (9, 10). However, although more evidence is required to make recommendations related to diet, exercise, rest (7), restriction in the consumption of salt, alcohol and cigarettes, and workload or stress reduction (9), they are self-care behaviors that continue to be important in pregnant women and their family nucleus.

The literature suggests that a large part of the complications related to HDP are the result of low knowledge levels, negative attitudes, and lack of sensitization among pregnant women towards the disease and health behaviors (11). In the face of this problem, a theoretical proposal such as the Theory of Planned Behavior (TPB) has been useful to understand, predict, and explain human behavior. According to the theory, behavior is determined by intention, which in turn is influenced by three determinants (12). The first one is *attitude*, which reflects the favorable or unfavorable assessment level towards a given behavior. The second one is *subjective norms*, which refer to the pressure exerted by significant people on the subject who approve or disapprove of a given behavior. Finally, there is *perceived behavioral control*, defined as the personal ability to control the factors that ease or hinder performing a given behavior (12, 13).

The TPB proposes that to predict the intention, it is indispensable to establish people's salient beliefs about the behavior of interest; in other words, those that a person mentions more frequently and which are considered determinants of their actions. Theoreticians distinguish three types of salient beliefs: 1) Behavioral, which influence attitudes, 2) Normative, which precede subjective norms, and 3) Control, which constitute the grounds of behavioral control (12).

In the context of caring for pregnant women, studies (14-20) following the TPB approach have sought behavioral goals targeted at promoting health and preventing complications during pregnancy. However, research focused on establishing pregnant women's be-

liefs towards self-care behaviors when facing HDP in the light of the TPB is still incipient in Colombia and Latin America. It is for that reason that it is fundamental to identify the beliefs preceding the determinant of behavioral intention in pregnant women. In addition, specifying the salient beliefs constitutes the first phase of the theoretical framework for the elaboration of measuring instruments and for planning interventions targeted at motivating the acquisition of health behaviors (21). Consequently, the objective of the current study was to identify the salient beliefs in the intention for self-care behaviors when facing hypertensive disorders in pregnant women.

Materials and Methods

Design

A descriptive study with a quantitative approach guided by the TPB (12). It was conducted between January and February 2022 at a low-complexity public health institution from the municipality of Piedecuesta, Santander (Colombia).

Sample

Considering the criteria of the TPB adopted in this study, a sample of 25 participants was selected to determine the salient beliefs about the behavior of interest (21). The population consisted of 289 women enrolled in the prenatal control program, of which 114 met the inclusion criteria and agreed to take part in the study. The inclusion criteria corresponded to pregnant women of at least 18 years old, enrolled in the prenatal control program at the health institution, with a gestational period equal to or less than 28 weeks, living in urban or rural areas. Pregnant women with cognitive, linguistic or auditory limitations that hindered conducting the interviews were excluded.

Instruments

The first instrument was a form with sociodemographic and clinical questions to define the participants' characterization.

The second instrument included a questionnaire for each self-care behavior, targeted at obtaining the behavioral, normative, and control beliefs associated with HDP. The questionnaires were prepared and validated according to the guide for the elaboration of questionnaires outlined in the TPB from the author of the theory (22) and to the guide published by Francis (23), following three phases. The first phase involved identifying the self-care behaviors when facing HDP, based on a review of the scientific literature and clinical practice guides. After analyzing the information, the most relevant health behaviors for HDP risk prevention or control were extracted. The behaviors of interest included the

following: 1) Practice of physical exercise, 2) Sleep pattern and rest periods, 3) Salt consumption, 4) Consumption of fats, flours, and sugars, 5) Consumption of fruit, vegetables, and legumes, 6) Consumption of fish, chicken, and red meats, 7) Consumption of caffeinated drinks, alcohol, tobacco, or cigarettes, 8) Consumption of calcium supplements, and 9) Blood pressure control.

In the second phase and following the TPB recommendations (12) and the author's web page (22), each behavior was defined in terms of its objective, action, context, and time to know the advantages and disadvantages, the positive and negative referents, and the factors that ease or hinder its performance. Consequently, each of the nine questionnaires was structured with six questions, two for each type of belief and in an open-answer format (22, 23). The questions were designed by the study researchers, taking as reference examples from the authors of the TPB (22) and the study by Sousa *et al.* (21). Subsequently, they were verified by a linguist and assessed by a group of researchers from Universidad de Antioquia. The final version of the instruments included the recommendations made by the experts.

The questions formulated for the behavioral, normative, and control beliefs are stated below, taking the practice of physical exercises during pregnancy as an example. For the behavioral beliefs: "In your opinion, which are the advantages of practicing physical exercise at least for thirty minutes and five times a week in the next month?" and "Which are the disadvantages of practicing physical exercise at least for thirty minutes and five times a week in the next month?". For the normative beliefs: "In your opinion, which significant others would approve or believe that you should practice physical exercise at least for thirty minutes and five times a week in the next month?" and "Which significant others would disapprove or believe that you should not practice physical exercise at least for thirty minutes and five times a week in the next month?". For the control beliefs: "In your opinion, which are the factors or circumstances that would ease or allow you to practice physical exercise at least for thirty minutes and five times a week in the next month?" and "Which are the factors or circumstances that would hinder or preclude you from practicing physical exercise at least for thirty minutes and five times a week in the next month?".

In the third phase, following the guidelines outlined in the TPB (22) and the guide by Francis *et al.* (23), each questionnaire was submitted to a semantic validity test based on individual interviews with 5 pregnant women from the target population. They were asked to read the instrument and report any difficulty to understand the writing of each question. When a participant stated not understanding or not knowing the meaning of any term, she was asked to express what she understood and other terms that might replace the unknown word were proposed. Subsequently, the researchers consolidated the observations made by the participants and, in the light of the theoretical conceptualization, adjustments were implemented in

the semantic structure of some questions along with a linguist, to improve clarity and understanding of each instrument. In synthesis, the pregnant women stated having difficulties understanding the following terms: 'supplement,' 'caffeine,' and 'arterial tension,' which were replaced by 'pill,' 'caffeinated drinks,' and 'blood pressure,' respectively. Likewise, there was certain confusion when interpreting the term 'diet,' therefore, it was removed.

Data Collection

The participants that met the inclusion criteria were contacted by telephone, explained the study objective, and asked for their voluntary participation and verbal consent. The interviews were conducted by a nurse via telephone calls. During the interviews, the sociodemographic and clinical characterization form was applied, as well as the questionnaire about salient beliefs in the intention for self-care behaviors when facing HDP. Each interview lasted between 20 and 25 minutes, and the participants' answers were recorded in written form during the time of the telephone call. Each participant answered two questionnaires.

Data Analysis

A database in Microsoft Office Excel was designed to analyze the information obtained. A descriptive analysis was performed with the sociodemographic and clinical variables of the sample. The continuous variables were evaluated using frequency distributions and central tendency measures. The categorical variables were analyzed based on the calculation of absolute and percentage frequencies.

The beliefs corresponding to each self-care behavior were submitted to thematic analysis, according to the recommendations proposed by the TPB (22, 23). At first, the researchers independently analyzed the content of the answers to each belief and labeled them in topics, according to the similarity criterion and their frequency. Subsequently, each of the topics was numbered from those containing the most mentioned salient beliefs to the least mentioned. As a criterion, it was adopted that the salient beliefs were those that were mentioned at least three times; in other words, beliefs with a representativeness percentage equal to or greater than 75 % of all those stated by the participants, an index with which proper coverage of the beliefs of the entire population is achieved (23).

Ethical Considerations

This research was approved by the health institution and by the Research Ethics Committee of the Nursing School belonging to Universidad de Antioquia (Minute No. CEI-FE 2021-31). In addition, it respected the scientific, technical and administrative norms for

Results

A total of 114 pregnant women took part in this study, with a mean age of 24.63 years, maximum gestational age of 27.4 weeks, mostly primigravidae, living in urban areas, in stable unions and belonging to socioeconomic strata 2 (low) according to the classification issued by the National Statistics Administration Department (25). Additional details regarding the participants' sociodemographic and clinical characterization are presented in Table 1.

Table 1.

Characterization of the Study Participants' Sociodemographic and Clinical Profile. Piedecuesta, Santander, 2022

| Variable | N=114 (%) |
|------------------------------------------|---------------------------------------|
| Age (years old) | |
| Mean - Median (SD - IQR - Min - Max.) | (24.63 - 24) (5.57 - 21 - 18 - 39) |
| Area of residence | |
| Urban | 91 (79.82) |
| Rural | 23 (20.17) |
| Marital status | |
| Single | 13 (11.40) |
| Consensual union | 86 (75.43) |
| Married | 15 (13.15) |
| Schooling | |
| Elementary School | 8 (7.01) |
| Bachelor's Degree | 87 (76.31) |
| Technical/Technology | 13 (11.40) |
| University | 6 (5.26) |
| Socioeconomic strata | |
| 1 Low - Low | 41 (35.96) |
| 2 Low | 51 (44.73) |
| 3 Average - Low | 22 (19.29) |
| Occupation | |
| House chores | 74 (64.91) |
| Student | 9 (7.89) |
| Independent | 24 (21.05) |
| Employee | 7 (6.14) |
| Number of pregnancies | |
| 1 | 48 (42.10) |
| 2 | 42 (36.84) |
| 3+ | 24 (21.05) |
| Number of deliveries | |
| 0 | 74 (64.91) |
| 1 | 29 (25.43) |
| 2+ | 11 (9.64) |

| Variable | N=114 (%) |
|------------------------------------------|-------------------------------------------------|
| Number of C-sections | |
| 0 | 91 (79.82) |
| 1 | 17 (14.91) |
| 2 | 6 (5.26) |
| Number of miscarriages | |
| 0 | 101 (88.59) |
| 1 | 12 (10.52) |
| 2 | 2 (1.75) |
| Gestational age (weeks) | |
| Mean - Median (SD - IQR - Min - Max.) | 19.02 - 18.60 (5 - 24 - 19.40 - 8 - 27 - 40) |

SD: Standard Deviation; IQR: Interquartile Range; Min: Minimum value; Max: Maximum value

Source: Prepared by the authors.

The representativeness frequency and percentage corresponding to the behavioral, normative, and control beliefs mentioned in each of the nine self-care behaviors when facing HDP that were explored in this study are presented below.

Table 2 describes the behavioral salient beliefs related to the advantages and disadvantages perceived by the participants for each self-care behavior. The main advantages are focused on the mother's proper nutrition, healthy growth and development of the baby, disease prevention and control during pregnancy, and relaxation, rest and tranquility of the mother and baby.

Table 2.

Frequency of Behavioral Beliefs about Self-Care Behaviors when Facing HDP

| Self-Care Behavior | Advantages | Fr (%) | Disadvantages | Fr (%) |
|---------------------------------------------------------|-----------------------------------------------------------------------|------------|-----------------------------------------------------------|------------|
| Physical exercise | It improves the mother's and baby's health. | 21 (32.30) | No disadvantage | 17 (62.96) |
| | It serves as preparation for delivery. | 20 (30.76) | It generates tiredness, pain and abdominal discomforts. | 6 (22.22) |
| | It improves the respiratory, circulatory and musculoskeletal systems. | 8 (12.30) | It generates excessive and inadequate force or positions. | 4 (14.81) |
| | Other advantages. | 16 (24.59) | | |
| Total 65 (100) 27 (100) | | | | |
| Behavioral Salient Beliefs 49 (75.36) 23 (85.18) | | | | |
| Reducing salt consumption | It prevents high blood pressure. | 14 (35) | No disadvantage | 18 (72) |
| | It prevents diseases in the mother. | 10 (25) | Food taste loss | 4 (16) |
| | It promotes the baby's development and well-being. | 6 (15) | Loss of appetite or taste for food | 1 (4) |
| | Other advantages | 10 (30) | Other disadvantages | 2 (8) |

| Self-Care Behavior | Advantages | Fr (%) | Disadvantages | Fr (%) |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------|-------------------------------------|----------|
| Total 40 (100) 25 (100) | | | | |
| Behavioral Salient Beliefs 30 (75) 22 (88) | | | | |
| Consumption of fruit, vegetables and legumes | It contributes vitamins and minerals that promote the healthy growth and development of the baby. | 27 (51.92) | No disadvantage | 25 (100) |
| | It prevents diseases in the mother and contributes to her health. | 12 (23.07) | | |
| | It contributes to maintaining healthy eating. | 8 (15.38) | | |
| | Other advantages | 5 (9.6) | | |
| Total 52 (100) 25 (100) | | | | |
| Behavioral Salient Beliefs 39 (74.99) 25 (100) | | | | |
| Consumption of fish, chicken and red meats | It contributes vitamins, minerals and proteins in the nutrition of the baby. | 22 (42.30) | No disadvantage | 20 (80) |
| | It promotes baby's growth. | 9 (17.30) | Other disadvantages | 5 (20) |
| | It promotes adequate nutrition in the mother. | 8 (15.38) | | |
| | Other advantages | 13 (24.98) | | |
| Total 52 (100) 25 (100) | | | | |
| Behavioral Salient Beliefs 39 (74.98) 20 (80) | | | | |
| Calcium intake | It promotes baby's growth, development, and well-being. | 25 (55.55) | No disadvantage | 19 (76) |
| | Nutritional supplement for the mother and the baby. | 8 (17.77) | It increases nausea and acid reflux | 2 (8) |
| | It prevents dental and bone decalcification in the mother. | 6 (13.32) | Other disadvantages | 4 (16) |
| | Other advantages | 6 (13.32) | | |
| Total 45 (100) 25 (100) | | | | |
| Behavioral Salient Beliefs 39 (86.64) 19 (76) | | | | |
| Reducing consumption of fats, flours and sugars | It prevents health problems in the mother (diabetes and hypertension). | 25 (41.66) | No disadvantage | 25 (100) |
| | It promotes baby's growth, development and well-being. | 16 (26.66) | | |
| | It maintains the mother's healthy weight. | 9 (15) | | |
| | It prevents complications during delivery | 3 (5) | | |
| | Other advantages | 7 (11.66) | | |
| Total 60 (100) 25 (100) | | | | |
| Behavioral Salient Beliefs 50 (83.32) 25 (100) | | | | |

| Self-Care Behavior | Advantages | Fr (%) | Disadvantages | Fr (%) |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------|------------|-----------------|----------|
| Avoiding caffeinated drinks, alcohol, tobacco or cigarettes | It prevents malformations in the baby and promotes their growth and development. | 18 (58.06) | No disadvantage | 25 (100) |
| | It contributes to preserving the mother's health. | 11 (35.48) | | |
| | It prevents high blood pressure. | 2 (6.45) | | |
| Total 31 (100) 25 (100) | | | | |
| Behavioral Salient Beliefs 29 (93.54) 25 (100) | | | | |
| Sleep and rest | It favors the mother's rest, relaxation, and tranquility. | 17 (33.33) | No disadvantage | 25 (100) |
| | It contributes to the baby's development, rest, and relaxation. | 16 (31.37) | | |
| | It improves the mother's mood and energy levels. | 8 (15.68) | | |
| | It reduces the mother's stress levels. | 4 (7.84) | | |
| | Other advantages | 6 (19.6) | | |
| Total 51 (100) 25 (100) | | | | |
| Behavioral Salient Beliefs 41 (80.38) 25 (100) | | | | |
| Blood pressure control | It allows controlling the blood pressure levels. | 18 (48.64) | No disadvantage | 25 (100) |
| | It eases controlling and monitoring the mother's and baby's health. | 14 (37.83) | | |
| | It prevents complications during pregnancy. | 3 (8.10) | | |
| | Unknown advantages of performing blood pressure control. | 2 (5.40) | | |
| Total 37 (100) 25 (100) | | | | |
| Behavioral salient beliefs 22 (86.47) 25 (100) | | | | |

Source: Prepared by the authors

Table 3 presents the normative salient beliefs related to the positive and negative referents; in other words, the people that are significant for the participants and who consider that they should or should not perform each of the self-care behaviors when facing HDP. In this type of belief, health personnel, mothers, husbands or spouses and other family members (sisters, uncles, grandmothers and mothers-in-law) are positive referents exerting a higher influence on women to adopt, change or discard self-care behaviors when facing HDP.

Table 3.

Frequency of Normative Beliefs about Self-Care Behaviors when Facing HDP

| Self-Care Behaviors | Positive Referents | Fr (%) | Negative Referents | Fr (%) |
|--------------------------------------------------------|----------------------|------------|----------------------|------------|
| Physical exercise | Mother | 12 (28.57) | Nobody | 19 (73.07) |
| | Husband/Partner | 10 (23.80) | Other family members | 4 (15.37) |
| | Nobody | 8 (19.04) | Other referents | 3 (11.53) |
| | Other family members | 6 (14.28) | | |
| | Other referents | 6 (14.28) | | |
| Total 42 (100) 26 (100) | | | | |
| Normative Salient Beliefs 36 (85.69) 23 (88.44) | | | | |
| Reducing salt consumption | Mother | 11 (26.82) | Nobody | 24 (96) |
| | Other family members | 10 (24.39) | Other family members | 1 (4) |
| | Health personnel | 7 (17.07) | | |
| | Nobody | 7 (17.07) | | |
| | Other referents | 6 (14.62) | | |
| Total 41 (100) 25 (100) | | | | |
| Normative Salient Beliefs 35 (85.35) 24 (96) | | | | |
| Consumption of fruit, vegetables and legumes | Health personnel | 17 (26.56) | Nobody | 24 (96) |
| | Mother | 17 (26.56) | Other referents | 1 (4) |
| | Other family members | 14 (21.87) | | |
| | Husband/Partner | 11 (17.18) | | |
| | Other referents | 5 (7.8) | | |
| Total 64 (100) 25 (100) | | | | |
| Normative Salient Beliefs 48 (74.99) 24 (96) | | | | |
| Consumption of fish, chicken and red meats | Health personnel | 17 (30.35) | Nobody | 22 (88) |
| | Mother | 14 (25) | Other referents | 3 (12) |
| | Husband/Partner | 12 (21.42) | | |
| | Other family members | 11 (19.64) | | |
| | Nobody | 2 (3.57) | | |
| Total 56 (100) 25 (100) | | | | |
| Normative Salient Beliefs 43 (76.77) 22 (88) | | | | |
| Calcium intake | Husband/Partner | 12 (26.66) | Nobody | 22 (84.61) |
| | Mother | 11 (24.44) | Other family members | 2 (7.69) |
| | Health personnel | 10 (22.22) | Other referents | 2 (7.69) |
| | Other family members | 5 (11.11) | | |
| | Other referents | 7 (15.54) | | |
| Total 45 (100) 26 (100) | | | | |
| Normative Salient Beliefs 38 (84.43) 22 (84.61) | | | | |
| Reducing consumption of fats, flours and sugars | Health personnel | 15 (30) | Nobody | 23 (92) |
| | Mother | 11 (22) | Other family members | 1 (4) |
| | Husband/Partner | 9 (18) | Other referents | 1 (4) |
| | Other family members | 6 (12) | | |
| | Other referents | 9 (18) | | |
| Total 50 (100) 25 (100) | | | | |
| Normative Salient Beliefs 41 (82) 23 (92) | | | | |

| Self-Care Behaviors | Positive Referents | Fr (%) | Negative Referents | Fr (%) |
|--------------------------------------------------------------------|----------------------|------------|----------------------|---------|
| Avoiding caffeinated drinks, alcohol, tobacco or cigarettes | Health personnel | 12 (23.07) | Nobody | 21 (84) |
| | Husband/Partner | 11 (21.15) | Other referents | 3 (12) |
| | Mother | 10 (19.22) | Other family members | 1 (4) |
| | Other family members | 9 (17.30) | | |
| | Other referents | 6 (11.52) | | |
| | Nobody | 4 (7.69) | | |
| Total 52 (100) 25 (100) | | | | |
| Normative Salient Beliefs 42 (80.74) 21 (84) | | | | |
| Sleep and rest | Husband/Partner | 14 (31.11) | Nobody | 23 (92) |
| | Mother | 10 (22.22) | Mother | 1 (4) |
| | Other family members | 10 (22.22) | Other family members | 1 (4) |
| | Nobody | 6 (13.33) | | |
| | Other referents | 5 (11.1) | | |
| Total 45 (100) 25 (100) | | | | |
| Normative Salient Beliefs 24 (75.55) 23 (92) | | | | |
| Blood pressure control | Nobody | 21 (70) | Nobody | 23 (92) |
| | Other family members | 5 (16.66) | Other referents | 2 (8) |
| | Mother | 2 (6.66) | | |
| | Husband/Partner | 2 (6.66) | | |
| Total 30 (100) 25 (100) | | | | |
| Normative Salient Beliefs 26 (86.66) 23 (92) | | | | |

Source: Prepared by the authors.

Table 4 describes the control salient beliefs related to the factors that ease or hinder performing each of the self-care behaviors when facing HDP. The control belief that eases the most performing physical exercises during pregnancy corresponds to walking when visiting friends or family members. At the nutritional level, preparing food options with low salt content, social and family support when buying or offering fruit, vegetables and legumes, preference for the consumption of meats and purchasing power to buy calcium are factors that ease these behaviors. Likewise, lack of habit or taste for the consumption of fats, flour, sugars, caffeinated drinks, alcohol, tobacco or cigarettes are factors that prevent these type of behaviors. The sleep and rest pattern improves after taking a previous shower, and frequent micturition desire becomes a barrier. Going to a pharmacy allows for performing periodic blood pressure controls.

Table 4.

Frequency of Control Beliefs about Self-Care Behaviors when Facing HDP

| Self-care behavior | Facilitating factors | Fr (%) | Hindering factors | Fr (%) |
|------------------------------------------------------|-------------------------------------------------------------------|------------|------------------------------------------------------|------------|
| Physical exercise | Visiting friends and family members | 7 (16.27) | Pain | 8 (24.24) |
| | Walking with family members | 6 (13.95) | No factor | 7 (21.21) |
| | Taking their children to school | 6 (13.95) | Discomforts during pregnancy | 6 (18.18) |
| | Having parks and sports spaces nearby | 5 (11.62) | Medical recommendation | 5 (15.15) |
| | Walking pets | 4 (9.30) | Other factors | 7 (21.21) |
| | Going different places | 4 (9.30) | | |
| | Work/Home conditions | 3 (6.97) | | |
| Other factors | 8 (18.59) | | | |
| Total 43 (100) 33 (100) | | | | |
| Control Salient Beliefs 35 (81.36) 26 (78.78) | | | | |
| Reducing salt consumption | Preparations with low salt content | 18 (46.15) | No factor | 25 (100) |
| | Habit of consuming low-salt products | 6 (15.38) | | |
| | High blood pressure diagnosis during pregnancy or HDP history | 5 (12.82) | | |
| | Family history of high blood pressure | 3 (7.69) | | |
| | Other factors | 7 (17.92) | | |
| Total 39 (100) 25 (100) | | | | |
| Control Salient Beliefs 32 (82.04) 25 (100) | | | | |
| Consumption of fruit, vegetables and legumes | Support by friends or family members when buying or offering them | 10 (20.40) | No factor | 16 (55.17) |
| | The husband/partner buys them | 9 (18.36) | Economic factor | 9 (31.03) |
| | Habit and taste for their consumption | 9 (18.36) | Intolerance | 3 (10.34) |
| | Purchase ease | 6 (12.24) | Fruit or vegetables not available in the supermarket | 1 (3.44) |
| | The mother or mother-in-law prepares the food | 3 (6.12) | | |
| | Other factors | 12 (24.48) | | |
| Total 49 (100) 29 (100) | | | | |
| Control Salient Beliefs 37 (75.48) 25 (86.20) | | | | |
| Consumption of fish, chicken and red meats | Taste for their consumption | 9 (24.32) | No factor | 9 (30) |
| | Economic factor to buy them | 9 (24.32) | Economic factor | 7 (23.33) |
| | The husband/partner buys them | 9 (24.32) | Aversion to their consumption | 7 (23.33) |
| | Habit of consuming them in the diet | 5 (13.51) | Other factors | 7 (23.33) |
| | Other factors | 5 (13.51) | | |
| Total 37(100) 30 (100) | | | | |
| Control Salient Beliefs 32 (86.47) 23 (76.66) | | | | |

| Self-care behavior | Facilitating factors | Fr (%) | Hindering factors | Fr (%) |
|--------------------------------------------------------------------|-------------------------------------------------------|------------|---------------------------------|-----------|
| Calcium intake | Economic factor to buy them | 12 (30) | No factor | 9 (29.03) |
| | The baby's well-being | 10 (25) | Not provided in the hospital | 8 (25.80) |
| | Provided by the health institution | 6 (15) | Forgetting to take it | 6 (19.35) |
| | Strict time to take it | 5 (12.5) | Health problems | 4 (12.90) |
| | Family members remind about taking it | 3 (7.5) | Other factors | 4 (12.89) |
| | Other factors | 4 (10) | | |
| Total 40 (100) 31 (100) | | | | |
| Control Salient Beliefs 33 (82.5) 27 (87.08) | | | | |
| Reducing consumption of fats, flours and sugars | Habit of avoiding their consumption | 10 (27.02) | No factor | 15 (60) |
| | The baby's well-being | 6 (16.21) | Pregnancy cravings | 5 (20) |
| | Aversion to their consumption | 5 (13.51) | Purchase power | 2 (8) |
| | Medical recommendation or from family members | 4 (10.81) | Other factors | 2 (8) |
| | History or alteration in the glucose test | 4 (10.81) | Consumption habit | 1 (4) |
| | Other factors | 8 (21.60) | | |
| Total 37 (100) 25 (100) | | | | |
| Control salient beliefs 29 (78.36) 20 (80) | | | | |
| Avoiding caffeinated drinks, alcohol, tobacco or cigarettes | Habit of not consuming them | 25 (55.55) | No factor | 24 (96) |
| | The baby's well-being | 12 (26.66) | Coffee cravings | 1 (4) |
| | They generate insomnia, headache, nausea and vomiting | 6 (13.33) | | |
| | Other factors | 2 (4.44) | | |
| Total 45 (100) 25 (100) | | | | |
| Control Salient Beliefs 37 (82.21) 24 (96) | | | | |
| Sleep and rest | Taking a shower before going to bed | 12 (21.42) | Frequent micturition desire | 14 (25) |
| | Habit of going to bed early | 8 (14.28) | Discomforts during pregnancy | 9 (16.07) |
| | Performing activities that favor sleep and rest | 7 (12.5) | Abdominal discomfort | 5 (8.92) |
| | Sensation of tiredness | 6 (10.71) | Concerns and stress | 6 (10.71) |
| | Increased sleep during pregnancy | 4 (7.14) | Care of children | 6 (10.71) |
| | Avoiding activities that limit sleep | 4 (7.14) | Getting up early in the morning | 4 (7.14) |
| | Support from the partner | 3 (5.35) | Insomnia | 4 (7.14) |
| | Rest routine during the day | 3 (5.35) | Other factors | 8 (14.27) |
| | Other factors | 9 (16.05) | | |
| Total 56 (100) 56 (100) | | | | |
| Control Salient Beliefs 44 (78.54) 44 (78.55) | | | | |

| Self-care behavior | Facilitating factors | Fr (%) | Hindering factors | Fr (%) |
|-----------------------------------------------------|-------------------------------------------------------|----------|------------------------------------------------------|------------|
| Blood pressure control | Going to a pharmacy | 16 (40) | No factor | 11 (40.74) |
| | Family member or acquaintance measures blood pressure | 7 (17.5) | Long distances to the health institution or pharmacy | 8 (29.62) |
| | Low cost of the measuring procedure | 5 (12.5) | Lack of time, concerns and forgetfulness | 5 (18.51) |
| | Having a tensiometer at home | 3 (7.5) | Other factors | 3 (11.10) |
| | Other factors | 9 (22.5) | | |
| Total 40 (100) 27 (100) | | | | |
| Control Salient Beliefs 31 (77.5) 24 (88.87) | | | | |

Source: Prepared by the authors.

Discussion

The TPB sets forth that human behaviors are reasoned or planned actions, as they are consistent with a person's beliefs (26). In this sense, it can be asserted that it is through behavioral beliefs that people weigh the consequences of future actions in terms of their favorable or unfavorable nature (21).

The behavioral beliefs related to physical exercises stand out as the ones with the greatest advantage in improving mothers' and babies' health during pregnancy. Although this result is coherent, there is a limited perception of the benefits of physical exercises on blood pressure control, a finding that can be related not only to causal unawareness of these disorders in the obstetric population (27) but also to women's disinformation and lack of knowledge by the health personnel in terms of the effects of physical exercises during pregnancy, which results in not providing this type of recommendation and in few pregnant women benefiting from this behavior (28). Physical exercises have been considered an important non-pharmacological strategy to reduce the risk of suffering HDP (27). The findings of a systematic review and meta-analysis showed the beneficial effect of aerobic, strength and flexibility exercises (OR = 0.50; 95 %CI: 0.33-0.75; p = 0.001) or yoga (OR = 0.28; 95 %CI: 0.13-0.58; p = 0.001) in preventing or reducing the risk of developing HDP (29). Currently, the recommendations proposed by the American College of Obstetricians and Gynecologists (ACOG) suggest that, whether during pregnancy or in the postpartum period, all women should practice moderate-intensity physical exercises for at least thirty minutes a day and five or more days in the week (30). Among the negative behavioral beliefs, most of the participants state no disadvantages regarding physical exercises during pregnancy; such practice generates sensations of tiredness, pain and abdominal discomforts only for some women, in addition to the use of improper strength and positions. In this sense, the ACOG describes that physical exercises contribute to reducing body, back and sciatic pain in

pregnant women. In addition, it recommends motivating women undergoing uneventful pregnancies to perform aerobic and strength exercises before, during and after pregnancy (30).

Considering nutritional behaviors, reducing salt consumption contributes to preventing high blood pressure and diseases in the mother. Although, according to clinical practice guides, there is not enough evidence showing that reducing salt in the diet helps treat or prevent hypertension during pregnancy (7-9), such restriction can be beneficial for normotensive pregnant women with metabolic disorders or obesity, or with a chronic hypertension diagnosis (31). The unfavorable beliefs towards this behavior are related to losing taste, appetite and preference for food. These findings are similar to those described by Sousa *et al.* (21), where it is highlighted that the changes in food palatability associated with salt usage in the preparation of meals represent negative aspects for reducing its consumption.

In the consumption of fruit, vegetables, legumes and meats, the contribution of vitamins and minerals assisting in the baby's proper growth and development and the mother's nutrition and health stands out. Several studies have found that eating fruit, vegetables and legumes is positively related to newborns' size and weight (32). Likewise, food products of animal origin are iron, protein and vitamin sources that not only contribute to preventing maternal diseases but, due to their high nutritional value, also exert an influence on the baby's development and protection (33).

On the other hand, the participants included in this study did not describe the importance of eating fruit, vegetables and legumes on weight control during pregnancy. In this sense, it has been described that gestational weight gain higher than the recommended increases the risk of obstetric complications like hypertension. Therefore, proper prenatal control, adequate nutritional classification, sound indications from the health personnel and elaborating a diet are key strategies to attain a food regime in pregnant women that allows for avoiding excessive weight gain and reduces the risk of developing HDP (34).

Likewise, the women included in this study consider that reducing the consumption of fats, flour and sugar would avoid diabetes, high blood pressure, and maternal overweight problems, in addition to promoting the baby's healthy growth and development. These beliefs are in line with the scientific evidence, where it has been identified that maternal diets with high energy intake are associated with higher risks of hypertension, gestational diabetes, increased maternal weight, macrosomia, and C-sections (35).

The favorable beliefs of calcium intake during pregnancy are related to the baby's growth, development and well-being, as well as to its value as a nutritional supplement in mothers and babies

alike, which prevents dental and bone decalcification in women. Although these findings are consistent with what is reported in the literature, the role of calcium in reducing HDP risk is unknown. A Cochrane review has concluded that there is enough evidence to prove that calcium supplementation (≥ 1 g/day) is significantly associated with a reduction in the risk of pre-eclampsia and other pregnancy hypertensive diseases, particularly in women on diets that are low in this mineral (36).

Among the advantages of avoiding caffeinated drinks, alcohol, tobacco or cigarettes, beliefs such as preventing malformations and promoting the baby's healthy growth and development stand out, as well as preserving the mother's health and preventing high blood pressure. There is evidence that prenatal exposure to alcohol, tobacco and caffeine exerts adverse effects on the health of the pregnant woman, the fetus and the newborn (37,38). Considering the development of HDP, a systematic review suggested an association between alcohol and pre-eclampsia, with a 13 % prevalence, although none of the studies included reported tobacco consumption as a risk factor (39). Likewise, Kawanishi *et al.* (40) showed that consuming 131 mg/day of caffeine, a value way below the amount recommended by the World Health Organization (300 mg/day), was associated with higher HDP risk (OR=1.35; 95 %CI: 1.99-1.52; $p = 0.001$).

Both sleep and the periods during pregnancy are mentioned as behaviors that favor relaxation and peace of mind in the mother and the baby. However, there is a lack of knowledge about the importance of sleep quality and pregnancy results. Some studies suggest that pregnant women are a population group at a higher risk of sleep disorders such as sleep apnea, restless leg syndrome and insomnia (41). In this sense, the findings by Sharma *et al.* (42) indicated that sleep insufficiency or fragmentation can predispose pregnant women to several adverse results, such as gestational hypertension and C-section deliveries.

Finally, in the behavioral beliefs, blood pressure control is mentioned as a behavior that allows monitoring the blood pressure values, controlling and following up on the mother's and baby's health and preventing complications during pregnancy. Although blood pressure monitoring plays no role in HDP prevention, it is in fact useful to determine alterations in the parameters considered normal and in early detection of HDP.

Regarding the normative beliefs, the findings emphasize that health personnel, mothers, husbands or partners and other family members are referents that might exert an influence on pregnant women's motivation to perform a given self-care behavior when facing HDP. In this sense, Malta *et al.* (43) describe that women are in frequent contact with physicians and nurses during their prenatal appointments. Therefore, these professionals, as providers of knowledge, practices and support, play a relevant role in promoting changes in health behaviors. In the family context, the evidence has shown that

when partners, mothers and close family members are involved in the pregnancy, pregnant women are more likely to timely access prenatal care programs, avoid harmful behaviors for their health and develop self-care actions, all components that are associated with better results in maternal/perinatal health (44, 45).

In the control beliefs, it is evident that visiting other people, going out for a walk with their partner and taking their children to school are facilitating factors for physical exercises during pregnancy. These findings highlight that there is a dependent relationship between the participants and their social referents, which contributes to adopting health behaviors during pregnancy that might be able to promote optimum results in the mothers' and babies' health (44).

At the nutritional level, preparing meals with low salt content and the habit of low consumption to prevent diseases in the mother and the baby are beliefs that ease the behavior. In fact, the mothers' knowledge about the benefits of reducing salt consumption during pregnancy and the strategies to do so can help reduce its use (46). Eating fruit, vegetables, legumes and meats can be favored by the support from friends and family members, by the partner buying them and by the habit and preference for their consumption. In this sense, the study by Hromi *et al.* (47) showed that social, spouse and family support is the main source driving healthy eating behaviors, especially the consumption of fruit and vegetables. Likewise, Asiabar *et al.* (48) reported that the partners are usually the financial support source in the family and, therefore, they play an important role in the food supply. In addition, it has been described that social support exerts a direct influence on pregnant women's perceived self-efficacy, favoring access, preferences, knowledge and strategies required to increase consumption of this type of food products (47).

On the other hand, the beliefs that contribute to reducing unhealthy nutritional behaviors during pregnancy emphasize the habit of avoiding fats, flours and sugars, aversion to meals, and lack of habit or preference for caffeinated drinks, alcohol or cigarettes, which are ways to promote the baby's well-being and prevent health problems in the mother. These beliefs are consistent with the findings by Forbes *et al.* (49), for whom the most common reasons for women to reduce or discard consumption of this type of food products include the baby's health, concern about their own health, aversions, nausea and the intention to meet the dietary recommendations provided by the health professionals.

Regarding consumption of calcium supplements, the participants describe thinking about the baby's well-being, provision by the health institution or purchasing power to buy them as the major facilitating factors. According to a study conducted in Bangladesh, calcium supplementation during pregnancy depends on factors such as maternal knowledge, support from the hus-

band or partner, reminders by the household members to take it, early initiation and more prenatal visits, as well as the free provision by the health services (50).

The control beliefs associated with sleep and rest are targeted at the habit of taking a previous shower, going to bed early and performing activities that favor sleep and rest. The activities described coincide with the findings by Hashmi *et al.* (51), who emphasize that strategies that improve sleep quality should be implemented during pregnancy, such as going to bed and getting up at the same time every day, taking a warm bath and performing non-stimulating activities such as knitting, reading a book, etc. Likewise, the participants describe beliefs that interfere with sleep duration and quality that are also identified in the literature, such as pollakiuria, discomforts caused by back pain, fetal movements and abdominal discomfort (51).

Finally, going to a nearby pharmacy, a family member or acquaintance measuring blood pressure and the low cost involved in the procedure are identified as beliefs that ease measuring it. The findings by Tucker *et al.* (52) describe that pregnant women feel satisfied with monitoring blood pressure either in the self-control or outpatient modality and, therefore, it is possible that the beliefs stated by the participants included in this study contribute positively to this behavior.

In terms of the implications for the Nursing practice, the findings set forth the need to strengthen pregnant women's self-care knowledge and actions when facing HDP, through education in prenatal consultations or by developing health education interventions or programs that promote a positive attitude, involve greater social or family support and reinforce in pregnant women the acknowledgment and control over their own resources and abilities, as well as their motivation to develop health behaviors when facing HDP. In addition, identifying the salient beliefs will support the elaboration of instruments that allow assessing the attitudes, subjective norms and perceived behavioral control as key determinants in pregnant women's intention towards self-care behaviors when facing HDP.

This study acknowledges the following as one of its limitations: the absence of more answers to the questions asked that would allow for a better understanding of the phenomenon, which may have been due to how the information was collected or to the participants' refusal to provide more in-depth answers. Another limitation corresponds to the fact that the study was conducted in a single environment, which entails carrying out new research studies in different Colombian regions, acknowledging pregnant women's cultural plurality, nutritional diversity and lifestyle habits, to expand, ratify or refute the findings of this study, as it deals with care behaviors during the prenatal stage that subjected to diverse influence from the pregnant women's cultural and social contexts, thus precluding generalization of the findings.

Conclusion

The results of this study revealed pregnant women's behavioral, normative and control salient beliefs towards the self-care behaviors related to HDP. In the behavioral beliefs, some advantages should be preserved, reinforced or modified in HDP risk prevention or control, as well as disadvantages that need to be corrected. On the other hand, health personnel, mothers, partners or husbands and other family members are referents that exert a strong influence on achieving the expected self-care behaviors. Finally, factors easing the behaviors were identified, as well as others that exert a negative influence, which can be negotiated or restructured to achieve health behaviors that strengthen maternal/perinatal health care when facing HDP risks.

Conflicts of interest: The authors declare no conflict of interests.

Referencias

- Wang W, Xie X, Yuan T, Wang T, Zhao F, Zhou Z, et al. Epidemiological trends of maternal hypertensive disorders of pregnancy at the global, regional, and national levels: a population-based study. *BMC Pregnancy Childbirth*. 2021;21:364. <https://doi.org/10.1186/s12884-021-03809-2>
- Lazo L, Toledo L, Badner A, Barriga J, Castro M, Euser A, et al. ACOG and local diagnostic criteria for hypertensive disorders of pregnancy (HDP) in La Paz-El Alto, Bolivia: A retrospective case-control study. *The Lancet Regional Health – Americas*. 2022;9:100194. <https://doi.org/10.1016/j.lana.2022.100194>
- Kahsay H, Gashe F, Ayele W. Risk factors for hypertensive disorders of pregnancy among mothers in Tigray region, Ethiopia: Matched case-control study. *BMC Pregnancy Childbirth*. 2018;18(1):482-492. <https://doi.org/10.1186/s12884-018-2106-5>
- Rojas L, Rojas L, Villagómez M, Rojas A, Rojas A. Preeclampsia-eclampsia diagnóstico y tratamiento. *Rev. Eugenio Espejo*. 2019;13(2):79-91. <https://doi.org/10.37135/ee.004.07.09>
- Ministerio de Salud y Protección Social, Instituto Nacional de Salud (INS). Boletín epidemiológico Semanal (BES). *Semana Epidemiológica* 52; 2021. <https://www.ins.gov.co/buscador-eventos/Paginas/Vista-Boletin-Epidemiologico.aspx>
- Poon L, Shennan A, Hyett J, Kapur A, Hadar E, Divakar H, et al. The International Federation of Gynecology and Obstetrics (FIGO) initiative on pre-eclampsia: A pragmatic guide for first-trimester screening and prevention. *Int J Gynaecol Obstet*. 2019;145(51):1-33. <https://doi.org/10.1002/ijgo.12802>
- National Institute for Health and Care Excellence (NICE). Hypertension in pregnancy: diagnosis and management; 2019. <https://www.nice.org.uk/guidance/ng133>
- Mounier C, Amar J, Boivin J, Denolle T, Fauvel J, Plu G, et al. Hypertension and pregnancy: expert consensus statement from the French Society of Hypertension, an affiliate of the French Society of Cardiology. *Fundam Clin Pharmacol*. 2016;31(1):83-103. <https://doi.org/10.1111/fcp.12254>
- Magee L, Pels A, Helewa M, Rey E, Von Dadelszen P. Diagnosis, evaluation, and management of the hypertensive disorders of pregnancy: Executive summary. *J Obstet Gynaecol Can*. 2014;36(5):416-438. [https://doi.org/10.1016/S1701-2163\(15\)30588-0](https://doi.org/10.1016/S1701-2163(15)30588-0)
- Ministerio de Seguridad y Protección Social, Colciencias. Guía de Práctica Clínica para la prevención, detección temprana y tratamiento de las complicaciones del embarazo, parto o puerperio para uso de profesionales de Salud. Guías No 11-15. Bogotá: Colombia; 2013. <https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/INEC/IETS/Guía.completa.Embarazo.Parto.2013.pdf>
- Ouasmani F, Engeltjes B, Haddou Rahou B, Belayachi O, Verhoeven C. Knowledge of hypertensive disorders in pregnancy of Moroccan women in Morocco and in the Netherlands: A qualitative interview study. *BMC Pregnancy Childbirth*. 2018;18(1):344-455. <https://doi.org/10.1186/s12884-018-1980-1>
- Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process*. 1991;50(2):179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Guzmán F, García B, Rodríguez L, Alonso M. Actitud, norma subjetiva y control conductual como predictores del consumo de drogas en jóvenes de zona marginal del norte de México. *Frontera norte*. 2014;26(51):53-74. http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=So187-73722014000100003&lng=es&tlng=es
- Farzaneh Z, Asadollahi Z, Asadpour M, Rahaei Z, Sardari F, Rezaeian M. The effect of educational intervention based on the theory of planned behavior in promotion of oral health behaviors in pregnant women of Rafsanjan City, Kerman, Iran. *JCHR*. 2021;10(1):12-21. <https://doi.org/10.18502/jchr.v10i1.5827>
- Jalambadani Z, Borji A, Delkshos M. The effect of education based on the theory of planned behavior on iron supplementation among pregnant women. *Korean J Fam Med*. 2018;39(6):370-374. <https://doi.org/10.4082/kjfm.17.0141>
- Moradpour S, Shahnazi H, Hassanzadeh A. The effect of behavior-based education in adopting the urinary tract infection prevention behavior in pregnant women: A randomized controlled trial. *Research Square*; 2020. Preprint. <https://doi.org/10.21203/rs.3.rs-52176/v1>
- Mohammadi Z, Pakpour A, Mohammadi Z. Effectiveness of educational intervention on exclusive breast feeding in primipara women: application of planned behavior theory. *RJMS*. 2015;21(127):12-23. <http://rjms.iuims.ac.ir/article-1-3469-en.html>

18. Zhu Y, Zhang Z, Ling Y, Wan H. Impact of intervention on breastfeeding outcomes and determinants based on theory of planned behavior. *Women Birth*. 2017;30(2):146-152. <https://doi.org/10.1016/j.wombi.2016.09.011>
19. Ghaffari M, Rakhshanderou S, Harooni J, Mehrabi Y, Ebrahimi A. Prenatal interventional program about mothers' behavior related to exclusive breast feeding: Findings of planned behavior theory-based research. *J Lifestyle Med*. 2019;9(2):143-149. <https://dx.doi.org/10.15280/jlm.2019.9.2.143>
20. El Sayed H, Said S, Mohy H, Emam A. Efficacy of an intervention based on theory of planned behavior on self-care management among women with pregnancy induced hypertension. *J Nurs Heal Sci*. 2020;9(1):7-20. <https://www.iosrjournals.org/iosr-jnhs/papers/vol9-issue1/Series-3/Cog01030720.pdf>
21. Sousa M, Gouveia B, Almeida T, Freire M, Sousa Oliveira S. Crenças de pessoas com insuficiência cardíaca relacionadas à ingestão de sal. *Rev Enferm UERJ*. 2019; 27:e44197. <https://doi.org/10.12957/reuerj.2019.44197>
22. Ajzen. Constructing a theory of planned behavior questionnaire. <https://people.umass.edu/ajzen/tpb.html>
23. Francis J, Eccles M, Johnston M, Walker A, Grimshaw J, Foy R, et al. Constructing questionnaires based on the theory of planned behavior: A manual for health services researchers. Newcastle upon Tyne, UK: Centre for Health Services Research, University of Newcastle upon Tyne; 2004. <https://openaccess.city.ac.uk/id/eprint/1735/>
24. Ministerio de Salud. Resolución Número 008430: por la cual se establecen las normas científicas, técnicas y administrativas para la investigación en salud. Ministerio de Salud. Bogotá, Colombia; 1993. <https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/DE/DIJ/RESOLUCION-8430-DE-1993.PDF>
25. Departamento Administrativo Nacional de Estadística. Estratificación Socioeconómica – Preguntas frecuentes. Bogotá: DANE; 2021. <https://www.dane.gov.co/index.php/116-espanol/informacion-georreferenciada/2421-estratificacion-socioeconomica-preguntas-frecuentes>
26. Hernández E, Salazar M, Vacio M, Rodríguez S. Instrumento para evaluar la intención de niños mexicanos para consumir bebidas alcohólicas desde la Teoría de la Conducta Planeada. *Univ Psychol*. 2017;16(2):80-9. <https://doi.org/10.11144/javeriana.upsy16-2.iein>
27. Sánchez S, Sánchez A, Castro J. Optimum training programme during pregnancy to prevent gestational hypertension and preeclampsia: a systematic review. *Arch Med Deporte*. 2021;38(2):127-35. <https://doi.org/10.18176/arch-meddeporte.00036>
28. Montes A, Sánchez J, Merino E, Molina E, Rodríguez R. El ejercicio físico en el embarazo y/o el posparto frente a la fatiga percibida. *JONNPR*. 2020;5(3):329-46. <https://dx.doi.org/10.19230/jonnpr.2916>
29. Danielli M, Gillies C, Thomas R, Melford S, Baker P, Yates T, et al. Effects of supervised exercise on the development of hypertensive disorders of pregnancy: A systematic review and meta-analysis. *J Clin Med*. 2022;11(1):793. <https://doi.org/10.3390/jcm11030793>
30. ACOG Committee. Physical activity and exercise during pregnancy and the postpartum period: ACOG Committee Opinion, Number 804. *Obstet Gynecol*. 2020;135(4):e178-e188. <https://doi.org/10.1097/AOG.0000000000003772>
31. Asayama K, Yutaka I. The impact of salt intake during and after pregnancy. *Hypertens Res*. 2018;41(1):1-5. <https://doi.org/10.1038/hr.2017.90>
32. Martínez J, Amezcua C, Salcedo I, González G, Bueno A, Delgado M. Maternal dietary consumption of legumes, vegetables and fruit during pregnancy, does it protect against small for gestational age? *BMC Pregnancy Childbirth*. 2018;18(1):486. <https://doi.org/10.1186/s12884-018-2123-4>
33. Quintana M. Beneficios y barreras al consumo de alimentos de origen animal percibidos por gestantes de diferente nivel socioeconómico en Lima. *An Fac Med*. 2016;77(4):351-6. http://www.scielo.org.pe/scielo.php?pid=S1025-5583201600400006&script=sci_abstract
34. Minjarez M, Rincón I, Morales Y, Espinosa M, Zárate A, Hernández M. Ganancia de peso gestacional como factor de riesgo para desarrollar complicaciones obstétricas. *Perinatol Reprod Hum*. 2014;28(3):159-6. http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0187-53372014000300007&lng=es
35. Lowensohn R, Stadler D, Naze C. Current Concepts of Maternal Nutrition. *Obstet Gynecol Surv*. 2016;71(7):413-26. <https://doi.org/10.1097/OGX.0000000000000329>
36. Hofmeyr G, Lawrie T, Atallah A, Duley L, Torton M. Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems. *Cochrane Database Syst Rev*. 2018;10(10):CD001059. <https://doi.org/10.1002/14651858.CD001059.pub5>
37. Corrales I, Baena F, Gómez D, León F, Mendoza R. Relationship between eating habits, physical activity and tobacco and alcohol use in pregnant women: Sociodemographic inequalities. *Nutrients*. 2022;14(3):557. <https://doi.org/10.3390/nu14030557>
38. Oh S, Park S, You Y-A, Jee Y, Ansari A, Kim S, et al. Prenatal exposure to alcohol, tobacco, and coffee: associated congenital complications and adverse birth outcomes. *Int J Environ Res Public Health*. 2021;18(6):3140. <https://doi.org/10.3390/ijerph18063140>
39. Hounkpatin O, Amidou S, Houehanou Y, Lacroix F, Preux P, Houinato D, et al. Systematic review of observational studies of the impact of cardiovascular risk factors on preeclampsia in sub-Saharan Africa. *BMC Pregnancy and Childbirth*. 2021;21(97). <https://doi.org/10.1186/s12884-021-03566-2>
40. Kawanishi Y, Kakigano A, Kimura T, Ikehara S, Sato T, Tomimatsu T, et al. Hypertensive disorders of pregnancy in relation to coffee and tea consumption: The Japan environment and children's study. *Nutrients*. 2021;13(2):343. <https://doi.org/10.3390/nu13020343>
41. Reid K, Facco F, Grobman W, Parker C, Herbas M, Hunter S, et al. Sleep during pregnancy: The nuMoM2b pregnancy and sleep duration and continuity study. *Sleep*. 2017;40(5). <https://doi.org/10.1093/sleep/zsx045>
42. Sharma S, Nehra A, Sinha S, Soneja M, Sunesh K, Sreenivas V, et al. Sleep disorders in pregnancy and their association with pregnancy outcomes: A prospective observational study. *Sleep Breath*. 2016;20(1):87-93. <https://doi.org/10.1007/s11325-015-1188-9>
43. Malta M, Carvalhaes M, Takito M, Tonete V, Barros A, Parada C, et al. Educational intervention regarding diet and physical activity for pregnant women: changes in knowledge and practices among health professionals. *BMC Pregnancy Childbirth*. 2017;16(1):175. <https://doi.org/10.1186/s12884-016-0957-1>
44. Walsh T, Carpenter E, Costanzo M, Howard L, Reynders R. Present as a partner and a parent: Mothers' and fathers' perspectives on father participation in prenatal care. *Infant Mental Health J*. 2021;42(3):386-399. <https://doi.org/10.1002/imhj.21920>
45. Laguado T, Lafaurie M, Vargas L. Experiencias de participación de los hombres en el cuidado de su

- pareja gestante. *Duazary*. 2019;16(1):79-92. <https://doi.org/10.21676/2389783X.2532>
46. Aktaş, S, Sabuncular G, Kargin D, Gunes F. Evaluation of nutrition knowledge of pregnant women before and after nutrition education according to sociodemographic characteristics. *Ecol Food Nutr*. 2018;57(6):441-55. <https://doi.org/10.1080/03670244.2018.1544561>
47. Hromi, A, Chapman D, Segura S, Damio G, Clark P, Martínez J, et al. Barriers and facilitators to improve fruit and vegetable intake among WIC-eligible pregnant latinas: An application of the health action process approach framework. *J Nutr Educ Behav*. 2016;48(7):468-77.e1. <https://doi.org/10.1016/j.jneb.2016.04.398>
48. Asiabar A, Amin F, Hajifaraji M, Zayeri F. The effect of an educational intervention with spouse's participation on food intake of pregnant females: A randomized controlled trial. *Iran Red Crescent Med J*. 2018;20(51):e55954. <https://doi.org/10.5812/ircmj.55954>
49. Forbes L, Graham J, Berglund C, Bell R. Dietary change during pregnancy and women's reasons for change. *Nutrients*. 2018;10(8):1032. <https://doi.org/10.3390/nu10081032>
50. Nguyen P, Sanghvi T, Kim S, Tran L, Afsana, K, Mahmud Z, et al. Factors influencing maternal nutrition practices in a large scale maternal, newborn and child health program in Bangladesh. *PLoS One*. 2017;12(7):e0179873. <https://doi.org/10.1371/journal.pone.0179873>
51. Hashmi A, Bhatia S, Bhatia S, Khawaja I. Insomnia during pregnancy: Diagnosis and rational interventions. *Pak J Med Sci*. 2016;32(4):1030-7. <https://doi.org/10.12669/pjms.324.10421>
52. Tucker K, Taylor K, Crawford C, Hodgkinson J, Bankhead C, Carver T, et al. Blood pressure self-monitoring in pregnancy: examining feasibility in a prospective cohort study. *BMC Pregnancy Childbirth*. 2017;17(442). <https://doi.org/10.1186/s12884-017-1605-0>