Research Article

Overall Maternal Morbidity during Pregnancy Identified with the WHO-WOICE Instrument

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Objective. To evaluate the prevalence of nonsevere maternal morbidity (including overall health, domestic and sexual violence, functionality, and mental health) in women during antenatal care and further analyze factors associated with compromised mental functioning and clinical health by administration of the WHO’s WOICE 2.0 instrument. Method. A cross-sectional study was conducted at a referral center in Brazil with an interview and questionnaire administered to pregnant women at 28 weeks of gestation and beyond. Data collection and management were supported by REDCAP software. A descriptive analysis was performed, and a multiple regression analysis also investigated factors associated with impairment in mental conditions, functionality, and clinical health. Results. 533 women at a mean age of 28.9 years (±6.7) were included, and the majority had a partner (77.1%) and secondary education (67.7%). Exposure to violence occurred in 6.8%, and 12.7% reported substance use. Sexual satisfaction was reported by the vast majority (91.7%), although almost one-fifth were sexually abstinent. Overall, women reported very good and good health (72%), despite being told that they had a medical condition (66%). There was an overall rate of anxiety in 29.9%, depression in 39.5%, and impaired functioning in 20.4%. The perception of an abnormal clinical condition was the only factor independently associated with impaired functioning and mental health in the multiple regression model. Obesity was independently associated with clinical impairment. Conclusion. During antenatal care, pregnant women in the study reported having a high rate of anxiety, depression, impaired functioning, and substance use. These issues can affect a woman’s health and should be further addressed for specific interventions and improved quality of care.

1. Introduction

In 2015, the World Health Organization (WHO) set the new agenda for Sustainable Development Goals [1], built on the legacy of the Millennium Development Goals [2] (2000-2015), which were not fully achieved. Among the new objectives established, the third goal is to ensure a healthy life and promote well-being for all, which includes improving maternal health and reducing maternal mortality [1].

Maternal deaths have been described as the tip of the iceberg, considering maternal morbidity as the basis [3]. It is estimated that annually thousands of women worldwide suffer from complications associated with pregnancy or the postpartum period. For each maternal death, 20 to 30 women suffer from some type of morbidity [3], although these estimates are based on nonstandard methodologies [4, 5]. Severe morbidity has been extensively studied in the past decade, with standard definitions for potentially life-threatening conditions (PLTC) and mater-
nal near miss (MNM) issued by the WHO [6]. Nevertheless, there is growing interest in understanding morbidity in a broader sense, including nonsevere morbidity and a woman’s different perspective on her own well-being.

Given the lack of standardized instruments for accurate assessment of overall and nonsevere maternal morbidities, the WHO implemented the Maternal Morbidity Working Group (MMWG) in 2012 that defined maternal morbidity as “any health condition attributed to and/or aggravated by pregnancy and childbirth that has a negative impact on a woman’s well-being” [3] and created an instrument, later called WOICE, for measuring maternal morbidity, focusing on health and a woman’s self-perception of well-being [4, 7, 8].

The WHO-VOICE is a questionnaire designed from a matrix [7]. Its name evokes the need to listen to women’s perspectives, how they perceive their pregnancies, and the possible long-term impact not only on their lives but also on the lives of their children, family, and society [9].

The MMWG conducted a pilot study in institutions of different levels of care in three different low-income countries (Jamaica, Kenya, and Malawi), where the first version of the WOICE was applied to 750 women in the antenatal period (ANC) and 740 women in the postnatal period (PPC) [4, 7], highlighting not only clinical conditions but also the relevance of exposure to violence and mental health alterations [10].

Up to now, the prevalence of nonsevere maternal morbidity remains largely unknown, especially the conditions related to domestic violence, sexual violence, and changes in mental health, social role, and functionality. These issues may have a negative impact on women’s lives. A lack of understanding of these issues may lead healthcare providers to dismiss their occurrence. As a result, this study was aimed at implementing the WHO working group (WOICE) tool in a middle-income setting in Brazil, to evaluate the whole prevalence of maternal morbidity, along with factors associated with clinical, mental, or functional impairment.

2. Materials and Methods

2.1. Study Design and Sample Size. A cross-sectional study was developed, and a questionnaire created by the WHO was used to evaluate maternal morbidity. The questionnaire includes several previously validated scales. To evaluate functionality and the ability to perform daily tasks, the WHODAS 2.0 12-item (WHO Disability Assessment Schedule 2.0-12 item) version was used. For mental health assessment, the General Anxiety Disorder test, 7-item (GAD-7) and the Patient Health Questionnaire, 9-item (PHQ-9) were used [11–13]. To measure substance use, sexual satisfaction, and exposure to violence, parts of some scores already validated were used, such as the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) and Brief Sexual Symptom Checklist for Women (BSSC-W) including some questions from a questionnaire used in the Multi-Country Study on Women’s Health and Domestic Violence against Women of the WHO [14–16]. The WOICE instrument was previously used in a pilot study [4, 10].

Sample size was estimated at 500 participants for convenience, as a pilot study, considering that the WOICE instrument had not been previously published by the time data collection was planned and started. The only previous study used 250 women during ANC for each setting (3 different countries) [10].

The prevalence of abnormal functioning (20.4%) was used to estimate the statistical power of the sample, setting the level of alpha significance or type I error at 5% (alpha = 0.05), with a 95% confidence interval and sampling error of 5% (d = 0.05). The considered sample had a power of 82.5%.

2.2. Data Collection. Eligible women (pregnant from 28 weeks of gestation onwards) were selected at the antenatal care outpatient clinic at the University of Campinas maternity, a tertiary and quaternary referral hospital for over 5 million inhabitants of more than 42 cities located in the metropolitan region.

The WOICE questionnaire was applied to each participant by a trained research assistant, after the informed consent form was signed. In addition to the interview, patient medical records were reviewed to confirm inclusion criteria and clinical data. The complete procedure lasted an average of 30 minutes per case.

Data collection was performed with a tablet powered by the Android operating system. All interviewers were trained, using a detailed manual of operations. The electronic signature for informed consent was also obtained. Tablets used REDCap® software, which supported data collection, transmission, verification, checking, correction, storage, and analysis of data. Electronic equipment was protected with passwords to ensure confidentiality. Tablets worked both online and offline to simultaneously feed the database, respectively, hosted in a safe energy-protected server afterwards.

2.3. WOICE Tool and Data Analysis. The WOICE questionnaire was originally published in English [4]. The respective translation into Brazilian Portuguese was performed and revised by experts in the area of obstetrics and was further applied as a pilot test to measure the time of application and understanding of questions. The instrument was then adapted and modified for greater clarity (Supplement 1).

The WOICE questionnaire contains three sections:

(1) Collection of social and demographic information, obstetric history, violence, sexual health and risk factors, and environment

(2) Functional assessment, general symptoms, mental health, and anxiety

(3) Data on physical examination and medical record review

The database was built into the REDCap® software, subsequently exported to a format compatible with the statistical package SPSS (IMB, Armonk, NY, USA) for analysis.

A descriptive analysis of sociodemographic characteristics and clinical, social, and sexual conditions of the studied
population was carried out, as well as the general prevalence of validated instruments included in the WHO-VOICE questionnaire and the combination of both. The instruments were WHO-DAS-12 to evaluate the ability to carry out daily tasks and social responsibilities and PHQ-9 and GAD-7 scores to evaluate mental health.

For WHO-DAS-12, the 95th percentile was considered the cutoff point to diagnose dysfunctionality, according to a previous study of a similar population conducted during the postpartum period, with a score of ≥37.4 [17]. For the GAD-7 and PHQ-9 tests, a score greater than or equal to 10 per test was required to identify anxiety and depression, respectively [12, 13].

A multiple regression analysis was also performed to evaluate factors associated with impaired conditions. Three models were proposed. The first model considered that abnormal functioning was the outcome. The second model considered that the outcome was any abnormal condition for mental health (score ≥ 10 for anxiety and depression questionnaire). The predictors tested were maternal age, marital status, education, literacy, employment, travel time to healthcare facility, parity, gestational age, BMI (≥30 kg/m²), overall health rating, any clinical condition, preexisting conditions, and taking any medication. The third model tested factors independently associated with impaired clinical conditions (women who answered “yes” to the question: “have you been told you have anything wrong or any medical condition?”). The predictors tested were the same used in model 1 but also impaired mental health, abnormal functioning, substance use, sexual satisfaction, and violence.

2.4. Ethical Considerations. This study was approved by the Local Institutional Review Board of the University of Campinas (UNICAMP) on November 17, 2017, under number: #78497817.0.0000.5404. An informed consent form was always required in women over the age of 18. Adolescents as young as 13 years of age were also included. In this subgroup, the consent form was waived, due to the consent on violence. To have a copy of this document or ask the adult responsible for the adolescent to sign the paper might expose people to additional risks. Nevertheless, all included adolescents were properly informed about the research and were only interviewed after giving verbal assent.

3. Results

This study was conducted in a referral maternity unit, where 533 pregnant women were invited to participate. Of the total number of women, 531 women gave full consent and 2 did not participate in the interview but provided us with their sociodemographic data (Figure 1).

Among the characteristics of our population, the mean age of the women was 28.9 years (±6.7), with most women (67.0%) aged between 20 and 34 years and 10% aged less than 20 years. More than two-thirds of the women had a partner and were employed. The majority of our study population had a secondary school level, and 14.3% had a higher educational level (Table 1).

Although the study was performed in a high-risk outpatient clinic and two-thirds of the women reported being informed about having a medical condition since they became pregnant, most participants regarded their general health level as “good” or “very good” (59.4% and 12.6%, respectively) and only 6.8% regarded their health as “poor” or “very poor” (Table 2).

An interesting approach in the current study was to evaluate the number of pregnant women that had more than one type of impairment, taking into consideration all aspects of the WHO-VOICE. More than half of these women had at least one condition, and nearly one-quarter had 2 conditions. Only 2.4% had absolutely no abnormal results (Table 2).

Any substance use during the current pregnancy is also evaluated by WHO-VOICE. In this study, 12.7% of the interviewees reported substance use. Among substance users, 22.6% reported feeling an impact on their daily activities due to substance use, which was the cause of major family concern (over 60%). A very important piece of information is that more than half of the substance users had tried to stop consuming but had not succeeded (Table 3).

Women reported feeling fear or experiencing some form of physical violence by the current partner or anyone else at a rate of 6.8% (n = 36). This rate referred to women who had been afraid of their current/most recent husband or partner or anyone else or those that had answered positively to the question “during this pregnancy, was there ever a time when you were pushed, slapped, hit, kicked, or beaten by (any of) your husband/partner(s) or anyone else?” (Table 3).

We explored data on sexual health of interviewees and found that one-fifth of the women responded that they had stopped having sex during pregnancy. The reasons were the following: no longer having a partner (22%), medical restrictions (39.4%), and low sex drive in her partner (3.7%) or in her (34.9%). However, the remaining 91.7% of participants reported feeling sexually satisfied (Table 3).

To evaluate functionality or ability to do everyday tasks, WHO-DAS-12 version 2.0 found a mean score of 23.1
(±16.7) which was higher than 37.4 in 20.4% of the cases. In the GAD-7 and PHQ-9 tests for anxiety and depression, respectively, 29.9% and 39.5% of women scored 10 or more, which defined an impaired condition [12, 13] (Table 4).

The prevalence of conditions assessed by WHO-WOICE was compiled individually and in combination, as shown in Figure 2. The most frequent combined conditions were anxiety and depression (34.5%), depression and abnormal functionality (20.4%), having been informed of any clinical condition, and anxiety (23.7%) and depression (26.5%).

On multivariate analysis, a woman’s clinical condition (self-report of poor health) was the factor associated with an increased risk of abnormal functioning and impaired mental health. Illiteracy was also associated with anxiety and depression. The third model for multivariate analysis considered that clinical condition (impaired clinical health) was the outcome and obesity (BMI ≥ 30) was the associated factor. In this model, substance use was protective, most likely due to characteristics of the instrument and use of a self-reported response to define health status (Table 5).

### Table 1: Sociodemographic characteristics of included women (during antenatal care).

| Characteristics | Variable | Total, N = 533 | % |
|-----------------|----------|---------------|----|
| Maternal age    | Mean (SD) 28.9 (±6.7) | 53 9.9<br>20-34 years 357 67.0<br>34+ years 123 23.1<br>No partner 122 22.9 |
| Marital status  | Has partner 411 77.1<br>Primary or less 96 18.0 |
| Education       | Secondary 361 67.7<br>Higher 76 14.3<br>Cannot read 1 0.2<br>Can read parts of sentence 4 0.7<br>Can read whole sentence 526 99.1 |
| Literacy³ ¹     | Employment⁴ ¹ | Yes 365 68.6<br>No 167 31.4<br><15 146 27.4<br>15-30 211 39.7<br>30-60 135 25.4<br>Mean (SD) 1.1 (±0.8) |
| Parity⁵ (n = 529) | 1 183 34.5<br>2 to 4 136 25.6<br>≥5 4 0.8<br>28-31 245 46.1<br>32-36 221 41.5<br>≥37 66 12.4 |
| Gestational age (weeks)⁶ | Mean (SD) 7.7 (±5.6) |

Missing: "2, "1, "1, "2, and "1.

### Table 2: Clinical conditions of included women (antenatal care study population), n = 531.

| Variable | ANC, N = 531 | % |
|----------|--------------|----|
| (a) Overall health rating | Very good 67 12.6<br>Good 315 59.4<br>Neither poor nor good 112 21.1<br>Poor 29 5.5<br>Very poor 7 1.3 |
| (b) Have you been told you have anything wrong/any medical condition(s)? | No 180 34.0<br>Yes 349 66.0 |
| Are you taking any medication(s)? | No 201 37.9<br>Yes 330 62.1 |
| (c) Do you have any other medical conditions or other problem(s) you would like to report? | Yes 188 35.6 |
| (d) Obesity | BMI ≥ 30 269 51.0<br>Yes 258 48.6<br>No 273 51.4 |
| Leading direct preexisting conditions | Gestational diabetes 64 12.1<br>Gestational hypertension 48 9.0<br>Preeclampsia 17 3.2<br>Urinary tract infection 11 2.1<br>Pyelonephritis 5 0.9<br>Others 8 1.5<br>Chronic hypertension 37 7.0<br>Cervical insufficiency 16 3.0 |
| Leading indirect preexisting conditions | Preexisting diabetes mellitus 15 2.8<br>Others 36 6.8 |
| Symptoms | Mean SD 7.7 (± 5.6) |
| (e) Any condition diagnosed on the day of the interview* | No 472 90.9<br>Yes 47 9.1<br>0 11 2.4<br>1 228 50.2 |
| Number of conditions diagnosed*, N = 454 | 2 92 20.3<br>3 68 15.0<br>≥4 55 12.1 |

Missing: (a) 1, (b) 2, (c) 3, (d) 4, and (e) 12. *Any of the conditions: clinical, WHODAS ≥ 37.4, anxiety score ≥ 10, depression score ≥ 10, exposure to domestic or sexual violence, sexual dissatisfaction, or substance use.

The WHO-WOICE instrument was always administered after a scheduled antenatal care visit and did not interfere with the woman’s medical follow-up. Nevertheless, since questions could potentially lead to unpleasant memories and reveal exposure to violence and substance abuse,
additional support was offered. We found that 35.2% of the women requested such follow-up and 94.1% sought psychological referrals (result not shown).

4. Discussion

This study shows the results of the WHO-WOICE version 2.0 instrument used during antenatal care at a referral maternity unit from a middle-income setting in Brazil. Overall, there was very good compliance, which shows that women are willing to participate in research during pregnancy, irrespective of whether the research is about sensitive issues such as physical or sexual violence. This may reflect an opportunity to share their experiences. Main results included a high rate of anxiety, depression, impaired functioning, and substance use.

The WHO-WOICE had once been previously employed in a pilot study, mostly in low-risk populations from low-income settings in Jamaica, Kenya, and Malawi [10]. Relative to sociodemographic data, our population was older and the majority had a partner and a much higher educational level than women in countries of the pilot study [10]. Another marked difference in the current study was an increased rate of substance use.

It is well known that substance use leads to negative consequences during pregnancy [20–24], despite the still high prevalence of substance use in pregnant women. Some studies show that one in every three women consumes alcohol...
than 40% [29, 32]. It is likely that our study obtained under-

studies have shown a prevalence of domestic violence greater 

against women published by the WHO in 2005 [16]. Other 

of violence, compared to 12.8% in the pilot study [10] and 8% 

showed that 6.8% of women had been exposed to some kind 

refrain from reporting these cases [16, 29]. Our results also showed a 

and cocaine being the most frequently used illicit sub-

during pregnancy. Tobacco use varies between 12% and 

25% and illicit drugs between 4% and 7.4%, with cannabis 

and having sex as soon as they became pregnant. Nevertheless, most par-

reported that the frequency of sexual inactivity during the 

first trimester of pregnancy was 24% [36], compared to our 

findings showing that around 20% of women stopped having 

sex as soon as they became pregnant. Nevertheless, most participants reported being satisfied with their sex lives, which 

means that some women interviewed did not need sexual 

intercourse to report sexual satisfaction. In pregnant women, 

sexual satisfaction is linked to a woman’s acceptance of her 

body image, the type of communication with her partner, 

and having sex [37].

In addition, according to a systematic review and the 
pilot study, sexual dissatisfaction is associated with clinical 
or obstetrical morbidity [10, 39]. However, in our study, this 
was not the case. Regardless of increased overall morbidity, 

women mainly reported having good or very good health 
and sexual satisfaction. A woman’s self-perception of well-

being is possibly, what really matters, not the clinical diagno-

sis itself. Women may feel good to receive treatment and 

appropriate follow-up at a referral center. Another possibility 
is that part of the sample is just oblivious to the details and 

risks inherent in their conditions [40].

Another aspect evaluated by the short WHODAS 2.0 ver-

cion was functionality. A previous study showed that the best 
cutoff point to define disability with this instrument is the 
95th percentile (score over 37.4 points, of a total of 100 in a 
sample of postpartum women). This cutoff point identified 
around one-fifth of included women. This was a striking 
result, indicating higher levels of impaired functioning than 
previously published [17, 40], which was in agreement with 
the understanding that functioning is more often impaired in 
the antenatal period rather than in the postnatal period.

The aim of our multivariate analysis was to identify fac-
tors associated with impaired conditions related to clinical 

health, overall mental, and functional health. Our results 
were mostly in agreement with the literature, and obesity 
was associated with clinical diagnosis. According to the 
WHO, the global prevalence of obesity increased almost 
threefold from 1975 to 2016 [41]. In the general population 
(nonnongnant), a body mass index above 30 is classified as 
obesity [42]. For pregnant women, there are recommendations 
of weight gain per gestational week depending on preg-
estational weight. However, in pregnancy, there is a lack of 
international consensus on the level that best determines 
obesity. Nevertheless, studies support that BMI > 30 increases comorbidity risk during pregnancy. In this study, 
more than half of the women had a BMI above 30.

Table 4: Mental and functional conditions of the study population.

| Variable                          | ANC, N = 531   | %        |
|-----------------------------------|---------------|----------|
| (a) Anxiety score                 | Mean (SD)     | 6.8 (±6.0) |
| Score ≥ 10                        | 159           | 29.9     |
| Score < 10                        | 372           | 70.1     |
| Mean (SD)                         | 9.4 (±6.0)    |          |
| (b) Depression score, N = 25      | Score ≥ 10    | 100      | 39.5    |
| Score < 10                        | 153           | 60.5     |
| Mean (SD)                         | 23.1 (±16.7)  |          |
| (c) WHODAS score, N = 515         | Score < 37.4  | 410      | 79.6    |
| Score ≥ 37.4                      | 105           | 20.4     |

(a) GAD-7: seven items, with four-point scale: 0 (not at all) to 3 (several days). A score ranging from 0 to 10 is considered a positive indicator of anxiety, equal to or greater than 10 [12]. (b) PHQ-9: nine items, with a four-point scale: 0 (not at all) to 3 (several days). A score ranging from 0 to 27 is considered a positive indicator of major depression, equal to or greater than 10 [13]. (c) WHODAS 12. Contains 12 items, the scores of each question were recoded and later the following formula was used [11]: Compute \( S1 - S12 = (S1 + S2 + S3 + S4 + S5 + S6 + S7 + S8 + S9 + S10 + S11 + S12) \times 100/36. \)
Another relevant finding is that a clinical diagnosis may have an impact on a woman’s mental health and functioning. Although this is a well-known fact, it is not commonly reported in a systematic manner. Understanding that clinical conditions may be associated with further impairment can guide interventions and improve healthcare [43].

One important point to be addressed refers to the potential clinical application of this instrument. Pregnancy is no longer understood only as a magic and beautiful situation when everything goes well. In fact, the recognition that pregnancy poses a weight for women in terms of higher morbidity directly or indirectly associated with pregnancy, plus the burden of the pregnancy itself on the woman’s well-being, health and quality of life, represent a step forward in the process of listening women voices. Although relatively time consuming, the application of a questionnaire like the one assessed in the present study would allow for a full assessment of maternal morbidity in a broad spectrum. This should be performed routinely during pregnancy to properly identify, select, and manage conditions affecting the women’s general and mental health, functioning and quality of life, according to their own feelings.

Our study has some limitations. The WHO-WOICE instrument evaluates a broad number of aspects. However,

| Sexual | Anxiety | Depression | WHODAS | Substance use | Violence | Clinical |
|--------|---------|------------|--------|---------------|---------|----------|
| 37     | 17      | 15         | 12     | 7             | 7       | 22       |
| (9.5%) | (4.3%)  | (35%)      | (3.2%) | (1.8%)        | (2.1%)  | (5.6%)   |

Figure 2: Combined social, mental, and functional impairment (antenatal care study population), n = 454.

Table 5: Factors associated with alterations in functionality (model 1), mental (model 2), and clinical alterations (model 3)—multivariate analysis.

| Model/variable | PR     | 95%CI | p/PR | p    |
|----------------|--------|-------|------|------|
| (a) Model 1: functional impairment (n = 512) | | | | |
| Overall health rating (neither poor nor good; poor; very poor) | 3.37 | 2.41–4.71 | <0.001 |
| Literacy (can read parts of sentence or cannot read) | <0.01 | <0.01–<0.01 | <0.001 |
| (b) Model 2: anxiety and depression (n = 284) | | | | |
| Overall health rating (neither poor nor good; poor; very poor) | 1.25 | 1.04–1.50 | 0.020 |
| Literacy (can read parts of sentence or cannot read) | 1.81 | 1.57–2.08 | <0.001 |
| (c) Model 3: clinical alterations (n = 522) | | | | |
| Drug (yes) | 0.70 | 0.54–0.91 | 0.007 |
| *BMI (≥30 kg/m²) | 1.14 | 1.01–1.29 | 0.034 |

Multiple regression analysis by the Poisson regression model. *BMI: body mass index. (a) For model 1, the outcome was WHODAS ≥ 37.4, and predictors were the variables maternal age, marital status, education, literacy, employment, travel time to facility, parity, gestational age, BMI (≥30 kg/m²), overall health rating, any clinical condition, preexisting conditions, and taking any medication. (b) For model 2, the outcome was anxiety score ≥ 10 and depression score ≥ 10, and predictors were the variables maternal age, marital status, education, literacy, employment, travel time to facility, parity, gestational age, BMI (≥30 kg/m²), overall health rating, any clinical condition, preexisting conditions, and taking any medication. (c) For model 3, the outcome was any clinical condition reported by the woman, and predictors were the following variables: maternal age, marital status, education, literacy, employment, travel time to facility, parity, gestational age, BMI (≥30 kg/m²), alteration in mental health (anxiety score ≥ 10, depression score ≥ 10), sexual dissatisfaction, WHODAS ≥ 37.4, exposure to domestic or sexual violence, and substance use.
some are not further detailed, such as substance use (including any type of substance) and violence, with no information on previous history of violence or psychological violence. Another aspect is the duration of the questionnaire, which is a limiting factor for implementation in routine healthcare. In the future, a review of the structure of antenatal visits would be welcome to complement their features with the WOICE aspects. Furthermore, there is a lack of information on long-term follow-up or possible effects of abnormal findings using this instrument. Here, we reported that more than one-third of the women requested psychological support after talking about all the conditions included in the WHO-WOICE.

5. Conclusions
Maternal morbidity should be analyzed beyond severity. It has a broad spectrum that should be studied in its entirety to ensure that actions are taken for the prevention, diagnosis, and treatment of conditions other than clinical diseases. It is essential to consider women at the center of care, recognizing the existence of nonsevere morbidities. When these morbidities are routinely evaluated, a multidisciplinary approach can be used to improve healthcare. Anxiety, depression, impaired functioning, substance use, and violence are frequent conditions among pregnant women. These issues are brought to light by the use of the WHO-WOICE instrument and merit further prioritization to improve women’s health.

Data Availability
Data used to support the findings of this study are available at reasonable request to the corresponding author. The WOICE tool is included as supplementary material.

Disclosure
This manuscript was part of the Master’s Dissertation of Stephanie Pabon, under tutorial supervision of Mary A. Parpinelli and Maria L. Costa, presented to the Postgraduation Program of Obstetrics and Gynecology at the University of Campinas, School of Medicine, on August 16, 2019. Therefore, it is deposited in the University repository without any commercial purpose.

Conflicts of Interest
The authors deny any conflicts of interest regarding the publication of this paper.

Authors’ Contributions
All authors read and approved the final manuscript.

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Supplementary Materials
Supplement 1: WHO-WOICE in English: maternal morbidity measurement tool (ANC) (version 2.0). (Supplementary Materials)

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