

High-risk pregnancy and low-risk pregnancy: Association with sociodemographic, anthropometric, obstetric and psychological variables

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Abstract:

Introduction: Considering the biopsychosocial aspects during pregnancy is important for the maternal and neonatal health. A high-risk pregnancy may involve traumatic events and introduce severe mental illness to a woman. **Purpose:** This study investigated the association between the presence of pregnancy risk and sociodemographic, anthropometric, obstetric, and psychological variables. **Methods:** This study was cross-sectional, quantitative, descriptive, and correlational. The participants were 386 pregnant women aged 18-46 (mean 29.32 years old \pm 6.04 years). The participants were classified as low risk pregnancy (n = 289) and high-risk pregnancy (n = 97). Sociodemographic, anthropometric, and obstetric data were evaluated in addition to the women's body attitudes, depressive symptoms, eating attitudes, self-esteem, and anxiety. Multiple Correspondence Analysis was used to verify the associations between the variables. **Results:** The results suggested associations between low-risk pregnancy and: higher education, higher socioeconomic level, primigravida, being married, family support, planned pregnancy, a good relationship with the father of the child, never contemplating abortion, lack of a smoking habit, low weight and overweight, second and third trimesters, low and moderate anxiety, lack of depression, and appropriate eating attitudes. The results of the group containing high-risk pregnant women were associated with: no education beyond high school, lower socioeconomic level, multigravida, being unmarried, lack of family support, lack of pregnancy planning, consideration of abortion, first trimester and obesity, negative body attitudes, high anxiety and depression. **Conclusion:** This study considered multiple variables in order to expand the general understanding of factors related to gestational risk. It was concluded that high-risk pregnant women presented more troubled sociodemographic structures and psychological aspects harmful for their own health when compared to women with low-risk pregnancy.

Key Words: Maternal health; Pregnant; Body Image; Mental Health; Adult.

Introduction

Pregnancy is a period of complexity in a woman's life, one with many physical, psychological and social adaptations occur (Brasil, 2012; Meireles, Neves, Morgado, & Ferreira, 2020). Physical changes include increased nail and hair growth, the potential appearance of stretch marks and cellulite, and the increase of body size and weight (Brasil, 2012). Psychological changes include emotional instability, irritability, being too emotional, anxiety and fear (Brasil, 2012; Meireles, Neves, Carvalho, & Ferreira, 2016; Segato, Andrade, Vasconcellos, Matias, & Rolim, 2009). Regarding social life, a woman has to adapt herself to the new role of motherhood, besides the ones of daughter and woman that she already plays (Segato et al., 2009). These changes are essential for the appropriate progression of pregnancy, foetal development, and balance within the maternal body (Brasil, 2012; Mehta, Siega-Riz, & Herring, 2011).

From analyzing the conditions of the mother and the foetus, the doctor who is responsible for the patient can classify the pregnancy as low-risk or high-risk (Brasil, 2012). A few pregnant women, due to specific health conditions, may present a higher possibility of having problems during pregnancy (Brasil, 2012). High-risk pregnancy refers to a pregnancy that negatively affects the health of the mother, the baby, or both (Brasil, 2012; Isaacs & Andipatin, 2020). There are risk factors that can be identified before pregnancy and can be

related to poor sociodemographic conditions, for example being under 15 years old or over 35, presenting abnormalities of the reproductive organs, being drug-addicted and having a history of abortion or sterility and infertility (Brasil, 2012). Furthermore, there are also pre-existing clinical conditions that represent risk factors, such as arterial hypertension, heart diseases, obesity and endocrine diseases (Brasil, 2012; Dodd, Grivell, Crowther, & Robinson, 2010; Nelson, Matthews, & Poston, 2010).

High-risk pregnancy evokes a range of emotional and psychological experiences for the expectant mother, and can adversely affect both the mother and the baby's health (Isaacs & Andipatin, 2020; Meireles, Neves, Carvalho, & Ferreira, 2015a; Meireles, Neves, Carvalho, & Ferreira, 2017; Watson, Fuller-Tyszkiewicz, Broadbent, & Skouteris, 2015). Because of the complexity of this moment in women's lives, it is not enough to consider only the physical aspects (Meireles et al., 2015a). The Brazilian Ministry of Health (2012) recommends that attention to women be holistic, that is to say, that women's health care include physical, emotional and social aspects inseparably. Some of the physical symptoms identified during pregnancy may mask psychological issues, anxiety and fears that many times go unnoticed (Brasil, 2012; Roomruangwong, Kanchanatawan, Sirivichayakul, & Maes, 2017). For the general well-being of the mother, and consequently of the baby, it is necessary to understand the psycho-affective demands involved in this stage.

Previous studies identified the relation between body image and depression, anxiety, self-esteem, eating attitudes and Body Mass Index (BMI) in pregnant women (Doustan, Seifourian, Zarghami, & Azmsha, 2012; Meireles et al., 2017; Roomruangwong et al., 2017; Andrews, Hill, & Skouteris, 2018; Kiani-Sheikhabadi, Beigi, & Mohebbi-Dehnavi, 2019; Shiraishi, Haruna, Matsuzaki, Murayama, & Sasaki, 2018). Meireles et al. (2017) showed that when any of these variables is negatively affected, women tend to present changes in the other evaluated factors. However, the study did not take into account the risk condition: whether a pregnancy was high-risk or low-risk. Recently, Meireles, Neves, Carvalho and Ferreira (2015b) verified that high-risk pregnant women presented more negative beliefs and feelings related to their bodies when compared to those classified as low-risk. Nevertheless, the authors did not evaluate other variables. Taking into account the complexity in each stage of pregnancy, various factors should be evaluated together in order to achieve a better understanding of this moment in women's lives and provide them full support (Brasil, 2012). It is possible that in high-risk pregnancy, the difficulties of emotional adjustment are higher, first of all, because of the label of "high-risk" they receive, and therefore "different" from the others who are considered "normal" (Brasil, 2012; Gadit, 2016).

A high-risk pregnancy may involve traumatic events and introduce severe mental illness to a woman. A better understanding of women's mental health in high-risk pregnancies is imperative and requires additional investigation (Ni, Cheng, Chen, & Heinonen, 2020). Medical research on high-risk pregnancy abounds, while women's emotional/psychological experiences are not sufficiently documented, and hence much less attention and/or programming is directed to support women with high-risk pregnancies (Isaacs & Andipatin, 2020). Thus, the objective of this study was to verify the association between gestational risk condition and sociodemographic, anthropometric, obstetric, and psychological variables. The hypothesis of this study is that women with high gestational risk tend to present more troubled sociodemographic backgrounds and also more harmful psychological disorders during pregnancy, when compared to those of low-risk pregnancy.

Material & methods

This study was cross-sectional, quantitative, descriptive, and correlational (Thomas, Nelson, Silverman, 2012). This research had the approval of the Committee for Ethics in Research in Humans of the Federal University of Juiz de Fora, registration number 14406413.0.0000.5147, approval number 337.124.

Participants

The target audience of this study was pregnant women who had their prenatal care in the city of Juiz de Fora, MG. According to the data provided by the Health Department of the city, 5849 adult women were pregnant in Juiz de Fora in 2015. The number of pregnant women, a prevalence of 50% for body dissatisfaction (Meireles et al., 2015a), a confidence level of 95%, and a margin of error of 5% were taken into account in order to determine the sample size. Therefore, 361 adult pregnant women were a fitting representative sample for this study.

In order to recruit the participants of the sample, ten obstetricians were contacted and consented to the study. These doctors permitted collecting data in their offices in private and public health clinics located in different neighborhoods of the city. They provided the best time and days to collect data in each place according to their schedules. Pregnant women in all stages of pregnancy agreed to participate in this research and signed a Consent Form. Women with incomplete data were excluded from this study.

Instruments

The Body Attitudes Questionnaire (BAQ) was used in order to evaluate the body attitudes of the pregnant women (Scagliusi et al., 2005). The questionnaire was composed of 44 items organized on a Likert-type scale, with five levels that vary from 1 (Strongly agree) to 5 (Strongly disagree). The total score can range from 44 to 220 points and can be obtained from the sum of every item. Higher scores indicated stronger feelings towards the subscales (physical attraction, self-disparagement, total fat, body salience, lower body fatness

perception, and strength). Cronbach's alpha was calculated in order to evaluate the internal consistency of the instrument. In this sample, Cronbach's α was equal to 0.84.

The Beck Depression Inventory (BDI) was used to find depressive symptoms (Gorestein & Andrade, 1998). This instrument had 21 items and 4 response options, from 0 to 3 points. Its total score varied from 0 to 63 points. As recommended by Kendall et al. (1987), scores above 15 were preferred in order to detect dysphoria (a state of sudden and transitory change of mood), and the term "depression" was used in cases when the pregnant woman presented a score higher than 20. The internal consistency of this sample was considered appropriate ($\alpha = 0.89$).

The Eating Attitudes Test - 26 (EAT-26) was adopted in order to evaluate inappropriate eating attitudes (Nunes, Camey, Olinto, & Mari, 2005). This instrument had 26 items to be answered on a three-point scale, which range from 0 (rarely, very rarely and never) to 3 (always), except for item 25, which had a reverse score. After totaling the answers, scores equal to or higher than 21 indicated possible inappropriate eating attitudes (Nunes et al., 2005). The EAT-26 presented good internal consistency for this sample ($\alpha = 0.8$).

The Rosenberg Self-Esteem Scale (RSS; Dini, Quaresma, & Ferreira, 2004) was employed in order to evaluate the self-esteem of the pregnant women. The scale was composed of 10 items with four Likert-type response options ranging from 0 (Strongly agree) to 3 (Strongly disagree). The total score varied from 0 to 30 points. The higher the score, the higher the level of self-esteem of the pregnant woman. The analysis of the internal consistency of this instrument showed a Cronbach's alpha of 0.85.

The Brazilian State-Trait Anxiety Inventory (STAI; Fioranti-Bastos, Cheniaux, & Landeira-Fernandez, 2011) was adopted in order to investigate the level of trait and state anxiety of the pregnant women. The questionnaire had 12 affirmative sentences, organized on a four-point Likert scale. The final score obtained from the sum of the items varied from 12 to 48 in this questionnaire. Lower scores indicated lower levels of anxiety. The internal consistency for this sample was $\alpha = 0.74$.

The socioeconomic status of pregnant women was evaluated by the Brazilian Economic Classification Criteria (Critério de Classificação Econômica Brasil [CCEB]), developed by Brazilian Association of Market Research Companies (ABEP, 2012). This instrument differentiated the population by collecting household information such as the possession and quantity of home comfort products and the level of schooling of the head of the family. It distributed scores according to each attribute which, after being totaled, vary from 0 to 46. The final scores are classified into levels, from A1 to E. In this study they were classified into: A, from 46 to 35 points; B, from 34 to 23; C, from 22 to 14; D and E - from 13 to 0 (ABEP, 2012).

In order to obtain sociodemographic data, a questionnaire was applied with direct questions concerning level of schooling, marital status, number of children, relationship with the father of the child, family support, whether the pregnancy was planned or not, the possibility of abortion, and smoking and drinking habits. This questionnaire was developed specifically for this research.

Furthermore, data such as body mass, height, gestational age in weeks, and whether the pregnancy was low- or high-risk were obtained through the pregnant women's medical records, which were filled in by the doctor in charge of the patient. Using this information, pregnant women were divided into two groups: high-risk pregnancy and low-risk pregnancy. Their body mass and height were used to calculate BMI, which, according to the Brazilian Ministry of Health (2012), establishes the cut-off point depending on gestational week and classifies the patient as underweight, normal weight, overweight, or obese.

Finally, the women's updated anthropometric and obstetric data were obtained after consulting the medical record filed by the responsible physician.

Data collection

One of the researchers went to the health clinics on the days suggested by the doctors. While in the waiting room, the pregnant women were invited to participate in the study. They received an explanation about the research and signed the Informed Consent Form when they agreed to participate. The pregnant women answered the questionnaires individually, with no time limit, in the waiting room or in a nearby room provided by the doctor. All participants received the same verbal explanation, and all their doubts were assuaged. After their consultations the researcher had access to each pregnant woman's medical record.

Statistical analysis

All data were collected using the software STATISTICA v.8.0 (Stat Soft. Inc.) and the significance level that was adopted was $p < 0.05$. Measures of central tendency (mean) and dispersion (standard deviation) were used on the age of the participants. The sociodemographic, anthropometric and obstetric variables (socioeconomic level, level of schooling, marital status, number of children, relationship with the father of the child, family support, whether the pregnancy was planned or not, the possibility of abortion, smoking and drinking habits, nutritional status, stage of pregnancy, and risk condition) and the psychological variables (body and eating attitudes, depressive symptoms, self-esteem, and anxiety) were described through absolute and relative frequency. The Cronbach's alpha was calculated in order to evaluate the internal consistency of all instruments. Values above 0.70 were considered appropriate (Streiner, 2003).

Multiple Correspondence Analysis (MCA) was performed in order to verify the associations among the categories of the variables (Hair Júnior, Black, Babin, Anderson, & Tatham, 2009). As a premise of the MCA, a chi-squared test was used in order to verify if the variables were independent. Two analyses were performed separately: one for the sociodemographic, anthropometric, and obstetric variables, and the other for the psychological variables. As the MCA is based on categorical data and uses the observed frequency (Hair Júnior, 2009), the categories of the sociodemographic variables were: socioeconomic level (A, B, C, D/E), level of schooling (elementary school, high school, undergraduate/graduate level), marital status (single, married/lives with partner or widowed/divorced), number of children (primigravida or multigravida), relationship with the father of the child (good or poor), family support (yes or no), whether the pregnancy was planned (yes or no), the possibility of abortion (yes or no), smoking habits (yes or no), and drinking habits (yes or no). The categories of the anthropometric variables were underweight, appropriate weight, overweight and obesity. The categories of the obstetric variables were: first, second and third trimester, and high risk and low risk.

We adopted existing categories for: EAT-26 (appropriate eating attitudes ≤ 20 ; inappropriate eating attitudes > 20) and BDI (0–14 = no depression; from 15–20 = dysphoria; from 21–63 = depression). New categories were created for BAQ, RSS and STAI using the 25th and the 75th percentiles. Therefore, pregnant women were classified as having low (44–108), moderate (109–132), and high (133–220) negative feelings towards their bodies; as having low (0–3), moderate (4–9), and high (10–30) self-esteem; and as having low (12–28), moderate (29–3) and high (37–48) anxiety. Both high- and low-risk condition were taken into account in the analysis.

It was possible to interpret the associations according to the positions of the categories of each variable in a multidimensional diagram³³. The distance between the position of each variable was a “chi-squared distance,” which permitted analysis of the association between them. In other words, the distance of the variables was evaluated, which was represented in a multidimensional space through factorial axes (dimensions). Each axis optimized the variability of data. Theoretically, it was possible to use a high number of dimensions or factorial axes, but it was common to use a manageable size of up to three axes to analyze the position of the points in space (Hair Júnior et al., 2009; Clausen, 1998).

Results

A total of 417 pregnant women participated in the study, of whom 31 (7.43%) did not fully complete the questionnaire and were excluded from the sample. As a result, the final sample had 386 pregnant women aged 18–46 years old (mean 29.32 years old ± 6.04 years). The participants were classified according to the risk condition of the pregnant women: low risk ($n = 289$; mean = 28.57 ± 5.36 years) and high risk ($n = 97$; mean = 31.54 ± 6.33 years). The majority of total sample was: higher school ($n=162$; 41.9%), married/lives with a partner ($n=295$; 76.4%), primigravida ($n=205$; 53.1%), good relationship with the father of the children ($n=390$; 93.3%), with family support ($n=372$; 96.4%), has planned the pregnancy ($n=212$; 54.9%), no possibility of abortion ($n=366$; 94.8%), no drinking ($n=349$; 90.4%) or smoking habits ($n=366$; 94.8%), normal weight ($n=148$; 38.3%) and third trimester ($n=211$; 54.6%). Regarding psychological variables, the majority of participants were classified as moderate negative feelings towards their bodies ($n=199$; 51.5%), no depression ($n=304$; 78.7%), moderate self-esteem ($n=229$; 59.3%), appropriate eating attitudes ($n=307$; 79.5%), and moderate anxiety ($n=161$; 41.7%). In order to perform the MCA, Chi-square test showed significant values for the sociodemographic, anthropometric, and obstetric variables [$\chi^2(33) = 10475.6$; $p < 0.0001$] and for the psychological variables [$\chi^2(16) = 5024.49$; $p < 0.0001$], indicating that MCA was adequate.

The MCA results of the sociodemographic, anthropometric, obstetric, and psychological variables showed that three factorial axes were enough for the data analysis, explaining 30.92% and 49.03% of the total variability of the data, respectively. From the visual analyses of the scree plots (Hair Júnior et al., 2009), it was confirmed that the three factorial dimensions were maintained (this graph is not available in this study). In Table 1, it was possible to verify the absolute contributions of each variable composing the dimensions. The highlighted values indicated the dimension in which the category was better represented.

Taking into account dimension 1 (D1) of the sociodemographic, anthropometric, and obstetric variables, its composition was: elementary school, high school, undergraduate/graduate education, single, married/lives with partner, primigravida, multigravida, planned or unplanned pregnancy, possibility or not of abortion, and socioeconomic levels A and B. The categories that contributed the most for dimension 2 (D2) were: low-risk pregnancy, high-risk pregnancy, family support (yes or no), drinking habits (yes or no), smoking habits (yes or no), nutritional status (underweight, overweight and obesity), stage of pregnancy (first and third trimesters). Finally, the third dimension (D3) had the following variables: high school, widowed/divorced, good and poor relationship with the father of the children, socioeconomic level C and D/E, appropriate BMI and second gestational trimester. The categories related to gestational risk were better represented in the D2, thus it was preferred to graphically demonstrate D2 versus D2 and D2 versus D3 (Figure 1).

Regarding the psychological variables, the following conditions were better represented in D1: lack of depression, depression, appropriate and inappropriate eating attitudes, high self-esteem and high anxiety. The

categories of low and moderate BAQ, dysphoria, and low and moderate self-esteem showed higher values of inertia in D2. Finally, the variables that contributed to D3 were: low-risk pregnancy, high-risk pregnancy, high BAQ, and low and moderate anxiety.

Although the categories based on the risk condition were represented in D3, graphs D1 versus D2 and D1 versus D3 (Figure 2) were selected as the ones that better represent the relations among the variables of this study. Additionally, these graphical representations were chosen because of the higher number of psychological variables that contributed to D1 and D2 in relation to D3.

In both analyses, the objective was to maintain in the graphical representations only the categories that contributed to the represented dimensions in order to enable a better understanding. As a result, the variables that were part of D3 were hidden in the graph of D1 versus D2, and the same happened for the following figures.

Table 1. Absolute contributions (mass, quality, and inertia) of sociodemographic, anthropometric, and obstetric variables composing each factor of the Multiple Correspondence Analysis (geometrical interpretation).

	Mass	Quality	Inertia D1	Inertia D2	Inertia D3
Risk condition					
Low-risk	0.0576	0.4104	0.0094	0.0411	0.0059
High-risk	0.0193	0.4104	0.0280	0.1225	0.0175
Level of schooling					
Elementary school	0.0159	0.3317	0.0795	0.0003	0.0065
High school	0.0322	0.3097	0.0085	0.0003	0.1062
Undergraduate/Graduate level	0.0287	0.6716	0.0951	0.0011	0.0815
Marital status					
Single	0.0171	0.3133	0.0662	0.0102	0.0116
Married/Lives with a partner	0.0588	0.3359	0.0201	0.0004	0.0101
Widowed/Divorced	0.0009	0.2634	0.0005	0.0685	0.1053
Number of children					
Primigravida	0.0408	0.4361	0.0514	0.0014	0.0271
Multigravida	0.0361	0.4361	0.0582	0.0016	0.0307
Relationship with the father of the child					
Good	0.0717	0.5947	0.0047	0.0036	0.0134
Poor	0.0052	0.5947	0.0661	0.0494	0.1863
Family support					
Yes	0.0028	0.2559	0.0015	0.0018	0.0010
No	0.0741	0.2559	0.0412	0.0475	0.0284
Whether the pregnancy was planned					
Yes	0.0347	0.3491	0.0463	0.0041	0.0024
No	0.0422	0.3491	0.0564	0.0049	0.0030
Possibility of abortion					
Yes	0.0729	0.1967	0.0406	0.0012	0.0387
No	0.0039	0.1967	0.0022	0.0001	0.0021
Drinking habits (alcohol)					
Yes	0.0074	0.4836	0.0387	0.1985	0.0009
No	0.0695	0.4836	0.0041	0.0210	0.0001
Smoking habits					
Yes	0.0039	0.4959	0.0549	0.1695	0.0199
No	0.0729	0.4959	0.0030	0.0092	0.0010
Socioeconomic level					
A	0.0036	0.0595	0.0154	0.0001	0.0052
B	0.0345	0.4820	0.0714	0.0021	0.0248
C	0.0329	0.5374	0.0437	0.0145	0.1019
D/E	0.0059	0.4187	0.0612	0.0319	0.0987
Nutritional status					
Underweight	0.0098	0.0543	0.0013	0.0270	0.0004
Normal weight	0.0295	0.0688	0.0091	0.0001	0.0093
Overweight	0.0199	0.0717	0.0002	0.0204	0.0141
Obese	0.0177	0.2441	0.0177	0.0832	0.0002
Stage of pregnancy					
First trimester	0.0084	0.1294	0.0020	0.0548	0.0157
Second trimester	0.0265	0.0588	0.0001	0.0019	0.0247
Third trimester	0.0420	0.0337	0.0002	0.0048	0.0047

Note: MCA: Multiple Correspondence Analysis; D1: Dimension 1; D2: Dimension 2; D3: Dimension 3. The inertia values in bold indicate the dimension that best represents each variable.

Table 2. Absolute contributions (mass, quality, and inertia) of psychological variables composing each factor of the Multiple Correspondence Analysis (geometrical interpretation).

	Mass	Quality	Inertia D1	Inertia D2	Inertia D3
Risk condition					
Low-risk	0.1248	0.5189	0.0134	0.0001	0.0846
High-risk	0.0419	0.5189	0.0398	0.0002	0.2519
BAQ					
Low	0.0389	0.6032	0.0558	0.2482	0.0036
Moderate	0.0859	0.5216	0.0054	0.1071	0.0874
High	0.0419	0.5696	0.1110	0.0001	0.1331
BDI					
No depression	0.1312	0.5397	0.0457	0.0006	0.0013
Dysphoria	0.0151	0.1374	0.0261	0.0418	0.0058
Depression	0.0203	0.5437	0.1635	0.0581	0.0008
EAT-26					
Appropriate eating attitudes	0.1325	0.2637	0.0177	0.0039	0.0048
Inappropriate eating attitudes	0.0341	0.2637	0.0687	0.0153	0.0185
RSS					
Low	0.0384	0.5023	0.0553	0.1696	0.0269
Moderate	0.0989	0.5503	0.0068	0.1420	0.0203
High	0.0294	0.6101	0.1766	0.0485	0.0054
STAI					
Low	0.0535	0.5150	0.0693	0.0360	0.1150
Moderate	0.0695	0.6330	0.0043	0.0958	0.2031
High	0.0436	0.5825	0.1405	0.0326	0.0373

Note: MCA: Multiple Correspondence Analysis; D1: Dimension 1; D2: Dimension 2; D3: Dimension 3; BAQ: Body Attitudes Questionnaire; BDI: Beck Depression Inventory; EAT-26: Eating Attitudes Test - 26; RSS: Rosenberg Self-Esteem Scale; STAI: Brazilian State-Trait Anxiety Inventory. The inertia values in bold indicate the dimension that best represents each variable.

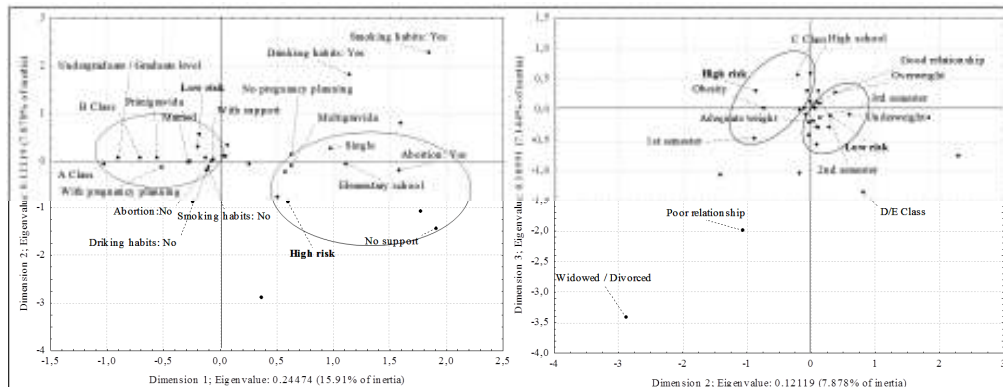


Figure 1. Distribution of the sociodemographic, anthropometric, and obstetric variables during the Multiple Correspondence Analysis of the Dimensions 1 and 2 and Dimensions 2 and 3.

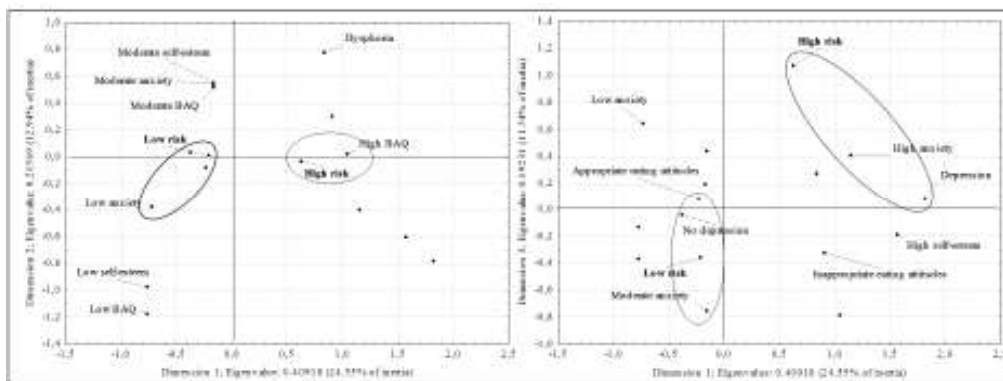


Figure 2. Distribution of the psychological variables resulting from the Multiple Correspondence Analysis of the Dimensions 1 and 2 and Dimensions 1 and 3.

The associations among the categories of all the variables could be evaluated through the proximity analysis of points of Figure 1 and 2. In Figure 1, it was possible to identify through the graphical representation of D1 versus D2 that on the negative side of D1, there was the following categories: low-risk pregnancy, primigravida, married, having family support, planned pregnancy, no contemplation of abortion, non-smoker, non-drinker of alcohol, higher education, and socioeconomic levels A and B. On the other hand, on the positive side of D1, there were the following categories: high-risk pregnancy, multigravida, single, no family support, unplanned pregnancy, and contemplation of abortion. In D2 versus D3, on the negative side of D2, the condition of high gestational risk presented a correspondence with: socioeconomic level C, high-school education, first gestational trimester, and obesity. On the positive side of D2, the condition of low-risk pregnancy was associated with underweight and overweight, second and third trimesters, and good relationship with the father of the child.

The psychological data were shown in Figure 2. In D1 versus D2, the low risk was associated with low anxiety levels on the negative side of D1. On the positive side of this dimension, the high-risk gestational condition was related to negative body attitudes. In D1 versus D3, low-risk pregnancy presented an association with moderate anxiety, no depression, and appropriate eating attitude. In this same graph, high gestational risk was associated with high anxiety and depression.

Discussion

The MCA method permits including different variables and visually demonstrating their interdependence. The possibility to include many variables and to analyze them together is a considerable advantage for the evaluation of multifactorial phenomena and/or multifaceted constructs. Thus, this study had the objective of identifying the possible associations between the conditions of gestational risk and sociodemographic, anthropometric, obstetric, and psychological variables. The relevance of this study resides in the fact that it considered multiple variables in order to expand the general understanding of factors related to gestational risk. According to the results of the MCA for the sociodemographic, anthropometric and obstetric variables, it was verified that the low-risk condition was associated with different factors. Pregnant women who were married and having their first child with family support, who had planned the pregnancy, who did not contemplate an abortion, who did not smoke or drink alcohol, who had completed higher education and who were part of the higher socioeconomic levels (A and B) were the ones to have a higher association with low-risk pregnancy. On the other hand, the women more likely to have a high-risk pregnancy had a higher association with being single multigravidas without family support, not having planned their pregnancy, having contemplated abortion, having completed no education beyond high school, suffering from obesity, being in their first gestational trimester and belonging to socioeconomic level C. Therefore, the results confirm the initial hypothesis of this study as high-risk pregnant women presented more troubled structures than the ones with low-risk pregnancy. High BMI, smoking and drinking habits, and higher number of previous pregnancies are factors that may indicate a high-risk pregnancy (Brasil, 2012). Inappropriate weight gain during pregnancy is important predictor of complications for the mother and the child, revealing the importance of nutritional assessment during the prenatal period (Andrews et al., 2018; Shiraishi et al., 2018). Furthermore, the inappropriate consumption of psychoactive substances may have serious consequences for the development of the foetus, since they cross the placental barrier and also enter into breast milk (Brasil, 2012). The reproductive past of the woman, such as the number of previous childbirths, is also a risk factor because it can jeopardize the health of the mother and baby (Brasil, 2012). As a result, the association between these factors and the high-risk gestational condition are understandable.

Previous studies used marital status, level of schooling, number of children, socioeconomic level and gestational age only as ways to characterize samples (Meireles et al., 2015b; Fuller-Tyszkiewicz, Skouteris, Watson, & Hill, 2012). Troubled marriage or relationship, family conflicts, low level of schooling and adverse conditions in the home environment are predictors that need to be evaluated as they may lead to a high-risk condition (Brasil, 2012; Meireles, Neves, Nacif, Carvalho, & Ferreira, 2019; Pascoal, Rosa, & Coelho, 2019). In this study, it was identified that lack of planning and lack of family support are associated with high-risk pregnancy. As a result, it is important to evaluate the physical and social characteristics that may affect the health of the mother and baby. Such characteristics reinforce the relevance of a holistic women's health care.

Regarding the psychological variables, the results also confirmed the initial hypothesis. The emotional traits of high-risk pregnant women were more jeopardized than the ones under a low-risk condition. The data of the latter were associated with low and moderate anxiety, appropriate eating attitude, and no depression. Therefore, besides having a healthy physical condition, these women also presented a more positive mental health. A certain degree of anxiety is considered normal during pregnancy, taking into account that this period of life represents a state of increased vulnerability and biopsychosocial changes (Meireles et al., 2015a; Roomruangwong et al., 2017; Watson et al., 2015). On the other hand, the high-risk gestational condition was associated with negative body attitudes, high anxiety, and depression. In other words, in high-risk pregnancy, besides jeopardizing physical health, mothers are also more vulnerable to psychological changes. Meireles et al. (2015b) support these results in observing that the condition of gestational risk was related to negative body

attitudes. Furthermore, previous study also shows that, in cases when the gestational risk increases, the depression and anxiety indices tend to do the same (Saviani-Zeoti & Petean, 2015). Women with high-risk pregnancy may be more exposed to situations of uncertainty, such as health issues, complications in delivery, foetal abnormalities, foetal death, eclampsia and more (Brasil, 2012). Thus, physical adversities may lead to negative psychological consequences for the pregnant women (Saviani-Zeoti & Petean, 2015).

Despite the contributions that this study has made to its field, a few limitations must be mentioned. Initially, the fact of being cross-sectional is a constraint: the possibility of prevalence hampers the causal associations (Thomas et al., 2012). Furthermore, the instruments have not had all their psychometric aspects adjusted for pregnant women. However, they were chosen because of the lack of validated instruments specific for this population in Brazil (Meireles et al., 2015a). Additionally, their reliability was calculated through the Cronbach's alpha test, for all the questionnaires, and the values were considered appropriate (Streiner, 2003). Some instruments did not present a cut-off point. In order to categorize data and enable the statistical analysis, the calculation of percentiles was performed, which is considered a conservative approach (Streiner, 2003). Finally, the sample was recruited from a select number of physicians' practices, which may limit the generalizability of results.

Conclusions

It was concluded that women in high-risk gestational conditions presented more-troubled sociodemographic structures and psychological aspects that were harmful for their mental health when compared to women with low-risk pregnancy. Therefore, the results suggest that monitoring the psychosocial profile of pregnant women is crucial in order to prevent and early diagnose possible risks to their physical and mental health. Furthermore, it is necessary to discuss strategies that aim to improve services for women as well as the referrals of women to psychiatric, psychological and social services by professionals, which reinforces the importance of holistic care.

Further studies in the field are still necessary in order to achieve a better understanding and subsequently benefit pregnant women and medical professionals. The priority should be on studies that aim to include and analyze multiple factors aligned with the complexity of the aspects under investigation, as in pregnancy. In the practical contribution, it is important to provide specialized care particularly to high-risk pregnant women. Offering multi-disciplinary support—not only with obstetricians, but also with nutritionists, psychologists and physical educators—could provide these women with the tools to deal with all changes that are common in this moment of their lives.

Conflicts of interest - None.

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