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Skin-to-skin contact in a reference center for the kangaroo method: descriptive study

Contato pele a pele em um centro de referência do Método Canguru: estudo descritivo

Contacto piel con piel en un centro de referencia del método Madre Canguro: estudio descriptivo

Bruna Schiphorst Delgado[I], Roberta Costa[I], Janaina Medeiros de Souza[I], Juliana Coelho Pina[I], Vívian Mara Gonçalves de Oliveira Azevedo[II], Débora Evelin Felix Quirino de Almeida[I]

[I]Universidade Federal de Santa Catarina. Florianópolis, Brazil; [II]Universidade Federal de Uberlândia. Uberlândia, Brazil

ABSTRACT

Objective: to describe how skin-to-skin contact is practiced in a neonatal unit that is a reference for the Kangaroo Mother Care. **Method:** descriptive, cross-sectional study, carried out in a neonatal intensive unit in southern Brazil. Data analyzed using simple descriptive statistics. Protocol approved by the Research Ethics Committee. **Results:** data from 29 preterm newborns weighing less than 1,800 grams were analyzed. The first skin-to-skin contact took place, on average, after 6.38 days. The frequency of skin-to-skin contact was 1.6 times a day, with a minimum time of 56 minutes and an average weight gain of 26.98g per day. **Conclusion:** skin-to-skin contact occurs, for the most part, after the fifth day of life, in the first stage of the Method. The frequency of this contact was once a day, and the average duration was 120 minutes. In the second stage of the Method, the data varied little.

Descriptors: Intensive Care Units, Neonatal; Neonatal Nursing; Infant, Premature; Kangaroo-Mother Care Method.

RESUMO

Objetivo: descrever como ocorre a prática do contato pele a pele em uma unidade neonatal referência para o Método Canguru. **Método**: estudo descritivo, transversal, realizado em unidade intensiva neonatal do sul do Brasil. Dados analisados por meio de estatística descritiva simples. Protocolo aprovado pelo Comitê de Ética em Pesquisa. **Resultados:** analisados dados de 29 recém-nascidos pré-termo, com peso menor de 1.800 gramas. O primeiro contato pele a pele foi realizado, em média, com 6,38 dias. A frequência de contato pele a pele foi de 1,6 vezes ao dia, sendo o tempo mínimo de 56 minutos e o ganho ponderal médio de 26,98 gramas por dia. **Conclusão:** a realização do contato pele a pele acontece, em sua maioria, após o quinto dia de vida, na primeira etapa do Método. A frequência de realização deste contato foi de uma vez por dia e o tempo de duração médio foi de 120 minutos. Na segunda etapa do Método, os dados pouco variaram.

Descritores: Unidades de Terapia Intensiva Neonatal; Enfermagem Neonatal; Recém-Nascido Prematuro; Método Canguru.

RESUMEN

Objetivo: describir cómo se practica el contacto piel con piel en una unidad neonatal que es referencia del Método Madre Canguro. **Método:** Estudio descriptivo, transversal, realizado en una unidad intensiva neonatal del sur de Brasil. Datos analizados mediante estadística descriptiva simple. Protocolo aprobado por el Comité de Ética en Investigación. **Resultados:** se analizaron los datos de 29 recién nacidos prematuros, cuyo peso era inferior a 1.800 gramos. El primer contacto piel con piel se produjo, en promedio, después de 6,38 días. La frecuencia de contacto piel con piel fue de 1,6 veces al día, durante un tiempo mínimo de 56 minutos y un aumento medio de peso de 26,98 g por día. **Conclusión:** el contacto piel con piel ocurre, en su mayor parte, después del quinto día de vida, en la primera etapa del Método. La frecuencia de este contacto fue una vez al día y la duración, en promedio, fue de 120 minutos. En la segunda etapa del Método los datos variaron poco.

Descriptores: Unidades de Cuidado Intensivo Neonatal; Enfermería Neonatal; Recién Nacido Prematuro; Método Madre-Canguro.

INTRODUCTION

Prematurity is currently considered a public health problem due to the high rates of premature birth worldwide. Globally, approximately 30 million newborns (NBs) are born prematurely or with low birth weight or fall ill in the first days of life[1]. In Brazil, the prevalence of preterm NBs (PTNBs) is nearly double that observed in European countries, placing Brazil among the top ten countries with the highest prematurity rates. According to the World Health Organization (WHO), there are approximately 280 thousand premature births per year[2].

Preterm NB is defined as a birth occurring before the 37th week of gestation and was classified as extreme preterm (less than 28 weeks), very preterm (28 to 32 weeks), and moderate preterm (32 to 37 weeks). Globally, prematurity is the principal cause of death in children under five years of age, and in all countries, this index is increasing[3].

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Corresponding author: Bruna Schiphorst Delgado. E-mail: bsddelgado@hotmail.com

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Advancements in neonatal care technology have enabled the survival of NBs with increasingly lower gestational ages. The WHO also asserts that three-quarters of PTNBs can be saved with viable and low-cost care, improving prenatal and postnatal monitoring, using antibiotics to prevent infections in NBs, and employing the Kangaroo Mother Care (KMC) method[3].

The KMC method, internationally, consists of skin-to-skin contact (SSC) between mother and NB, this contact is also known as the kangaroo position, where the NB is wearing only a diaper in the vertical position next to the mother's chest. From the Brazilian perspective, KMC signifies a paradigm shift in NB care, making humanized care and technological advancements complementary[4].

Inspired by the method created in Colombia in 1979, Brazil adopted this practice in 1991 at the Guilherme Álvaro Hospital in Santos/SP in the Joint Stay wards; subsequently, some Brazilian hospitals began practicing the kangaroo position, though without many defined technical criteria. In 2000, the Humanized Care for Low-Birth-Weight Newborns – Kangaroo Method was published as a public policy and was updated in 2007[4].

The KMC method in Brazil is a perinatal care model focused on humanized care, bringing together various biopsychosocial intervention strategies[5]. The process is divided into three phases. The first begins during high-risk prenatal care, extending to the NB's admission to the unit. In this first moment, parents and families should be welcomed in the Neonatal Unit, explaining the NB's health conditions, informing them about the particularities, the care performed, and the unit's routine, and reinforcing that parental access is free, without time restrictions, and that they are important modulators for the NB's well-being[4,5].

In this phase, early contact is advocated; therefore, whenever possible, contact with the NB should be provided, and not only the mother but also the father should be encouraged to participate in all activities in the unit. It is also essential to ensure the mother's presence during the first phase, providing transportation assistance, meals, a suitable seat next to the NB, and complementary activities that help with acclimatization[5].

To improve the development of the NB, adverse environmental stimuli in the neonatal unit, such as odors, lights, and noises, should be reduced. Care should be adapted according to the individual needs expressed by the NB, ensuring protection against stress and pain and using proper positioning to provide greater comfort, organization, and a better sleep pattern[5,6].

In the second phase, the NB spends most of the time with the mother, preferably in the kangaroo position. The following criteria are used for transfer to this phase: the clinical stability of the NB, enteral nutrition (breast, tube, or cup), a minimum weight of 1,250g, the desire and availability of the mother to participate, whether she is capable of recognizing signs of stress and risk for the NB, whether she is confident in handling and caring for her child, and her ability to adopt the kangaroo position[5].

The transition to the third phase occurs when the mother is secure and psychologically motivated, and when family members are confident about providing home care for the NB and are committed to continuing the position for as long as possible. The NBs must have a minimum weight of 1,600g and show adequate weight gain in the three days preceding discharge. This phase is characterized by monitoring the child and the family in the outpatient and/or home setting until they reach a weight of 2,500g, continuing the biopsychosocial approach. The first consultation should be carried out 48 hours after the patient moved from the second phase, with three consultations in the first week, two in the second week, and one weekly consultation from the third week until the NB reaches 2,500g[5].

Despite this governmental policy being disseminated for more than twenty years in Brazil, little is known about the experience of the various units that have adopted this care model. Qualitative studies have highlighted the benefits of these practices for both mothers and NBs[7,8], however, quantitative research describing how these practices are carried out in neonatal units is still scarce[9,10].

Consequently, the following questions arise: For how long do NBs receive skin-to-skin contact? What is the frequency of this contact? At how many days of life are NBs placed in contact with their mothers for the first time? What is the minimum weight and gestational age for performing this practice? Are there differences in variables in the first and second phases of the method?

This study aimed to describe how skin-to-skin contact occurs in a neonatal unit, a reference for the Kangaroo Method in Brazil.

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METHOD

This was an observational, cross-sectional, descriptive study with a quantitative approach conducted in a hospital serving as the national reference center for KMC, located in the southern region of Brazil. The hospital has 12 active beds in its neonatal unit, with six beds in the Neonatal Intensive Care Unit (NICU) and the remaining six varying according to the unit's demand, with beds in either the Conventional Neonatal Intermediate Care Unit (CNICU) or the Kangaroo Neonatal Intermediate Care Unit (KNICU). The availability of professionals is a factor influencing the transfer of NBs to the KNIMCU, and the hospital is currently hiring new staff.

This study is part of an ongoing multicenter project titled "Effect of the duration of skin-to-skin contact on clinical outcomes in low-birth-weight newborns," approved by the Research Ethics Committee, following the ethical guidelines of Resolution No. 466/2012 of the National Health Council[11].

The data collection period was from October 2018 to September 2019. The inclusion criterion for observation was all NBs with a weight equal to or less than 1,800g admitted to the neonatal unit. The exclusion criteria for preterm NBs were as follows: NBs who were discharged or died in the Neonatal Unit within the first seven days of life, had perinatal asphyxia, were twins, were diagnosed with severe congenital malformation, had symptomatic congenital infection, had a genetic syndrome, or had severe metabolic disease. Additionally, the NBs of mothers with severe illness who needed more than five days of intensive care unit admission, who died, who had psychiatric diseases, who were substance-dependent, who had any other condition that prevented skin-to-skin contact with their child, or who had contraindications to breastfeeding were excluded.

The data were collected by a team consisting of a supervising professor, a Master's student, and extension and scientific initiation grant holders. Training was conducted for all team members to assist in identifying NBs eligible for the study, in approaching, inviting, and guiding parents in the unit regarding their participation, in requesting the signing of the consent form, in making necessary records, and subsequently in filling in the database.

The unit's staff were aware of the study, and nurses communicated when a new NB meeting the inclusion criteria was admitted. The maternal and birth data and follow-up data from NB admission to hospital discharge were recorded in an “Admission Summary”. A table, known to the unit staff, was used where mothers filled in the times and duration of SSC performed.

The studied variables included: a) maternal variables - age, marital status, economic class, number of children (including the current one); b) PTNB variables related to birth and admission - sex, gestational age, birth weight, mode of delivery, Apgar score at the first and fifth minute, length of hospital stay, whether the neuroprotection protocol (minimal handling) was performed, use of invasive mechanical ventilation, CPAP, and nasal oxygen catheter, diagnosis/reason for admission; and c) related to the two phases of KMC - days of life, gestational age and weight at the first SSC, frequency and mean duration of SSC, weight gain, weight and diet at the time of discharge, between phases and at hospital discharge.

The data were entered into a Microsoft Office Excel® spreadsheet, cross-verified by two researchers, and analyzed using simple descriptive statistics, including absolute (*n*) and relative (%) frequency, mean, median, minimum, and maximum values. Variables were initially collected as continuous, however, they were also analyzed categorically.

RESULTS

During one year of data collection, 42 eligible NBs were admitted to the unit, however, only 29 were included in the study, as seven died, two were transferred to another hospital, one stayed in the Neonatal Unit for less than seven days, one was placed for adoption, one mother refused to participate in the research, and one mother withdrew from the study after signing the consent form.

The majority of the mothers were between 20 and 34 years of age and were predominantly in social classes B2 and C1. Concerning marital status, ten were married, 17 were in a stable union, and two did not have a partner at the time of the research. For 17 mothers, this was their first child, and for one mother the NB accompanied was the sixth child.

Table 1 presents the characteristics related to birth, including sex, gestational age, weight, mode of delivery, Apgar score, total length of hospital stay, implementation of the neuroprotection protocol, use of mechanical ventilation, CPAP, or nasal oxygen catheter.

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Table 1: Characterization of preterm newborns receiving SSC stratified according to birth and hospitalization variables, Florianópolis, SC, 2019.

Variable	n	%	Mean	Median (Min-Max)
Sex				
Male	16	55.17		
Female	13	44.83		
Gestational Age			31w	31w3d (26w2d – 36w3d)
≤ 30 weeks	13	44.83		
31-35 weeks	15	51.72		
≥ 35 weeks	1	3.45		
Birth Weight (in grams)			1371g	1425g (830 - 1790)
≤ 1000 g	4	13.79		
1001g to 1500g	16	55.17		
1501g to 1800g	9	31.03		
Mode of Delivery				
Vaginal Birth	10	34.48		
Cesarean Section	19	65.52		
Apgar 1' (n=27)*				**6 (3 - 9)**
0 – 3	2	7.41		
4 – 6	13	48.15		
7 – 10	12	44.44		
Apgar 5' (n=27)*				**8 (5 - 9)**
0 – 3	-	-		
4 – 6	1	3.70		
7 – 10	26	96.30		
Length of Hospital Stay (days)			40.9	**33 (13 – 105)**
1 – 30	13	44.83		
31 – 60	12	41.38		
61 – 90	2	6.90		
>91	2	6.90		
Neuroprotection				
Yes	26	89.66		
No	3	10.34		
Use of Invasive Mechanical Ventilation				
Yes	11	37.93		
No	18	62.06		
Use of CPAP				
Yes	17	58.62		
No	12	41.37		
Use of CNO2				
Yes	22	75.86		
No	7	24.13		

Notes: w (weeks); d (days); weight by age (SGA: Small for Gestational Age, AGA: Appropriate for Gestational Age, LGA: Large for Gestational Age). *Two NBs were born outside the hospital environment, and their Apgar score was not recorded.

Regarding the diagnosis/reason for admission to the neonatal unit, the majority of the NBs were premature, had a low birth weight, and had respiratory distress. Rare occurrences during the NBs' hospital stay included bronchopulmonary dysplasia (*n*=2), bilateral pneumothorax (*n*=1), perinatal infection, RH isoimmunization, and supraventricular tachycardia.

Table 2 presents the data related to the variables analyzed during the hospitalization of the PTNBs in the first phase and the information regarding moving to the second phase of KMC.

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Table 2: Newborn admission data related to the first phase of KMC. Florianópolis, SC, Brazil, 2019.

Variable	n	%	Mean	Median (Min-Max)
Days of life at the 1st SSC			6.38	4 (1 – 27)
1 to 3 days	9	31.03		
4th day	7	24.14		
5th day or more	13	44.83		
GA at the 1st SSC			31w 5d	29w 6d (28w 2d – 35w2d)
Up to 30 weeks	10	34.48		
31-33 weeks	17	58.62		
≥34 weeks	2	6.90		
Weight at the 1st SSC			1338	1330 (790 - 1920)
< 1000g	2	6.90		
1000g to 1500g	20	76.69		
1500g	7	24.14		
Frequency of SSC			1.53	1.43 (1 – 2.5)
1x/day	16	55.17		
2x/day	11	37.93		
3x or more/day	2	6.90		
Mean duration of SSC (in minutes)			121.91	112.50 (66.59 – 215.50)
< 60 min	-	-		
60 and < 90 min	4	13.79		
90 and < 150 min	19	65.52		
150 min	6	20.69		
Weight gain (in grams)			24.09	23.38 (-15 – 41)
Up to 15g/day	7	24.14		
15g to <25g/day	9	31.03		
25g/day	13	44.83		
Weight when moving from the 1st phase n=26			1806.85	1705 (1270 – 2716)
1,200g – 1,500g	5	19.23		
1,501g – 2,000g	14	53.85		
2,000g	7	26.92		
Diet when moving from the 1st phase n=26				
Free breastfeeding	1	3.85		
Breastfeeding for stimulation + tube supplementation	10	38.46		
Breastfeeding + oral supplementation	6	23.08		
Oral + tube	1	3.85		
Tube	8	30.77		

The weight when moving from the first phase included only the NBs who participated in the second phase and were transferred to the KNICU.

As shown in Table 3, the data pertain to the period of hospitalization for NBs in the second phase when they are transferred to the KNICU. In this study, three NBs remained in the CNICU after discharge from the NICU.

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Table 3: Newborn hospitalization data related to the second phase of KMC. Florianópolis, SC, Brazil, 2019.

Variable	n	%	Mean	Median (Min-Max)
Frequency of SSC			1.60	1 (1 – 3)
1x/day	10	38.46		
2x/day	16	61.54		
Duration of SSC (in minutes)			145.97	120.42 (56 – 338.24)
> 30 and < 60 min/day	1	3.85		
> 60 and < 90 min/day	3	11.54		
> 90 and < 150 min/day	12	46.15		
> 150 min/day	10	38.46		
Weight gain (in grams)			26.98	28.07 (-12 – 46.21)
Up to 15g/day	3	11.54		
15g to ≤ 25g/day	6	23.08		
25g to ≤ 35g/day	11	42.31		
35g/day	6	23.08		
Weight when moving from the 2nd phase			2281.6	2141.0 (1702.0 – 3820.0)
Up to 1800g	3	11.54		
1801g to 2000g	5	19.23		
2001g to 2500g	11	42.31		
2500g	7	26.92		
Diet when moving from the 2nd phase				
EBF	13	50.00		
BM + formula	8	30.77		
Formula only	5	19.23		

Notes: Exclusive breastfeeding (EBF); Breast milk (BM).

DISCUSSION

Aiming to describe the practice of skin-to-skin contact in a neonatal unit, a reference for the Kangaroo Mother Care method, it was observed that the majority of mothers engaged in SSC once per day for a mean duration of 120 minutes. The norm stipulated by the Ministry of Health is that the minimum duration of exposure to SSC should be one hour, as this is the duration needed for the NB to organize itself after manipulation, and there is no prescribed maximum time for this practice, emphasizing the need for parents' comfort in maintaining this position for as long as necessary[4]. Studies indicate no contraindications to performing SSC with intubated NBs receiving mechanical ventilation, with SSC being associated with a reduction in the incidence of apnea and bradycardia[12,13].

Concerning the duration of SSC and its benefits, a study conducted in Asia in 2019 in which mothers were encouraged to practice SSC for five consecutive days for a mean duration of 60 to 120 minutes, concluded that SSC yields numerous benefits for neonatal outcomes, emphasizing the importance of early initiation. This study further reported that, even with a duration of only one hour, SSC influenced the weight gain of NBs[13]. A Brazilian study conducted in Rondônia in 2018 revealed greater weight gain in NBs receiving SSC than in those not receiving this contact[14].

A critical factor influencing the practice of SSC is the training and competence of the healthcare team to encourage the incorporation of this practice into daily neonatal care. Informed engagement of healthcare providers regarding the benefits of SSC enhances the likelihood of NBs being subjected to this practice[15]. Studies reveal that SSC enables mothers to feel more confident in caring for their children, encouraging their active participation in care[8,16]. Gradually, mothers become attuned to their child's signals related to comfort, stress, and respiration, acquiring knowledge and skills to manage the NB in the kangaroo position. With the ability to stay full-time in the hospital, they become eligible for transition to the second phase.

The unit where the study was conducted follows a Minimal Handling Protocol, keeping preterm infants with a gestational age of less than 32 weeks and/or weight of 1,500g or less in a dorsal decubitus position during the first 72 hours of life, aligning the head with the midline. This protocol aims to reduce the risk of intracranial hemorrhage by minimizing the manipulation of preterm infants, allowing for an extended and improved period of sleep,

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cephalocaudal alignment, maintenance of body temperature, and enhancement of respiratory patterns[17]. The mean of 6.38 days for the initiation of the first contact may be associated with this protocol.

A literature review published in 2019 concluded that the scientific evidence related to minimal handling practices is still limited, emphasizing that their use aligns with the literature consensus, as minimizing excessive handling mitigates the pain and stress of preterm infants, thereby reducing cases of intracranial hemorrhage[18]. The instability of preterm infants, particularly those with lower weights and gestational ages, is a significant factor influencing the practice of SSC[19].

Regarding ventilatory support, less than half of the NBs needed invasive mechanical ventilation. However, CPAP was necessary for 17 PTNBs, and the most commonly used device for assisting in oxygenation was the nasal oxygen catheter (75.86%). Considering the NBs in this study, 68.97% of the admissions were diagnosed with RDS, a finding consistent with the other studies reporting a high incidence of PTNBs combined with respiratory distress syndrome[20]. The use of devices that assist respiratory function may affect the duration of SSC, as mothers are apprehensive about engaging in it due to the instability of their infants, necessitating guidance from the healthcare team.

According to the hospitalization data, PTNBs were associated with a mean hospitalization period of 40.9 days. A study conducted in a NICU in São Paulo in 2015 concluded that extended hospitalization periods are associated with low birth weight and gestational age: the lower the gestational age is, the more likely the infant is to stay hospitalized for a longer duration[20].

In this study, the mean weight of the NBs in the first phase for the NBs was 1806.85g, and the majority of the prescribed diet was maternal breast milk for stimulation, supplemented with tube-fed milk (*n*=10; 38.46%). In this context, the minimum weight for moving the NB to the second phase exceeded the weight recommended by the Ministry of Health[4]. Therefore, investigating the causes of this discrepancy is imperative, as one of the pillars of KMC is to facilitate early discharge of the NB.

The second phase of KMC involves mothers staying "hospitalized" with their infants in the KNICU. During this phase, the NB should remain in continuous SSC with the mother, with this contact being sustained for the longest possible duration[4]. The results of this study do not align with the norms of the KMC manual, as the mean duration of SSC practiced by participants in this phase was 145.97 minutes. There was no clinical difference in the duration of SSC between the first and second phases in this context. Given that mothers remain in the unit full-time and that the facility provides greater comfort, the expectation is that the duration and frequency of the kangaroo position could increase during this phase.

Another finding of the study that contradicts the recommendations of the Ministry of Health is the weight when moving from the second phase of the NBs (mean = 2281.6g), surpassing the recommended weight of 1,600g[4].

Regarding breastfeeding, 50% of the participating preterm infants were discharged with exclusive breastfeeding, confirming the findings of other studies that highlight breastfeeding as one of the benefits of KMC[14,21].

Limitations of the study

One limitation of this study was the small sample size, which prevented the association of different neonatal variables to better comprehend the outcomes. Additionally, no other studies associated with the duration or frequency of exposure of these preterm infants to SSC in different phases of the method were found, which could reinforce or clarify the results of this study. The generalizability of the findings is also limited by the local study design pattern.

CONCLUSION

The present study delineated the implementation of SSC in NBs weighing less than 1800g within a neonatal unit of a hospital renowned as a reference center for KMC. According to the profile of the NBs, male gender predominated, and the mean birth weight was 1362g.

The SSC performance predominantly occurred after the fifth day of life. In the first phase, the frequency of SSC was once per day, with a mean duration of 120 minutes. In the second phase, the data showed little variation (frequency 1.60/day and mean SSC duration 145.67 minutes). Considering the numerous benefits of this practice and the recommendation of the Brazilian Ministry of Health, more pronounced encouragement/implementation of this practice in the daily care routine of the neonatal unit was anticipated. Further studies are warranted to elucidate and identify the causes of the limited implementation of SSC.

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Another aspect to be highlighted in this study was the mean weight when moving from the first phase (1806.85g) and second phase of the KMC (2281.6g), considerably below the recommendation by the Ministry of Health, which may influence the possibility of earlier discharge for the NBs and their families. Despite recognizing that weight alone is not the sole variable determining the NB's discharge.

In conclusion, it should be emphasized that this study reaffirms that SSC may be associated with higher rates of exclusive breastfeeding upon hospital discharge.

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Authors' contributions

Conceptualization, B.S.D. e R.C.; methodology, B.S.D. e R.C.; formal analysis, B.S.D., R.C. e J.M.S; investigation, B.S.D., R.C. e J.M.S; resources, B.S.D., R.C. e J.M.S; data curation, B.S.D., R.C. e J.M.S; manuscript writing, B.S.D., R.C. e J.M.S; manuscript review and editing, B.S.D., R.C., J.M.S., J.C.P., V.M.G.O.A. e D.E.F.Q.A.; visualization, B.S.D., R.C., J.M.S., J.C.P., V.M.G.O.A. e D.E.F.Q.A.; supervision, B.S.D. e R.C..; project administration, B.S.D. e R.C.; financial aquisition, R.C. All authors have read and agreed to the published version of the manuscript.