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ARTIGO ORIGINAL

## THE ADEQUACY OF PRENATAL CARE IN A SOUTHERN BRAZILIAN UNIVERSITY HOSPITAL

*Adequação do pré-natal em um hospital universitário do sul do Brasil**Adecuación de la atención prenatal en un hospital universitario del sur de Brasil*Clarice dos Santos Mottecy<sup>1</sup> Patrícia Molz<sup>2</sup> Raquel Montagner Rossi<sup>3</sup> Itamar dos Santos Riesgo<sup>3</sup>   
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### ABSTRACT

**Introduction:** the purpose of prenatal care is to identify risk factors in a timely manner in order to take action to prevent disease and maintain a high level of attention to maternal and child health during pregnancy. While there has been increasing quality and access to maternal health care globally, many times the level of adequacy of Prenatal Care is unfortunately inappropriate or insufficient. **Objective:** to evaluate the adequacy of prenatal care for puerperae of the Basic Health Network in a Southern Brazilian University Hospital and associated it with sociodemographic and health determinants. **Method:** prospective cross-sectional study, with information obtained through a questionnaire/interview, medical record and the pregnant card of the mothers admitted to the Obstetrics Service in a Southern Brazilian University Hospital. **Results:** overall, 61.1% of the women reported starting prenatal care before the 14th-week of pregnancy, with prenatal care considered as adequate in 67.0% of women. Adequate prenatal care was associated with first pregnancy, planned pregnancy and higher gestational age. Inadequate prenatal care, on the other hand, was associated with a higher number of pregnancies, low education, lower gestational age, and an incomplete prenatal booklet. **Conclusion:** inadequate prenatal care was associated with multiparity, educational level, gestational age and an incomplete prenatal booklet.

**Keywords:** Prenatal booklet; Gestation; Mother; Women's Health.

### RESUMO

**Introdução:** a finalidade do pré-natal é identificar os fatores de risco em tempo hábil, a fim de tomar medidas para prevenir doenças e manter um alto nível de atenção à saúde materna e infantil durante a gravidez. Embora tenha havido um aumento da qualidade e do acesso aos cuidados de saúde materna em todo o mundo, muitas vezes o nível de adequação dos cuidados pré-natais é, infelizmente, inadequado ou insuficiente. **Objetivo:** avaliar a adequação da assistência pré-natal às puérperas da Rede Básica de Saúde em um Hospital Universitário do Sul do Brasil e associá-la aos determinantes sociodemográficos e de saúde. **Método:** estudo transversal prospectivo, com informações obtidas por meio de questionário/entrevista, prontuário e cartão de gestante das mães internadas no Serviço de Obstetria de um Hospital Universitário do Sul do Brasil. **Resultados:** no geral, 61,1% das mulheres relataram iniciar o pré-natal antes da 14ª semana de gestação, sendo o pré-natal considerado adequado em 67,0% das mulheres. O pré-natal adequado esteve associado à primeira gravidez, gravidez planejada e maior idade gestacional. Já o pré-natal inadequado esteve associado à maior número de gestações, baixa escolaridade, menor idade gestacional e caderneta de pré-natal incompleta. **Conclusão:** pré-natal inadequado esteve associado à multiparidade, escolaridade, idade gestacional e caderneta de pré-natal incompleta.

**Palavras-chave:** Caderneta Pré-Natal; Gestação; Mãe; Saúde da Mulher.

### RESUMEN

**Introducción:** el propósito de la atención prenatal es identificar los factores de riesgo de manera oportuna para tomar medidas preventivas y mantener un alto nivel de atención a la salud materna e infantil durante el embarazo. Aunque ha habido un aumento en la calidad y acceso a la atención materna a nivel mundial, muchas veces el nivel de adecuación de la atención prenatal es desafortunadamente inapropiado o insuficiente. **Objetivo:** evaluar la adecuación de la atención prenatal para puérperas de la Red Básica de Salud en un Hospital Universitario del Sur de Brasil y asociarla con determinantes sociodemográficos y de salud. **Método:** estudio prospectivo de corte transversal, con información obtenida a través de un cuestionario/entrevista, historial médico y la tarjeta de embarazo de las madres ingresadas al Servicio de Obstetricia en un Hospital Universitario del Sur de Brasil. **Resultados:** en general, el 61.1% de las mujeres informaron iniciar la atención prenatal antes de la 14ª semana de embarazo, considerándose adecuada en el 67.0% de las mujeres. La atención prenatal adecuada se asoció con el primer embarazo, embarazo planificado y mayor edad gestacional. Por otro lado, la atención prenatal inadecuada se asoció con un mayor número de embarazos, baja educación, menor edad gestacional y un folleto prenatal incompleto. **Conclusión:** la atención prenatal inadecuada se asoció con la multiparidad, el nivel educativo, la edad gestacional y un folleto prenatal incompleto.

**Palabra Clave:** Folleto prenatal; Gestación; Madre; Salud de la mujer.



## INTRODUCTION

Prenatal care is characterized by a set of activities, carried out by a multidisciplinary team, with objective of identify risks early to maintain a high level of attention to maternal and child health.<sup>1-4</sup> In Brazil, this segment is still worrying, since the maternal and perinatal mortality rates remain a concern issue.<sup>5,6</sup> As a result, a set of public policies was created that focus on the pregnancy-puerperal cycle.<sup>7</sup>

From the perception this scenario and understanding that it is essential to propose a change in the current assistance model, in 2000, the Brazilian Ministry of Health created the Humanization Program in Prenatal and Birth (PHPN), with aimed to promote organization and regulation in this segment, within the scope of the Brazilian National Health System.<sup>8</sup> Moreover, in 2011 was created the Childbirth Program that consists of a care network with objective to guarantee women the right to humanized care during pregnancy, childbirth and the puerperium.<sup>7</sup> Therefore, these policies have been structured mainly in seeking for increased availability and access to prenatal care with quality and care in a universal and early manner.

Although health care indicators are showing improvement, Brazilian reality is still below the current proposals for the prevention of maternal mortality. In Brazil, there is a serious public health problem associated with underreporting of high-risk conditions for maternal mortality, including prenatal care, one of the direct and preventable causes of this mortality. Moreover, the difficulty of implementing effective strategies is still visible. Medical-professional and political-social cultural factors are still prevalent and easily recognized, which expose existing inequities.<sup>4,9-11</sup>

The evaluation of health systems is a powerful tool for managers and health professionals, especially with regard to the planning of public health policies.<sup>12,13</sup> In prenatal care, it is possible to analyze its adequacy, through the observation of indicators grouped differently in terms of quantity or use; and qualitative or process. Most studies use quantitative indicators, using data on gestational age at the beginning of prenatal care and the number of consultations, isolated or combined, the most used being the process indicators of PHPN<sup>1,14</sup> and the criteria proposed by Takeda.<sup>9-10</sup> The qualitative assessment of care, on the other hand, is poorly performed, because it presents difficulties when it comes to observing results due to the services received. In this scenario, birth weight serves as a significant outcome-sentinel event associated with better maternal and child well-being, due to access and use of prenatal care.<sup>14-16</sup>

Adequate prenatal care reduces maternal and child morbidity and mortality, evidenced in the child through the weight compatible at birth, decreased prematurity, neonatal mortality and, in pregnant women, with a lower number of complications during this period as well childbirth.<sup>17</sup> In the municipality of Santa Maria, RS, PHPN was introduced in 2006 and aims to improve the quality of health care services during pregnancy.<sup>18</sup>

The present study aimed to assess the adequacy of prenatal care for mothers who had their births at the Obstetrics Service of a Southern Brazilian University Hospital, from the Basic Health Network and to associate with sociodemographic and health determinants.

## METHODS

A sample of postpartum women (n=283) from the Basic Health Network of Brazil and who had their deliveries at the University Hospital of Santa Maria, RS/Brazil (HUSM) were recruited to participate in this a prospective, cross-sectional study. The following categories were excluded in this study: i) women who did not have any prenatal care prior to giving birth; ii) those who did not perform prenatal care exclusively in the basic health network in the area

covered by the HUSM; iii) those who performed prenatal care in a non-SUS service; iv) postpartum women under 18 years old, due to difficulties in contacting the person responsible for the consent; v) women who did not have their prenatal booklet at the time of admission for delivery. The ethics research committee of the University of Santa Cruz do Sul (no. 091663/2014) and of the Federal University of Santa Maria (no. 039174) approved this study and all procedures.

A self-reported questionnaire was applied with questions regarding demographic (age, skin color and marital status), socioeconomic information (completed years of schooling), previous obstetric history (number of pregnancies and current pregnancy planning) and assistance received during the current pregnancy (meeting in the waiting room, home visits). Information was also collected in official documents - registration books and medical records - as well as indirectly obtained from the prenatal booklet - number of prenatal consultations, week of the first prenatal consultation -, and it was also observed whether the prenatal booklet was completely filled or not.

The quantitative information evaluated was the following: i) demographic characteristics: age in completed years (subsequently categorized into: 18 to 24, 25 to 34 and 35 or more), skin color (white and non-white) and marital status (with or without a partner); ii) socioeconomic level: schooling (three categories: from 0 to 8, 9 to 11, and 12 or more years of study) and the National Economic Indicator according to the classification of ABEP<sup>19</sup> (grouped into three categories: class B, class C and class D/E, without any women belonging to class A); iii) reproductive life (number of pregnancies and current pregnancy planning (yes or no)); iv) assistance received during the current pregnancy (presence or absence of a meeting in the waiting room with the health team and which professional performed it; presence or absence of home visits by the health team and who performed them; and filling out the prenatal booklet (complete or incomplete)); v) childbirth information (gestational age of the newborn baby at birth according to the Capurro index,<sup>20</sup> type of birth, (vaginal or cesarean) and newborn weight (appropriate, as defined by weight range between the 10th and 90th percentile for gestational age, and inappropriate, defined by below the 10th percentile or above the 90th percentile).<sup>21</sup>

The prenatal booklet was considered complete when all the data referring to obstetric history and current pregnancy were correctly registered, as well as family and personal risk factors, past medical history, complete records of previous appointments (date, gestational age, weight, blood pressure, uterine height, fetal heartbeat, recommendations and identification of which professional cared for the pregnant woman), recording of data from laboratory tests, ultrasounds, vaccinations and folic acid and iron supplementation. In the absence of any of these data, the prenatal booklet was considered as incompletely filled.

The adequacy of prenatal care was assessed according to the Kessner index modified by Takeda,<sup>22</sup> which takes into account the following indicators: total number of prenatal appointments and gestational age at the first appointment. Prenatal care was defined as adequate when pregnant women had six or more appointments and started prenatal care before 20 weeks gestational age, while inadequate prenatal care was defined as starting after 28 weeks gestational age or less than three prenatal appointments. Other situations were considered of intermediate adequacy. The adequacy of prenatal care was then characterized in two outcomes: adequate prenatal care and non-adequate prenatal care (intermediate and inadequate), according to Takeda.

Data were analyzed using the Statistical Package for Social Science version 20.0 (IBM, Armonk, NY). Descriptive analysis and Chi-square test were used to assess the association between the outcome (adequacy of prenatal care) and the exposures (demographic, socioeconomic, and reproductive characteristics, and assistance received during the current gestation). The global significant association between variables was evaluated by calculating

the adjusted residuals. The adjusted residual had a normal distribution with a mean of zero and standard deviation equal to 1. Thus, if the adjusted residue was greater than 1.96, in absolute value, there was evidence of a significant association between the two variables analyzed. The greater the adjusted residual, the greater the association between the categories.  $P < 0.05$  was used to indicate statistical significance. This study followed all the guidelines established in the Declaration of Helsinki and Resolution 466/2012 of the Brazilian National Health Council.

## RESULTS

From January to April 2015, 661 women had their childbirth at the HUSM and 283 mothers (42.8%) were include in the study. In this sample, the losses were 2.9%, consisting of 5 refusals and 3 early discharges. Were excluded: i) Postpartum women under 18 years old (9.2%); ii) those who did not have the pregnant card at the time of admission (11.2%); iii) gestational and previous diabetics (8.1%); iv) women who performed prenatal care in the private network (13.6%); and v) pregnant women who started prenatal care in the basic network and were referred to the most complex prenatal care at HUSM (11,7%). Of the mothers attended in this period, 96.8% reported that have had performed prenatal care during pregnancy.

The puerperal women had a mean age of  $26.82 \pm 6.00$  years (18 and 45 years), with a prevalence of the age range between 25 to 34 years. In addition, most women were white, lived with a partner, had 9 to 11 years of schooling, belonging to class C1/C2 and reported having 2 to 3 pregnancies. Still, among pregnant women who had two or more pregnancies ( $n=193$ ), 28% had a history of miscarriages.

The average number of prenatal consultations was  $7.51 \pm 3.19$  and 61.1% ( $n=173$ ) of women reported starting prenatal care in the 1st trimester of pregnancy, before the 14th week gestation. The Takeda index<sup>22</sup>, among puerperal women, was found to be adequate, intermediate and inadequate in 67.0%, 28.3% and 4.6% of puerperal women, respectively.

The data in Table 1 indicate an association between the evaluation of prenatal care, referenced by the Takeda Index, and the previous reproductive history of the patients, in which the primiparous children were significantly related to an adequate prenatal care, while the patients with more than three pregnancies were related to inadequate prenatal care.

**Table 1** - The sample distribution according to demographic, socioeconomics and reproductive characteristics, consider an adequate prenatal by Takeda at the University Hospital of Santa Maria, Brazil (n=283).

Variable	Kessner index medicate by Takeda				Total		p-value
	Adequate		No adequate		N	%	
	N	%	N	%			
<b>Age group (years)</b>							
18-24	76	40.0	37	39.8	113	39.9	0.977
25- 34	90	47.4	45	48.4	135	47.7	
35 or more	24	12.6	11	11.8	35	12.4	
<b>Education (years)</b>							
0-8	71	37.4	48	51.6	119	42.0	0.072
9-11	105	55.3	39	41.9	144	50.9	
12 or more	14	7.4	6	6.5	20	7.1	
<b>Skin color</b>							
White	114	60.0	53	57.0	167	59.0	0.629
No white	76	40.0	40	43.0	116	41.0	
<b>Marital status</b>							
With a partner	125	65.8	55	59.1	180	63.6	0.168
Without a partner	64	34.2	38	40.9	103	36.4	
<b>Reproductive history</b>							
Primigravida	69	36.3	21	22.6	90	31.8	0.003
2-3 gestation	94	49.5	44	47.3	138	48.8	
More than 3 gestation	27	14.2	28	30.1	55	19.4	
<b>ABEP</b>							
B1/B2	53	27.9	16	17.2	69	24.4	0.139
C1/C2	121	63.7	67	72.0	188	66.4	
D/E	16	8.4	10	10.8	26	9.2	

The profile of the patients with an adequate Takeda index was women aged between 25 and 34 years old, with 9 to 11 years of schooling, white, and living with a partner, presenting 2 to 3 pregnancies and belonging to class C1/C2. The inadequate Takeda index was associated with low education (0-8 years).

Table 2 shows the association between assistance received during the current pregnancy and the adequacy of prenatal care according to Takeda. It was found that women who planned the pregnancy were related to having adequate prenatal care. In addition, it was observed that women with gestational age of 37 weeks or more had adequate prenatal care, and women who had an inadequate prenatal care, were related to a gestational age of less than 37 weeks. In addition, it was found that filling out the incomplete pregnant card was related to an inadequate prenatal care.

**Table 2** - Sample distribution according to the assistance received during the current gestation, considering the adequacy of prenatal care according to Takeda, at the University Hospital of Santa Maria, Brazil(n=283).

Variables	Kessner index medicate by Takeda				Total		p-value
	Adequate		No adequate		N	%	
	N	%	N	%			
<b>Current planning of gestation</b>							
Yes	100	52.6	34	36.6	134	47.3	0.011
No	90	47.4	59	63.4	149	52.7	
<b>Household visit</b>							
Yes	66	34.7	26	28.0	92	32.5	0.253
No	124	65.3	67	72.0	191	67.5	
<b>Attendance in the waiting room</b>							
Yes	53	27.9	17	18.3	70	24.7	0.078
No	137	72.1	76	81.7	213	75.3	
<b>Type of delivery</b>							
Cesarean	119	62.6	54	58.1	173	61.1	0.459
Vaginal delivery	71	37.4	39	41.9	110	38.9	
<b>Gestational age (week)</b>							
<37	36	18.9	29	31.2	65	23.0	0.022
≥37	154	81.1	64	68.8	218	77.0	
<b>Weight of newborn</b>							
Adequate	155	81.6	70	75.3	225	79.5	0.217
Inadequate	35	18.4	23	24.7	58	20.5	
<b>Fill out a pregnant card</b>							
Complete	53	27.9	6	6.5	59	20.9	<0.001
Incomplete	137	72.1	86	93.5	223	79.1	

Of the interviewed mothers, 24.7% (n=70) stated that they had participated in activities “meeting in the waiting room” during prenatal care and 32.5% of women (n=92) received home visits from some member of the team of health.

## DISCUSSION

In the present study, we sought to assess the association between demographic, socioeconomic and reproductive characteristics with the adequacy of prenatal care, according to the Kessner index modified by Takeda.<sup>22</sup> Moreover, this study evaluated the relationship between this adequacy and prenatal care during pregnancy current, in the puerperal women who had their births at the HUSM.

It is important to note that, of the total deliveries during the studied period, 3.2% reported not having performed prenatal care, a percentage similar to the lack of coverage of prenatal care in Brazil that varies from 0.7 to 2.5%.<sup>2</sup> According to Saavedra, prenatal coverage substantially increased from 69% to 80% considering Takeda.<sup>10</sup> The lack of interest in prenatal care may be associated with a number of factors, some of an administrative and other operational nature, practiced by those who should receive these women. Almeida et al.<sup>13</sup> identified that the attention to women in prenatal care should be based on the principles of universal, comprehensive and humanized care, in which some factors are decisive for the choice of health services by pregnant women. Main factors are among them, the reception and the guarantee of access to health services, such as exams, as well as the presence of prepared and well-listened professionals. In addition, Rodrigues et al.<sup>3</sup> pointed out that the bond between health professionals and the pregnant woman is considered an important way to guarantee adherence and the success of prenatal care.

Among the objectives stipulated by the Ministry of Health to guarantee the quality of prenatal care is the early capture of pregnant women up to 120 days of gestation and the

performance of at least six prenatal consultations, as well as the demand for other actions to ensure comprehensive and humanized care during the gestational cycle.<sup>8</sup> In the present study, 61.1% of women started prenatal care before the 14th week of pregnancy, as recommended by the Ministry of Health (13.53±6.79 weeks). Leal et al.<sup>23</sup> verified that of the women evaluated, 56.5% started prenatal care until the 12th week of pregnancy, a lower prevalence than the present study.

In Brazil, the protocols recommend, for adequate prenatal care, the minimum number of six consultations with the early start of care, varying from the 12th to the 20th week of pregnancy.<sup>8,17</sup> From this, it has been verified that Rio Grande do Sul women presented an increase of average of prenatal consultations per pregnant, with average of 0,93, in 2012 to 5.16, in 2017.<sup>24</sup> In the present study, the average number of prenatal consultations for pregnant women in the present study was 7.5 consultations, a result within the range recommended by Brazilian protocols.

The Ministry of Health reinforces the importance of carrying out educational activities during prenatal care. The waiting room represents the public space, where the health team has the opportunity to develop activities that go beyond direct care, helping to prevent diseases and promote health. In this environment, it is possible to promote welcoming and listening actions, improving the user/system/health professional interrelation, and humanizing, often, the bureaucratic services offered.<sup>25</sup> The meetings in the puerperal waiting room, in the present study, occurred in 24.7%, a result similar to that found by Anversa<sup>26</sup> in 2012 in Santa Maria/RS (>20% of pregnant women), demonstrating the fragility of health care attention maternal and fetal in the pregnant population of Santa Maria/Brazil.

In the present study, 67.1% of the puerperal women had adequate prenatal care, according to the Kessner index modified by Takeda.<sup>22</sup> Evaluating the adequacy of prenatal care quality according to Takeda's criteria, our results found a prevalence lower than the levels of adequacy of prenatal care in Rio Grande, RS (80.5%).<sup>10</sup> According to the authors, although adequate prenatal care has been increasing, there is a need to prioritize the care of pregnant women with the lowest household income. Additionally, when assessing the adequacy of prenatal care, it is essential to consider variables beyond just the number of appointments to provide a more in-depth analysis.<sup>10</sup> Furthermore, in this study, adding the two classes of inadequate and intermediate of the Takeda index, the non-adequacy corresponded to 32.9% of the women studied.

The pregnant card has been considered an important communication tool between health professionals, as well as an assessment tool for health services, in which the presence or absence of records can be considered as indicative of good or bad quality of care to pregnant.<sup>3</sup> Of the puerperal women attended in the present study, 11.2% did not have the pregnant card at the time of admission, a higher prevalence than study of Rodrigues et al.<sup>3</sup> who found that 7.6% of the pregnant card had partially readable and unreadable records. In addition, in this study, there was a significant association between filling the pregnant woman's portfolio and the adequacy of prenatal care, demonstrating that incomplete pregnant card is associated with non-adequacy of prenatal care. Therefore, it is essential that it contain all information regarding the prenatal care.

The reduction in maternal and perinatal morbidity and mortality rates are directly related to the adequacy of prenatal care, and in this context, it is essential to communicate the different levels of care in pregnancy care.<sup>6,27,28</sup> In the present study, there was no significant relationship between education and the adequacy of prenatal care. On the other hand, Mario et al.<sup>9</sup> verified that quality prenatal care was associated with higher education (high school and higher education 79.0% and 75.6%, respectively). In addition, the lack of this care with prenatal care has been associated with prematurity and/or low birth weight, as well as peri and postnatal complications<sup>14</sup> that can lead to infant mortality.

Maternal parity has been shown to be inversely associated with the adequacy of prenatal care, with primiparity being related to lower rates of inadequate care.<sup>1,29,30</sup> In this study, we also found a significant association between the adequacies of prenatal care in pregnant women who were pregnant at the expense of multiparous women.

This study has some limitations. Firstly, it only includes women who receive prenatal care in the basic health network, potentially restricting the generalization of results. Additionally, the exclusion of women under 18 years old may have overlooked a significant vulnerable group. Furthermore, the utilization of self-reported data to complement information from pregnancy cards might have introduced memory and recording biases. Lastly, the generalizability of the findings to other populations may be constrained due to the study's execution in a single university hospital and within a specific health network.

## CONCLUSION

The results of this study showed that, although the coverage of prenatal care has been increasing in recent years, much remains to be invested in the implementation of the minimum procedures recommended by the Ministry of Health for the best care of women during the pregnant-puerperal cycle. In addition, the knowledge of prenatal care local characteristics may assist in development of strategies to reduce maternal and child morbidity and mortality.

The proposal is that this work, exposing the profile of pregnant women and associating it with the adequacy of prenatal care, can contribute for managers of this health micro-region to review the prenatal care policy. Thus, training, commitment and active participation of the health team with all the actors involved in the prenatal care process are essential.

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