

## Analyzing the Uncertainty of Pregnant Women with Morbidity: A Cross-Sectional Study

Mildred Guarnizo-Tole<sup>a\*</sup>, Néstor Eduardo González-Mendieta<sup>b</sup>  
Angie Valentina Patiño-Caro<sup>c</sup>, Jessica Alexandra Peralta-Castillo<sup>d</sup>  
Paula Andrea Rojas-Herrera<sup>e</sup>, Andrea Yurany Ruge-Vargas<sup>f</sup>  
Liceth Fainory Varón-Trujillo<sup>g</sup>, Emely Carolina Vásquez-Gómez<sup>h</sup>

<sup>a</sup> Associated Professor\*. Nursing College, Universidad El Bosque. Fundadores Building Av. Cr. 9 #131a2.

Bogotá, Colombia. Email: guarnizomildred@unbosque.edu.co

<sup>b,c,d,e,f,g,h</sup> Nurse. Nursing College, Universidad El Bosque.

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### Abstract

For the pregnant woman the uncertainty is a relevant factor, which could have a positive or negative influence on the maternal-fetal welfare, due to it is a moment that generates reordering in woman's life.

### Objective

This study had as a objective to analyze the uncertainty level handled by pregnant women with morbidity that attended gynecological-obstetrics service.

### Design

Cross-sectional study.

### Settings

Two highly complex health institutions in the metropolitan area of Bogotá, Colombia.

### Participants

Pregnant women with morbidity diagnosis.

### Methods

It was implemented a questionnaire to know pregnant women's socio-demographic characteristics, just as the Colombian version of Measurement of Uncertainty in Illness Scale for evaluating the stimulus frame, cognitive capacity and providers or sources of structure of 74 participants. It was executed the software SPSS 26.0, the statistical calculations were of descriptive and inferential type, it was possible to obtain central tendency and dispersion measure through them, and relations among central variables by means of inferential statistics methods non-parametric such as the Rho Spearman test and Chi Square test.

### Results

In institution 1, the uncertainty handled by the pregnant woman reported "strong and very strong" relationship of this condition with the stimulus frame, cognitive capacity and providers and sources of attention that the mother required for the morbidity management. Nevertheless, the measurements generated among these three sub-scales revealed relations catalogued as "weak-moderate". While in institutions 2, the valuation of the existing relation between the uncertainty and its structure components, had a level of "very strong"; but the values reported in sub-scales indicated a relation level "moderated".

**Conclusions:** This study identified the uncertainty must be understood in a comprehensive way, and its analysis must not only take into account the stimulus frame generated by the morbidity, woman's cognitive capacity, or health providers' support, since for this context woman's obstetrics characteristics related to fetal age, the time until birth, and the socio-demographic origin are linked to the experience of this condition. On the other hand, it registers great importance in the communication process origin around the way women is supported in her pathological process.

**Keywords:** Pregnancy, Uncertainty, Morbidity, High-risk pregnancy, Nursing care, Cross-Sectional Study

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### What is already known about the topic?

- The impact of uncertainty on pregnant woman with morbidity can increase the maternal fetal complications.
- The uncertainty registers a multi-cause origin that must be faced from the bio-psico-social-cultural and spiritual perspective.

- The uncertainty comprehensive management in the future mother improves the maternal and child health, and the nursing practices because is provided the coherent care regarding to people's needs.

#### **What this paper adds**

- This study identified that in the therapeutic care given to the pregnant women with morbidity, in order to control her uncertainty, it is crucial to generate actions to allow obtaining better comprehension of her pathology and the importance of providing social support to the woman and her family group, bearing in mind her socio-demographic Reality.
- The uncertainty experience has a lot of nuances that can be connected with diverse conditions experienced by the mother. For that reason, the health institutions must develop attention process to give a response to these needs and personalise nursing care.

### **I. Introduction**

About 830 women die all over the world due to causes related to pregnancy and childbirth. The World Health Organization indicates that 99.0% of maternal mortality falls to women belonging to developing countries, or with armed conflicts and humanitarian crisis and those who are mainly in rural areas characterized by poverty and vulnerability, in social environment without health education (WHO, 2019). On the other hand, the data shows extreme maternal morbidity rates, which is higher for middle and low-income countries; it is distributed geographically as follows: Latin America 4.9%, Asia 5.7%, Africa 14.9 %, what contrast with the data provided by high-income countries whose rate fluctuates in Europe 0.8% and in North America 1.4% (Tunçalp et al., 2012).

The same organization reports the morbidity decrease near 44.0% the last 25 years, registering in 2017 a reduction of 5.0% regarding to direct maternal morbidity (WHO, 2015). It is know the main causes of maternal morbidity has to do with diseases such as severe preeclampsia 75.0%, postpartum hemorrhage 34.3% and Hellp syndrome 31.5% (Salud Capital, 2017), which are presented significantly in women between 20 and 24 years and in an elderly age of their lives.

The Millennium Development Goals states for Colombia, the necessity of diminishing the Maternal Mortality Ratio to 32.0 by 2030. In order to achieve this goal the country has implemented the program called "Key practices to save lives" and the Public Surveillance System of Maternal Morbidity (DNP, 2018). Nevertheless, the results are not the expected ones because by the year 2017 and 2018 the Maternal Mortality Ratio reported 73.8 and 80.3, respectively (Así Vamos en Salud, 2020), while the Severe Maternal Morbidity Ratio or mothers' life exposure registered by 2018 (35.3) and by 2019 (36.3) for every 1000 live births (INS, 2020).

The studies denote that the age, the presence or absence of support networks, the comorbidities, and the woman's current health conditions can contribute to trigger anxiety. Add to this, the occurrence of social phenomena that represents sanitary emergencies in a global scale as there were in a specific moment the epidemics of Ebola, MERS-CoV, Zika and now the pandemic SARS-CoV-2. This finally affects people's health since they increase the development of illnesses, their perception about the fragility as human beings, bringing about the spreading of uncertainty in all society (Correa Lopez, 2020; UNIZAR, 2020), and generate bigger effects. So that, this type of circumstances origin difficulties in the sense that it affects the way woman assumes and manage the prolonged hospitalization, and she perceives vulnerability, loneliness and stress feelings because it is not possible to carry out her daily life activities. Other manifestations related to this situation are sadness and guilty for being separated of their homes and families, among others (Gómez López et al., 2016; Nilufer Korkmaz, 2005; Ruydiaz Gómez & Fernández Aragón, 2015).

Based on this overview, it is appropriate to mention that woman's gestation process can become into a critical event because the future mother has to reorder her life and she will probably experiment a lot of changes that can impact the lifestyle in a social, economic and familiar level; she could even suffer of morbidities getting worse her life quality (Prías-Vanegas HE & Miranda-Mellado CI, 2009). It is important to say that many of these complications can be avoided by providing an adequate following to women and giving them clearer indications about the possible complications and alarm signs, which they must keep in mind (DANE, 2017). These changes can arise uncertainty. For instance, in the case the woman does not count with appropriate communication channels among the health staff (Gómez López et al., 2016), the pregnant woman and her care provider.

The uncertainty about their future and her life conditions to face a specific situation regarding to her health can originate an unpleasant sensation for the woman and the family group. The reasons mentioned before unleash different outcomes, for example, at a physical and psychosocial level women might present implication with the fetus. For that reason, it is crucial to address situations that produce uncertainty as a previous process to the confrontation and adaptation to existing morbidity.

The study is supported by a middle range nursing theory called Uncertainty in Illness Theory proposed by Merle Mishel, this theory states health-illness process in diverse life stages and how it can bring about positive and negative changes depending on each person's perspective (Raile Alligood, 2018). This research shows the pregnant woman's level of difficulty to adapt to morbidity event. The adaptability will be shaped by her emotional intelligence and strategies to deal with uncertainty not only as a problem, but also as an opportunity (Trejo Martínez F, 2010).

Uncertainty in Illness Theory can be put into practice since it involves a middle range hierarchy. Thus, it allows providing an explanation and a coherent and real measuring about uncertainty, tackling constitutive elements from pregnant mothers' experiences (Muñoz LA et al., 2013), such as *Stimuli Frame*, which encompass the way, composition and structure of symptoms perceived by the woman. In addition to this, *cognitive capacity* that refers to the woman's ability to process information, and it reflects the inherent capacity and the response to each situation as well. Finally, the *Providers or sources* are denominated as reliable authorities for the educational level and social support (doctors, nurses, health staff) (Smith, 2018).

For the reasons mentioned above, it is relevant the biopsychosocial assessment of the pregnant woman for allowing detecting situations that has to do with uncertainties, which are linked directly with the difficulties during the gestation, and at the same way they are associated with each woman's perspectives in terms of feelings, emotions and anxiety; what increase the obstetrical risk and raise the probability of developing a maternal morbidity (Muñoz LA et al., 2013). Likewise, for health professionals it is vital to know this context, in order to create aware attention plans taking into account the mother's and family's needs.

Hence, this study had as objective to analyze the uncertainty level experienced by pregnant women with morbidity in obstetrics gynecology service.

## II. Methods

### 2.1. Study design and participants

It is a transversal type study developed in obstetrics gynecology service at two health institutions of high complexity located in Bogotá, Colombia; the first one is private and the second one is public. It participated 74 pregnant woman distributed in the following way: Health Institution 1 (n=27), Health institution 2 (n=47). The inclusion criteria showed that pregnant woman have some type of basic or extreme diagnosis morbidity, they do not present health instability at the moment of the measuring, they were over 18 years; and they did not have any type of cognitive or mental disability. The sampling was not probabilistic. It was excluded the scales that were filled incorrectly.

To keep the methodological rigor of the study, it was conducted bias control of selection, for the researchers had a number of pregnant women cataloged by their characteristics and conditions in relation to morbidity. The bias classification control was found through the implementation of a rigorous protocol of data collection and the MUIS, which is a validate scale. On the other hand, the confusion bias was controlled because of during the execution of the study; it was aimed to achieve the general and specific objectives to give a response to the phenomenon investigated.

The researchers implemented The Checklist STROBE Strengthening the Reporting of Observational Studies in Epidemiology for the explicit and complete construction of this report.

### 2.2. Data collection procedures

The Data collection process involved the following situations:

- The pregnant women were users of the obstetrics gynecology service at health institution 1, or health institution 2.
- The nursing service coordinators help the researchers informing them about the pregnant women, who had the required medical conditions to be included in the study.
- The researchers explained the pregnant woman and her family the study's objective, the way of participating, the informed consent's purpose, and the way of filling the questionnaires implemented during the study.
- The data collection was carried out in the institutional setting, in which the pregnant woman stayed. It was respected her privacy in every moment.
- The researchers processed the socio-demographic questionnaire while the pregnant woman filled the questionnaire.
- The time average for the process of these instruments was about 20-30 minutes.
- The data was collected during the period of time of January 30th to March 22nd in 2020. The time when was ordered the sanitary emergency in Colombia due to Covid-19, six days later after having being confirmed the first case, what generates the population enter in confinement. However, none of the participants had this diagnosis.

- The health institutions did not have people with a diagnosis of Covid-19 hospitalized when it was done the measurement.
- The pregnant women did not ask to be removed from the study in any moment.

## 2.3. Measurements

### 2.3.1. Demographic and clinical characteristics

The characterization questionnaire included socio-demographic data for the pregnant woman such as age, socio-economical status, scholarship, ethnic group, demographic origin, type of social security.

In addition to this, the number of prenatal controls were required, last date menstruation, gestational age and the reason for hospital attendance.

### 2.3.2. MUIS Subscales

The Measurement of Uncertainty in Illness Scale (MUIS) was validated in Colombia (Mejía Rojas ME, 2012), it has a Likert type structure and it is built by 33 items grouped. The answers options are 5 –totally agree- 4 –agree 3- indecisive, 2 –disagree and 1- totally disagree. The scale internal consistency shows a Cronbach's Alpha of 0.92. The three subscales that conceptually structure uncertainty are represented in the next item distribution: stimuli frame, (1-9 items), cognitive ability (10-26 items) and providers or sources of structure (27-33 items).

## 2.4. Statistical analysis

The obtained data from the characterization of the socio-demographic questionnaire, and MUIS Scale were digitalized and tabulated through Excel program; this data base migrated to statistical software SPSS version 26, licensed by the Universidad El Bosque. By means of descriptive statistics, it was determined the frequency and distribution of the answers provided by the pregnant women in all items. Hence, it was calculated the percentages and measures of dispersions (standard deviation). The measure of the items that conform the instrument's subscales was expressed using the measure of central tendency calculation (mean) taking into account the values of the given answers. Nevertheless, it is relevant to clarify that it was necessary to interpret each item individually to arrive to a comprehensive measure since the instrument contains positive and negative items as well. The inferential analysis allow for obtaining valid conclusions of the source regarding the population, in that way, it could be considered representative. As a consequence of that, it was sought the possible existing relationships between the central variables of the study by means of the Coefficient Calculate by Rho Spearman, and Chi-square test  $X^2$ . The significance level established for the study was  $p \leq 0.05$ . The data statistics analysis was carried out respectively in each health institution.

## III. Results

### 3.1. Demographic and clinical characteristics

The socio-demographic information of the pregnant women (see Table 1) indicates for Institution 1, the majority of the users were between a range age of 25 y 29 years (SD 1.31); in Institution 2 the age fluctuates between 20 - 34 years 80.8% (DS 1.21). In relation to the Institution 1 socio-economic status, prevailed the pregnant women who belong to the Third socio-economical status (48.1%); and in Institution 2, the pregnant women belong to the Second socio-economic status (68.1%). The pregnant women's education level in Institution 1 was complete university level 74.1%; while in Institution 2 complete high school level 31.9%. On the other hand, the 88.9% of the pregnant women in Institution 1 belong to cities located in the Andina region; in Institution 2 the 53.2% there were foreign pregnant women principally from Venezuela (SD 2.34). In the institution 1, the totalities of pregnant women were affiliated with the General System of Social Security through the contributive system. The pregnant women of Institution 2 were affiliated with subsidized system 70.2%. As for the ethnic group, the obtain findings in both institutions revealed that the 1.4% of the pregnant women were Afro-Colombians. The rest of the participants were not associated with any ethnic group.

**Table 1.** Socio-demographic Characterization

Variable	Categories	Institution 1		Institution 2	
		n (%)	SD	n (%)	SD
Age	14-19 years	1 (3.7)		6 (12.8)	
	20-24 years	2 (7.4)		19 (40.4)	
	25-29 years	9 (33.3)		8 (17.0)	
	30-34 years	5 (18.5)	1.31	11 (23.4)	1.21
	35-39 years	7 (25.9)		2 (4.3)	
	40-44 years	3 (11.1)		1 (2.1)	

<b>Socio economic status</b>	1	0 (0.0)		8 (17.0)	
	2	6 (22.2)		32 (68.1)	
	3	13 (48.1)	.92	7 (14.9)	.57
	4	5 (18.5)		0 (0.0)	
	5	3 (11.1)		0 (0.0)	
<b>Education level</b>	Primary school incomplete	0 (0.0)		2 (4.3)	
	Primary school complete	0 (0.0)		3 (6.4)	
	High school incomplete	1 (3.7)		9 (19.1)	
	High school complete	0 (0.0)	1.15	15 (31.9)	1.85
	Technician incomplete	0 (0.0)		2 (4.3)	
	Technician complete	4 (14.8)		7 (14.9)	
	University incomplete	2 (7.4)		6 (12.8)	
	University complete	20 (74.1)		3 (6.4)	
<b>Demographic origin</b>	Andina Region	24 (88.9)		15 (31.9)	
	Atlantic Coast Region	1 (3.7)		4 (8.5)	
	Pacific Region	0 (0.0)	1.33	2 (4.3)	2.34
	Amazonía Region	0 (0.0)		1 (2.1)	
	Foreigner	2 (7.4)		25 (53.2)	
<b>Social security</b>	Subsidized	0 (0.0)		33 (70.2)	
	Contributive	27 (100.0)		3 (6.4)	
	Particular	0 (0.0)	.00	2 (4.3)	1.62
	Without affiliation	0 (0.0)		9 (19.1)	

Note: SD, standard deviation

### 3.2. Admission Service characteristics

It was observed that the major number of pregnant women went to the hospital during the third trimester of their pregnancies, represented by more than 60.0% in both institutions. The 92.5% of the pregnant women of Institution 1 and the 51.1% of Institution 2 did not go to a more than 4 prenatal controls. However, in the Institution 2 the 27.7% of pregnant women did not register any prenatal control. On account of the sample was collected in the hospital premises, the 98.6 % of the pregnant women that were interviewed explain the reasons why they went to the hospital, it was because of illness and only the 1.4% of the pregnant women went for prenatal control. It was showed for both institutions that the gestational diabetes was the dominant pathology in women. In institution 2, there were women with diagnosis related to infectious causes and risk of preterm labor (Table 2).

**Table 2.** Admission service data

Variable	Categories	Institution 1		Institution 2	
		n (%)	SD	n (%)	SD
<b>Gestational Age</b>	<13	1 (3.7)		4 (8.5)	
	14-27	8 (29.6)		4 (8.5)	
	28-32	5 (18.5)	.92	13 (27.7)	.95
	33-40	13 (48.1)		26 (55.3)	
<b>Last date menstruation</b>	Less 3 months	3 (11.1)		4 (8.5)	
	Between 3-6 months	7 (25.9)	.70	7 (14.9)	.62
	Larger to 7 months	17 (63.0)		36 (76.6)	
<b>Months to the laborbirth</b>	Less 3 months	21 (77.8)		36 (76.6)	
	Between 3-6 months	5 (18.5)	.52	6 (12.8)	.66
	Larger to 7 months	1 (3.7)		5 (10.6)	
<b>Prenatal controls</b>	None	0 (0.0)	.62	13 (27.7)	.95

<b>attended</b>	Between 1-3	2 (7.4)	10 (21.3)
	Between 4-7	13 (48.1)	21 (44.7)
	>8	12 (44.4)	3 (6.4)
<b>Disease aetiology</b>	Infection	5 (18.5)	12 (25.5)
	Gestational Diabetes	8 (29.6)	14 (29.8)
	Hematological disorder	3 (11.1)	1 (2.1)
	Mood alteration	2 (7.4)	0 (0.0)
	Commitment hepatorenal	1 (3.7)	0 (0.0)
	Vaginal bleeding	2 (7.4)	0 (0.0)
	Risk of preterm labor.	3 (11.2)	10 (21.3)
	Fetal risk	1 (3.7)	0 (0.0)
	Polyhydramnios	0 (0.0)	2 (4.3)
	Others	2 (7.4)	8 (17.0)

Note: SD, standard deviation

### 3.3. Health institution 1

**Table 3.** Pregnant women’s uncertainty Institution 1

ITEMS	Subscales	Measurement categorization					SD	Items mean
		Totally agree n(%)	Agree n(%)	Indecisive n(%)	Disagree n(%)	Totally disagree n(%)		
1	<b>Stimuli frame</b>	3 (11.1)	7 (25.9)	3 (11.1)	8 (29.6)	6 (22.2)	1.37	3.3
2		15 (55.6)	9 (33.3)	0 (0.0)	3 (11.1)	0 (0.0)	.961	1.7
3		8 (29.6)	8 (29.6)	6 (22.2)	4 (14.8)	1 (3.7)	1.17	2.3
4		4 (14.8)	9 (33.3)	3 (11.1)	7 (25.9)	4 (14.8)	1.35	2.9
5		1 (3.7)	2 (7.4)	0 (0.0)	13 (48.1)	11 (40.7)	1.02	4.2
6		4 (14.8)	8 (29.6)	1 (3.7)	8 (29.6)	6 (22.2)	1.46	3.2
7		1 (3.7)	3 (11.1)	3 (11.1)	9 (33.3)	11 (40.7)	1.16	4.0
8		8 (29.6)	13 (48.1)	5 (18.5)	1 (3.7)	0 (0.0)	.80	2.0
9		3 (11.1)	3 (11.1)	1 (3.7)	8 (29.6)	12 (44.4)	1.40	3.9
10	<b>Cognitive capacities</b>	0 (0.0)	4 (14.8)	0 (0.0)	8 (29.6)	15 (55.6)	1.05	4.3
11		0 (0.0)	1 (3.7)	1 (3.7)	12 (44.4)	13 (48.1)	.74	4.4
12		0 (0.0)	4 (14.8)	4 (14.8)	8 (29.6)	11 (40.7)	1.09	4.0
13		1 (3.7)	4 (14.8)	1 (3.7)	9 (33.3)	12 (44.4)	1.20	4.0
14		3 (11.1)	2 (7.4)	1 (3.7)	12 (44.4)	9 (33.3)	1.30	3.8
15		13 (48.1)	11 (40.7)	1 (3.7)	1 (3.7)	1 (3.7)	.98	1.7
16		3 (11.1)	6 (22.2)	4 (14.8)	7 (25.9)	7 (25.9)	1.38	3.3
17		0 (0.0)	4 (14.8)	4 (14.8)	11 (40.7)	8 (29.6)	1.02	3.9
18		0 (0.0)	3 (11.1)	2 (7.4)	10 (37.0)	12 (44.4)	.98	4.2
19		0 (0.0)	2 (7.4)	1 (3.7)	9 (33.3)	15 (55.6)	.88	4.4
20		0 (0.0)	4 (14.8)	0 (0.0)	10 (37.0)	13 (48.1)	1.03	4.2
21		3 (11.1)	10 (37.0)	7 (25.9)	5 (18.5)	2 (7.4)	1.13	2.7
22		3 (11.1)	2 (7.4)	2 (7.4)	12 (44.4)	8 (29.6)	1.28	3.7
23		3 (11.1)	11 (40.7)	3 (11.1)	7 (25.9)	3 (11.1)	1.26	2.9
24		4 (14.8)	6 (22.2)	5 (18.5)	9 (33.3)	3 (11.1)	1.28	3.0
25		8 (29.6)	6 (22.2)	6 (22.2)	6 (22.2)	1 (3.7)	1.25	2.5
26		1 (3.7)	7 (25.9)	7 (25.9)	6 (22.2)	6 (22.2)	1.20	3.3
27	<b>Structure providers or sources</b>	0 (0.0)	3 (11.1)	4 (14.8)	13 (48.1)	7 (25.9)	.93	4.0
28		0 (0.0)	3 (11.1)	1 (3.7)	12 (44.4)	11 (40.7)	.94	4.2
29		0 (0.0)	7 (25.9)	1 (3.7)	9 (33.3)	10 (37.0)	1.21	3.8
30		0 (0.0)	4 (14.8)	5 (18.5)	9 (33.3)	9 (33.3)	1.06	3.9
31		17 (63.0)	8 (29.6)	1 (3.7)	1 (3.7)	0 (0.0)	.75	1.5
32		8 (29.6)	12 (44.4)	5 (18.5)	2 (7.4)	0 (0.0)	.89	2.0
33		15 (55.6)	10 (37.0)	1 (3.7)	1 (3.7)	0 (0.0)	.75	1.6

Note: SD, standard deviation; MEAN: Totally agree: 1.0-1.9, Agree: 2.0-2.9, Indecisive: 3.0-3.9, Disagree: 4.0-4.9, Totally disagree: 5.0

The pregnant women showed in the *stimuli frame*: item 1) They did not have clear how strong the pain will be 37.0%; item 2), they identified the purpose of each treatment received 88.9%; item 3) The pregnant women knew what the pain meant or indicated concerning their health situation 59.2%; item 4), the presence of unpredictable changes in the symptoms, presented diverging contrast in pregnant women 48.1% (SD 1.35); item 5), they identified the medical staff functions 88.8%; item 6) they expressed the disease course continued changing , so they had good and bad days 51.8% item 7) they did not consider their exams could have

inconsistencies 74.0%; item 8) they stated the treatment had a recognized success probability 77.7%; item 9) they emphasized that they were given a specific diagnosis 74.0%.

In relation to pregnant women's *cognitive capacity*, it was revealed: item 10) They had knowledge what was happening to them and what was their problem 85.2%; item 11) her questions have been answered 92.5%; item 12) they realized if their health problem was being overcome or it was getting worse 70.3%; item 13) they understood the given explanations of their health condition 77.7%; item 14) they were familiar with interventions, procedures or treatments to be performed 77.7%; item 15) they had clear doctors', nurses' and medical staff's recommendations and orders 88.8%; item 16) they did not predict their health problem how long will last 51.8%; item 17) It was not difficult to them to realize if the treatment and medicines provided were helping to get well 70.3%; item 18) they made future plans despite their disease's unpredictability 81.4%; item 19) they clearly knew how to take care of themselves after they were discharged 88.9%; 20) They had clarity of what was happening 85.1 %; item 21), they were agree 37.0% or indecisive 25.9% about if they had good or bad days; item 22) they found relevant it was not difficult to know the time will take before they could take care of themselves 74.0%; item 23) they were able to predict their disease's course 51.8%; item 24) it displayed the treatment's interventions that can be performed (22.2%) or cannot be performed (33.3%) (SD1.28); item 25) there is not exist consensus about if the pregnant women were sure if the doctors will find something bad in them (SD 1.25); the same outcome had item 26) it did not reveal consensus related to the predictability of physical pain (improvement or worsening) (SD1.20).

While the *providers or source of information* referred by the pregnant women showed that: item 27) the aspects mentioned by doctors have a precise meaning 74.0%; item 28) they deduced their treatment was simple to explain 85.1%; item 29) I do not consider there were given different opinions about what was occurring 70.3%; item 30) they manifested the effectiveness of their treatment was resolute 66.6%; item 31) they trusted nurses that were present the times they needed them 92.6%; item 32) they thought their health problem's gravity was determined 74.0% and item 33) they recognized doctors and nurses used a daily and simple language, in order to make sure they understand 92.6%.

#### **Relationship among the study variables in Institution 1:**

In order to prove if there was or was not an existence of quantitative variables of the study regarding uncertainty; and the aspects that structure it, it was carried out the correlation test of Spearman Rho (rs), the findings were as follows:

- Existed a positive moderate relationship between the pregnant women's age and their stimuli frame 0.462\*\*<sup>1</sup>, this signifies according to the mothers' age increase, the stimuli frame experimented the same behavior, and vice versa.
- It was found a positive moderate relationship between the pregnant women and their uncertainty level 0.447\*\*<sup>2</sup>, showing to the extent the mothers' age increase, it was higher the uncertainty, and vice versa.
- It was identified a positive moderate relationship between the gestant's age and her providers or source of structure 0.520\*\*. It disclosed that, older mothers had aspects related to educational and social support, these issues were more representative, and vice versa.
- The strong positive relationship between their gestational age and their stimuli frame 0.617\*\*, which showed the more weeks of fetus formation, the aspects that has to do with the form, composition and mothers' disease symptoms structure were representative, and vice versa.

The negative relationship type pointed out to the degree an aspect highlighted in the gestant, the another diminished as it was observed in some cases:

- Strong negative relationship between the woman's probable labour and her stimulus frame -0.645\*\*, showing that the mother's symptomatology context increased or diminished depending on baby's arrival time.
- Negative moderate relationship between the mother's probable day for labour and her providers or sources of structure -0.435\*\*, reveals according to the pending time for baby's arrival; the role that the providers had during the attention provided to the mother could diminish or increase.
- Negative moderate relationship between the woman's possible date for labour and her total level of uncertainty -0.512\*\*, stating that according to the pending time for baby's birth, the uncertainty level in the mother could be low, moderate or high.

Whereas the Chi-square  $X^2$  demonstrated that there were relationships among the pregnant woman's demographic origin, composition and structure of disease's symptoms  $p=0.04$ .

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<sup>1\*\*</sup> The correlation is significant at the level 0.01 (bilateral).

<sup>2\*</sup> The correlation is significant at the level 0.05 (bilateral).

3.4. Health institution 2

Table 4. Pregnant women’s uncertainty Institution 2

MUIS		Measurement categorization						SD	Items mean
ITEMS	Subscales	Totally agree n(%)	Agree n(%)	Indecisive n(%)	Disagree n(%)	Totally disagree n(%)			
1	Stimuli frame	21 (44.7)	11 (23.4)	4 (8.5)	8 (17.0)	3 (6.4)	1.34	2.2	
2		16 (34.0)	22 (46.8)	5 (10.6)	2 (4.3)	2 (4.3)	1.01	2.0	
3		11 (23.4)	22 (46.8)	8 (17.0)	5 (10.6)	1 (2.1)	.99	2.2	
4		12 (25.5)	22 (46.8)	6 (12.8)	2 (4.3)	5 (10.6)	1.21	2.3	
5		16 (34.0)	15 (31.9)	4 (8.5)	8 (17.0)	4 (8.5)	1.34	2.3	
6		9 (19.1)	26 (55.3)	4 (8.5)	4 (8.5)	4 (8.5)	1.14	2.3	
7		12 (25.5)	19 (40.4)	4 (8.5)	5 (10.6)	7 (14.9)	1.38	2.5	
8		13 (27.7)	22 (46.8)	7 (14.9)	2 (4.3)	3 (6.4)	1.08	2.2	
9		5 (10.6)	8 (17.0)	5 (10.6)	20 (42.6)	9 (19.1)	1.28	3.4	
10	Cognitive capacities	6 (12.8)	9 (19.1)	5 (10.6)	20 (42.6)	7 (14.9)	1.29	3.2	
11		12 (25.5)	15 (31.9)	6 (12.8)	10 (21.3)	4 (8.5)	1.31	2.6	
12		6 (12.8)	6 (12.8)	15 (31.9)	14 (29.8)	6 (12.8)	1.20	3.2	
13		7 (14.9)	16 (34.0)	4 (8.5)	13 (27.7)	7 (14.9)	1.35	2.9	
14		10 (21.3)	16 (34.0)	5 (10.6)	10 (21.3)	6 (12.8)	1.36	2.7	
15		16 (34.0)	25 (53.2)	4 (8.5)	2 (4.3)	0 (0.0)	.76	1.8	
16		2 (4.3)	8 (17.0)	14 (29.8)	13 (27.7)	10 (21.3)	1.13	3.5	
17		6 (12.8)	17 (36.2)	8 (17.0)	14 (29.8)	2 (4.3)	1.14	2.8	
18		3 (6.4)	17 (36.2)	9 (19.1)	7 (14.9)	11 (23.4)	1.31	3.1	
19		3 (6.4)	9 (19.1)	3 (6.4)	17 (36.2)	15 (31.9)	1.28	3.7	
20		5 (10.6)	10 (21.3)	4 (8.5)	20 (42.6)	8 (17.0)	1.29	3.3	
21		4 (8.5)	15 (31.9)	13 (27.7)	12 (25.5)	3 (6.4)	1.08	2.9	
22		4 (8.5)	14 (29.8)	14 (29.8)	11 (23.4)	4 (8.5)	1.11	2.9	
23		3 (6.4)	9 (19.1)	15 (31.9)	14 (29.8)	6 (12.8)	1.10	3.2	
24	3 (6.4)	22 (46.8)	8 (17.0)	7 (14.9)	7 (14.9)	1.21	2.9		
25	5 (10.6)	27 (57.4)	9 (19.1)	5 (10.6)	1 (2.1)	.89	2.4		
26	7 (14.9)	13 (27.7)	10 (21.3)	12 (25.5)	5 (10.6)	1.25	2.9		
27	Structure providers or sources	9 (19.1)	20 (42.6)	5 (10.6)	12 (25.5)	1 (2.1)	1.14	2.5	
28		4 (8.5)	10 (21.3)	10 (21.3)	17 (36.2)	6 (12.8)	1.18	3.2	
29		8 (17.0)	14 (29.8)	3 (6.4)	12 (25.5)	10 (21.3)	1.45	3.0	
30		2 (4.3)	16 (34.0)	5 (10.6)	18 (38.3)	6 (12.8)	1.17	3.2	
31		11 (23.4)	22 (46.8)	8 (17.0)	3 (6.4)	3 (6.4)	1.09	2.3	
32		5 (10.6)	20 (42.6)	9 (19.1)	10 (21.3)	3 (6.4)	1.12	2.7	
33		14 (29.8)	21 (44.7)	6 (12.8)	4 (8.5)	2 (4.3)	1.07	2.1	

Note: SD, standard deviation; MEAN: Totally agree: 1.0-1.9, Agree: 2.0-2.9, Indecisive: 3.0-3.9, Disagree: 4.0-4.9, Totally disagree: 5.0

Pregnant women’s *stimuli frame*: item 1) they did not know how strong the pain would be 68.1%; item 2) they mentioned that they had understood the treatments’ purpose 80.8%; item 3) they expressed what the pain means regarding to their condition; item 4) they indicated their symptoms continue changing unexpectedly 72.3%; item 5) they did not identify the type of staff and their corresponding roles within the health team 65.9%; item 6) they claimed their illness’ course changed progressively that’s why they experimented good and bad days 74.4%; item 7) They highlighted their test results presented inconsistencies 65.9%; item 8) they revealed that the treatment received had a well known success probability 74.5%; whereas in item 9) they affirmed that they received a specific diagnosis 61.7%

The pregnant women’s *cognitive capacity* showed: item 10) they knew what occurred and what the problem was 57.5%; item 11) they manifested that their answers have been replied 57.4%; item 12) they claimed if their health problem will improve or will get worse 42.6%; item 13) they stated the given explanations about their health condition were confusing 48.9%, and clear 42.6% (SD 1.35); item 14) they said that they did not know when the procedures will be performed (test and treatment, etc.) 55.3%; item 15) they understood all the explications provided by doctors, nurses and health staff 87.2%; item 16) they could not predict how long the health problem will last 49.0%; item 17) they said that it was too difficult to know if the treatments o medicines were helping to them 49.0%; item 18) they did not make future plans because of disease’s unpredictability 42.6%, but 38.3% made future plans in spite of their disease’s unpredictability (SD 1.31); item 19) they had a clear idea of how to take care of themselves after leaving the hospital 8.1%; item 20), they displayed clarity about what was happening 59.6%; item 21) they were agree 31.9% or indecisive 27.7% about if they would have a good or bad day; item 22) they were agree or indecisive 29.8% about the time they will take after being able to take care of themselves; item 23) they were indecisive 31.9% and disagree 29.8% talking about the possibility of predicting their illness’ course; item 24) they realized the treatment changed continuously, so that they assimilated what activities they could or could not do 53.2%; item 25) they mentioned



that doctors will not find anything bad 68.3%; item 26) they expressed to be agree 27.7% and disagree 25.5% about the possibility of predicting if their physical aches would improve or they would get worse.

*Providers or sources of information* subscale in pregnant women revealed: item 27) they considered doctor's explanations could have various meanings 61.7%; item 28) they felt the explanation about their treatment was not complex 49.0%; item 29) there was not given a different opinion about what was bad with them 46.8%; item 30) they believed the treatments' effectiveness was determined 51.1%; item 31) they affirmed that they could trust the nurses will be available in case they need them 70.2%; item 32) they reported there was determined their illness' gravity 53.2%; finally, item 33) they stated that the doctor and nurses used a daily and simple language, in order to make sure that they understand 74.5%.

**Relationship among the study variables in Institution 2:**

The behavior of the variables studied in the women who belong to Institution 2 indicates by means of the test of correlation of rho Spearman (rs), the existence of weak, positives or negatives relationships (rs=0.00-0.39 +/-) among sociodemographic variables, the constitutive aspects of uncertainty, and the uncertainty level that the gestants had at the moment of doing the measuring. Nevertheless, the test of Chi X<sup>2</sup> showed associations such as:

- The mother's ethnic group and her stimulus frame 0.00; her ethnic group and her cognitive capacity 0.03; her ethnic group and her uncertainty level 0.03.
- The demographic origin that the gestant had and her stimulus frame 0,00; her demographic origin and her uncertainty level 0.00.

**Table 5.** Relationship level of uncertainty components

INSTITUTION 1				
Rho Spearman	Stimuli frame	Cognitive capacity	Providers or sources of structure	Uncertainty level
Stimuli frame	1.00			
Cognitive capacity	0.288 (p=0.141)	1.00		
Providers or sources of structure	0.323(p=1.000)	0.437*(p=0.023)	1.00	
Uncertainty level	0.625** (p=0.000)	0.88** (p=0.000)	0.641** (p=0.000)	1.00
INSTITUTION 2				
Stimuli frame	1.00			
Cognitive capacity	0.541** (p=0.000)	1.00		
Providers or sources of structure	0.571** (p=0.000)	0.574** (p=0.000)	1.00	
Uncertainty level	0.790** (p=0.000)	0.886** (p=0.000)	0.802** (p=0.000)	1.00

NOTE: \*The correlation is significant at the level 0.05 (bilateral). \*\* The correlation is significant at the level 0.01 (bilateral).

The uncertainty global analysis associated to the pregnant women belonging to the two health institutions, reported in Institution 1 that uncertainty has a relation "strong and very strong" with the stimulus frame, the cognitive capacity and the providers or sources of structure that were immersed during the care attention that the mother required for managing her morbidity. However, the analysis also showed that the established relation among the stimulus frame, the cognitive capacity and the providers were "weak-moderate". In institution 2, it was observed the same behavior when evaluating uncertainty level and its structure components, because it was obtained "very strong relationships"; but the values reported in subscales indicated a moderate relation level.

**IV. Discussion**

The uncertainty analysis handled by the pregnant women, who had a morbidity diagnosis and use the obstetrics service, concur with some studies which affirm how the uncertainty and higher anxiety levels are prominent in the women that are going through a high risk pregnancy (Abrar A et al., 2020; Liang HM, 2019; Schmuke, 2019). Taking into account what was mentioned above, it is necessary from the care management performed by the nurses; to provide different interventions that redound to reduce the risk for the mother and baby.

It is relevant to distinguish this study shows how the uncertainty handle by the pregnant women of two health institutions, presents relationship in the way the woman develop her symptomatology of her morbidity, her cognitive capacity and the social support received by the health staff. On the contrary, the degree of linkage regarding the components that articulate these three aspects is lower among them, what demonstrates the importance of understanding the uncertainty from the comprehensiveness, which contemplates intrinsic and extrinsic factors experienced by the woman in this moment of his life. Considering that it has been documented this condition as a stress factor, frequently exacerbated when suffering a disease.

In relation to the way of expressing the symptomatology, it had the greatest relevance in the pregnant woman belonging to the institution 2, in which prevailed mothers who had an infection diagnosis due to different reasons, such as gestational diabetes and risk for preterm labor. Likewise, the item-item analysis made visible more actitudinal symptomatology; this has to do with the component's presence or absence that measured the subscale, what agree with the evidence described about when experimenting more symptoms' unpredictability, it generates more uncertainty (Schmuke, 2019). In certain cases, the pregnant woman can arrive to think wrongly, manifesting the clinical picture that they have will cause preterm births (Liang HM, 2019), or clinical pictures of similar nature that exacerbate the anxiety (Cataudella et al., 2019; Pulliainen et al., 2019), and affect the psychological well-being (Çevik & Yağmur, 2018). We coincide the findings mentioned previously highlight the importance of continuing strengthening the therapeutic care of morbidities that have affected the maternal health historically (WHO, 2019), and launched key aspects for preconceptional attendance of women, who are in a fertile period of their lives (Lau López S et al., 2013).

Similarly, it was observed the same behavior in the mothers that attended the same institution when processing the information: coinciding with another study, because it manifested the pregnant women with high schooling level present lower levels of uncertainty (Schmuke, 2019). In this context, the women who belong to the Institution 1 showed higher academic level, but the experience lived by women about uncertainty was linked to other issues, being crucial to understand the complete meaning of maternal health under nursing perspective.

Another aspect that generates uncertainty in fathers and health staff are the possible consequences of maternal diseases in the fetus (Chandler et al., 2020; Löwy, 2020), showing that the uncertainty level is not only a communication characteristic or a diagnosis, but also the causality, the evaluation, the treatment, the moral and legal implication concerning to this type of repercussions (Chandler et al., 2020; Malha & August, 2019). Some women refer to fear of dying and the baby's unknown future (Flocco et al., 2020), they express worries of their family relationships, their role and their health since they have to adapt to a new high risk condition (Badakhsh M et al., 2020). It is recommended the sanitary personnel support the mothers desire to conceive bearing in mind their health history, for the purpose of considering a comprehensive care that make shared decisions between woman and health team (Papaleontiou & Haymart, 2020).

Regarding the providers and sources of structure that supply maternal care, catch the attention the Institution 1, this registered better percentages, highlighting nurses functions, this finding is similar to other studies that reveal the nurse as a care provider during the gestation and the postnatal, and as the woman's and family group's educator about sexual and reproductive health rights and duties (Guarnizo-Tole M et al., 2018), however, it differs the findings given in an integrative review of the literature carried out in USA, where the social support was perceived lower in women who presented greater uncertainty and incident of personal conflicts (Schmuke, 2019).

The mothers of Institution 2 explained the necessity of having more concrete medical opinions around their condition and treatment established, it becomes a management priority regarding the women with high biopsychosocial risk, allowing diminishing negative feelings that cause anguish (Badakhsh M et al., 2020). So that, the results showed in this study are similar to those found in other places, that indicate how the lack of the clarity in the information carve out uncertainty in parents, and it is manifested in pain, untrustworthy memory, confusion and depression (Méndez Díaz ML et al., 2019).

Based on the what was posed above, it is valid to affirm nurses contribute to counteract the maternal morbidity through the updated knowledge of the woman's health condition, teamwork, care management (Guarnizo-Tole M et al., 2018); also nurses are perceived as facilitators in mothers' acceptance process of pregnancy with high risk (Badakhsh M et al., 2020). Therefore, the attention providers should construct their therapeutic conduct from a clear and concise communication, including a psychosocial and physiological perspective in the face of each pregnant woman's condition (Craig et al., 2020). In this study, the providers' support was seen as essential and positive during the process; although it requires improving the way to inform the future mothers their health condition.

Under this panorama, it is relevant to understand the pregnant women's uncertainty states, within the comprehensiveness context, which include the proper aspects of the stimulus frame, cognitive capacity and the providers or sources of structure, with the purpose of developing a perinatal care management from a multicausality point of view. Even thought, it is reported associations among the biologic, psychology, and social welfare regarding mothers with high-risk pregnancy that exceed 28 weeks (Bera, 2020); it is clear that the welfare can be modified depending on the personal and social expectations of what it means to become a mother, in this aspects the health professionals contribute to help the mothers to assimilates theses experiences as normal and valid in her condition (Hore B; Smith DM; Wittkowski A, 2019).

This study discovered that uncertainty is connected with the mother's age, her place of origin, fetal age, and the possible date of labour; so to consider external aspects of women's biological condition can bring about prevention and a comprehensive management. This affirmation confirms that the uncertainty experienced by mothers with morbidity, it is influenced by personal factors related to her health and demographic aspects (Bera,

2020). About this topic, it is important to know the ways the health staff set up relationships during the prenatal medical assistance, (Hui et al., 2020) keeping in mind the mother's cultural and geographic environment. Add to this, the data showed an outstanding participation of migrant women in institution 2, condition that could have generated impact on the findings, and it coincide with the need of improving maternal health conditions, it encompass inequality's ethnic and sexual and reproductive health mitigation (Johnsen et al., 2020).

We agree with the necessity of obtaining more evidence of the presence of maternal uncertainty from the beginning of the pregnancy until its end. By the same token, it is important to include in the studies different types of women population to be able of comparing, which are the factors that generate more uncertainty (van den Heuvel et al., 2020), validate if the strategies implemented for its management are adequate (Papaleontiou & Haymart, 2020), and enhance the knowledge in this care area taking into account the existing theories (Hui et al., 2020). Also, share in deep the uncertainty experience according to the medical attendance in the private or public clinic context (Chen et al., 2013).

As in any study, it was experienced limitations, in our case these has to do with the number of participants due to the study was interrupted because of the sanitary emergency of Covid-19, also for not having the comparative statistical analysis in response to the ethic committee request belonging to the institutions that participated in the study.

## **V. Conclusions**

Our study strengthen the body of knowledge of the discipline in the area, according to the analysis elaborated about the uncertainty lived by the pregnant women with a morbidity diagnosis, it was possible to find evidence that indicate how this disability has a connection in the way of expressing symptoms, the information processing capacity (intrinsic and extrinsic), and the social support that they received. However, the understanding of the data provided by the subscales, reported that there are relationships from moderate to weak, changing from one to another institution. Hence, the importance of contemplating the woman's proper factors and context, in order to facilitate the identification, individualization, and intervention of risk factors that could be counter-productive for the mother and the baby who is near to born.

### **Conflict of Interest**

The authors declare not having any type of interest that could have some influence during the development of this study.

### **Funding**

This study did not have funding.

### **Ethics approval and informed consent**

This study laid the foundation on the ethics principles recounted in Belmont Report, it talks about the respects for all people, beneficence and justice. Moreover, it was acted bearing in mind the respect for life and the dignity of human beings stated in the Law 911 of 2004 which attempts to order the disposition in terms of deontological responsibility within the professional performance exercise in relation to nurses in Colombia. In this order of ideas, the researchers processed an informed consent previous to the execution of the study protocol. Also, it was developed risk and benefit assessments for capturing the pregnant women potentially suitable for the research. This study was approved by the Ethics Committee and Social projection belonging to the Nursing College (code NUR-AVAL-003-19), by the Ethics and Research Institutional Committee of Universidad El Bosque (code PIS 05-2019), by the Ethics Committees of the two institutions that participated. One of the two health institutions asked not carrying out comparisons between themselves. For that reason, the statistical analysis was not included comparative type. According to national Resolution 008430 de 1993, the study risk was minimum for it did not apply any intervention to the participants. Only accessed to the study the women who wanted to participate voluntary and signed the informed consent; ensuring their anonymity and confidentiality about the provided data.

### **Authors' contributions**

#### **Main author**

- Director of the project.
- In charge of design and execution of the study protocol.
- Collection, analysis and interpretation of data.
- Paper's Writing.
- Approval of the final version of the document.

## Other authors

- Contributions to the protocol design.
- Collection, analysis and interpretation of data.
- Contributions to the paper's writing.

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