ANALYSIS OF NEUROPSYCHOMOTOR DEVELOPMENT OF CHILDREN PARTICIPATING IN A MOTHER-BABY PROGRAM

Análise do desenvolvimento neuropsicomotor de crianças participantes de um programa mãe-bebê

Análisis del desarrollo neuropsicomotor de niños participantes de un programa madre-bebé

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ABSTRACT

Objective: To analyze the neuropsychomotor development of children participating in a Mother-baby Program. **Methods:** A cross-sectional study was carried out with 52 children between 6 and 12 months of age, from the Mother-baby Program, an extension project carried out in a deprived community of Novo Hamburgo, Rio Grande do Sul, Brazil, in 2017. The children were selected from the records and to evaluate child development, the Denver II Development Screening Test was applied in the children's home by trained professionals during the period from March to November 2017. **Results:** The sample consisted of infants born at term (38.52 ± 1.83 weeks), weighing more than 2500g (94.23%; n = 49), who received exclusive breastfeeding (57.70%; n = 30). As to neuropsychomotor development, 30.8% (n = 16) of the children presented suspicious global development, with the most affected domains being language (13.5%; n = 7) and gross motor (11.5%; n = 6). The independent variables that showed an association with suspected delay in neuropsychomotor development were exclusive breastfeeding (p = 0.03), number of children (p = 0.01) and marital status (p = 0.04). **Conclusion:** The majority of the children (69.2%, n = 36) participants in the Mother-baby Program presented adequate neuropsychomotor development compatible with their age group. However, 30% (n = 16) of the children who had neurodevelopment considered suspect had the language and the motor gross as the most affected domains.

Descriptors: Child Development; Health Promotion; Primary Health Care.

RESUMO

Objetivo: Analisar o desenvolvimento neuropsicomotor de crianças participantes de um Programa Mãe-bebê. Métodos: Estudo transversal, realizado com 52 crianças entre 6 e 12 meses de idade, procedentes do Programa Mãe-bebê, um projeto de extensão realizado em uma comunidade carente de Novo Hamburgo, Rio Grande do Sul, Brasil, em 2017. A partir dos prontuários, selecionaram-se as crianças e, para a avaliação do desenvolvimento infantil, utilizou-se o Teste de Triagem de Desenvolvimento de Denver II, aplicado no domicílio das crianças, por profissionais treinados, no período de março a novembro de 2017. Resultados: A amostra compôs-se de crianças nascidas a termo (38,52±1,83 semanas), com peso acima de 2500g (94,23%; n=49), que receberam aleitamento materno exclusivo (57,70%; n=30). Quanto ao desenvolvimento neuropsicomotor, 30,8% (n=16) das crianças apresentam desenvolvimento global suspeito, sendo que os domínios mais afetados foram a linguagem (13,5%; n=7) e o motor grosso (11,5%; n=6). As variáveis independentes que mostraram associação com suspeita de atraso no desenvolvimento neuropsicomotor foram o aleitamento materno exclusivo (p=0,03), o número de filhos (p=0,01) e a situação conjugal (p=0,04).

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Conclusão: A maioria das crianças (69,2%, n=36) participantes do Programa Mãe-bebê apresentaram um desenvolvimento neuropsicomotor adequado e compatível com sua faixa etária. No entanto, 30% (n=16) das crianças que apresentaram um neurodesenvolvimento considerado suspeito tiveram a linguagem e o motor grosso como os domínios mais afetados.

Descritores: Desenvolvimento Infantil; Promoção da Saúde; Atenção Primária à Saúde.

RESUMEN

Objetivo: Analizar el desarrollo neuropsicomotor de niños participantes de un Programa Madre-bebé. Métodos: Estudio transversal realizado con 52 niños entre los 6 y 12 meses de edad de un Programa Madre-bebé que es un proyecto de extensión realizado en una comunidad que está falta de condiciones socio-económicas de Novo Hamburgo, Rio Grande de Sur, Brasil, en 2017. Se ha elegido los niños a partir de los historiales clínicos y se ha aplicado la Prueba de Tamizaje del Desarrollo de Denver II para la evaluación del desarrollo infantil en los domicilios de los niños por profesionales entrenados en el periodo entre marzo y noviembre de 2017. Resultados: La muestra ha sido de niños nacidos a término (38,52±1,83 semanas), con más de 2500g de peso (94,23%; n=49) y que han recibido amamantamiento materno exclusivo (57,70%; n=30). Respecto el desarrollo neuropsicomotor el 30,8% (n=16) de los niños presentan el desarrollo global sospechoso con los dominios de lenguaje (13,5%; n=7) y motor grueso (11,5%; n=6) más afectados. Las variables independientes que señalaron asociación sospechosa para el retraso del desarrollo neuropsicomotor fueron el amamantamiento materno exclusivo (p=0,03), el número de hijos (p=0,01) y la situación conyugal (p=0,04). Conclusión: La mayoría de los niños (69,2%, n=36) participantes del Programa Madre-bebé presentaron un desarrollo neuropsicomotor adecuado y compatible con su franja de edad. Sin embargo, el 30% (n=16) de los niños que presentaron un desarrollo neurológico sospechoso tuvieron los dominios de lenguaje y motor grueso más afectados.

Descriptores: Desarrollo Infantil; Promoción de la Salud; Atención Primaria de Salud.

INTRODUCTION

Neuropsychomotor development is a unique process of each child whose purpose is their insertion in the society in which they live. Because of the intense ability of the nervous system to rearrange and adapt its neural networks in response to environmental and organic demands, the period of childhood is expressed by significant advances in motor, cognitive, psychosocial, and language skills, with progressively more complex acquisitions in the functions of daily life. The prenatal period and the first years of life are the foundation of this process, which results from the interaction of genetically inherited biopsychological characteristics and experiences offered by the environment. The experiences are constituted by the care the child receives and the opportunities he has to actively exercise his skills[1-3].

Care focused on developmental needs enables children to reach their full potential in each phase, with positive repercussions in adulthood[2]. However, it is estimated that more than 250 million children under the age of 5 are at risk for delayed neuropsychomotor acquisition, possibly resulting in long-term learning disabilities and an approximate 20% annual income deficit in adulthood[4].

In this context, the Ministry of Health determines that monitoring the development of children in primary care aims at their promotion, protection and early detection of changes that may affect their future life. This occurs mainly through educational actions and comprehensive monitoring of child health[5]. Besides, the National Health Promotion Policy adds that child development, motor, cognitive and emotional monitoring procedures should be valued in child health programs as an important disability prevention strategy in this population[6].

Thus, for the full promotion of child health, understanding of the multifactorial aspects associated with child development, including not only biological factors but also the influence of psychosocial requirements that adversely affect the acquisition of developmental milestones is indispensable[7]. Among the risk factors for developmental delays, the inadequate nutritional status of the child, the low level of stimulation in the family environment and the cultural and sociodemographic weaknesses of the family stand out. All these aspects, associated with poverty, can lead to inequalities in the child's early development and, consequently, undermine their educational level and productivity in adulthood, thus perpetuating the cycle of poverty[4].

In line with the National Policy for Comprehensive Child Health Care (PNAISC)[8], the Feevale University Mother-Baby Community Extension Program was created in 2016 with the objective of promoting the health of women in the pregnancy-puerperal cycle, of the newborn and of children up to 1 year old through integrated and interdisciplinary actions of childcare focusing on childbirth and birth care and its impact on neonatal and maternal mortality. In this program, for monitoring child development and maternal and child health indicators, participating families receive monthly assistance from academics and professionals from the areas of Nutrition, Physiotherapy,

Nursing, and Psychology, through home visits. Due to the importance of developing health promotion strategies aimed at child development and reducing child morbidity and mortality, this study aimed to analyze the neuropsychomotor development of children participating in a Mother-Baby Program.

METHODS

A cross-sectional, observational and descriptive study conducted with 52 children aged 6 to 12 months, male and female, participating in the Feevale University Mother-Baby Community Extension Program, Rio Grande do Sul, Brazil. The program is developed in a neighborhood on the outskirts of Novo Hamburgo, which has around 10,981 people enrolled in four Family Health Strategies. In addition to the high rates of violence and prevalent involvement with drug trafficking, the sociodemographic profile of this community is characterized by people with low income and education, and residents of invasion areas with poor sanitation - characteristics that make families residents are socially vulnerable.

Acting in an interdisciplinary manner, the Mother-Baby Program conducts individual monitoring of benefited families through home visits and interviews in Family Health Unit practices, promoting child health up to 12 months of age. In addition to assessing the growth and development of the newborn and infant, families receive guidance on the vaccination schedule, appropriate care for the baby, the importance of exclusive breastfeeding, strengthening family ties, among others. The activities take place three times a week, with the participation of all health areas and in alignment with the unit's health team.

In this study, children diagnosed with neurological disorders or those who were poorly collaborative at the time of the test were excluded. Only children whose parents and / or guardians accepted the invitation to participate and signed the Informed Consent Form were included in the survey.

The children were selected based on the analysis of medical records of the Mother-Baby Program, which contained clinical, gestational, and sociodemographic information about the families followed. After research participants were selected, child development was assessed through the Denver II Developmental Screening Test (TTDDII) following the instructions in the test manual[9]. The test consists of 125 items distributed in four areas of development: personal-social, fine-adaptive motor, language and gross motor. After identifying the child's age, a vertical line was drawn corresponding to the age. We evaluated all the items cut by the line, as well as the three items completely to the left of the line in each development area, such as: (N) normal when the child performs an item cut by the line; (C) caution when the child fails an item in which the age line crosses between 75 and 90%; and (A) delay, when the child fails an item that is entirely to the left of the age line. After interpreting each item, the final test score determines two classifications: adequate development, when there are no delays or at most 1 caution; and suspicious development when there are 2 or more cautions and / or 1 or more delays.

Developmental assessments were conducted in 2017, from March to November, and were conducted by health professionals undergoing previous training to use the test. The evaluation of the children took place individually, at home, and the materials used formed a standard kit containing square and colored wooden blocks, raisins, plastic doll, mugs and ball. The mothers or guardians of the child participated and helped in the report of some activities provided for in the test. The total time for the test application was approximately 30 minutes.

Quantitative data analysis was performed by descriptive statistics, and the results are presented in absolute numbers and percentages, in the form of tables, considering the interpretation criteria of the test results. The association between dependent and independent variables was also studied, using the chi-square test and odds ratio values with their respective 95% confidence intervals. To obtain the odds ratio values, the logistic regression model (backward stepwise method) was used using the SPSS 11.0 software. Variables with $p < 0.05$ were considered significant. To calculate the sample size, the prevalence of 33% of delayed neuropsychomotor development was taken into account[10], with 90% confidence interval, 5% sampling error and a population of 61 children attended in the Mother-Baby Program. Based on these parameters, the minimum sample size of 59 children was considered.

This study was approved by the Feevale University Research Ethics Committee under Opinion No. 2,340,689 and is in accordance with the rules in force in Resolution No. 466/12 of the National Health Council, and its complements, which regulate research involving humans[11].

RESULTS

It can be observed that the sample consisted of 39 male and 13 female babies; predominantly full-term and weighing at birth over 2500g, assessed by TTDDII in the third trimester of life. Most were born vaginally (67.30%; n

= 35) and received breast milk at least until six months of age (57.70%; n = 30). Regarding socioeconomic issues, it is observed that the families of the evaluated children live with more than 1 monthly minimum wage and that most mothers have less than 2 children and has the presence of a partner, despite the low education level. The main characteristics of the mothers and children participating in this study are described in Table I.

Table I - Characteristics of mothers and children participating in the study (n = 52). Novo Hamburgo, Rio Grande do Sul, 2017.

Caracteristics	Mean ± DP
Mother's age (years)	26.71±6.20
Age of child on assessment (months)	8.65±3.01
Number of children	1.69±1.00
Gestational age at birth (weeks)	38.52±1.83
Birth weight (g)	3290.50±537.34
Caracteristic	**% (n)**
Birth weight	
≥2500g	94.23 (49)
<2500g	5.76 (3)
AME / EBF	
Yes	57.70 (30)
No	42.30 (22)
Type of delivery	
Vaginal	67.30 (35)
Caesarean	32.69 (17)
Monthly household income	
< 1 minimum wage	32.69 (17)
≥ 1 minimum wage	67.30 (35)
Maternal age	
< 18 years	3.85 (2)
≥ 18 years	96.15 (50)
Maternal education	
≤ 8 anos	67.30 (35)
> 8 anos	32.69 (17)
Number of children	
≤ 2	86.53 (45)
> 2	13.46 (7)
Marital situation	
Live with partner	80.76 (42)
Live without partner	19.23 (10)

EBF: exclusive breastfeeding until 6 months of age; %: percentage; n: absolute number; g: grams

Regarding the variables related to neuropsychomotor development, 30.8% of children had suspected global development, according to TTDDII (Table II), and the most affected domains were language and gross motor, with developmental percentages of 13. 5% and 11.5% respectively.

Table II - Overall and domain performance of children in the Denver Developmental Screening Test II (n=52). Novo Hamburgo, Rio Grande do Sul, 2017.

Global score	% (n)
Proper development	69.2 (36)
Suspicious Development	30.8 (16)
Domains	
Personal-social	
Proper development	94.2 (49)
Suspicious Development	5.8 (3)
Fine-adaptive motor	
Proper development	94.2 (49)
Suspicious Development	5.8 (3)
Language	
Proper development	86.5 (13.5)
Suspicious Development	13.5 (7)
Grosso Motor	
Proper development	88.5 (46)
Suspicious Development	11.5 (6)

%: percentage; n: absolute number

Table III shows the results regarding logistic regression and the percentage of suspicious development in each of the analyzed variables. The independent variables that showed significant association with suspected neuropsychomotor developmental delay were: exclusive breastfeeding and children who were not breastfed were 6.93 times more likely to have suspicion of delayed neuropsychomotor development when compared to children who were breastfed up to 6 months.; the number of children, which increased by 16.94 times the chance of developing suspicious development in children from families with 3 or more children; and marital status, which indicated that children living in families without a partner were 8.31 times more likely to have suspicion of delayed neuropsychomotor development.

Table III - Analysis between independent variables and the suspected outcome of neuropsychomotor developmental delay according to the Denver Developmental Screening Test II. Novo Hamburgo, Rio Grande do Sul, 2017.

Variable	% (n) of suspects	Value of p	*Odds Ratio*	IC 95%
AME / EBF				
Yes	13.33 (4)			
No	54.54 (12)	0.03*	6.93	(1.16-41.13)
Maternal education				
≤ 8 years	34.28 (12)			
> 8 years	23.52 (4)	0.533	1.70	(0.29-9.84)
Maternal age				
< 18 years	50 (1)			
≥ 18 years	30 (15)	0.73	0.53	(0.01-2.52)
Number of children				
≤ 2	22.22 (10)			
> 2	85.71 (6)	0.01*	16.94	(1.71-42.87)
Birth weight				
≥ 2500grams	33.33 (1)			
< 2500grams	66.66 (2)	0.40	4.31	(0.13 –137.08)
Monthly household income				
≥ 1 minimum wage	22.85 (8)			
< 1 minimum wage	47.05 (8)	0.40	0.37	(0.03-3.62)
Marital situation				
Live with partner	26.16 (11)			
Live without partner	50% (10)	0.04*	8.31	(1.02-67.24)

%: percentage; n: absolute number; CI: confidence interval; EBF: exclusive breastfeeding until 6 months of age

DISCUSSION

The sample characterization of the current study revealed that the participating mothers and children had low biological risk, despite unfavorable sociodemographic conditions. Besides, the prevalence of exclusive breastfeeding (EBF) was higher than the national average, indicating a percentage of almost 60% of breastfed children up to 6 months of age.

Ministry of Health reports show that the country has a 41% prevalence of EBF in children aged 0 to 6 months. Despite the strengthening of Breastfeeding Promotion, Protection and Support initiatives and the clear progress in the Brazilian scenario, challenges remain to provide safe conditions for birth in the country[12]. In low- and middle-income countries, only 37% of children are exclusively breastfed. With few exceptions, breastfeeding duration is shorter in high-income countries than in resource-poor countries[13].

Breastfeeding has numerous benefits for children and women and is the most sensitive, cost-effective and effective intervention to reduce child morbidity and mortality. It is known that different social and cultural contexts can influence the practice of exclusive breastfeeding and its determinants[14]. The favorable results presented in the present study regarding the breastfeeding index in Brazil may be related to the actions developed by the Mother-Baby Program, which determines as one of its priority activities the encouragement of exclusive breastfeeding through home visits and guidance to pregnant women and postpartum women in socially vulnerable situations. Following the principles of the Rede Cegonha / Stork Network, the program is based on the principles of humanization and care, which assures women the right to reproductive, planning, humanized care for pregnancy, childbirth and the puerperium; and children, the right to a safe birth, healthy growth and development[15].

Regarding neuropsychomotor development, the sample studied in the current study had a suspected prevalence of developmental delay of 30.8%, similar to previous studies conducted in Brazil[16,17]. In a systematic review based on Brazilian investigations, the authors observed that approximately 33% of the children evaluated at home had suspected developmental delay, and language was the most affected domain, followed by the broad motor area[11].

Early childhood is a crucial phase for the development of cognitive and language functions. Over the first three years of life, it is estimated that 85% of all neuronal connections, including communication-related areas, are formed in response to environmental stimuli. In the first 12 months of age, TTDD II language mastery assesses skills ranging from sound emission and syllable vocalization to specific breast/pope speech. Factors such as low socioeconomic status, age, and maternal education have been considered determinant for the emergence of phonological delays due to the decreased linguistic repertoire, low speech stimulation and prioritization of care focused on the basic needs of the child[18,19].

In addition to language acquisition deficits, motor-gross domain delays are also referenced in the literature. Motor dysfunctions are the first observable markers of developmental changes, especially at earlier ages. In Brazilian children, the onset of antigravity postural control is slower when compared to Canadian children, resulting in delayed prone and standing postures[20]. According to data in the literature, progress in the broad motor repertoire is established mainly as a result of the activities the child performs, which are facilitated by the encouraging environment and the active involvement of caregivers[21].

Child development is multidimensional. These interdependent dimensions include motor, cognitive, emotional and social performance, as well as behavioral, health and nutritional status patterns. Rarely are these aspects individually and individually influenced. In contrast, the combination of two or more factors significantly influences the path of neuropsychomotor development[4]. Due to the multifactorial characteristic of development, the Brazilian documents that guide integral attention in childhood recommend that to care for children, educate and promote their health and their integral development, the partnership between parents, the community and health professionals is important health, social care and education[5,8,22].

The promotion and monitoring of the integral growth and development of children form one of the principles of PNAISC, prioritizing surveillance and stimulating actions for the full growth and development of children, especially Early Childhood Development, for primary health care, according to the guidelines. of the "Child Health Handbook", including actions to support families to strengthen family bonds[8].

In the present study, the absence of exclusive breastfeeding until six months, a family constitution with more than three children and the absence of a partner demonstrated a strong association with the suspected delayed neuropsychomotor development in the children participating in the Mother-Baby Program.

In addition to short-term positive effects on children's health, proper nutrition and healthy growth bring lifelong benefits. In a cohort of children living in the city of Pelotas, Rio Grande do Sul, the authors showed a dose-response

association between duration of exclusive breastfeeding and increased child intelligence, educational performance, and income at age 30[23]. Similar to the present study, research conducted at the Goiania Maternal-Infant Hospital Outpatient Clinic also showed that non-exclusive breastfeeding within the mother until six months of age may be related to delays in child development, especially in aspects such as personal relationship, social, manipulative and rude skills[24].

Children with developmental disabilities are considered more vulnerable and require specific support, such as legislation and public health policies that are adequate to meet their needs and guarantee their rights. The main Brazilian public policies aimed at maternal and child health have as their main objective to promote and protect child health and breastfeeding, through comprehensive and integrated early childhood care and care, from the gestational period to the age of nine, with special attention to the most vulnerable populations, aiming at reducing disease (morbidity) and mortality, providing an environment that facilitates life, with conditions worthy of existence and full development[8].

Human milk is a complex fluid that contains lipids, proteins, carbohydrates, vitamins, minerals, immunocompetent substances, as well as trophic factors or growth modulators[25]. For the development of the nervous system, docosahexaenoic acid (DHA), contained in human milk, plays a fundamental role in neuronal maturation and, consequently, in the development of cognitive and language skills. In rats, DHA deficiency during lactation resulted in poor memory retention during learning tasks[26]. In addition to nutritional support, exclusive breastfeeding also enables the construction of a healthy bond between mother and baby, favoring the emotional, social and psychic development of the child and preventing the emergence of long-term behavioral problems[25].

The family plays an important mediating role between the child, the environment and society, enabling the construction of essential elements for child development and the promotion of health and quality of life. Health promotion, disease prevention, and early detection of physical abnormalities and developmental problems are at the heart of child health surveillance programs. Based on this, global family and community-based child health promotion initiatives have encouraged early childhood development practices from multisectoral structures that include: health actions; nutrition; access to services; safe and affective environment; advocacy; protection and learning opportunities[27].

In addition to the family environment, the adequacy of the family structure to the monthly income, including the number of children, also represents the viability of the basic resources for the full development of its members[28]. Households represented by mothers living alone with their children indicate a more vulnerable family environment, either economically or in terms of childcare[29].

It is known that the presence of a partner positively interferes with the quality of stimulation available in the family environment by providing greater security in the performance of a maternal function. The fact that children are cared for by parents with a stable union and have positive stimuli at home seems to be protective mechanisms for development in the context of psychosocial adversity in which some families live[30]. Studies have suggested that a child's bond with his father is as important as the mother-baby relationship. Children whose parents did not support their mothers in childcare are estimated to be at least ten times more likely to have suspected developmental delay[4,16,31]. Parents, in addition to helping to provide material conditions, also help to maintain a climate of harmony and satisfaction in the family environment through love and companionship, thus promoting an environment conducive to healthy development[4,16,31].

The child's interaction with family members and the social safety net not only ensures their survival but contributes to neuropsychomotor, cognitive and emotional development. The bond of the child with the mother/caregiver plays an important role in the acquisition of skills in conjunction with the brain growth and maturation that accompany the development. This process is complex and relies on the biological and psycho-affective dimension, but depends strictly on the environment for its flourishing. It is in the interaction with the family environment, with the broader school and social cooperation networks that the child can fully develop[8].

Finally, it is important to consider that, despite the advances, Brazil still has a huge social inequality, which is directly reflected in the quality of life of children. This reinforces the need for continued investment in public health promotion policies and early childhood actions and in improving the quality of services and actions already established. It is important to remember the need for a comprehensive approach, which not only guarantees survival and physical health, but also focuses on establishing bonds, promoting healthy family and community life, and the creative development of children. Therefore, the articulation of intersectoral services and actions that include health, education, social development and care, in a supportive network for comprehensive childcare, are essential to constantly assist and monitor families at home and in the community, validating attention and support, in particular, to parents of children identified with delay or established deficits[32].

From the findings of the present study, it is observed that child development surveillance in the first year of life should include multiple connections, including not only biological aspects but also the analysis and monitoring of environmental determinants, especially related to family structure. Therefore, the strengthening of Brazilian public policies that value protection, health promotion, prevention and expansion of comprehensive child health care and its full development is fundamental for reducing child morbidity and mortality rates. In the integral and intersectoral perspective, there is also the need for a social protection network whose purpose is to address the basic needs of children and their families, especially those in situations of social vulnerability, including individual and collective actions in the areas of health, education and social development. Thus, preventive strategies and early intervention focused on neurodevelopment, from early childhood, will change the life course of these children and, certainly, will reflect the quality of life of the population and better long-term socio-educational opportunities.

The present study has some limitations. Due to the difficulty in accessing homes and the lack of complete data in the participants' medical records, data collection was performed only in a portion of the community that participates in the Mother-Baby Program actions. Besides, validated child development tests in Brazilian children are still scarce. In this study, TTDDII was selected as a research instrument due to its wide standardization and ease of application. However, due to cultural differences, the data may not reflect the exact neuropsychomotor performance of children in this community, as the test has been validated in American children.

CONCLUSION

The present study demonstrates that most children (69.2%) participate in the Mother-Baby Program that had an adequate neuropsychomotor development, compatible with their age group. However, approximately 30% of children had suspected neurodevelopment, with the most affected domains being language and gross motor. In addition, it was observed that the children participating in the program who did not receive exclusive breastfeeding until 6 months and who lived in families with more than 3 children without their father were at risk for suspected neuropsychomotor developmental delay.

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CONFLICTS OF INTEREST

There were no conflicts in this study.

CONTRIBUTIONS

Simone de Paula and **Ellen Becker Rohr** contributed to the elaboration and design of the study; data acquisition, analysis and interpretation; the writing and / or revision of the manuscript. **Maristela Cassia de Oliveira Peixoto**, **Caroline D'Azevedo Sica** and **Ilse Maria Kunzler** contributed to the acquisition, analysis and interpretation of data; the writing and / or revision of the manuscript.

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