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Lifestyle and dietary habits according to extent and purpose of Brazilian pregnant women: Vigitel epidemiological survey

Hábitos de vida e consumo alimentar segundo extensão e propósito de gestantes brasileiras: inquérito epidemiológico Vigitel

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ABSTRACT

During pregnancy, food consumption is extremely important for the health of the mother-child binomial. Therefore, a diet based on natural and minimally processed foods, as opposed to ultra-processed foods, is essential to ensure health during pregnancy and postpartum. The objective of this study was to analyze the relationship between lifestyle habits and food consumption among pregnant Brazilian women. This is a cross-sectional study using data from pregnant women included in the Chronic Disease Risk Factor Surveillance System via Telephone Survey (Vigitel) in 2021. Food consumption, considered the outcome variable, was assessed through a food frequency questionnaire, focusing on consumption from the previous day. The NOVA classification was used to categorize foods as fresh or ultra-processed. The Shapiro-Wilk test was conducted to verify normality, and the Pearson Chi-square test was applied. A significance level of $p < 0.05$ was adopted. The sample consisted of 90 pregnant women. The analysis revealed a greater association with the consumption of ultra-processed foods among younger pregnant women compared to older age groups (p=0.020), as well as lower consumption of fresh foods (p=0.044). In conclusion, differences in food consumption were evident among pregnant women of different age groups. However, in order to understand the dietary patterns of pregnant women by regions of Brazil, it is necessary to conduct further studies to support programs aimed at the gestational period, reducing adverse effects and promoting maternal and child health.

Keywords: pregnancy; industrialized foods; in natura foods; health surveys

RESUMO

Durante a gestação o consumo alimentar é de suma importância para a saúde da mãe e do bebê. Uma alimentação baseada em alimentos in natura e minimamente processados em detrimento dos alimentos ultraprocessados é essencial para assegurar a saúde durante a gestação e o pós-parto. O objetivo deste estudo foi analisar a relação de hábitos de vida e o consumo alimentar de gestantes brasileiras. Trata-se de um estudo transversal, utilizando os dados de gestantes incluídas no Sistema de Vigilância de Fatores de Risco de Doenças Crônicas por Inquérito Telefônico (Vigitel), no ano de 2021. O consumo alimentar, considerado variável desfecho foi avaliado por meio do questionário de frequência alimentar, considerando o consumo do dia anterior. Utilizou-se a classificação NOVA para categorizar os alimentos em: in natura e ultraprocessados. O teste Shapiro-Wilk foi conduzido para verificar a normalidade e aplicado o teste de Qui-quadrado de Pearson. Adotou- se o nível de significância de $p < 0,05$. A amostra foi constituída por 90 gestantes. Na análise, constatou-se maior relação no consumo no de ultraprocessados pelas gestantes de menor faixa etária, quando comparadas as de maior faixa etária (p=0,020), bem como menor consumo de alimentos in natura (0,044). Em conclusão, evidenciou diferenças de consumo alimentar entre gestantes de diferentes faixas etárias. No entanto, a fim de conhecer o padrão alimentar das gestantes por regiões do Brasil é necessário que novos estudos sejam realizados, para fomentar subsídios de apoio a programas destinados ao período gestacional, reduzindo agravos e promovendo saúde materno-infantil.

Palavras-chave:gravidez; alimentos industrializados; alimentos in natura; inquéritos epidemiológicos.

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INTRODUCTION

Pregnancy is often described as a "learning period," during which women are encouraged to adopt positive behaviors that benefit their health and well-being (de seymour; beck; conlon, 2022). During pregnancy, a woman experiences rapid and significant physiological changes, including alterations in body composition throughout gestation (achón *et al.*, 2019). Moreover, pregnancy entails a diversity of hormonal, immunological, and metabolic changes that have significant effects on a woman's body, such as alterations in circulating hormone levels, increased intravascular volume, and uterine size, which are the foundations of the complex physiological adaptations essential for fetal development (motosko *et al.*, 2017).

The nutritional status and health of pregnant women are closely related to the fetus (bhowmik *et al.*, 2019). Promoting food and nutrition education for pregnant women can prevent inadequate nutritional habits, which contributes to a healthy intrauterine environment and prevents the baby from developing various chronic diseases in adulthood (fang; reddy; lai, 2024).

Studies have identified quantitative and qualitative inadequacies during pregnancy in relation to food consumption, such as the reduced number of meals consumed daily (between three and four throughout the day), high consumption of sugars, sweets, and fats, and low consumption of fruits and vegetables (pires; gonçalves, 2021). Moreover, the consumption of ultra-processed foods affects the nutritional quality of the diet of pregnant women (mariano *et al.*, 2023). In this context, public policies that encourage healthy eating habits should be directed toward more susceptible groups, especially pregnant ones (fraga; bastos; theme-filha, 2024).

Thus, the Food Guide for the Brazilian Population advocates a diet based on fresh, minimally processed foods and culinary preparations rather than ultra-processed foods (brasil, 2014). Furthermore, it provides recommendations aimed at promoting safe and healthy eating, considering a wide variety of nutritionally adequate foods (brasil, 2014; monteiro *et al.*, 2018).

In this sense, investigating and monitoring indicators of adequate and healthy eating can promote the health of individuals and populations throughout their life course. In this context, the Surveillance System for Risk and Protective Factors for Chronic Diseases by Telephone Survey (vigitel) provides support for health promotion policies in Brazil, including encouraging healthier eating, as part of the Vigitel questionnaire, which addresses the frequency of consumption of foods considered markers of healthy and unhealthy diets (brasil, 2022).

Healthy eating is essential for the health of both the mother and child. Given that data on the food consumption of pregnant Brazilian women are scarce in the literature and are of utmost importance for health managers and professionals to implement effective health programs and policies, this study aimed to analyze the relationship between lifestyle habits and food consumption according to the extent and purpose of the interviews with pregnant Brazilian women via the Vigitel telephone survey in 2021.

MATERIALS AND METHODS

Sampling and Data Collection

This is a cross-sectional study based on secondary data from the "Surveillance System for Risk and Protective Factors for Chronic Diseases by Telephone Survey (vigitel 2021)," conducted by the Health Surveillance Secretariat (SVS) of the Ministry of Health, approved by Conep under the number CAAE: 65610017.1.0000.0008 (brasil, 2022).

The sampling design considered Brazilian capitals (n=26) and the Federal District, with a minimum sample size of one thousand individuals per city. Data collection was carried out throughout 2021 via telephone surveys with adults over 18 years of age, in conjunction with other surveys, such as household and school population surveys, aiming to expand knowledge about noncommunicable diseases (NCDs) in the country (brasil, 2022).

In the present study, data related to pregnant women were evaluated. For this purpose, question "Q14" of the survey was used: "Are you currently pregnant?" (brasil, 2022).

Data Organization

Outcome Variable

Food consumption was measured using the "Food Frequency Questionnaire (FFQ)," considering "yes/no" responses regarding consumption on the previous day. Foods were grouped according to their degree of processing (fresh foods and ultra-processed foods) and classified according to the Food Guide for the Brazilian Population and the NOVA classification (Brasil, 2014; Monteiro *et al.*, 2010). The group of fresh foods included: fruits, vegetables, meats, eggs, cereals, milk, roots, and tubers, while the ultra-processed foods group included soda or artificial juice, chocolate-flavored drinks, packaged snacks, filled cookies, sweets, processed meats, bread, sauces, margarine, and instant noodles or soup.

Covariates

To characterize the sample, information was included regarding age group (≥ 18 to ≤ 34 years and ≥ 35 to ≤ 54 years), self-declared race (non-white and white), marital status (without a partner and with a partner), and education level (≤ 12 years and >12 years).

To evaluate lifestyle habits, the following variables were considered: physical activity practice: "In the last three months, have you practiced any type of physical exercise or sport?" (yes/no) and alcohol consumption: "Do you usually consume alcoholic beverages?" (yes/no).

Data Analysis

Descriptive statistical analysis was performed, with comparisons between proportions conducted using the chi-square test. For all analyses, Stata software version 13.1 was used, with a significance level of 0.05.

RESULTS AND DISCUSSION

The sample consisted of 90 pregnant women, with the highest percentage from the Northern region 33.36% (n=33). In the matter of sociodemographic data, the predominant age group was between ≥ 18 to ≤ 34 years (n=54), and 72.41% (n=63) self-identified as non-white, as reported in Table 1.

When analyzing the relationship between sociodemographic characteristics, lifestyle habits, and food consumption, a statistical difference was observed between age group and consumption of fresh foods (p=0,044) as well as between the consumption of ultra-processed foods (p=0,020). The other variables did not show significance (Table 2).

In this study, it was possible to analyze the food consumption profiles of pregnant Brazilian women and analyze their socioeconomic characteristics. Younger women were more likely to not consume fresh foods and more likely to consume ultra-processed foods than older women. Furthermore, a difference in the consumption of fresh and ultra-processed foods was identified among pregnant women from different geographic regions.

This finding is in line with global data and reflects changes in the dietary profile of the population, evidenced by nutritional transition, a phenomenon characterized by changes in food consumption with increased intake of animal-derived foods, saturated and trans fats, simple sugars, and decreased consumption of fruits, vegetables, cereals, and legumes, along with a new lifestyle (sedentarism) (Monteiro; Martínez-Steele; Cannon, 2024). Studies have shown that this dietary pattern is associated with excessive weight gain during pregnancy, an increased risk of complications such as gestational diabetes, hypertensive syndrome, and nutritional deficiencies, which can impact both the pregnancy and the postpartum period (Cummings *et al.*, 2022).

In this study, the food consumption questionnaire referred to consumption on the previous day through a telephone survey. Conversely, Carreira *et al.* (2024) estimated the dietary intake of pregnant women using two 24-hour dietary recalls. Because the estimation of consumption was conducted using different methodological approaches, pregnant women may overestimate the consumption of healthy foods at the expense of ultra-processed foods (Carreira *et al.*, 2024).

It is important to emphasize the significance of food consumption during this life stage. During pregnancy, it is suggested to consume lean meats and fish while limiting the intake of red and processed meats (Mizgier; Jarzabek-Bielecka; Mruczyk, 2021). Additionally, the importance of consuming whole foods rich in fiber is highlighted, along with eating

Table 1 - Sociodemographic variables of pregnant women interviewed by the Vigitel telephone survey – 2021, according to geographic regions. (n=90)

Variables	Total	Southeast	Northeast	Central-West	South	North
Age						
≥ 18 a ≤ 34 years	60.00 (54)	57.14 (4)	68.75 (22)	53.85 (7)	20.00 (1)	60.61 (20)
≥ 35 a ≤ 54 years	40.00 (36)	42.86 (3)	31.25 (10)	46.15 (6)	80.00 (4)	39.39 (13)
Skin color						
Non-white	72.41 (63)	83.33 (5)	80.65 (25)	61.54 (8)	20.00 (1)	75.00 (24)
White	27.59 (24)	16.67 (1)	19.35 (6)	38.46 (5)	80.00 (4)	25.00 (8)
Marital status						
Without a partner	42.22 (38)	28.57 (2)	53.13 (17)	30.77 (4)	60.00 (3)	36.36 (12)
With a partner	57.78 (52)	71.43 (5)	46.88 (15)	69.23 (9)	40.00 (2)	63.64 (21)
Education level						
≤ 12 anos	43.33 (39)	28.57 (2)	53.13 (17)	23.08 (3)	40.00 (2)	45.45 (15)
>12 anos	56.67 (51)	71.43 (5)	46.88 (15)	76.92 (10)	60.00 (3)	54.55 (18)

Table 2 - Relationship between sociodemographic characteristics, lifestyle habits, and consumption of fresh and ultra-processed foods of pregnant women interviewed by the Vigitel telephone survey – 2021. (n=90)

	Fresh consumption			Ultra-processed consumption		
	No% (n)	Yes% (n)	p	No% (n)	Yes% (n)	p
Age			**0.044***			**0.020***
≥ 18 a ≤ 34 years	64.47 (49)	35.71 (5)		56.10 (46)	100.0 (8)	
≥ 35 a ≤ 54 years	35.53 (27)	64.29 (9)		43.90 (36)	0.00 (0)	
Skin color			0.104			0.726
Non-white	75.68 (56)	53.85 (7)		75.86 (22)	66.67 (2)	
White	24.32 (18)	46.15 (6)		24.14 (7)	33.33 (1)	
Marital status			0.086			0.777
Without a partner	46.05 (35)	21.43 (3)		42.68 (35)	37.50 (3)	
With a partner	53.95 (41)	78.57 (11)		57.32 (47)	62.50 (5)	
Education level			0.225			0.252
≤ 12 anos	46.05 (35)	28.53 (4)		41.26 (34)	62.50 (5)	
>12 anos	53.95 (41)	71.43 (10)		58.54 (48)	37.50 (3)	
Physical exercise			0.245			1.000
No	52.63 (40)	35.71 (5)		50.00 (41)	50.00 (41)	
Yes	47.37 (36)	64.29 (9)		50.00 (4)	50.00 (4)	
Alcohol consumption			0.107			0.110
No	24.07 (13)	0.00 (0)		20.34 (12)	20.00 (1)	
Yes	75.93 (41)	100.00 (10)		79.66 (47)	80.00 (4)	

Note: *p<0.05.

at least five servings of fruits and vegetables every day, avoiding fried foods, and regularly consuming dairy products, opting for those with low fat content (DE SEYMOUR; BECK; CONLON, 2022). Micronutrients such as zinc, iron, iodine, calcium, vitamin D, and folate, among others, are essential during pregnancy (JOSHI

et al., 2023). These nutrients have been endorsed by the World Health Organization as supplements during pregnancy to reduce the risks of low birth weight (LBW) and small for gestational age (SGA) (Joshi *et al.*, 2023).

According to data from the Family Budget Survey for the years 2017/2018, the consumption of fresh foods in the population represents 53.4%, while the consumption of ultra-processed foods was 19.7% (IBGE, 2020). Although the gestational period is marked by specific nuances, the intake of ultra-processed foods corroborates with the consumption patterns of the general population. A study conducted with 2,377 pregnant women from different regions of Spain revealed that, on average, 17% of the total diet was represented by ultra-processed foods consumption (Ben-Avraham *et al.*, 2023; Puig-Vallverdú *et al.*, 2022). Conversely, in a systematic review, the results suggest that consuming fresh foods can reduce the risk of developing Diabetes Mellitus (Liao *et al.*, 2023).

Furthermore, knowing that eating habits comprise different aspects, it is noted that the adoption of inadequate dietary practices may also stem from the loss of cooking practices and communal eating (Oliveira; Santos, 2020). Thus, as designed by the Food Guide for the Brazilian Population, it is necessary for professionals involved in prenatal care to respect regional dietary habits (Brasil, 2014). It is known that regional foods and preparations have "better acceptability" due to their integration into tradition and food culture. Therefore, it is essential to encourage culinary practices that value family and local agriculture, aiming to meet nutritional needs and promote the Human Right to Adequate Food while respecting cultural diversity (Oliveira; Santos, 2020).

In addition to food consumption, the adoption of physical activity during pregnancy is recommended. Physical activity during pregnancy is safe and provides health benefits for both the mother and the baby (Watt; Hubbard; Mottola, 2024). Moreover, it improves the physical and psychological capacity of the pregnant woman and offers benefits to the baby when performed at the appropriate intensity and supervised by a qualified physical education professional (Brasil, 2021; Budler; Budler, 2022). Engaging in physical activity helps reduce the risk of complications such as gestational diabetes and preeclampsia, enhances the pregnant woman's ability to perform daily activities, and contributes to better conditioning for labor (Rodrigues-Denize; Zolnikov; Furio, 2024; Wójcik; Aniśko; Siatkowski, 2024).

Conversely, some habits, such as smoking or drinking alcohol, should be discouraged during pregnancy. Smoking exposes the mother and baby to various toxic substances, which can lead to physical and behavioral changes (Míguez; Pereira, 2021). Alcohol consumption during pregnancy can have several consequences, depending on the amount consumed and the stage of fetal development. Such effects may include restricted fetal growth, facial anomalies, and learning and behavioral disorders. Additionally, women who consume large amounts of alcohol have a higher risk of premature birth (de Seymour; Beck; Conlon, 2022). Regarding smoking during pregnancy, a systematic review and meta-analysis demonstrated that maternal smoking is associated with reduced fetal size and growth starting from the second trimester (Abraham *et al.*, 2017).

This study must be analyzed in light of certain limitations. Vigitel is a telephone survey focused on monitoring non-communicable diseases (NCDs) in the general adult population, resulting in a small sample of pregnant women. Additionally, one must consider restricting the sample to Brazilian individuals residing in the capitals and the Federal District and who had a landline telephone. However, minimized by the use of data weighting factors through post-stratification. Moreover, the questionnaire administered via telephone allows for little interaction between the interviewer and the interviewee, which may create a monotonous environment for the interviewee and lead to automated responses that might not accurately reflect the usual food consumption of the participants. Furthermore, the food frequency questionnaire was not designed with specific criteria according to the NOVA classification, which may lead to potential errors in classifying the degree of processing of the items.

However, despite the limitations, the data in this study are derived from a large-scale national survey that contributes to improvements and development of public policies in the country.

CONCLUSION

The present study highlighted differences in food consumption among pregnant women of different age groups. However, in order to understand the dietary patterns of pregnant women by regions of Brazil, it is necessary for new studies to be conducted to support programs aimed at the gestational period, reducing adverse effects and promoting maternal and child health.

REFERENCES

ABRAHAM, M.; ALRAMADHAN, S.; INIGUEZ, C.; DUIJTS, L.; JADDOE, V. W. V., DEKKER, H. T. D.; CROZIER, S.; GODFREY, K. M.; HINDMARSH, P.; VIK, T.; JACOBSEN, G. W.; HANKE, W.; SOBALA, W.; DEVEREUX, G.; TURNER, S. A systematic review of maternal smoking during pregnancy and fetal measurements with meta-analysis. PLOS ONE, v. 12, n. 2, p. e0170946, 2017.

ACHÓN, M.; ÚBEDA, N.; GARCÍA-GONZÁLEZ, A.; PARTEARROYO, T.; VARELA-MOREIRAS, G. Effects of Milk and Dairy Product Consumption on Pregnancy and Lactation Outcomes: A Systematic Review. Advances in Nutrition, v. 10, p. S74–S87, 2019.

BEN-AVRAHAM, S.; KOHN, E.; TEPPER, S.; LUBETZKY, R.; MANDEL, D.; BERKOVITCH, M.; SHAHAR. D. R. Ultra-processed food (UPF) intake in pregnancy and maternal and neonatal outcomes. European Journal of Nutrition, v. 62, n. 3, p. 1403–1413, 2023.

BHOWMIK, B.; SIDDIQUE, T.; MAJUMDER, A.; MDALA, I.; HOSSAIN, I. A.; HASSAN, Z.; JAHAN, I.; MOREIRA, N. C. V.; ALIM, A.; BASIT, A.; HITMAN, G. A.; KHAN, A. K. A.; HUSSAIN, A. Maternal BMI and nutritional status in early pregnancy and its impact on neonatal outcomes at birth in Bangladesh. BMC Pregnancy and Childbirth, v. 19, n. 1, p. 413, 2019.

BRASIL. MINISTÉRIO DA SAÚDE. SECRETARIA DE VIGILÂNCIA EM SAÚDE. DEPARTAMENTO DE ANÁLISE EM SAÚDE E VIGILÂNCIA DE DOENÇAS NÃO TRANSMISSÍVEIS. VIGITEL BRASIL 2021.Vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico: Estimativas sobre frequência e distribuição sociodemográfica de fatores de risco e proteção para doenças crônicas nas capitais dos 26 estados brasileiros e no distrito federal em 2021. Brasília: Ministério da Saúde, 2022.

BRASIL. MINISTÉRIO DA SAÚDE. SECRETARIA DE ATENÇÃO À SAÚDE. DEPARTAMENTO DE ATENÇÃO BÁSICA. Guia alimentar para a população brasileira. 2. ed. Brasília: Ministério da Saúde, 2014.

BRASIL. MINISTÉRIO DA SAÚDE. SECRETARIA DE ATENÇÃO PRIMÁRIA À SAÚDE. DEPARTAMENTO DE PROMOÇÃO DA SAÚDE. Guia de Atividade Física para a População Brasileira. Brasília: Ministério da Saúde, 2021.

CARREIRA, N. P.; LIMA, M. C.; TRAVIESO, S. G.; SARTORELLI, D. S.; CRIVELLENTI, L. C. Fatores maternos associados ao consumo usual de alimentos ultraprocessados na gestação. Ciência & Saúde Coletiva, v. 29, n. 1, p. 11, 2024.

BUDLER, C. L.; BUDLER, M. Physical activity during pregnancy: a systematic review for the assessment of current evidence with future recommendations. BMC Sports Science, Medicine and Rehabilitation, v. 14, n. 1, p. 133, 2022.

CUMMINGS, J. R.; LIPSKY, L. M.; SCHWEDHELM, C.; LIU, A.; NANSEL, T. R. Associations of ultra-processed food intake with maternal weight change and cardiometabolic health and infant growth. International Journal of Behavioral

Nutrition and Physical Activity, v. 19, n. 1, p. 61, 2022.

DE SEYMOUR, J. V.; BECK, K. L.; CONLON, C. A. Nutrition in pregnancy. Obstetrics, Gynaecology & Reproductive Medicine, v. 32, n. 11, p. 253–258, 2022.

FANG, W.; REDDY, O. S.; LAI, W. F. Nutritional awareness of pregnant women and the underlying influencing factors. Nutrition Reviews, v. 82, n. 4, p. 561–569, 2024.

FRAGA, A. C. S. A.; BASTOS, M. P.; THEME-FILHA, M. M. Increased consumption of ultra-processed foods during pregnancy is associated with sociodemographic, behavioral, and obstetric factors: A cohort study. Nutrition Research, v. 121, p. 28–38, 2024.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). Pesquisa de Orçamentos Familiares 2017-2018: Avaliação nutricional da disponibilidade domiciliar de alimentos no Brasil. Rio de Janeiro: IBGE, 2020.

JOSHI, S.; SHARMA, L.; BARDE, L.; TARE, M.; BAHETI, D.; DAMA, G.; TARE, H. The Nutritional Needs of Mothers and Babies: A Review. International Journal of Pharmaceutical Quality Assurance, v. 14, n. 2, p. 421–425, 2023.

LIAO, Y. P.; ZHENG, Q. X.; JIANG, X. M.; CHEN, X. W.; GAO, X. X.; PAN, Y. Q. Fruit, vegetable, and fruit juice consumption and risk of gestational diabetes mellitus: a systematic review and meta-analysis. Nutrition Journal, v. 22, n. 1, p. 27, 2023.

MARIANO, K. R.; ANDRADE, G. C.; LOUZADA, M. L. C.; NAKAMURA, M. U.; ARAUJO JÚNIOR, E.; SOUZA, E. Ultra-processed foods and the nutritional quality of the diet of Brazilian pregnant women. Revista da Associação Médica Brasileira, v. 69, n. 1, p. 169–174, 2023.

MÍGUEZ, M. C.; PEREIRA, B. Effects of active and/or passive smoking during pregnancy and the postpartum period. Anales de Pediatría (English Edition), v. 95, n. 4, p. 222–232, 2021.

MIZGIER, M.; JARZABEK-BIELECKA, G.; MRUCZYK, K. Maternal diet and gestational diabetes mellitus development. The Journal of Maternal-Fetal & Neonatal Medicine, v. 34, n. 1, p. 77–86, 2021.

MONTEIRO, C. A.; LEVY, R. B.; CLARO, R. M.; CASTRO, I. R. R.; CANNON, G. A new classification of foods based on the extent and purpose of their processing. Cadernos de Saúde Pública, v. 26, n. 11, p. 2039–2049, 2010.

MONTEIRO, C. A.; CANNON, G.; MOUBARAC, J. C.; LEVY, R. B.; LOUZADA, M. L. C.; JAIME, P. C. The UN Decade of Nutrition, the NOVA food classification and the trouble with ultra-processing. Public Health Nutrition, v. 21, n. 1, p. 5–17, 2018.

MONTEIRO, C. A.; MARTÍNEZ-STEELE, E.; CANNON, G. Reasons to avoid ultra-processed foods. BMJ, v. 384, p. q439, 2024.

MOTOSKO, C. C.; BIEBER, A. K.; POMERANZ, M. K.; STEIN, J. A.; MARTIRES, K. J. Physiologic changes of pregnancy: A review of the literature. International Journal of Women's Dermatology, v. 3, n. 4, p. 219–224, 2017.

OLIVEIRA, M. S. da S.; SANTOS, L. A. da S. Guias alimentares para a população brasileira: uma análise a partir das dimensões culturais e sociais da alimentação. Ciência & Saúde Coletiva, v. 25, n. 7, p. 2519–2528, 2020.

PIRES, I. G.; GONÇALVES, D. R. Consumo alimentar e ganho de peso de gestantes assistidas em unidades básicas de saúde. Brazilian Journal of Health Review, v. 4, n. 1,

p. 128–146, 2021.

PUIG-VALLVERDÚ, J.; ROMAGUERA, D.; FERNÁNDEZ-BARRÉS, S.; GIGNAC, F.; IBARLUZEA, J.; SANTA-MARIA, L.; LLOP, S.; GONZALEZ, S.; VIOQUE, J.; RIAÑO-GALÁN, I.; FERNÁNDEZ-TARDÓN, G.; PINAR, A.; TURNER, M. C.; ARIJA, V.; SALAS-SAVADÓ, J.; VRIJHEID, M.; JULVEZ, J. The association between maternal ultra-processed food consumption during pregnancy and child neuropsychological development: A population-based birth cohort study. Clinical Nutrition, v. 41, n. 10, p. 2275–2283, 2022.

RODRIGUES-DENIZE, N.; ZOLNIKOV, B. T. R.; FURIO, F. A systematic review on the physical, mental, and occupational effects of exercise on pregnant women. Dialogues in Health, v. 4, p. 100181, 2024.

WATT, G. E.; HUBBARD, M. E.; MOTTOLA, M. F. The association of physical activity during pregnancy with birthweight extremes: a scoping review. Journal of Science and Medicine in Sport, 2024.

WÓJCIK, M.; ANIŚKO, B.; SIATKOWSKI, I. Quality of life in women with normal pregnancy. Scientific Reports, v. 14, n. 1, p. 12434, 2024.

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