Saúde e Pesquisa
DOI: 10.17765/2176-9206.2023v16n2.e11200

Adolescent pregnancy: epidemiological aspects of early motherhood in the state of Pará, Brazil

Gravidez na adolescência: aspectos epidemiológicos da maternidade precoce no estado do Pará, Brasil

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ABSTRACT
Adolescence is the transition phase to adulthood when physical, mental, and behavioral changes occur. The study evaluated the fertility rate of women aged 15 to 19 years living in the health macroregions of the state of Pará and their sociodemographic parameters, pregnancy and childbirth, from 2010 to 2020. The study is descriptive and analytical and uses data from SINASC/DATASUS. In 2014, the highest fertility rate (106.5%) was in Health Macroregion III. Single mothers or mothers in consensual unions, brown color/race, and between 8 and 11 years of study were the predominant ones. They had four to six prenatal care appointments between 37 and 41 weeks. Early pregnancy in adolescents exposes them to social and health risks such as school dropout, lack of support network in baby care, disadvantage in the labor market, and mental health problems.

Keywords: Pregnancy in adolescence. Reproductive health. Fertility rate.

RESUMO
A adolescência é caracterizada por modificações físicas, mentais e comportamentais nesta fase de transição para a vida adulta. Avaliaram-se a taxa de fecundidade de mulheres de 15 a 19 anos residentes nas macrorregiões de saúde do estado do Pará e seus parâmetros sociodemográficos, da gestação e parto, no período de 2010 a 2020. O estudo é descritivo e analítico e utilizou dados do SINASC/DATASUS. Em 2014, a maior taxa de fecundidade (106,5%) foi na Macrorregião de Saúde III. As mães solteiras ou em união consensual, cor/raça parda e entre 8 a 11 anos de estudo foram as predominantes. O pré-natal foi de quatro a seis consultas entre 37 e 41 semanas. A gravidez precoce em adolescentes expõe a riscos sociais e de saúde como abandono escolar, falta de rede de apoio nos cuidados do bebê, prejuízo na colocação no mercado de trabalho e problemas de saúde mental.

Palavras-chave: Gravidez na adolescência. Saúde reprodutiva. Taxa de fecundidade.

Recebido em setembro 15, 2022
Aceito em Maio 21, 2023

INTRODUCTION

Adolescence is the second decade of life during human development, in which transformations and adaptations occur in the biological, psychological, and sociocultural dimensions of an individual1. This phase is when individuals discover the body and sexual pleasure, enabling an increase in the risks of early and unwanted pregnancy2.

The World Health Organization (WHO) has established the age group of 10 to 19 years corresponding to adolescence3. The Statute of the Child and Adolescent (ECA) defines "child" as a person up to 12 incomplete years of age; and "adolescent," as one who has between 12 and 18 years of age4. The Statute of Youth defined "young-adolescents" as those between 15 and 17 years old5. The age milestone is fundamental for the planning and implementation of public policies; however, due to the singularities of ages and experiences, comprehensive healthcare for this group remains a challenge6.

Annually, about 16 million women between the ages of 15 and 19 become pregnant in the world7. Teenage pregnancy is a condition that poses a elevate risk, both for the health of the mother and the newborn, since cases of hypertensive syndrome, premature birth, anemia, among others, are frequent8. In this age group, due to complications, the probability of the mother's death is twice as high when compared to those of young adults8. Moreover, when pregnancy is unwanted and/or has no family support, abortions are caused in inappropriate conditions in countries where the practice is clandestine, becoming the main cause of death of adolescents8.

Some other difficulties are associated with teenage pregnancy, such as sexually transmitted infections (STIs), drug use, eating disorders, depression, and violence9,10,6. Low socioeconomic conditions are related to these experiences, and, together, they influence school dropout, lack of professional qualification, and abandonment of life projects, which accentuate social vulnerability10,11. In this way, underdeveloped countries have the highest numbers of cases of adolescent parturients on a global scale12.

Brazil is one of the leaders in relation to early motherhood in Latin America, with a risk of pregnancy four times higher than the countries of Europe13,14. In 2020, Brazil registered 14% of live births to adolescents up to 19 years of age, and the highest average (21.3%) is registered in the North region, in addition to the Northeast and Midwest regions15,16. The analysis of the spatial variation of teenage pregnancy conducted in Brazil showed that the highest median fertility rate occurred in women aged 15 to 19 with less than eight years of education, living in the North, Midwest and Northeast regions14. In the North region, the state of Pará occupies the second position with the highest incidence of adolescent mothers17.

Due to the high rates that expose the complexity of the subject and point to a major public health problem, the study aimed to analyze the fertility rate as well as maternal and newborn characteristics of adolescents aged 15 to 19 years living in the health macroregions of the state of Pará, from 2010 to 2020.

METHODOLOGY

This is a descriptive, analytical, and retrospective study of live births according to the place of residence of adolescent mothers in the health macroregions of the state of Pará from 2010 to 2020. It has the second-largest territory in Brazil, with an area of 1,245,870,700 km²18. It is also the most populous in the northern region

with 8,777,124 inhabitants and a demographic density of 6.07 inhabitants/km²19. In the country, it occupies the 23rd position in the ranking of the Municipal Human Development Index (MHDI), with 0.698, appearing along with three other Federative Units of medium development20. The state of Pará consists of four health macroregions, which bring together 13 health regions and 144 municipalities (Figure 1).

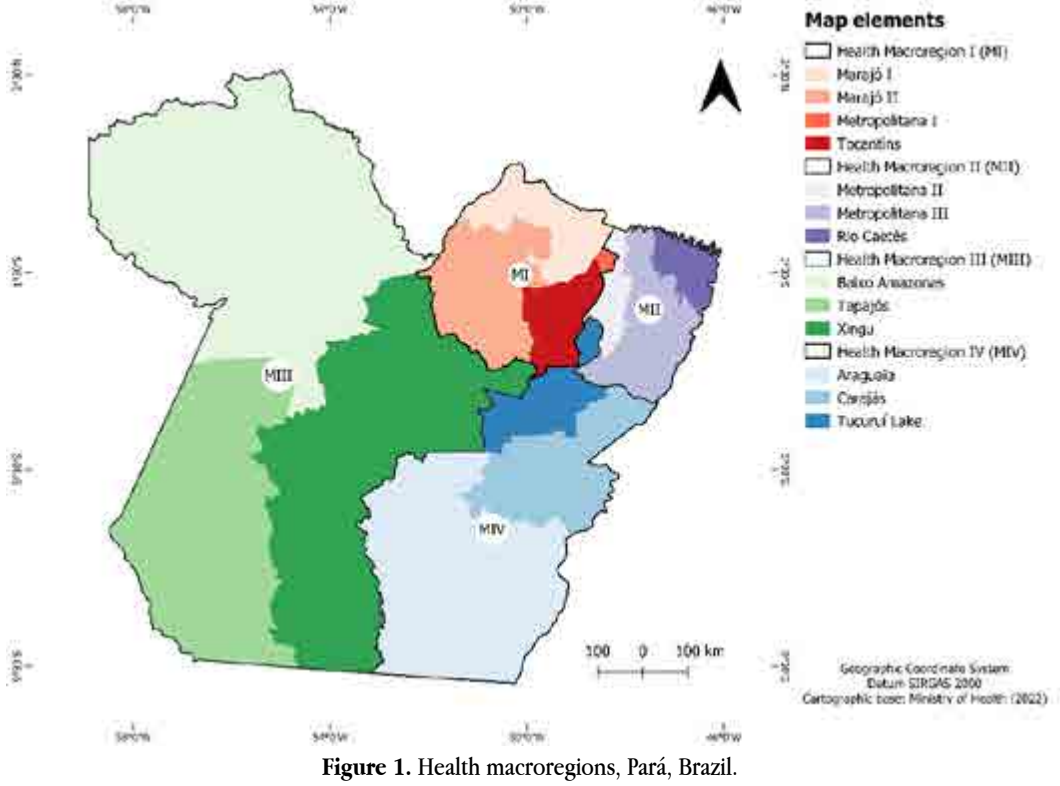

Figure 1. Health macroregions, Pará, Brazil.

The 'health macroregion' is defined as an expanded regional space that guarantees the resoluteness of the Health Care Network (RAS)21. The "health regions" are integrated into it, determined as the geographical space formed by a group of bordering municipalities, which share cultural, economic, and social identities, as well as communication networks and shared transport infrastructure22. The macroregions of the state are, then, divided into Health Macroregion I (Marajó I, Marajó II, Metropolitana I, Tocantins), Health Macroregion II (Metropolitana II, Metropolitana III, Rio Caetés), Health Macroregion III (Baixo Amazonas, Tapajós, Xingu), and Health Macroregion IV (Araguaia, Carajás, Tucuruí Lake)23.

The study collected the data from the database of the Department of Informatics of the Unified Health System (DATASUS), through the Information System on Live Births (SINASC), and other estimates imported from the Ministry of Health (MS). In SINASC, the variables selected for the mother aged 15 to 19 years were: the number of live births; education; marital status; self-declared color/race; prenatal appointments; duration of pregnancy; type of delivery; and birth weight. In the demographic and socioeconomic statistics of DATASUS, the analysis considered population estimates for females aged 15 to 19 years.

The specific fertility rate (SFR) measures the intensity of fertility to which women are subject in each age group of the reproductive period, from 15 to 49 years. Thus, for each year and health macroregion, the SFR was calculated by dividing the number of live births to resident

mothers aged 15 to 19 years by the total resident female population of the same age group, the result of which was multiplied by one thousand.

In data analysis, the study used bivariate inferential statistics with the chi-square test ($\chi 2$) for independence to correlate the categorical variables24. The degree of association was verified using the coefficient V (Crámer), which provides a measure between 0 and 1. The significance level established was 5% ($p < 0.05$). Also, the study analyzed the adjusted standardized residuals, which allows the evaluation of how the boxes expressed in the contingency tables contribute to the 2 calculated24. The analysis considered significant positive residuals higher than a standard deviation of 1.96 or negative residuals lower than a standard deviation of 1.96 ($\alpha < 0.05$), i.e., when the observed frequencies differ from those expected.

For each cell analyzed, the analysis tested the null hypothesis versus the alternative hypothesis to verify whether or not the sociodemographic variables of pregnancy and childbirth are independent of the health macroregions. The null hypothesis assumes there is no such association (independence), while the alternative determines that they are associated (non-independence).

The data were tabulated in Microsoft Office Excel 2019 and then statistically analyzed with IBM SPSS Statistics 20 software. The study does not require submission to the Research Ethics Council, as it did not identify subjects, but only secondary data in the public domain.

RESULTS

From 2010 to 2020, there were 370,903 live births to adolescent mothers aged 15 to 19 years. The Specific Fertility Rate (SFR) of this age group was higher in the Health Macroregion III if compared to the rate of the others, especially in 2014, with 106.5% (Figure 2). The SFRs of the other health macroregions declined, being below 80% in the last year analyzed, 2020, which presented the lowest value (61.5%). Health Macroregions II and IV had similar rates in the first three years, being 99.3 and 98.1%, 98.3 and 97.7%, and 92.2 and 92.7%, respectively.

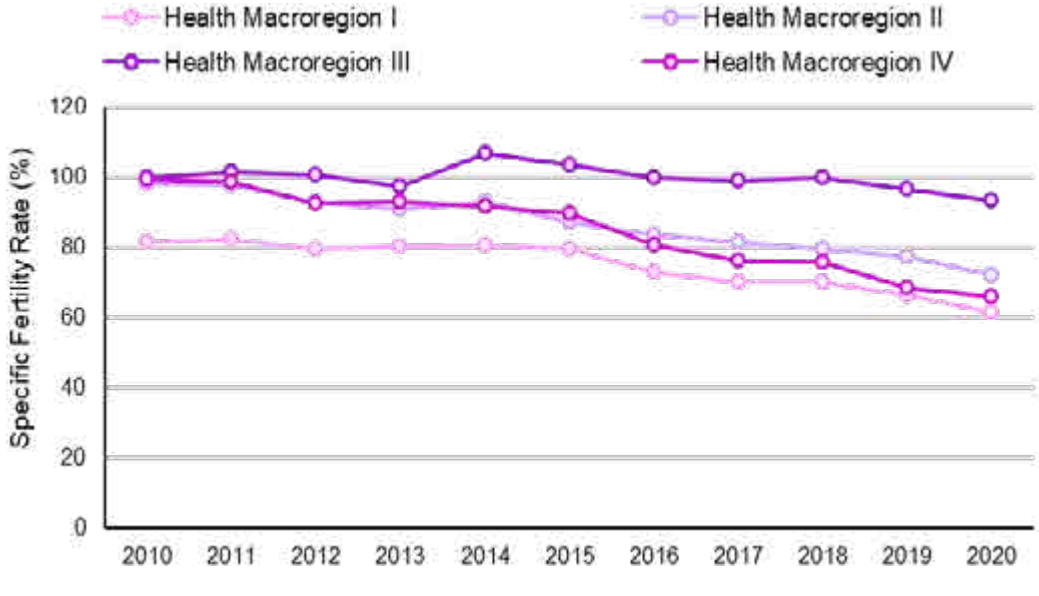

Figure 2. Specific fertility rate of young-adolescents people aged between 15 and 19 years, in each health macroregion of the state of Pará, in the years 2010 to 2020.

In the maternal sociodemographic aspects, the length of study (schooling) of 8 to 11 years predominated among adolescents from 2010 to 2020 (Table 1). Health Macroregions I and II had more than half of the mothers with single marital status. In Health Macroregions III and IV, young women had consensual unions. The self-declared color/race was mostly brown, covering 90% of all adolescents in the health macroregions (n = 333,740).

Table 1. Sociodemographic profile of adolescent mothers in the health macroregions of Pará from2010-2020

Sociodemographic variable	Health Macroregion								p*
	I		II		III		IV		
	n	%	n	%	n	%	n	%	
Mother's schooling (years)									**<0.0001**
None	**835**	0.64	**371**	0.44	440	0.61	**578**	0.69	
1 to 3	7,023	5.34	**5,111**	6.08	**3,313**	4.62	**4,097**	4.90	
4 to 7	**55,931**	42.54	**37,740**	44.90	**27,702**	38.61	**32,850**	39.29	
8 to 11	**61,984**	47.14	**37,993**	45.20	**37,019**	51.59	**43,883**	52.49	
12 and more	**2,236**	1.70	**1,125**	1.34	**1,001**	1.40	**1,135**	1.36	
Ignored	**3,479**	2.65	**1,716**	2.04	**2,280**	3.18	**1,061**	1.27	
Mother's marital status									**<0.0001**
Single	**74,045**	56.31	**45,757**	54.44	**30,497**	42.50	**34,513**	41.28	
Married	**4,663**	3.55	**2,955**	3.52	**5,219**	7.27	**6,346**	7.59	
Widow	**53**	0.04	44	0.05	35	0.05	**61**	0.07	
Judicially separated	**79**	0.06	81	0.10	**85**	0.12	75	0.09	
Consensual union	**50,807**	38.64	**34,066**	40.53	**34,709**	48.37	**41,876**	50.09	
Ignored	**1,841**	1.40	1153	1.37	**1,210**	1.69	**733**	0.88	
Mother's color/race									**<0.0001**
White	**6,529**	4.97	**3,308**	3.94	**3,702**	5.16	**7,221**	8.64	
Black	**1,630**	1.24	**1,215**	1.45	**1,567**	2.18	**3.015**	3.61	
Yellow	**148**	0.11	133	0.16	**73**	0.10	**237**	0.28	
Brown	**121,239**	92.21	**78,233**	93.07	**62,934**	87.71	**71,334**	85.32	
Indigenous	**91**	0.07	**247**	0.29	**2,616**	3.65	**1,179**	1.41	
Ignored	**1,851**	1.41	920	1.09	863	1.20	**618**	0.74	

* Values in bold have significant 2 ($p < 0.05$) and significant residue (< 0.05).

For the variables related to pregnancy and childbirth, the Health Macroregions of Pará showed similar values (Table 2). From 2010 to 2020, adolescent mothers attended four to six prenatal appointments, representing 42.4% (n = 157,222) of the total. The duration of gestation was concentrated from 37 to 41 weeks, with 77.2% (n = 286,402). The most frequent type of delivery was vaginal, 61.7% (n = 228,686). The analysis confirmed the same percentage for those born weighing between 3 kg and 3.9 kg (n = 228,861).

Table 2. Characteristics of adolescent pregnancy and childbirth in the health macroregions of Pará, in 2010-2020

Variable	Health Macroregion								p*
	I		II		III		IV		
	n	%	n	%	n	%	n	%	
Prenatal appointments									**<0.0001**
None	**8.979**	6.83	**5,092**	6.06	**2,647**	3.69	**1,598**	1.91	
1 to 3	**22,273**	16.94	**12,036**	14.32	**12,314**	17.16	**14,703**	17.59	
4 to 6	**52,706**	40.08	**37,540**	44.66	30,356	42.31	**36,620**	43.80	
7 or more	46,934	35.69	**29,092**	34.61	**25,944**	36.16	**30,383**	36.34	
Ignored	596	0,45	**296**	0.35	**494**	0,69	**300**	0.36	
Duration of gestation (weeks)									**<0.0001**
Under 22	91	0.07	47	0.06	58	0.08	52	0.06	
22 to 27	653	0.50	428	0.51	**442**	0.62	418	0.50	
28 to 31	**1,568**	1.19	**1,023**	1.22	986	1.37	**1,143**	1.37	
32 to 36	**14,233**	10.82	**9,140**	10.87	8,109	11.30	**9,741**	11.65	
37 to 41	**102,499**	77.95	**63,764**	75.86	**55,046**	76.71	**65,093**	77.86	
42 or more	**5,350**	4.07	3,942	4.69	**4,182**	5.83	**4,389**	5.25	
Ignored	**7,094**	5.40	**5,712**	6.80	**2,932**	4.09	**2,768**	3.31	
Type of delivery									**<0.0001**
Vaginal	**80,196**	60.99	**50,267**	59.80	**51,261**	71.44	**46,962**	56.17	
Caesarius	**51,151**	38.90	**33,571**	39.94	**20,384**	28.41	**36,571**	43.74	
Ignored	**141**	0.11	**218**	0.26	110	0.15	**71**	0.08	
Birth weight (g)									**<0.0001**
Less than 500	231	0.18	**157**	0.19	120	0.17	**94**	0.11	
500 to 999	**573**	0.44	**285**	0.34	249	0.35	303	0.36	
1,000 to 1,499	**881**	0.67	504	0.60	**404**	0,56	506	0,61	
1,500 to 2,499	**11,089**	8.43	**5,896**	7.01	**5,178**	7.22	**5,748**	6.88	
2,500 to 2,999	**37,765**	28.72	**20,948**	24.92	**18,123**	25.26	**19,932**	23.84	
3,000 to 3,999	**77,468**	58.92	**53,024**	63.08	**44,801**	62.44	**53,568**	64.07	
4,000 and more	**3,377**	2.57	**3,170**	3.77	**2,685**	3.74	**3,409**	4.08	
Ignored	**104**	0.08	**72**	0.09	**195**	0.27	**44**	0.05	

* Values in bold have significant 2 ($p < 0.05$) and significant residue (< 0.05).

The $\chi 2$ test for independence pointed to a statistical association between health macroregions and all variables, rejecting the null hypothesis. Although significant ($p < 0.0001$), the V coefficient showed a weak association, with indices of 0.096 for color/race; 0.087 for marital status; 0.076 for the type of delivery; 0.058 for prenatal appointments; 0.043 for the mother's education; 0.040 for birth weight; and 0.038 for pregnancy duration.

DISCUSSION

Early pregnancy is a relevant reality in Brazilian society, despite not being planned. This scenario can cause unexpected changes in the family life of adolescents and their families2,25,26. Even though it is a reality in the country, it is possible to evidence consecutive drops in its numbers since the 1960s27.

Among the factors that seem to contribute to the maintenance of the indices, the "reproductive coercion" stands out28. This type of measure disregards reproductive autonomy through pressure from the spouse and family or inadequate reproductive planning, in the sense of denying contraception or instituting barriers to access to methods chosen by adolescents28. Otherwise, the guarantee of sexual and reproductive rights can both avoid unwanted pregnancy and provide less risk in the choice of outcome, so it is essential for gender equality and women's well-being29.

In contrast, the analysis found that the fertility rate of adolescents living in the state of Pará was high from 2010 to 2020, with a predominance of brown women. Unlike this scenario, a drop in the fertility rate was observed between 1991 and 2000, more evident among black women, vulnerable and with lower education, living in rural areas and the North and Northeast regions. The cause may have been the desire to postpone motherhood and the growth of female schooling30.

This study highlighted that the lower fertility percentages observed occurred from 2018 and can be justified by the increased access to information on sexual and reproductive life and access to contraceptive methods. Mortality from the new coronavirus (SARS-CoV-2), which affected the Northern region with greater intensity, should also be considered31. Another reason for the reduction in SFR relates to the determination of social isolation as a preventive measure during the Covid-1932 pandemic. Still, there is the scenario of postponement of pregnancy due to the instability generated in the pandemic context, which can lead to the effect "baby boom," that is, a future explosion of birth rates, as already observed in other epidemics32.

Regarding the school education of mothers, the period between 8 and 11 years of study was predominant in all health macroregions. A shorter length of study (4-7 years) may result in limited access to adequate information on sexual and reproductive health since together, the school and the family, are the sources of this information33. This school lag, combined with the lack of socioeconomic assistance, can trigger the abandonment of educational projects and difficulties in the professional career34. In addition, the level of education of the pregnant adolescent interferes with the fertility rate in an inversely proportional ratio13.

The school is the space for debate and has a key role in clarifying safe information to adolescents to prevent early and unwanted pregnancy. In addition, the household should also be an environment for questioning, but the lack of dialogue with the family on the subject can lead to making wrong decisions at this time of life35. In this sense, studies report an association with sexual initiation, early pregnancy, and marriage among adolescents who did not attend school in African and Asian countries36,37,38.

The marital status "in consensual union" for Health Macroregions III and IV shows a possible family structure, whether it is nuclear or

not. In the other health macroregions, the large number of unmarried women may reveal the establishment of female single-parent families, whose responsibility for the child is entirely the mother's, to whom she begins to give greater attention and care when she does not have the presence of her spouse. If, on the one hand, this condition leads to greater female independence, on the other, it can burden the mother39. Most adolescents with marital status "single" and members of non-nuclear families presented risk factors for early pregnancy, a different situation compared to young women from families formed by couples of both sexes34. In a study conducted in Goiás, in the Brazilian Midwest region, 30% of pregnant adolescents were single, and 75% did not plan it40.

The characteristics of adolescent pregnancy and childbirth in all health macroregions achieved the expected for a healthy pregnancy-puerperal cycle41,42. The prenatal appointments of the adolescents in this study reached the number between four and six. The minimum number recommended by the Ministry of Health is six appointments41. In addition, early adherence to visits from the first trimester decreases the chance of maternal and infant morbidity and mortality41. Pregnant adolescents often have inadequate access to prenatal care, tending to start it later and have a lower number of appointments when compared to adults43.

The average duration of gestation was between 37 and 41 weeks. These data are consistent with the time limit of the gestation period indicated by the American College of Obstetricians and Gynecologists (ACOG) and the Society of Maternal-Fetal Medicine (SMFM)42,44,45. Vaginal deliveries were predominant among adolescents in the state of Pará. This mode of delivery is also more frequent among Brazilian adolescents (62.9%), especially those from the state of Minas Gerais (54,7%) since the probability of prematurity is lower in this condition41,45,46. Concomitantly, the weight of the newborns was within the normal range, considered low when less than 2.5 kg41. In Brazil and other countries, there has been a greater probability of premature birth in adolescent pregnant women; newborn with low birth weight; maternal and infant mortality; in addition to other complications during pregnancy47,48.

CONCLUSION

The number of live births of adolescent mothers in Pará highlights the difficulties faced in the sexual and reproductive health education of adolescents. Despite high fertility, rates showed a declining trend in all health macroregions of the state. In these, the adolescents had predominantly between 8 and 11 years of study; however, the school length between 4 and 7 years was relevant. The marital status "single" was predominant in Health Macroregions I and II. The brown color/race corresponded to the sociodemographic profile of the territory and corroborated the existence of racial inequalities of reproductive autonomy.

Prenatal follow-up was within the recommended limit, but adolescents living in Health Macroregions I and II did not attend all their appointments. The data from 37 to 41 weeks of gestational age, predominantly vaginal delivery, and the weight of 3 kg to 3.9 kg of the newborn were considered satisfactory for a healthy pregnancy, as well as the adequate development of the newborn.

Early adolescent pregnancy is worrying because it can result in emotional and socioeconomic losses, such as dropping out of school and inability to continue studies, especially in higher education, lack of support networks in baby care, difficulties in entering the labor market, and mental health problems. Thus, the healthcare for pregnant adolescents in Pará is sufficient but not ideal. Public health policies need to expand, qualify, and humanize this assistance to make progress.

By presenting a pattern inversely proportional to the level of education, the fertility rate can be used as an indicator by public policy administrators. To prevent and control this condition that interferes with families and the Unified Health System, the increase in education is a priority since formal education will reflect on the sexual and reproductive health of the population.

The lack of current data from the SINASC is pointed out as a limitation of this research, which hindered the observation of behaviors of early pregnancy during the second year of the Covid-19 pandemic.

ACKNOWLEDGEMENTS

This work was conducted with the support of the Coordination for the Improvement of Higher Education Personnel – Brazil (CAPES) – funding Code 001.

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