ORIGINAL ARTICLE

SOCIODEMOGRAPHIC, ANTHROPOMETRIC, OBSTETRIC AND BODY IMAGE DETERMINANTS AND THEIR RELATIONSHIP WITH INTUITIVE EATING IN PREGNANCY

Açucena Cardoso Vilas Boas[1], Laudicéia Ferreira Fróis[2]
Isabel Pereira[3], Nathália Stahlschmidt Petry[4]
Lydiane Bragunci Bedeschi[5], Marcella Lobato Dias Consoli[6]
Izabela Regina Cardoso de Oliveira[7], Lílian Gonçalves Teixeira[8]

Highlights: (1) Non-white pregnant women and those attended in the private sector show higher intuitive eating. (2) Body dissatisfaction and pre-pregnancy overweight reduce attention to physiological cues. (3) Gestational trimester and lower education influence eating confidence and autonomy.

http://dx.doi.org/10.21527/2176-7114.2026.51.15557

[1] Federal University of Lavras – UFLA. Department of Nutrition. Lavras/MG, Brazil. https://orcid.org/0000-0001-9105-7683
[2] Federal University of Lavras – UFLA. Department of Nutrition. Lavras/MG, Brazil https://orcid.org/0000-0002-8514-2600
[3] Federal University of Lavras – UFLA. Department of Nutrition. Lavras/MG, Brazil. https://orcid.org/0000-0002-5003-532X
[4] Institute of Conscius and Intuitive Eating. Belo Horizonte/MG, Brazil. https://orcid.org/0000-0002-4624-3222
[5] University of Coimbra. Coimbra/Portugal. https://orcid.org/0000-0002-4624-3222
[6] Federal University of Lavras – UFLA. Department of Nutrition. Lavras/MG, Brazil. https://orcid.org/0000-0002-0374-9725
[7] Federal University of Lavras – UFLA. Department of Statistics. Lavras/MG, Brazil. https://orcid.org/0000-0003-3254-2827
[8] Federal University of Lavras – UFLA. Department of Nutrition. Lavras/MG, Brazil. https://orcid.org/0000-0003-4682-8594

SOCIODEMOGRAPHIC, ANTHROPOMETRIC, OBSTETRIC AND BODY IMAGE DETERMINANTS AND THEIR RELATIONSHIP WITH INTUITIVE EATING IN PREGNANCY

How to cite:

Vilas Boas AC, Fróis LF, Pereira I, Petry NS, Bedeschi LB, Consoli MLD. et al. Sociodemographic, anthropometric, obstetric and body image determinants and their relationship with intuitive eating in pregnancy. Rev. Contexto & Saúde. 2026;26(51):e15557

ABSTRACT

The objective of the present study was to evaluate the association between sociodemographic, obstetric, anthropometric factors, and body image with intuitive eating in pregnant women. This cross-sectional study was conducted between June 2019 and February 2020 with pregnant women receiving care in the public and private healthcare networks in Lavras, Minas Gerais. Sociodemographic, obstetric, and anthropometric data were collected through a semi-structured questionnaire based on national surveys. Body image perception was assessed using the Body Shape Questionnaire, while intuitive eating was measured through the Intuitive Eating Scale. Univariate and multivariate logistic regression analyses were applied, adjusting for sociodemographic, anthropometric, and body image variables. The sample consisted of 189 pregnant women. In the adjusted analysis, it was found that pregnant women who identified as non-white were 3.72 times more likely (95% CI 1.74-8.38) to engage in intuitive eating compared to white women. Additionally, those receiving care in the public sector were 0.25 times less likely (95% CI 0.10-0.56) to practice intuitive eating compared to those assisted in the private sector. These findings suggest that external factors influence intuitive eating at different levels, affecting the perception of physical hunger and satiety cues.

Keywords: Feeding Behavior; Maternal health; Delivery of Health Care.

SOCIODEMOGRAPHIC, ANTHROPOMETRIC, OBSTETRIC AND BODY IMAGE DETERMINANTS AND THEIR RELATIONSHIP WITH INTUITIVE EATING IN PREGNANCY

DETERMINANTES SOCIODEMOGRÁFICOS,ANTROPOMÉTRICOS, OBSTÉTRICOS E IMAGEM CORPORAL E SUA RELAÇÃO COM ALIMENTAÇÃO INTUITIVA NA GESTAÇÃO

RESUMO

O objetivo do presente estudo foi avaliar a associação entre fatores sociodemográficos, obstétricos, antropométricos e a imagem corporal com a alimentação intuitiva em gestantes. Estudo transversal, conduzido entre junho de 2019 e fevereiro de 2020, com gestantes atendidas na rede pública e privada de saúde em Lavras, Minas Gerais. Os dados sociodemográficos, obstétricos e antropométricos foram coletados por meio de um questionário semiestruturado baseado em inquéritos nacionais. A percepção da imagem corporal foi avaliada com o *Body Shape Questionnaire***,** enquanto a alimentação intuitiva foi mensurada através da *Intuitive Eating Scale***.** Foi aplicada regressão logística univariada e multivariada, ajustada para variáveis sociodemográficas, antropométricas e de imagem corporal. A amostra foi composta por 189 gestantes. Na análise ajustada, verificou-se que gestantes que se declararam não brancas apresentaram uma chance 3,72 vezes maior (IC 95% 1,74-8,38) de se alimentarem intuitivamente, quando comparadas às mulheres brancas. Além disso, aquelas atendidas pelo setor público tiveram uma chance 0,25 vezes menor (IC 95% 0,10-0,56) de se alimentarem intuitivamente, quando comparadas às gestantes atendidas pelo setor privado. Dessa forma, observou-se que fatores externos influenciam a alimentação intuitiva em diferentes níveis, interferindo na percepção dos sinais físicos de fome e saciedade.

Palavras-chave: Comportamento alimentar; Saúde materna; Assistência à saúde.

INTRODUCTION

Food pattern has an important impact on maternal and child health and on gestational weight gain. Although nutritional treatment is essential, adherence to dietary recommendations during pregnancy is a challenge for women(1). Therefore, it is important to consider food choice as a complex process that involves cultural, socioeconomic and psychological aspects. Skouteris et al. (2009)(2) showed in a systematic review that psychological factors have a relevant role in strategies to help achieve adequate gestational weight gain. Thus, it is essential to consider

psychological aspects and eating behaviors. Pregnant experience several physical and psychological changes in a short period and those their eating behaviors are jolted by these change(3).

Eating behavior refers to the association of food choice and ingestion with the sociocultural and psychological attributes of an individual, that is, actions that involve what, how and in what context if eats(4). Several dimensions of eating behavior have been studied, including intuitive eating (IE). IE aims to help the individual to choose food based on the internal signs of hunger and satiety and to know how to differentiate physical from emotional sensations(5). This concept was systematized through a validated psychometric scale, which seeks to assess intuitive eating through four subscales: unconditional permission to eat (UPE), eating for physical rather than emotional reasons (EPR), reliance on hunger and safety cues (RHSC) and body-food choice congruence (B-FCC)(6). IE is an approach that demonstrates benefits to physical and mental health. IE has been positively associated with mental health indicators in the general population, such as low levels of depression, particularly among women. It was also associated with less dysfunctional eating consumption, more positive body image and better emotional health(7).

Despite the growing interest in IE, its role during pregnancy remains largely unexplored, with most research primarily focusing on gestational weight gain. Emerging evidence suggests that higher IE scores are linked to healthier weight outcomes, with women who gained weight within recommended guidelines reporting significantly higher scores of IE. Notably, Ledoux et al. (2020) found that higher scores on the Eating for Physical Reasons (EPR) subscale were associated with lower gestational weight gain in women with obesity(8). Similarly, Quansah et al. highlighted that adherence to IE may play a crucial role in controlling weight gain and blood glucose during and after pregnancy in women with gestational diabetes mellitus. Beyond physical health, greater adherence to IE in the postpartum period has been linked to increased body image satisfaction, fewer dysfunctional eating behaviors, and lower symptoms of depression(9). These findings demonstrate the potential of IE as a comprehensive approach to maternal health. However, despite these promising results, the association between IE and key social and demographic factors remains largely unaddressed. Understanding how

different social groups adopt and apply IE principles during pregnancy is vital for the development of more inclusive and effective maternal health strategies.

Sociodemographic factors, attitudes and beliefs, self-efficacy, body image, and social support are well-established mediators of health behavior change. Despite this, no study to date has explored the potential associations between IE and ethnic and socioeconomic factors in pregnant women. Our hypothesis suggests that the manifestation of IE may vary across different social groups. Therefore, expanding research in this area is crucial to understand how women with diverse characteristics engage with IE principles during pregnancy. The objective of the present study was to evaluate the association between sociodemographic, obstetric, anthropometric factors, and body image with intuitive eating in pregnant women.

METHODS

Cross-sectional study conducted in a city located in south of the state of Minas Gerais, Brazil. It presents preliminary data of a longitudinal and prospective study denominated CAGESLACT - Nutritional Status, Behavior Eating and Feeding Practices during Gestation, Lactation and Food Introduction.

The research was approved by the Ethics Committee on Human Research (CAAE: 10989519.5.0000.5148, protocol number: 3.362.629). All individuals were informed about the study and they consented to participate by signing consent forms. The research was carried out by a previously trained team in an individualized way and with all care to avoid embarrassment of any kind**.**

For the sample size calculation of pregnants, EPI INFO version 7.2 software was used, considering the latest data available at DATASUS (IT Department of the Brazilian Unified Health System). The average number of live births in the city from 2013 to 2017 was 1396. A significance level of 95%, a sampling error of 5%, a prevalence of pregnant women with excessive concern about the body weight of 5.5% and losses of 40% were considered, resulting in a minimum sample of 107 participants in the study(10).

Pregnant women in the city who were 18 years old or older, who were literate and who had a single pregnancy were eligible and were invited to participate and informed about the aim of the study. Incomplete forms were considered sample loss.

All participation was voluntary, without any monetary incentive. Recruitment occurred for convenience between July 2019 and February 2020 (before isolation from the COVID-19 pandemic). Pregnant were invited to participate in the study and recruited in the waiting rooms at their prenatal appointments at public health centers of the Brazilian's unified health system and in private offices of gynecologists/obstetricians in the city, where they answered the questionnaires. It should be emphasized that pregnant women were addressed by all active Family Health Strategies in the municipality.

Through an interview, the participants answered questions about sociodemographic characteristics, such as name, date of birth, contact information, address, civil status, self-reported race/skin color, education level, family income and occupation. They were also asked about obstetric data, such as number of pregnancies, pregnancy planning and Date of Last Menstruation – DLM. The gestational week was calculated according to the DUM and the date of the interview.

Anthropometric data, such as pre-pregnancy weight and height, were collected from the woman's pregnant medical records. These parameters were self-reported, for those who did not know this information. The pregestational BMI was calculated by dividing the weight by height squared and classified according to the criteria of the World Health Organization(11) for adults. The pre-pregnancy nutritional status of pregnant women aged between 18 and 19 years was classified using the specific BMI/A curve for adolescents. Gestational trimester was classified: first trimester – conception to 12 weeks; second trimester – 12 to 24 weeks; third trimester – 24 to 40 weeks.

IE was assessed using the IES-2(12) validated in Portuguese, self-applied. The total score is the sum of the scores of all subscales; and the higher the score is, the higher the IE.

The Body Shape Questionnaire – BSQ(13), validated in Portuguese. Score values less than 110 points were classified as body satisfaction, and scores above 110 were classified as dissatisfaction.

EPI INFO software version 7.2 was used to data tabulation, and double entry was conducted for validation. Data were analyzed using R version 3.6.3. The outcomes of interest were the total intuitive eating score and subscale scores. Considering that the IES questionnaire does not have cutoff points and determined classifications, for each subscale, the scores were

dichotomized according to the value of the sample's median so that 0 = below the median and 1 = equal to or above the median, as previously described (14). Logistic regression models were fitted in order to study the association between outcomes and sociodemographic, obstetric, BMI and body image variables. For each outcome, the full model was fitted with all variables, which was reduced using the backward elimination method based on the Akaike information criterion (AIC). The effects of the covariates in the final model were interpreted based on the estimated odds ratios and respective confidence intervals. In all inferential procedures, the level of significance was set at 5%.

RESULTS

Two hundred pregnant women were recruited, of whom 194 were eligible and 5 did not complete the IES-2 and thus did not complete the eligibility criteria. Therefore, the final sample was composed of 189 participants, as described in Table 1 and in Table 2.

The median age was 27 ± 4 years. Most pregnant women were attended by the public health system (74%), lived with a partner (64%), attended high school (49%) and were black (68%). Almost half (49%) reported a family income of 1 to 2 minimum wages, and about 56% of the participants had some employment.

Table 1. Socio-demographic data distributed according to the total score of IES-2 and the subscales.

Variables	Frequency (%) or Median (Q1, Q3 ± IIQ) (N = 189)	IES-2 total score			UPE			EPR			RHSC			B-FCC		
		Below the median (N=93)	Equal to or above the median (N=96)	*p*-value	Below the median (N=78)	Equal to or above the median (N=111)	*p*-value	Below the median (N=91)	Equal to or above the median (N=98)	*p*-value	Below the median (N=87)	Equal to or above the median (N=102)	*p*-value	Below the median (N=82)	Equal to or above the median (N=107)	*p*-value
Service				**0.004**			0.6			0.091			**0.003**			0.6
Public	140 (74.00)	78 (55.71)	62 (44.29)		60 (42.86)	80 (57.14)		73 (52.14)	67 (47.86)		74 (52.86)	66 (47.14)		63 (45.00)	77 (55.00)	
Private	49 (26.00)	15 (30.61)	34 (69.39)		18 (36.73)	31 (63.27)		18 (36.73)	31 (63.27)		13 (26.53)	36 (73.47)		19 (38.78)	30 (61.22)	
Age	27 (23, 31)	26 (22. 31)	27 (23, 31)	0.4	26 (22, 30)	28 (23, 33)	0.2	27 (22, 32)	28 (23, 31)	0.4	27 (22, 31)	27 (23, 32)	0.4	28 (22, 32)	27 (23, 31)	0.8
Marital status				**0.033**			0.5			0.3			0.7			0.2
Lived with partner	121 (64.00)	52 (42.98)	69 (57.02)		47 (38.84)	74 (61.16)		54 (44.63)	67 (55.37)		54 (44.63)	67 (55.37)		48 (39.67)	73 (60.33)	
Do not live with partner	68 (36.00)	41 (60.29)	27 (39.71)		31 (45.59)	37 (54.41)		37 (54.41)	31 (45.59)		33 (48.53)	35 (51.47)		34 (50.00)	34 (50.00)	
Education				**0.008**			**0.088**			**0.003**			**0.070**			**0.019**
Primary incomplete	55 (29.00)	36 (65.45)	19 (34.55)		18 (32.73)	37 (67.27)		37 (67.27)	18 (32.73)		32 (58.18)	23 (41.82)		32 (58.18)	23 (41.82)	
Secondary complete	92 (49.00)	36 (39.13)	56 (60.87)		37 (40.22)	55 (59.78)		36 (39.13)	56 (60.87)		40 (43.48)	52 (56.52)		37 (40.22)	55 (59.78)	
Higher education complete	42 (22.00)	21 (50.00)	21 (50.00)		23 (54.76)	19 (45.24)		18 (42.86)	24 (57.14)		15 (35.71)	27 (64.29)		13 (30.95)	29 (69.05)	
Race/skin color				**0.005**			**0.047**			0.15			**0.002**			**<0.001**
White	60 (32.00)	39 (65.00)	21 (35.00)		18 (30.00)	42 (70.00)		34 (56.67)	26 (43.33)		38 (63.33)	22 (36.67)		60 (100.0)	0 (00.00)	
Black/brown	129 (68.00)	54 (41.86)	75 (58.14)		60 (46.51)	69 (53.49)		57 (44.19)	72 (55.81)		49 (37.98)	80 (62.02)		22 (17.05)	107 (82.95)	
Family income				0.5			0.6			**0.049**			0.3			0.15
< 1 minimum wage *	31 (16.40)	18 (58.06)	13 (41.94)		11 (35.48)	20 (64.52)		21 (67.74)	10 (32.26)		13 (41.94)	18 (58.06)		18 (58.06)	13 (41.94)	
1 to 2 minimum wages	93 (49.21)	46 (49.46)	47 (50.54)		37 (39.78)	56 (60.22)		43 (46.24)	50 (53.76)		39 (41.94)	54 (58.06)		40 (43.01)	53 (56.99)	
≥ 2 minimum wages	65 (34.39)	29 (44.62)	36 (55.38)		30 (46.15)	35 (53.85)		27 (41.54)	38 (58.46)		35 (53.85)	30 (46.15)		24 (36.92)	41 (63.08)	
Employment[a]				0.4			**0.039**			0.051			0.2			**0.006**
With employment	101 (56.00)	46 (45.54)	55 (54.46)		49 (48.51)	52 (51.49)		41 (40.59)	60 (59.41)		51 (50.50)	50 (49.50)		35 (34.65)	66 (65.35)	
No employment	78 (44.00)	41 (52.56)	37 (47.44)		25 (32.05)	53 (67.95)		44 (56.41)	34 (43.59)		31 (39.74)	47 (60.26)		44 (56.41)	34 (43.59)	

*Minimum wage in Brazil 998.00 (July/2019). 2019, July: $1.00 was equivalent to R$3.78. So, 1 minimum wage was equivalent to $264.00. 2020, February: $1.00 was equivalent to R$4.35. So, 1 minimum wage was equivalent to $229.00

IES-2: Intuitive Eating Scale - 2; UPE: Unconditional permission to eat; EPR: Eating for physical rather than emotional reasons; RHSC: Reliance on hunger and satiety cues; B-FCC: Body-food-choice congruence. [a]n=179. The number of participants differs from the total due to missing data. P-values from Wilcoxon rank sum test or Pearson's Chi-squared test.

Table 2. Obstetric, antropometric, body image data distributed according to the total score of IES-2 and the subscales.

Variables	Frequency (%) ou Median (Q1, Q3 ± IIQ) (N = 189)	IES-2 total score			UPE			EPR			RHSC			B-FCC		
		Below the median (N=93)	Equal or above the median (N=96)	*p*-value	Below the median (N=78)	Equal or above the median (N=111)	*p*-value	Below the median (N=91)	Equal or above the median (N=98)	*p*-value	Below the median (N=87)	Equal or above the median (N=102)	*p*-value	Below the median (N=82)	Equal or above the median (N=107)	*p*-value
Planned pregnancy[a]				0.5			0.8			0.7			0.2			0.5
Yes	71 (38.00)	32 (45.07)	39 (54.93)		28 (39.44)	43 (60.56)		32 (45.07)	39 (54.93)		28 (39.44)	43 (60.56)		28 (39.44)	43 (60.56)	
No	115 (62.00)	59 (51.30)	56 (48.70)		49 (42.61)	66 (57.39)		57 (49.57)	58 (50.43)		57 (49.57)	58 (50.43)		53 (46.09)	62 (53.91)	
Gestation number[b]				0.7			0.8			0.2			0.9			0.7
Primiparous	83 (44.00)	39 (46.99)	44 (53.01)		36 (43.37)	47 (56.63)		35 (42.17)	48 (57.83)		39 (46.99)	44 (53.01)		34 (40.96)	49 (59.04)	
Multiparous	105 (56.00)	53 (50.48)	52 (49.52)		42 (40.00)	63 (60.00)		55 (52.38)	50 (47.62)		47 (44.76)	58 (55.24)		47 (44.76)	58 (55.24)	
Gestational trimester[c]				0.14			>0.9			0.13			0.4			0.7
First	36 (19.00)	23 (63.89)	13 (36.11)		15 (41.67)	21 (58.33)		23 (63.89)	13 (36.11)		18 (50.00)	18 (50.00)		18 (50.00)	18 (50.00)	
Second	77 (41.00)	38 (49.35)	39 (50.65)		31 (40.26)	46 (59.74)		34 (44.16)	43 (55.84)		39 (50.65)	38 (49.35)		33 (42.86)	44 (57.14)	
Third	73 (39.00)	32 (43.84)	41 (56.16)		31 (42.47)	42 (57.53)		34 (46.58)	39 (53.42)		29 (39.73)	44 (60.27)		30 (41.10)	43 (58.90)	
Pre gestational BMI classification[d]				0.2			0.4			**0.026**			0.14			0.6
Underweight	14 (07.90)	6 (42.86)	8 (57.14)		4 (28.57)	10 (71.43)		8 (57.14)	6 (42.86)		5 (35.71)	9 (64.29)		8 (57.14)	6 (42.86)	
Adequate weight	79 (45.00)	34 (43.04)	45 (56.96)		31 (39.24)	48 (60.76)		29 (36.71)	50 (63.29)		31 (39.24)	48 (60.76)		33 (41.77)	46 (58.23)	
Overweight	84 (47.00)	48 (57.14)	36 (42.86)		38 (45.24)	46 (54.76)		48 (57.14)	36 (42.86)		45 (53.57)	39 (46.43)		37 (44.05)	47 (55.95)	
Body image[e]				**0.030**			>0.9			**0.030**			**0.004**			0.8
Satisfaction	141 (84.00)	64 (45.39)	77 (54.61)		55 (39.00)	86 (61.00)		64 (45.39)	77 (54.61)		59 (41.84)	82 (58.16)		64 (45.39)	77 (54.61)	
Dissatisfaction	27 (16.00)	19 (70.37)	8 (29.63)		10 (37.04)	17 (62.96)		19 (70.37)	8 (29.63)		20 (74.07)	7 (25.93)		11 (40.74)	16 (59.26)	

BMI: Body Mass Index; IES-2: Intuitive Eating Scale - 2; UPE: Unconditional permission to eat; EPR: Eating for physical rather than emotional reasons; RHSC: Reliance on hunger and satiety cues; B-FCC: Body-food-choice congruence. [a]n=186. [b]n=188. [c]n= 186. [d]n=177. [e]n=168. The number of participants differs from the total due to missing data. P-values from Pearson's Chi-squared test.

Regarding obstetric data, 115 women (62%) did not plan the pregnancy, and 56% were multiparous. With regard to gestational trimester, the majority were in the second (41%) and third (39%) trimesters, with wide variation in gestational ages, ranging from 4 to 40 weeks. Based on the BMI before pregnancy, about 47% were classified as overweight (overweight and obese), 45% as having adequate weight and 7.9% as having low weight. In addition, 141 (84%) women were satisfied with their body image.

Considering the total score of the IES-2, the median was 3.48, with 96 women (51%) having scores equal to or above the median in the total score, that is, presenting greater adherence to IE. For the UPE subscale, the median was 3.50, with 111 women (59%) having scores equal to or above the median. For the EPR subscale, the median was 3.75, with 98 women (52%) having scores equal to or above the median. For the RHSC subscale, the median was 3.17, with 102 women (54%) having scores equal to or above. Finally, for the B-FCC subscale, the median was 3.33, with 107 women (57%) allocated to the group equal to or above the median.

Table 3 represents the associations between IE levels and its determinants. Regarding the total score of the IES-2, compared to being assisted by the private sector, being assisted by the public health system reduced the chances of women eating intuitively by 75%. Being black/brown increased the chance of eating intuitively by 3.72 times.

Table 3. Associated variables with characteristics of pregnant women and total score of IES-2 and its subscales by means of multiple logistic regression.

Variables	OR	95% CI	*p*-value
IES -2 TOTAL SCORE			
Service			
Private	1		
Public	0.249	0.101 – 0.575	**0.002**
Race/skin color			
White	1		
Black/brown	3.728	1.746 - 8.382	**<0.001**
Planned pregnancy			
Yes	1		
No	0.556	0.265 - 1.143	0.113
Body image			
Satisfaction	1		
Dissatisfaction	0.419	0.153 - 1.071	0.077
SUBSCALE UPE			
Age	1.070	1.009 - 1.138	**0.029**
Education			
Higher education complete	1		
Secondary complete	3.178	1.352 - 7.788	**0.009**
Primary incomplete	4.585	1.636 - 13.71	**0.005**
Gestation number			
Primipara	1		
Multipara	0.549	0.248 - 1.175	0.129
SUBSCALE EPR			
Service			
Private	1		
Public	0.315	0.127 - 0.735	**0.009**
Race/skin color			
White	1		
Black/brown	2.560	1.163 - 5.851	**0.022**
Employment			
With employment	1		
No employment	0.530	0.249 - 1.112	0.095
Gestational trimester			
First	1		
Second	3.565	1.297 - 10.48	**0.016**
Third	1.119	0.401 - 3.172	0.829
Pre-gestational BMI classification			
Adequate	1		
Overweight	0.353	0.154 - 0.773	**0.011**
Underweight	0.310	0.064 - 1.361	0.125
Body image			
Satisfaction	1		
Dissatisfaction	0.426	0.150 - 1.135	0.095

(Continued)

Table 3. (Continued)

Variables	OR	95% CI	*p*-value
SUBSCALE RHSC			
Service			
Private	1		
Public	0.271	0.104 - 0.657	**0.005**
Race/skin color			
White	1		
Black/brown	3.860	1.630 - 9.715	**0.003**
Education			
Higher education complete	1		
Secondary complete	0.338	0.108 - 0.97	0.052
Primary incomplete	0.198	0.048 - 0.744	**0.019**
Family income			
≥ 2 wages	1		
1 to 2 wages	3.405	1.247 - 10.20	**0.021**
< 1 salary	4.161	0.97 - 19.44	0.060
Employment			
With employment	1		
No employment	2.182	0.905 - 5.481	0.087
Planned pregnancy			
Yes	1		
No	0.517	0.219 - 1.178	0.122
Body image			
Satisfaction	1		
Dissatisfaction	0.281	0.090 - 0.787	**0.020**
SUBSCALE B-FCC			
Education			
Higher education complete	1		
Secondary complete	0.870	0.360 - 2.067	0.753
Primary incomplete	0.374	0.135 - 1.005	0.054
Employment			
With employment	1		
No employment	0.577	0.275 - 1.204	0.143

Multiple logistic regression models were adjusted to study the association between outcomes and sociodemographic, obstetric, anthropometric and body image variables. For each outcome, the complete model was used with all variables and reduced using the backward elimination technique based on the Akaike information criterion (AIC). In bold: statistically significant values ($p < 0.05$). n=189. OR: Odds ratio; CI: 95% Confidence interval; BMI: Body mass index IES-2: Intuitive Eating Scale; UPE: Unconditional permission to eat; EPR: Eating for physical rather than emotional reasons; RHSC: Reliance on hunger and satiety cues; B-FCC: Body-food-choice congruence.

Higher age and lower education level, such as complete high school and incomplete elementary school, were associated with greater chances of eating with unconditional permission (UPE subscale), that is, avoiding classifying foods as prohibited and allowed.

Being assisted by the public health system reduced the chances of eating to meet physiological and non-emotional needs by 68.5% (EPR subscale), in addition to being

associated with a 72.9% lower chance to trust the signs of hunger and satiety to eat (RHSC subscale). Being black/brown was associated with two times more chances for EPR and three times more chances for RHSC; that is, these women were more likely to respect physical signs to eat.

Being in the second trimester of pregnancy increased the chance of eating to respect physiological and non-emotional needs by 3.56 times. Excess weight reduced the chance for this subscale.

Having incomplete elementary education was associated with a 0.19 lower chance of eating to meet the physical signs of hunger and satiety (RHSC subscale). In contrast, women with an income of 1 to 2 minimum wages were associated with 3.40 more chances of trusting the internal signs to eat. Nevertheless, being dissatisfied with body image reduced the chances of eating for physiological reasons by 71.9%. The B-FCC subscale was not influenced by the variables evaluated.

DISCUSSION

This study made important contributions regarding the association of intuitive eating and sociodemographic, obstetric, anthropometric and body image characteristics in a heterogeneous social and racial sample of pregnant women. The findings indicate that associated factors influence IE in the sample studied. According to the results, women assisted by the public health system had a lower likelihood of eating intuitively, as well as eating to meet physiological and non-emotional needs (EPR subscale) and trusting the signs of hunger and satiety to eat (RHSC subscale) than women assisted by the private sector.

A possible explanation for this result is the standardization of public health system care with a focus on weight gain. In the first consultation, it is estimated how many grams per week a pregnant woman should gain according to the pregestational nutritional status(15). Women can start eating at established time intervals and follow dietary restrictions, being guided by external standards instead of by confidence in the internal signs of hunger and satiety. The concern with achieving the expected weight gain may distance women from eating according to their intuition. In contrast, the private health system offers more personalized prenatal care, with a focus on nutrition education and flexibility in dietary guidelines, encouraging a healthier

relationship with hunger and satiety cues. Studies have shown that pregnant women find it helpful to address weight gain during pregnancy; however, they report that health professionals do not know how to address these issues and often make judgments about dietary beliefs and body weight. In addition, women express the desire to receive more information about healthy lifestyle habits, as they usually receive simplistic and generalized recommendations during prenatal care visits (16).

Furthermore, unplanned pregnancies, as observed by the results of the present study (62%), are common among women attending the public health system. In an analysis carried out with data not shown, the majority of pregnant women (83.8%) seen at public health system have a family income of up to 2 minimum wages and the majority of pregnant women (65.4%) seen in the private sector have an income greater than 3 minimum wages, and none of them attended by the private sector has income below 1 minimum wage ($p > 0.05$). Food insecurity its normally associated in low-income families(17). In Brazil, there is an association between being assisted by the public health system and being in food insecurity. Moreover, another study showed that families with food insecurity are more likely than other families to have an unplanned pregnancy. Therefore, all of these factors can generate more negative feelings in women and increase the possibility of eating for emotional reasons. Pregnancy-related anxiety is common among women due to health concerns, unplanned pregnancies and the delivery process. The intense emotions related to pregnancy provide more perception of external stimuli and cravings for food(4). These mental problems are inversely related to intuitive eating.

Having an income of 1 to 2 minimum wages was associated with greater chances of eating to meet the physical signs of hunger and satiety (RHSC subscale). As reported in the literature, the cost of food influences food choices which affects low-income people. In addition, having incomplete elementary education was associated with lower chances of eating to meet the signs of hunger and satiety (subscale RHSC).

Being black/brown increased the chances of eating intuitively, eating to meet physiological and non-emotional needs (EPR subscale) and trusting the signs of hunger and satiety (RHSC subscale). One study investigated body image and eating behaviors in 67 black women and 53 Hispanic women and found no significant differences between the two groups(18). Sánchez-Johnsen et al. (2004)(19) found that Latin American women (n = 234) were more dissatisfied with their body image than black women (n = 271). In this sense, an

explanation for this result is that black/brown women eat more intuitively because they are more satisfied with their bodies. In an analysis carried out with data not shown, black / brown pregnant women dissatisfied with their body image was associated with a 3.398 lower chance to trust the signs of hunger and satiety to eat (RHSC subscale), that is, those women who are more satisfied with their body trust more the internal signs to eat. Another hypothesis may be related to food insecurity. Family food insecurity was associated with black race. An elevated occurrence of food insecurity was associated with black pregnant women. Food insecurity is believed to influence the quality and quantity of foods consumed. Therefore, the priority of the black woman can be to fight for the survival and to eat listening for the signs of hunger and satiety to control quantity. It is noteworthy that the further research on eating behavior in ethnic minorities is needed.

The association between lower educational levels and a higher propensity for unconditional eating (UPE subscale) can be explained by a combination of factors, including the influence of social media and the lack of comprehensive health education. Women with lower educational attainment, such as those with only a high school diploma or incomplete primary education, are often more vulnerable to external impositions, particularly those related to beauty standards promoted by social media. These platforms, by disseminating idealized aesthetic norms, exert considerable pressure on women's self-esteem, leading many to adopt a distorted perception of body image and compulsively strive for conformity to such standards. At the same time, the lack of health education limits these women’s access to essential information about healthy eating and practices that promote a balanced relationship with food, such as intuitive eating. The absence of knowledge in these areas may result in the adoption of external rules, such as the dichotomy of "permitted" and "forbidden" foods, rather than listening to internal hunger and satiety cues (20). In this context, social media, by encouraging constant comparisons and reinforcing the pursuit of idealized bodies, contributes to body dissatisfaction and promotes restrictive eating behaviors. Therefore, the lack of proper nutritional education, combined with external pressures, can distance women from intuitive eating practices, which rely on trust in the body’s physiological signals. Promoting more comprehensive and accessible health education could significantly aid these women, helping them develop a more harmonious relationship with food and their own body image (21).

Being in the second trimester of pregnancy increased the chances of pregnant women eating while honoring physiological and non-emotional needs. The most plausible hypotheses for changes over the gestational trimesters may be related to the fact that at the beginning of pregnancy, some women commonly thought they had to "eat for two". Pregnancy can affect eating behaviors, since women have the opportunity to "eat for two", abandon dietary restrictions and take advantage of changes in body weight(3). However, some women experience frequent nausea and vomiting, predominantly during the first trimester(22) which can influence food consumption. Furthermore, at the end of pregnancy, due to the frequent attention to weight gain and the impositions made by health professionals, pregnant women can adhere to dietary restrictions, following external rules and distancing themselves from the body's internal signs. The end of pregnancy and the beginning of the postpartum period are identified as high risk periods for initiating or aggravating eating disorders(23).

Pre-pregnancy overweight women were approximately 65% less likely to eat for physical rather than emotional reasons. This finding is consistent with a study with a nonpregnant sample. Camilleri et al. recruited a large sample composed of 11.774 men and 40.389 women and found a strong inverse association between intuitive eating and overweight and obesity, especially in women. In addition, inverse associations were observed for all subscales studied, such as the EPR(24). Daudaseskara et al. when evaluating 266 pregnant women over the age of 18, found an inverse association between high scores on the EPR subscale and pregestational BMI(25). Another study evaluated women during pregnancy and postpartum and concluded that the EPR and RHSC subscales were associated with lower weight and BMI.

Eating in emotional responses can lead to increased food intake. Therefore, emotions can affect eating behavior. In studies of nonpregnant adults, eating for physical rather than emotional reasons has been positively associated with body satisfaction and mental health and inversely related to controlled eating, dysfunctional eating, dietary practice and eating sweets, fats and more food calories(26).

Body image is described as a component of the perception that an individual has about his body and the attitudes, beliefs, feelings and emotions that result from this perception of himself. If the image evaluation is negative and the individual has concerns about body size, shape or weight, there is body dissatisfaction. Being dissatisfied with their body image reduced

the chances of pregnant women eating for physiological reasons by 71.9% (subscale RHSC). This relationship is corroborated by some previous studies. Denny et al. (27) observed that the women were almost 40% less likely to exhibit extremes of weight control when they trusted their bodies to tell them how much to eat. Furthermore, in a cross-sectional study with 419 women in the postpartum period(9) identified that those with a more intuitive eating style had greater satisfaction with their body image than women who practiced diets and/or food restriction. The authors conclude that adherence to intuitive eating can positively influence health and well-being outcomes for postpartum women.

Pregnancy is a period of great vulnerability for women; it can favor the presence of dysfunctional eating patterns or it can be an opportunity to improve and treat eating disorders because of maternal and child health concerns and the presence of a different perception of image during pregnancy(28). Therefore, it can be an opportune time for behavior change interventions due to women's increased motivation to care for health and great involvement in health services.

Among the limitations of the study, its transversal nature stands out and prohibits the determination of causality, as such a research design does not allow the assessment of temporality. However, this type of research is important to encourage future longitudinal studies that require more time and financial investment. There was also a wide variation in gestational ages, ranging from 4 to 40 weeks, and it does not address the great physiological and psychological differences that occur in each trimester. However, it was not the aim of the study to verify the association between the evolution of pregnancy and intuitive eating. The convenience method used for selecting the sample can also be considered a limitation but meets the sample calculation. Another study also used this methodology to reach a large number of people(29). It should be emphasized that pregnant women were addressed by all active family health strategies and several private offices in the municipality to reach a representative sample of the city.

Self-reported anthropometric measures also become a limitation, as they can influence nutritional status. However, the use of self-reported measures to calculate BMI is considered an acceptable practice in research and in pregnant women(30). The sample in this study, predominantly composed of black/brown women with a partner and a medium level of education, raises questions about the homogeneity of the participants' profile and its

implications for the study's conclusions. The limited sociodemographic diversity restricts the generalization of the results and highlights the need for a more representative sample to comprehensively understand the factors influencing intuitive eating during pregnancy. Women with this profile may face significant barriers in accessing quality information about dietary practices, which can directly impact their ability to adopt more autonomous eating behaviors based on internal hunger and satiety cues, as advocated by intuitive eating. In this context, it can be argued that health education and access to information play a crucial role in shaping these eating behaviors, especially in a population with lower education and limited access to appropriate guidance. Despite these limitations, this study stands out as one of the first to investigate intuitive eating in Brazilian pregnant women, providing important insights for developing intervention strategies that consider the sociodemographic particularities of pregnant women. Thus, although the results offer relevant contributions, it is essential that future research expands this analysis by investigating intuitive eating during different gestational trimesters and the postpartum period, in order to provide a more detailed and robust understanding of the factors influencing eating patterns throughout pregnancy.

CONCLUSIONS

This study highlights the complexity of factors influencing the adoption of intuitive eating during pregnancy, emphasizing the interconnection between medical care, sociodemographic characteristics, and body image perception. Black or brown pregnant women receiving private care were more likely to adopt intuitive eating practices, suggesting that access to quality healthcare services and an individualized approach promote healthier eating habits. Variables such as educational level, age, BMI, and gestational trimester also influenced eating behaviors, underscoring the need for interventions that take into account the specificities of each social group.

The study contributes to the understanding of the factors shaping the eating patterns of pregnant women and emphasizes the importance of considering socioeconomic and racial inequalities when formulating public health policies.

REFERENCES

1. Gomes C de B, Vasconcelos LG, Cintra RMG de C, Dias LCGD, Carvalhaes MA de BL. Hábitos alimentares das gestantes brasileiras:revisão integrativa da literatura. Cien Saude Colet. 2019 Jun 27;24(6):2293–306.
2. Skouteris H, Hartley-Clark L, McCabe M, Milgrom J, Kent B, Herring SJ, et al. Preventing excessive gestational weight gain: a systematic review of interventions. Obes Rev. 2010 Nov;11(11):757–68.
3. Clark A, Skouteris H, Wertheim EH, Paxton SJ, Milgrom J. The relationship between depression and body dissatisfaction across pregnancy and the postpartum: a prospective study. J Health Psychol. 2009 Jan;14(1):27–35.
4. Bijlholt M, Van Uytsel H, Ameye L, Devlieger R, Bogaerts A. Eating behaviors in relation to gestational weight gain and postpartum weight retention: A systematic review. Obes Rev. 2020 Oct 1;21(10).
5. Tribole E, Resch E. Intuitive Eating. 3rd ed. New York; 2012. 344 p.
6. Tylka TL, Kroon Van Diest AM. The Intuitive Eating Scale-2: Item refinement and psychometric evaluation with college women and men. J Couns Psychol. 2013;60(1):137–53.
7. Bruce LJ, Ricciardelli LA. A systematic review of the psychosocial correlates of intuitive eating among adult women. Appetite. 2016 Jan 1;96:454–72.
8. T L, SS D, A B, J R, M S. The association between pre-conception intuitive eating and gestational weight gain. Eat Weight Disord. 2021 Mar 1;26(2):467–74.
9. Lee MF, Williams SL, Burke KJ. Striving for the thin ideal post-pregnancy: cross-sectional study of intuitive eating in postpartum women. J Reprod Infant Psychol. 2019;00(00):1–12.
10. Soares RM, Antunes Nunes MA, Schmidt MI, Giacomello A, Manzolli P, Camey S, et al. Inappropriate eating behaviors during pregnancy: Prevalence and associated factors among pregnant women attending primary care in Southern Brazil. International Journal of Eating Disorders. 2009;42(5):387–93.
11. World Health Organization. Obesity : preventing and managing the global epidemic : report of a WHO consultation. Geneva; 1999.
12. Da Silva RW, Neves AN, Ferreira L, Campos JA, Swami V. Psychometric Investigation of Brazilian Portuguese Versions of the Caregiver Eating Messages Scale and Intuitive Eating Scale-2.
13. Di Pietro M, Silveira DX. Internal validity, dimensionality and performance of the Body Shape Questionnaire in a group of Brazilian college students. Brazilian Journal of Psychiatry. 2009;31:21-4.
14. Ramos MH, Silva JM, de Oliveira TAV, da Silva Batista J, Cattafesta M, Salaroli LB, et al. Intuitive eating and body appreciation in type 2 diabetes. J Health Psychol. 2020;

15. Niquini RP, Bittencourt SA, Lacerda EM, Saunders C, Leal MD. Avaliação da estrutura de sete unidades de saúde da família para a oferta da assistência nutricional no pré-natal no município do Rio de Janeiro, Brasil. Revista Brasileira de Saúde Materno Infantil. 2010;10:s61-8.

16. Kaitz J, Ray S, Harkins D. Barriers in addressing body image and eating issues in primary care: an overview of women's narratives. Women Health. 2020;60(3):260–70.

17. Gross RS, Mendelsohn AL, Arana MM, Messito MJ. Food Insecurity During Pregnancy and Breastfeeding by Low-Income Hispanic Mothers. Pediatrics. 2019 Jun 1;143(6).

18. Hrabosky JI, Grilo CM. Body image and eating disordered behavior in a community sample of Black and Hispanic women. Eat Behav. 2007 Jan;8(1):106–14.

19. LA SJ, ML F, Z M, MR S, AR D, L VH. Ethnic Differences in correlates of obesity between Latin-American and black Women. Obes Res. 2004;12(4):652–60.

20. Hogue J V., Mills JS. The effects of active social media engagement with peers on body image in young women. Body Image. 2019 Mar 1;28:1–5.

21. Lowe-Calverley E, Grieve R. Do the metrics matter? An experimental investigation of Instagram influencer effects on mood and body dissatisfaction. Body Image. 2021 Mar 1;36:1–4.

22. Bustos M, Venkataramanan R, Caritis S. Nausea and Vomiting of Pregnancy-What's New? Auton Neurosci. 2017 Jan 1;202:62.

23. Baskin R, Galligan R, Meyer D. Disordered eating from pregnancy to the postpartum period: The role of psychosocial and mental health factors. Appetite. 2021 Jan 1;156:104862.

24. Camilleri GM, Méjean C, Bellisle F, Andreeva VA, Kesse-Guyot E, Hercberg S, et al. Intuitive eating is inversely associated with body weight status in the general population-based NutriNet-Santé study. Obesity (Silver Spring). 2016 May 1;24(5):1154–61.

25. Daundasekara SS, Beasley AD, O'Connor DP, Sampson M, Hernandez D, Ledoux T. Validation of the intuitive Eating Scale for pregnant women. Appetite. 2017 May 1;112:201–9.

26. Bruce LJ, Ricciardelli LA. A systematic review of the psychosocial correlates of intuitive eating among adult women. Appetite. 2016;96:454–72.

27. Denny KN, Loth K, Eisenberg ME, Neumark-Sztainer D. Intuitive eating in young adults. Who is doing it, and how is it related to disordered eating behaviors? Appetite. 2013;60(1):13–9.

28. Sebastiani G, Andreu-Fernández V, Herranz Barbero A, Aldecoa-Bilbao V, Miracle X, Meler Barrabes E, et al. Eating Disorders During Gestation: Implications for Mother's Health, Fetal Outcomes, and Epigenetic Changes. Front Pediatr. 2020 Sep 17;0:587.

29. Ramos MH, Silva JM, de Oliveira TAV, da Silva Batista J, Cattafesta M, Salaroli LB, et al. Intuitive eating and body appreciation in type 2 diabetes. J Health Psychol. 2020;

30. Phelan S, Phipps MG, Abrams B, Darroch F, Schaffner A, Wing RR. Randomized trial of a behavioral intervention to prevent excessive gestational weight gain: the Fit for Delivery Study. Am J Clin Nutr. 2011 Apr 1;93(4):772–9.

Submitted: January 23, 2024

Accepted: June 25, 2025

Published: January 2, 2026

Author contributions	
Açucena Cardoso Vilas Boas:	Conceptualization, Data Curation, Methodology, Formal Analysis, Investigation, Visualization, Writing – Original Draft, Writing – Review & Editing.
Laudicéia Ferreira Fróis:	Conceptualization, Data Curation, Methodology, Formal Analysis, Investigation, Visualization, Writing – Original Draft, Writing – Review & Editing.
Isabel Pereira:	Writing – Review & Editing.
Nathália Stahlschmidt Petry:	Writing – Review & Editing.
Lydiane Bragunci Bedeschi:	Writing – Review & Editing.
Marcella Lobato Dias Consoli:	Writing – Review & Editing.
Izabela Regina Cardoso de Oliveira:	Writing – Review & Editing.
Lilian Gonçalves Teixeira:	Conceptualization, Methodology, Supervision, Writing – Review & Editing.
All the authors approved the final version of the text.	

Conflict of interest: The authors declare no conflict of interest.

Funding: This research received no funding.

SOCIODEMOGRAPHIC, ANTHROPOMETRIC, OBSTETRIC AND BODY IMAGE DETERMINANTS AND THEIR RELATIONSHIP WITH INTUITIVE EATING IN PREGNANCY

Corresponding author: Laudicéia Ferreira Fróis
Federal University of Lavras – UFLA
Department of Nutrition
Av. Norte UFLA - Aquenta Sol, Lavras/MG, Brazil. Zip code 37200-000
laudiceiafrois@hotmail.com