Cogitare Enfermagem

ORIGINAL ARTICLE

Social determinants of health among pregnant women living in riverside communities who received routine prenatal care

HIGHLIGHTS

1. Pregnant women living in riverside communities experience social inequalities in health care.
2. Socioeconomic vulnerability poses health risks to pregnant women.
3. Social and community networks influence the health of pregnant women.
4. The presence of a partner promotes the health of pregnant women.

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ABSTRACT

Objective: Analyze the social determinants of health among pregnant women in riverside communities who receive routine prenatal care and identify those that influence maternal health. **Method:** A quantitative cross-sectional study was conducted from January to April 2024 in the Basic Health Units of Cotijuba Island and Combú Island, Belém, Pará, Brazil, with 32 pregnant women living in riverside communities, at habitual risk, undergoing prenatal care. Data was obtained through interviews, using a questionnaire based on the social determinants of health model, and analyzed using inferential statistics. **Results:** Significant social determinants are related to social and community networks and environmental conditions, with an association between previous health problems and religion ($p=0.021$), marital status ($p<0.001$), and water supply ($p=0.042$). **Conclusion:** Determinants related to social and community networks and the environmental context concern previous health problems of pregnant women and should be considered when adopting strategic measures to ensure effective prenatal care.

KEYWORDS: Social Determinants of Health; Pregnant People; Primary Health Care; Prenatal Care; Maternal Health.

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INTRODUCTION

The quality of gestational development depends significantly on prenatal care, which aims to monitor the gestational process and identify possible risks present during pregnancy or in the postpartum period, both for the mother and the baby, ensuring a healthy birth without major impacts on maternal and neonatal health, highlighting prenatal care as a relevant indicator of prognosis at birth[1].

It is well known that clinical conditions directly influence women's health during pregnancy. However, in addition to biological aspects, factors such as housing, educational level, occupation, lifestyle, access to health services, among others, determine the health status of pregnant women and, therefore, must be considered to ensure quality, comprehensive, and equitable prenatal care[2].

In this regard, it is important to highlight the Social Determinants of Health (SDH), defined as a series of factors that characterize an individual's state of health, related to living conditions, individual behaviors, and the social, economic, and structural context in which the individual lives[3].

In the context of riverside communities, factors such as geographical barriers resulting from the permanence of rivers, low socioeconomic indicators, lack of knowledge about public policies, and poor basic sanitation produce health inequalities that characterize the vulnerability of these communities[4]. This reality highlights the importance of assessing DSS related to maternal and infant health, since socioeconomic, cultural, and environmental factors can have a decisive influence on fetal development, especially when pregnant women are exposed to unfavorable conditions[2].

The World Health Organization has reported that 99% of maternal deaths occur in low- and middle-income countries, with the highest percentage among adolescents living in rural areas and poor communities[5]. In this context, a study conducted in Brazil found that the proportion of pregnant women without any prenatal care was 60% higher in the northern region of Brazil compared to the national average[6].

In addition, there is a notable lack of studies on DSS among pregnant women in the context of prenatal care[7], reinforcing the need to address this issue to identify those that may be directly related to the health and disease conditions of pregnant women living in riverside communities[8].

This study aims to analyze the social determinants of health among pregnant women living in riverside communities who receive routine prenatal care and to identify those that influence maternal health.

METHOD

A quantitative, exploratory, cross-sectional study guided by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) methodological tool[9], conducted at the Family Health Units on the islands of Cotijuba and Combú, health services located in riverside territories and environmental protection areas (APA) administered by the Belém Municipal Health Secretariat (SESMA), in Pará, which are accessible only by river.

The sample was defined using the convenience technique. Thirty-two pregnant women receiving prenatal care participated in the study, corresponding to 71% of all pregnant women at normal risk enrolled in prenatal care at the two units. The inclusion criteria were pregnant women at normal risk, aged 18 years or older, residing on the islands, and receiving regular prenatal care.

Data collection was carried out from January to April 2024, through structured interviews based on a tool developed by the research team, grounded in Dahlgren and Whitehead's Social Determinants of Health model[3].

The questionnaire included questions related to the five layers that comprise the model. The first layer refers to individual determinants of the sociodemographic profile, the second to behavior and lifestyle, the third covers social and community networks, the fourth addresses living and working conditions, and the fifth to socioeconomic, cultural, and environmental conditions.

The interviews were conducted individually, on the premises of the health services, in private rooms, ensuring the privacy and comfort of the participants. For identification purposes, an alphanumeric code was assigned with the letter G for Pregnant, followed by the sequential number of the interviews (G1, G2, G3, etc.).

The data were tabulated in a spreadsheet in *Microsoft Excel*® 2010 and subsequently analyzed using *Bioestat*® 5.3. Inferential statistics were used to associate DSS with previous health problems reported by pregnant women, and the G test was chosen because it considers the variables' characteristics and number of observations. A significance level of 5% ($p < 0.05$) was considered.

This research was approved by the Research Ethics Committee of the Universidade Federal do Pará, under opinion No. 6,578,893.

RESULTS

The sociodemographic profile of pregnant women regarding individual determinants, presented in Table 1, corroborates a higher proportion in the age group between 20 and 34 years (n=24; 75%) and brown race (n=27; 84.3%). Regarding nutritional status, most pregnant women were overweight or obese (n=15; 46.9%), and seven (21.9%) reported previous health problems.

Regarding the number of pregnancies, there was a predominance of primigravidas (n=13; 40.6%), followed by tercigravidas (n=12; 37.5%) and secundigravidas (n=07; 21.0%). Regarding gestational age, the third trimester prevailed (n=17; 53.1%), and most did not use continuous medication (n=30; 93.8%) (Table 1).

Half of the pregnant women (n=16; 50%) reported no complaints during pregnancy, and among those who did, the most prevalent were: cramps and nausea, cramps, nausea, and asthenia (n=5; 15.6%) (Table 1).

As for social determinants related to habits, almost all denied alcoholism and smoking (n=31; 96.9%), as well as physical activity (n=29; 90.6%), and some acknowledged the presence of a previous health problem (n=10; 31.2%) (Table 2).

Table 1. Sociodemographic determinants of pregnant women living in riverside areas, according to previous health problems. Pará, PA, Brazil, 2024

Layer 1—Individual determinants	Previous health problems			p-value
	No n (%)	Yes n (%)	Total n (%)	
Age				
Up to 19 years old	3 (9.4)	3 (9.4)	6 (18.8)	0.705
20 to 34 years old	16 (50)	8 (25)	24 (75)	
≥ 35 years old	1 (3.1)	1 (3.1)	2 (6.2)	
Race				
White	0 (0)	2 (6.3)	2 (6.3)	0.080
Indigenous	1 (3.1)	0 (0)	1 (3.1)	
Brown	17 (53.1)	10 (31.2)	27 (84.3)	
Black	2 (6.3)	0 (0)	2 (6.3)	
Nutritional Status				
Eutrophic	12 (37.5)	5 (15.6)	17 (53.1)	0.248
Overweight	5 (15.6)	2 (6.3)	7 (21.9)	
Obesity	3 (9.4)	5 (15.6)	8 (25)	
Number of Pregnancies				
Primigravida	10 (31.3)	3 (9.4)	13 (40.6)	0.296
Secundigravida	3 (9.4)	4 (12.5)	7 (21.9)	
Tertigravida	7 (21.9)	5 (15.6)	12 (37.5)	
Gestational trimester				
First	5 (15.6)	2 (6.3)	7 (21.9)	0.482
Second	6 (18.7)	2 (6.3)	8 (25)	
Third	9 (28.1)	8 (25)	17 (53.1)	
Continuous Medication Use				
No	20 (62.5)	10 (31.3)	30 (93.8)	0.071
Yes	0 (0)	2 (6.2)	2 (6.2)	
Current pregnancy complaints				
No	10 (31.2)	6 (18.8)	16 (50)	0.051
Colic	3 (9.4)	0 (0)	3 (9.4)	
Colic and nausea	4 (12.5)	1 (31)	5 (15.6)	
Colic, nausea, and asthenia	3 (9.4)	2 (6.2)	5 (15.6)	
Nausea	0 (0)	3 (9.4)	3 (9.4)	

Source: The authors (2024).

More than half of pregnant women denied engaging in leisure activities (n=18; 6.3%) and reported some sleep disorder (n=18; 56.2%), while acknowledging previous health problems (n=15; 56.5%). Regarding sexual activity, most (n=28; 87.5%) reported having sex with a partner, with no statistical association with previous health problems (Table 2).

About eating habits, a significant proportion of pregnant women (n=15; 46.9%) reported consuming fruits and vegetables daily; however, almost half (n=7; 21.9%) reported previous health problems. Processed food consumption was less than three times per week, with recognition of a previous health problem (n=10; 31.3%). Regarding red meat consumption and water intake, there were no significant associations with previous health problems (Table 2).

Table 2. Determinants related to the behavior and lifestyle of pregnant women living in riverside areas, according to previous health problems. Pará, PA, Brazil, 2024

Layer 2 – Behavior and lifestyle	Previous health problems			p-value
	No	Yes	Total	
	n (%)	n (%)	n (%)	
Use of tobacco and/or alcohol				
No	20 (62.5)	11 (34.4)	31 (96.9)	0.253
Yes	0 (0)	1 (3.1)	1 (3.1)	
Physical activity				
No	19 (59.4)	10 (31.2)	29 (90.6)	0.322
Yes	1 (3.2)	2 (6.2)	3 (9.4)	
Sleep disorders				
No	8 (25)	6 (18.9)	14 (43.8)	0.526
Insomnia	7 (21.9)	2 (6.2)	9(28.1)	
Daytime fatigue	4 (12.5)	3 (6.2)	6 (18.7)	
Insomnia and daytime fatigue	1 (3.2)	4 (6.2)	3 (9.4)	
Leisure activity				
No	12 (37.5)	6 (18.7)	18 (56.3)	0.580
Yes	8 (25)	6 (18.7)	14 (43.7)	
Sexual activity				
No	4 (37.5)	0 (0)	4 (12.4)	0.057
Yes	16 (25)	12 (37.5)	28 (87.5)	
Weekly consumption of fruits and vegetables				
< 3 days	6 (18.7)	3 (9.4)	9 (28.1)	0.560
Up to 3 days	6 (18.7)	2 (6.3)	8 (25)	
7 days	8 (25)	7 (21.9)	15 (46.9)	
Weekly consumption of processed foods				
< 3 days	11 (34.4)	10 (31.3)	21 (65.7)	0.121
Up to 3 days	1 (3.1)	1 (3.1)	2 (6.2)	
7 days	8 (25)	1 (3.1)	9 (28.1)	
Weekly consumption of red meat				
< 3 days	4 (12.5)	3 (9.4)	7 (21. 9)	0.681
Up to 3 days	8 (25)	3 (9.4)	11 (34.4)	
7 days	8 (25)	6 (18.7)	14 (43.7)	
Daily water intake				
Less than 1 liter	3 (9.4)	4 (12.5)	7 (21.9)	0.425
1 to 2 liters	11 (34.4)	6 (18.7)	17 (53.13)	
> 2 liters	6 (18.7)	2 (6.3)	8 (25)	

Source: The authors (2024).

Regarding the determinants related to social and community networks, shown in Table 3, more than half of the pregnant women were evangelical (n=19; 59.4%), and 27 (84.4%) had a marital partner. In addition, most reported not having a support network (n=13; 40.6%) and not participating in groups or associations (n=26; 81.3%).

The bivariate analysis between determinants related to social and community networks with previous health problems showed a statistically significant association with religion (p=0.021) and marital status (p< 0.001) (Table 3).

Table 3. Determinants related to social and community networks of pregnant women living in riverside areas, according to previous health problems. Pará, PA, Brazil, 2024

Layer 3 – Social and community networks	Previous health problems			p-value
	No n (%)	Yes n (%)	Total n (%)	
Religion				
Catholic	5 (15.6)	2 (6.3)	7 (21.9)	0.021
Evangelical	9 (28.1)	10 (31.5)	19 (59.4)	
None	6 (18.7)	0 (0)	6 (18.7)	
Marital status				
With partner/spouse	16 (50)	11 (34.4)	27 (84.4)	0.001
No partner/spouse	4 (12.5)	1 (3.1)	5 (15.6)	
Has a family support network				
No	10 (31.3)	3 (9.4)	13 (40.6)	0.167
Yes	10 (31.3)	9 (28.1)	19 (59.4)	
Participation in an association or social group				
No	16 (50)	10 (31.3)	26 (81.3)	0.822
Yes	4 (12.5)	2 (6.2)	6 (18.7)	

Source: The authors (2024).

Still on the sociodemographic characterization, described by the macro determinants in Table 4, it was observed that the prevailing level of education was elementary school (n=20; 62.5%), while the occupational activity with the highest proportion was homemaking (n=20; 62.5%).

Regarding housing, most pregnant women owned their own homes (n=28; 87.5%), which were brick buildings (n=19; 59.4%) with four to six rooms (n=18; 56.2%), with no significant association with previous health problems (Table 4).

Table 4. Determinants related to the living and working conditions of pregnant women living in riverside communities, according to previous health problems. Pará, PA, Brazil, 2024

(continued)

Layer 4 – Living and working conditions	Previous health problems			p-value
	No n (%)	Yes n (%)	Total n (%)	
Years of study				
≤equal 9	4 (12.5)	5 (15.6)	9 (28.1)	0.160
10 to 12	15 (46.9)	5 (15.6)	20 (62.5)	
> than 12	1 (3.1)	2 (6.3)	3 (9.4)	
Work activity				
Formal	7 (21.9)	3 (9.4)	10 (31.3)	0.272
Informal	2 (6.2)	0 (0)	2 (6.2)	
From home	11 (34.4)	9 (28.1)	20 (62.5)	

Table 4. Determinants related to the living and working conditions of pregnant women living in riverside communities, according to previous health problems. Pará, PA, Brazil, 2024

(conclusion)

Layer 4 – Living and working conditions	Previous health problems			p-value
	No n (%)	Yes n (%)	Total n (%)	
Housing				
Rented	0 (0)	1 (3.1)	1 (3.1)	0.362
Provided	2 (6.3)	1 (3.1)	3 (9.4)	
Own	18 (56.2)	10 (31.3)	28 (87.5)	
Features of the house				
Masonry	11 (34.4)	8 (25)	19 (59.4)	0.524
Wood	9 (28.1)	4 (12.5)	13 (40.6)	
Number of rooms				
Up to 3	10 (31.2)	4 (12.6)	14 (43.8)	0.354
4 to 6	10 (31.2)	8 (25)	18 (56.2)	
Access to electricity				
No	1 (3.1)	0 (0)	1 (3.1)	0.327
Yes	19 (59.4)	12 (37.5)	31 (96.9)	
Easy access to healthcare services				
No	2 (6.2)	0 (0)	2 (6.2)	0.161
Yes	18 (56.3)	12 (37.5)	30 (93.8)	
The main means of transportation used to reach the health service				
On foot	1 (3.1)	1 (3.1)	2 (6.2)	0.1
Boat	2 (6.2)	2 (6.2)	4 (12.4)	
Speedboat	3 (9.4)	3 (9.4)	6 (18.8)	
River skiff	7 (21.9)	0 (0)	7 (21.9)	
Motorcycle	7 (21.9)	6 (18.8)	13 (40.7)	

Source: The authors (2024).

Regarding socioeconomic factors, as described in Table 5, monthly income was concentrated in less than one minimum wage (n=19; 59.4%), with 22 (n=68.8%) being beneficiaries of some government income transfer program (Table 5).

Regarding the water supply in the residence, it was found that pregnant women predominantly consume untreated water (n=28; 87.6%), with 11 (34.4%) having previous health problems. A statistically significant association was found between this variable and previous health problems (p=0.042). No relevant data were associated with previous health problems regarding solid waste disposal and garbage treatment. Regarding access to health services, practically all pregnant women stated that they always had what they needed (n=30; 93.8%), and more than half used river transportation (n=17; 53.1%) (Table 5).

Table 5. Determinants related to the general socioeconomic and environmental conditions of pregnant women living in riverside areas, according to previous health problems. Pará, PA, Brazil, 2024

Layer 5 – General socioeconomic and environmental conditions	Previous health problems			p-value
	No n (%)	Yes n (%)	Total n (%)	
Family income†				
< 1 minimum wage	13 (40.6)	6 (18.8)	19 (59.4)	0.416
1 to 2 minimum wages	7 (21.8)	6 (18.8)	13 (40.6)	
Beneficiary of a government income transfer program				
No	5 (15.6)	5 (15.6)	10 (31.2)	0.342
Yes	15 (46.9)	7 (21.9)	22 (68.8)	
Water supply				
Cistern	1 (3.1)	1 (3.1)	2 (6.2)	0.042
Straight from the river/untreated	6 (18.8)	0 (0)	6 (18.8)	
Private company	2 (6.2)	0 (0)	2 (6.2)	
Artesian well/untreated	6 (18.8)	8 (25)	14 (43.8)	
Shallow/untreated well	5 (15.6)	3 (9.4)	8 (25)	
Solid waste disposal				
Right on the river	3 (9.4)	0 (0)	3 (9.4)	0.203
Rudimentary pit	7 (21.9)	4 (12.5)	11 (34.4)	
Septic tank	10 (31.2)	8 (25)	18 (56.2)	
Waste destination				
Regular collection	14 (43.8)	8 (25)	22 (68.8)	0.299
Dumped in the open air	2 (6.2)	0 (0)	2 (6.2)	
Buried or cremated	4 (12.5)	4 (12.5)	8 (25)	
Uses teas/herbs to treat any illness				
No	19 (59.4)	10 (31.2)	29 (90.6)	0.281
Yes	1 (3.1)	2 (6.3)	3 (9.4)	

Caption: †Reference value of the minimum wage in Rio de Janeiro at the time of collection: R$1.412,00.
Source: The authors (2024).

DISCUSSION

The results of this study showed that the main social determinants of health among pregnant women living in riverside communities who received routine prenatal care are related to social and community networks and socioeconomic and environmental conditions, corresponding to layers 3 and 5 of Dahlgren and Whitehead's Social Determinants of Health Model, respectively.

The social determinants of the third layer, referring to social and community networks, demonstrate the composition of the support network for pregnant women. The partner's presence during pregnancy, even if considered the primary care network, is a distinguishing factor for the well-being of pregnant women[10]. It was also observed that pregnant women had a spouse, although most did not have a support network, and there was a low association between them and previous health problems. Also in this context, an association with religion was evident, contributing positively to the health

of pregnant women, since it favors the development of a support network, especially spiritual and emotional support[11].

Furthermore, the significant influence of macro health determinants stands out, i.e., factors such as housing, environment, and socioeconomic status, which define the degree of exposure of individuals to the development of diseases and can significantly impact the population's health, especially pregnant women[12].

Historically, rural populations, especially those living in riverside areas, are exposed to poor living conditions that are detrimental to health, as illustrated by the lack of basic sanitation and low access to treated water, which is three times lower than in urban areas, pointing to the vulnerability of these communities to infectious diseases[13].

In this regard, it should be noted that the lack of basic sanitation, especially the lack of water and sewage treatment, is directly linked to the development of diarrhea, intestinal parasites, and other waterborne diseases, since contaminated water favors the spread and persistence of pathogens[14]. As corroborated by a study of children living in riverside communities, which showed an 83% prevalence of intestinal parasitism associated with protozoan helminth infection and 65% of hospitalizations of children under 10 years of age resulting from intestinal parasitic diseases and diarrhea, due to the lack of sewage and treated water[4].

Thus, it is understood that the main risk factors for developing these diseases are contact with contaminated soil and consumption of untreated water, situations common in low-income countries[14]. Similarly, most pregnant women reported previous health problems and income below the minimum wage, in addition to working in informal jobs and depending on government financial assistance, highlighting their economic vulnerability and, consequently, greater exposure to risks.

In addition, it is worth highlighting the exposure of riverside communities to toxic waste from mercury and its derivatives, which are discarded into the environment by illegal mining activities and can cause maternal and fetal complications, since the chemical compound in question is considered teratogenic. Its presence has already been detected in the breast milk and placenta of contaminated pregnant women living in riverside communities[15]. Similarly, most participants reported consuming untreated water and having previous health problems, which may also be related to environmental social determinants.

A relationship was also identified between distal determinants and obesity/overweight, such as income and educational level, given that this condition is more prevalent among pregnant women in situations of social vulnerability and low educational attainment[16].

Nevertheless, lack of physical activity emerged as an important factor in health conditions, since the majority of participants reported not engaging in physical exercise and, at the same time, almost half reported being overweight or obese. It is well known that physical activity prevents excessive weight gain, and pregnant women who exercise regularly are more likely to gain weight appropriately[17].

It is important to highlight the cultural context as a strong social determinant of health, as women are discouraged from practicing physical activities due to the belief that it may pose risks to the baby[3]. However, it is known that this habit promotes healthy pregnancy, reducing the risk of gestational diabetes, preeclampsia, excessive weight gain, and symptoms of depression, in addition to providing positive outcomes for the

health of women and children[18]. Lack of physical activity can lead to obesity, which is a risk factor for other conditions such as hypertension, diabetes, dyslipidemia, and cardiovascular disease, as well as the risk of maternal and fetal death[3].

Regarding dietary patterns, there was a noticeable preference for fruits and vegetables over high-calorie processed foods. Nevertheless, it is necessary to invest in educational initiatives and strategies aimed at improving diet, since pregnant women reported previous health problems related to anemia and obesity.

In a study conducted with pregnant women living in riverside communities, an increase in the consumption of ultra-processed foods was observed during periods of fish scarcity, which is the main source of food during high tide, in addition to a preference for canned products due to their easier preservation without the need for electricity and lower market cost[7].

Thus, it is assumed that recent dietary habits may have been adjusted based on the guidance received during prenatal care, in light of the risks identified, since most pregnant women were overweight or obese. Guidance during prenatal care is crucial for adopting healthy habits, as women are sensitive to behaviors that will ensure a problem-free pregnancy[19].

In addition, more than half of pregnant women reported sleep disturbances, one of which was insomnia, which may be related to anxiety. It is known that during pregnancy, women are naturally more emotionally vulnerable, becoming more susceptible to developing anxiety and depression, which can contribute to further complications during pregnancy, childbirth, and the postpartum period[20].

Factors such as changes in sleep patterns and quality, weakened support networks, lack of physical activity and leisure activities, and restrictions on self-care act as risk factors for mental health problems[21]. In this context, it is important to understand that the position occupied by women living in riverside communities is often limited to domestic activities, due both to the cultural context, in which the female role is exclusively assigned to caring for others, and to limited access to leisure activities, which significantly influences the emergence of symptoms related to mental illness[22].

The limitations of this study refer to its implementation in only two riverside Family Health Strategies (ESFR), a fact that restricts the generalization of the results to other riverside contexts in the North region and other regions of Brazil.

CONCLUSION

The analysis of social determinants of health among pregnant women living in riverside communities who received routine prenatal care identified that the main determinants influencing maternal health are related to social and community networks and the social, cultural, and environmental context. These factors must be considered when adopting strategic measures to address the issue and thus ensure the effectiveness of prenatal care.

It is understood that the findings of this study enable reflection on the need for a broader view of prenatal care, which goes beyond the clinical approach to include actions that are sensitive to the needs of pregnant women and the identification of social determinants of health that can compromise their quality of life. These actions may favor

the development of essential skills for qualified care, which must be contextualized with the social reality of pregnant women.

Furthermore, it is hoped that the research will contribute to new studies on health in the riverside context that aim to minimize health inequalities among this population, given that such scientific work is still scarce in the literature.

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REFERENCES

1. Pereira AA, Rodrigues ILA, Nogueira LMV, Palmeira IP, Nunes HHM, de Andrade EGR, et al. Social representations of pregnant women about high-risk pregnancy: repercussions for prenatal care. Rev Esc Enferm USP [Internet]. 2023 [cited 2024 Sep 16];57:e20220463. Available from: https://doi.org/10.1590/1980-220X-REEUSP-2022-0463en

2. Gadelha IP, Diniz FF, Aquino PS, da Silva DM, Balsells MMD, Pinheiro AKB. Social determinants of health of high-risk pregnant women during prenatal follow-up. Rev Rene [Internet]. 2020 [cited 2024 Jun 1];21:e42198. Available from: https://doi.org/10.15253/2175-6783.20202142198

3. da Silva MVB, Ferreira ET, de Lima Filho CA, Basílio VKV, Lobo MJS, Gava PHR, et al. Efeitos dos determinantes sociais da saúde na hipertensão: uma revisão sob a luz do modelo de Dahlgren e Whitehead. J Educ, Sci Health [Internet]. 2023 [cited 2024 Sep 16];3(1):1-13. Available from: https://doi.org/10.52832/jesh.v3i1.172

4. Santos IO, Rabello RED, Corrêa RG, Melo GZS, Monteiro AX. Advances and challenges for the health of the riverside populations in the Amazon region: an integrative review. Rev APS [Internet]. 2021 [cited 2024 Jun 12];24(Suppl 1):185-99. Available from: https://periodicos.ufjf.br/index.php/aps/article/view/34823/24351

5. World Health Organization (WHO). Trends in maternal mortality 2000 to 2020: estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA/Population Division [Internet]. Geneva: WHO; 2023 [cited 2024 Jun 12]. Available from: https://www.who.int/publications/i/item/9789240068759

6. Leal MC, Pereira APE, Viellas EF, Domingues RMS, Gama SGN. Prenatal care in the Brazilian public health services. Rev Saúde Pública [Internet]. 2021 [cited Jun 12];8:1-12. Available from: http://doi.org/10.11606/s1518-8787.2020054001458

7. da Rocha CGG, Heidemann ITSB, de Souza JB, Durand MK, Maciel KS, Backes MTS. Social determinants as a way to promote health in prenatal care: perception of primary care professionals. Rev Enferm UFSM [Internet]. 2021 [cited 2024 Jul 10];11:e64. Available from: https://doi.org/10.5902/2179769264518

8. Pereira AA, da Silva FO, Brasil GB, Rodrigues IAL, Nogueira LMV. Perceptions of riverine pregnant women on prenatal care. Cogitare Enferm [Internet]. 2018 [cited 2024 Jun 15];23(4):e54422. Available from: http://dx.doi.org/10.5380/ce.v23i4.54422

9. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting

observational studies. Int J Surg. [Internet]. 2014 [cited 2024 Aug 12];12(12):1495-9. Available from: http://dx.doi.org/10.1016/j.ijsu.2014.07.013

10. Crisóstomo BS, do Nascimento AS, de Oliveira RA, Balsells MMD, Ribeiro SG, Gadelha IP, et al. Social determinants of health and psychoactive drug use in pregnancy. Acta Paul Enferm [Internet]. 2022 [cited 2024 Jul 10];35:eAPE0340345. Available from: https://www.scielo.br/j/ape/a/Hs3mVc3c4cdV3t5GwQhjDSS/?lang=en

11. Bührer FC, Ornell F. Evidências científicas sobre os benefícios da religião/espiritualidade em pacientes oncológicos. Rev Bras Psicoter [Internet]. 2022 [cited 2024 Jul 10];24(1):63-90. Available from: https://doi.org/10.5935/2318-0404.20220005

12. de Arruda LR, Ramos ARS. Importância do diagnóstico laboratorial para a sífilis congênita no pré-natal. J Manag Prim Health Care [Internet]. 2020 [cited 2024 Jul 10];12:e12. Available from: https://doi.org/10.14295/jmphc.v12.511

13. Guimarães AF, Barbosa VLM, da Silva MP, Portugal JKA, Reis MHS, Gama ASM. Access to health services for riverside residents in a municipality in Amazonas State, Brazil. Rev Pan Amaz Saúde. [Internet]. 2020 [cited Jul 24];11:e202000178. Available from: http://dx.doi.org/10.5123/s2176-6223202000178

14. Garn JV, Wilkers JL, Meehan AA, Pfadenhauer LM, Burns J, Imtiaz R, et al. Interventions to improve water, sanitation, and hygiene for preventing soil-transmitted helminth infection. Cochrane Database Syst Rev [Internet]. 2022 [cited 2024 Jul 26];6:CD012199. Available from: https://doi.org/10.1002/14651858.cd012199.pub2

15. Medeiros MF, Batista GCV, Cordova JVS, Santos LS, de Lima RM, de Sousa MVV. Fundamentals of nursing care in primary care for riverside pregnant women affected by the dumping of mercury in bodies of water. Glob Clin Res [Internet]. 2022 [cited 2024 Jul 27];2(2):e31. Available from: https://doi.org/10.5935/2763-8847.20220031

16. Lana TC, Oliveira LVA, Martins EF, Santos NCP, Matozinhos FP, Felisbino-Mendes MS. Prevalence, associated factors and reproductive outcomes related to excessive gestational weight gain. Rev Enferm UERJ [Internet]. 2020 [cited Jul 30];28:e53127. Available from: http://dx.doi.org/10.12957/reuerj.2020.53127

17. Silva-Jose C, Sánchez-Polán M, Barakat R, Díaz-Blanco Á, Martínez VC, Benasach FG, et al. exercise throughout pregnancy prevents excessive maternal weight gain during the COVID-19 pandemic: a randomized clinical trial. J Clin Med [Internet]. 2022 [cited Aug 11];11(12):3392. Available from: https://doi.org/10.3390/jcm11123392

18. de Freitas IGC, Lima CA, Santos VM, Silva FT, Rocha JSB, Dias OV, et al. Physical activity level and associated factors among pregnant women: a population-based epidemiological study. Ciên Saúde Colet [Internet]. 2022 [cited 2024 Jul 22];27(11):4315-28. Available from: https://doi.org/10.1590/1413-812320222711.07882022EN

19. Cruz IFS, Fernandes DLO, Arruda SPM, de Carvalho NS, de Azevedo DV, Maia CSC. The contribution of prenatal care in the dietary patterns of high-risk pregnant women. Rev Bras Saúde Mater Infant [Internet]. 2022 [cited 2024 Jul 30];22(4):879-889. Available from: http://dx.doi.org/10.1590/1806-9304202200040009

20. Kiepura E, Kmita G. Antenatal depression and anxiety in primiparous Polish mothers and fathers. Ginekol Pol [Internet]. 2020 [cited 2024 Aug 14];91(1):24-8. Available from: https://doi.org/10.5603/gp.2020.0006

21. da Silva JKAM, dos Santos AAP, Pontes CO, Silva JMO, Nascimento YCML, dos Santos CIR. Identification of early signs of change/mental disorders in postpartum to promote self-care. R Pesq Cuid Fundam [Internet]. 2023 [cited 2024 Aug 26];16:e11705. Available from: https://doi.org/10.9789/2175-5361.rpcfo.v16.11705

22. Parreira BDM, Goulart BF, Ruiz MT, Monteiro JCS, Gomes-Sponholz FA. Anxiety symptoms among rural women and associated factors. Esc Anna Nery [Internet]. 2021 [cited 2024 Aug 26];25(4):e20200415. Available from: https://doi.org/10.1590/2177-9465-EAN-2020-0415

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Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **de Souza YJP, Nogueira LMV, Trindade LNM, Rodrigues ILA, dos Santos DN.** Drafting the work or revising it critically for important intellectual content - **de Souza YJP, Nogueira LMV, Trindade LNM, Rodrigues ILA, dos Santos DN, Lima IB.** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **de Souza YJP, Nogueira LMV, Trindade LNM.** All authors approved the final version of the text.

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