

INTERVENING FACTORS IN PERINEAL OUTCOMES IN PARTURIENT WOMEN IN A NORMAL CHILDBIRTH CENTER

FATORES INTERVENIENTES NO COMPORTAMENTO DA MUSCULATURA PERINEAL EM PARTURIENTES DE CENTRO DE PARTO NORMAL

FACTORES INTERVENIENTES EN RESULTADOS PERINEALES EN PARTURIENTAS EN UN CENTRO DE PARTO NORMAL

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ABSTRACT

Objectives: to determine the frequency and types of perineal trauma in vaginal deliveries, and to verify the association between parity, birth position, and newborn weight and perineal outcomes after birth. **Methods:** an observational, retrospective, and cross-sectional study was carried out at the Normal Childbirth Center of the city of São Paulo, Brazil. The population consisted of vaginal birth records from January 2017 to January 2018. **Results:** from 2,367 births recorded, in 1,629 (68.7%) there was perineal trauma, with first-degree lacerations being the most prevalent (43.9%). Higher percentages of episiotomy were found in primiparous women and in deliveries in the lithotomic and semi-seated positions (<0.0001). When the newborn's weight was less than 2500 grams, the percentage of intact perineum was higher and, in those over 4000 grams, the percentage of second-degree lacerations was higher (<0.0001). **Conclusion:** there was an influence of the studied variables on perineal outcomes after birth. Perineal trauma remains a concern due to the prevalence and future consequences for women. Knowing the factors that can influence its occurrence is essential for improving obstetric care.

Descriptors: Lacerations; Obstetric Nursing; Humanized Delivery; Perineum; Natural, Childbirth; Labor, Obstetric.

RESUMO

Objetivos: conhecer a frequência e os tipos de traumas perineais em partos vaginais, bem como verificar a associação da paridade, posição do parto e peso do recém-nascido com a situação perineal, após o nascimento. **Métodos:** estudo observacional, retrospectivo, de corte transversal, realizado em Centro de Parto Normal, no município de São Paulo, Brasil. A população foi constituída pelos

registros de partos vaginais, no período de janeiro de 2017 a janeiro de 2018. **Resultados:** dos 2.367 partos registrados, em 1.629 (68,7%) houve traumatismo perineal, sendo as lacerações de primeiro grau as mais prevalentes (43,9%). Nas primíparas e nos partos em posição litotômica e semi-sentada, constataram-se maiores percentuais de episiotomia ($<0,0001$). Quando o peso do recém-nascido era menor do que 2500 gramas, foi maior o percentual de períneo íntegro e, nos maiores de 4000 gramas, foi maior o percentual de lacerações de segundo grau ($<0,0001$). **Conclusão:** houve influência das variáveis estudadas na situação do períneo após o nascimento. O trauma perineal continua a ser uma preocupação, devido à prevalência e às consequências futuras às mulheres. Conhecer os fatores que podem influenciar sua ocorrência é essencial para melhoria da assistência obstétrica.

Descritores: Lacerações; Enfermagem Obstétrica; Parto Humanizado; Períneo; Parto Natural; Trabalho de Parto.

RESUMEN

Objetivos: determinar la frecuencia y los tipos de trauma perineal en partos vaginales y verificar la asociación entre paridad, posición del parto y peso del recién nacido y resultados perineales después del nacimiento. **Métodos:** se realizó un estudio observacional, retrospectivo y transversal en el Centro de Parto Normal de la ciudad de São Paulo, Brasil. La población estuvo constituida por registros de partos vaginales de enero de 2017 a enero de 2018. **Resultados:** de 2.367 nacimientos registrados, en 1.629 (68,7%) hubo traumatismo perineal, siendo las laceraciones de primer grado las más prevalentes (43,9%). Se encontraron mayores porcentajes de episiotomía en primíparas y en partos en posición litotómica y semisentada ($<0,0001$). Cuando el peso del recién nacido era menor de 2500 gramos, el porcentaje de perineo intacto era mayor y, en los mayores de 4000 gramos, el porcentaje de laceraciones de segundo grado era mayor ($<0,0001$). **Conclusión:** hubo influencia de las variables estudiadas en los resultados perineales después del nacimiento. El trauma perineal sigue siendo una preocupación debido a la prevalencia y las consecuencias futuras para las mujeres. Conocer los factores que pueden influir en su ocurrencia es fundamental para mejorar la atención obstétrica.

Descriptores: Laceraciones; Enfermería Obstétrica; Parto Humanizado; Perineo; Parto Normal; Trabajo de Parto.

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INTRODUCTION

The pelvic floor is the only transverse musculature of the human body that supports the body's load, being responsible for several functions including: support of abdominal and pelvic organs,⁽¹⁾ maintenance of urinary and fecal continence,⁽²⁾ and aid in increasing intra-abdominal pressure, breathing and trunk stabilization. Besides, these muscles allow for sexual intercourse and childbirth.⁽³⁾

Perineal injuries are associated with an increased risk of pelvic floor injury, fecal and urinary incontinence, pain, and sexual dysfunction, and these symptoms can persist or be present many years after the delivery.⁽⁴⁾

It is estimated that, in Brazil, there are approximately 2.8 million births per year. Of these, 1.2 million are vaginal births.⁽⁵⁾ During the parturition process, perineal traumas may occur when the fetus passes through the vaginal canal. These spontaneous injuries are named "lacerations".⁽⁶⁾ Perineal injuries can also be medically caused and are called as episiotomy, which consists of an incision made in the perineum. According to the Brazilian Ministry of Health, 56% of women at habitual risk are submitted to episiotomy.^(7,8)

Perineal trauma can occur due to several Harmful Intervening Factors (HIF), such as maternal factors (age, ethnicity, and parity), fetal factors (weight, fetal statics, and head circumference), perineal conditions (preparation of the perineum during pregnancy, height of the perineum, and episiotomy procedure in previous pregnancies), and childbirth-related factors (factors related with the professional who provides childbirth assistance and performs interventions, directed pulls, perineal protection, management of the fetus, maternal position, and duration of the expulsive period).⁽⁹⁻¹¹⁾

The Beneficial Intervening Factors (BIF) for the perineal outcomes are reflected in childbirth, causing the integrity of the perineum, mild laceration, and physical, psychological and social well-

being of the woman in the immediate postnatal period, and in the long term. They facilitate the breastfeeding process, family life, and sexual intercourse.⁽¹²⁾

Perineal trauma can cause local morbidities and complications, such as pain, vulvar edema, hematoma, and infection, in addition to injuries such as dyspareunia and urinary and anal incontinence.⁽¹³⁻¹⁶⁾ It should be noted that these local morbidities can also occur in women with intact perineum.^(14,17)

The spontaneous lacerations are classified based on the depth of the injury and the affected tissues. First-degree lacerations reach the skin and mucosa; second-degree ones affect the perineal muscles without reaching the anal sphincter; those of the third degree reach the complex of the anal sphincter and the anal sphincter muscle; and those of the fourth degree involve the sphincter and the anal epithelium.^(6,18)

Through the Brazilian Ministry of Health Ordinance No. 985/GM, at the scope of the Unified Health System (SUS), an alternative was created for the implementation of a new model of obstetric care, named Normal Childbirth Centers (NCC), which are in-hospital units that assist women in the pregnancy-puerperal period.⁽¹⁹⁾ Ordinance No. 11, of January 7, 2015,⁽²⁰⁾ has constituted NCC as "a health unit for low-risk childbirth care, belonging to a hospital, located in its internal facilities or surroundings". Low-risk vaginal delivery can be assisted by doctors, obstetric nurses, and midwives.⁽⁶⁾ The NCC provides humanized assistance in which the woman has the right to autonomy in this process.

In 2017, the Brazilian Ministry of Health published, together with the National Commission for the Incorporation of Technologies in the SUS (CONITEC in Portuguese), the "National Guidelines for Normal Childbirth Assistance"⁽⁶⁾, which aim to qualify the way of being born, based on the guidelines on best practices in childbirth and birth assistance. Besides, concerning perineal injuries, this document presents the perineal care that should or should not be performed by professionals who conduct and assist vaginal deliveries.⁽⁶⁾

Given the above, the following questions emerged: what possible perineal outcomes can be found in parturient women from the Normal Childbirth Centers and what are the respective intervening factors (beneficial and harmful)? Is there a relationship between parity, birth position, and weight of the newborn and perineal trauma?

OBJECTIVE

To determine the frequency and types of perineal trauma in vaginal deliveries, and to verify the association between parity, birth position, and newborn weight and perineal outcomes after birth.

METHOD

An observational, retrospective, and cross-sectional study was carried out at the Normal Childbirth Center (NCC) of the General Hospital of Pedreira, in the municipality of São Paulo, Brazil. This is a state hospital of medium complexity, and a reference center for emergency care of the population of the south zone of São Paulo, which includes, in addition to other specialties, a maternity center, which is a reference center in the care of pregnant women of habitual and high risk. The hospital has a humanized childbirth center consisting of nine beds, five of which are rooms especially prepared for pre-delivery, childbirth, and immediate puerperium. At the NCC, there is about 300 deliveries/month.

This institution follows the guidelines for the implantation and qualification of NCCs within the scope of SUS for the care of women and newborns, at the moment of delivery and birth, following the delivery and birth component of the *Rede Cegonha* covered by Ordinance No. 11, of January 7, 2015.⁽²⁰⁾ Thus, at the NCC, assistance to women in labor is performed by obstetric nurses and resident nurses from the National Obstetric Nursing Residency Program at the Paulista School of Nursing at the Federal University of São Paulo (UNIFESP), under supervision. Surgical deliveries are performed in the operating room by obstetricians, who are also responsible for the hospitalization of the pregnant and parturient women.

Initially, contact was made with those responsible for the hospital in which the study was undertaken to obtain authorization for the data collection. A confidentiality term was requested. After consent was granted, the project was analyzed by the Research Ethics Committee of UNIFESP. According to opinion No. 2,771,260 and Certificate of Ethical Committee Approval (CAAE) No. 89107018.4.0000.5505, the study complies with national and international standards of ethics in research involving human beings.

The study population consisted of 2,367 registers of vaginal deliveries carried out at the NCC from January/2017 to January/2018. Data collection took place from 1 to November 30, 2019, using a form designed for the research, containing the following variables: identification data, obstetric history, maternal position during childbirth, medication use, perineum situation after birth,

professional who assisted the birth, and newborn’s weight. Exclusion criteria were assisted births performed in the operating room and diagnosis of fetal death.

Double typing was performed on 100% of the questions, and an agreement of 100% was reached (Kappa coefficient: 1.00).

For the data analysis, descriptive analysis was used, resulting in a frequency and percentage table. The Likelihood Ratio test was applied to compare the variables of interest by the perineal situation. The level of significance was set at 5% ($p\text{-value} \leq 0.05$) for the hypothesis tests. This process was carried out with computational support of the software Statistical Package for the Social Sciences (SPSS) for Windows version 23, and Microsoft Office Excel 2010®.

RESULTS

Two thousand three hundred sixty-seven records of vaginal deliveries assisted at the NCC were analyzed in a one-year period. Most women (70.2%) were aged between 20 and 34 years old and had an average of 2.26 pregnancies (SD: 1.45).

Concerning the perineal outcomes, the presence of trauma was recorded in 1,629 (68.7%) births, with 1,378 (58.2%) spontaneous lacerations and 251 (10.5%) episiotomies. Regarding spontaneous lacerations, 1,039 (43.9%) were first-degree, 329 (13.9%) second-degree, and 10 (0.4%) third- or fourth-degree. The perineum remained intact in 738 (31.2%) of deliveries.

Oxytocin was used in 814 (34.4%) deliveries and induction in four (0.2%) deliveries. Misoprostol was used in the induction process of 233 (9.8%) births. In another 188 (7.9%), misoprostol was used in the induction process and oxytocin in the conduction process. In 1,128 (47.7%) deliveries, no drugs were used for birth induction or conduction.

Regarding the positions adopted by women during childbirth, of 2,367 births, the majority (n: 2297/96.1%) opted for horizontal positions. Of the horizontal positions, 1,636 (69.1%) were semi-seated, 379 (16%) side-lying, and 261 (11%) lithotomic. The other 88 (3.9%) deliveries were distributed as follows: sitting upright (n: 48/2%), squatting (n: 19/0.8%), Gaskin (hands and knees) (n: 18/0.8%), and standing (n: 6/0.3%).

Most deliveries (n: 1614/68.2%) were attended by obstetric nurses, as shown in Table 1.

Table 1. Distribution of the parturient women studied according to age, obstetric data, delivery, and newborn.

Variables	n	(%)
Maternal age (in years)		
10 - 19	437	18.4
20 - 34	1,661	70
35 or +	269	11.4
Gestational age		
Pre-term	196	8.3
Term	2,159	91
Post-term	12	0.5
Parity		
Primiparous	976	41.2
Secondiparous	755	31.9
Multiparous	636	26.9
Birth position		
Lithotomic	261	11
Semi-seated	1,636	69
Side-lying	379	16
Sitting up right	48	2
Squatting	19	0.8
Gaskin (hands and knees)	18	0.8
Standing	6	0.3
Perineal outcome		
First-degree laceration	1039	43.9
Second-degree laceration	329	13.9
Third- or fourth-degree laceration	10	0.4
Episiotomy or episiotomy + laceration	251	10.6
Intact perineum	738	31.2
Use of medications		
Misoprostol (induction)	233	9.8
Oxytocin (induction)	4	0.2
Oxytocin (conduction)	814	34.4
Misoprostol (induction) + Oxytocin (conduction)	188	7.9
No medications	1128	47.7
Professional who performed the delivery		
Obstetric nurse	1614	68.2
Resident obstetric nurse	479	20.2
Medical resident in obstetrics	138	5.8
Nurse + obstetrician + doctor	129	5.4
Resident obstetric nurse + doctor	7	0.3
Newborn weight		
Less than 2,500g	167	7.1
≥2,500 and <4,000g	2133	90.1
≥4,000g	67	2.8
Total	n = 2,367	

The correlation between the variables of interest and theperineal outcomes after birth is shown in Table 2.

Table 2. Characteristics related to obstetric history, delivery, and newborn data from the studied records, according to the perineal outcomes after vaginal delivery.

Variables	Perineal outcomes after vaginal delivery					Total n (%)	p-value
	First-degree laceration	Second-degree laceration	Third- or fourth-degree laceration	Intact perineum	Episiotomy		
	n (%)	n (%)	n (%)	n (%)	n (%)		
Parity							
Primiparous	456 (46.7)	175 (17.9)	05 (0.5)	155 (15.9)	185 (19)	976 (100)	<0.0001*
Secondary	355 (47)	105 (13.9)	04 (0.5)	242 (32.1)	49 (6.5)	755 (100)	
Multipara	228 (35.8)	49 (7.7)	01 (0.2)	341 (53.6)	17 (2.7)	636 (100)	
Total	1039 (43.9)	329 (13.9)	10 (0.4)	738 (31.2)	251 (10.6)	2367 (100)	
Maternal position							
Lithotomic	91 (34.9)	42 (16.1)	2 (0.8)	74 (28.4)	52 (19.9)	261 (100)	<0.0001*
Semi-seated	708 (43.3)	226 (13.8)	4 (0.2)	503 (30.7)	195 (11.9)	1636 (100)	
Side-lying	189 (49.9)	43 (11.3)	4 (1.1)	139 (36.7)	4 (1.1)	379 (100)	
Sitting up right	26 (54.2)	13 (27.1)	0 (0)	9 (18.8)	0 (0)	48 (100)	
Squatting	11 (57.9)	3 (15.8)	0 (0)	5 (26.3)	0 (0)	19 (100)	
Gaskin	12 (66.7)	2 (11.1)	0 (0)	4 (22.2)	0 (0)	18 (100)	
Standing	2 (33.3)	0 (0)	0 (0)	4 (66.7)	0 (0)	6 (100)	
Total	1039 (43.9)	329 (13.9)	10 (0.4)	738 (31.2)	251 (10.6)	2367 (10)	
Newborn weight							
Less than 2500g	52 (31.1)	13 (7.8)	0 (0)	90 (53.9)	12 (7.2)	167 (100)	<0.0001*
≥2,500 and <4000g	966 (45.3)	299 (14)	10 (0.5)	629 (29.5)	229 (10.7)	2133 (100)	
≥4,000g	21 (31.3)	17 (25.4)	0 (0)	19 (28.4)	10 (14.9)	67 (100)	
Total	1039 (43.9)	329 (13.9)	10 (0.4)	738 (31.2)	251 (10.6)	2367 (100)	

p-value: probability of significance. *Likelihood ratio test

A higher percentage of episiotomy was found in primiparous births, while the multiparas had a higher percentage of intact perineum and a lower percentage of first- and second-degree trauma (<0.0001).

There was a significant relationship between the position adopted for childbirth and the performance of episiotomy. There was a higher percentage of episiotomy in deliveries in semi-seated

or lithotomic positions compared to the others (<0.0001). All women who underwent episiotomy gave birth in horizontal positions, 19.9% in the lithotomic position, 11.9% in the semi-seated position, and 1.1% in the side-lying position.

The semi-seated and the side-lying positions were considered as Beneficial Intervening Factors (BIF) for the perineal outcomes in parturient women, making a total of 1,739 (73%) of deliveries in which a first-degree injury occurred or the perineum remained intact.

Likewise, the Gaskin position behaved as a BIF since it resulted in a higher percentage of first-degree lacerations (66.7%), a lower percentage of second-degree lacerations (11.1%), and no case of third and fourth-degree lacerations or episiotomies, while among women who opted for upright positions, there was a higher prevalence of intact perineum (66.7%). There was no association between horizontal and vertical positions and the occurrence of spontaneous perineal lacerations.

Concerning the newborn's weight, a birth weight of less than 2500g was related to a higher incidence of intact perineum. In the births of newborns weighing 4000g, the percentage of second-degree lacerations was higher (<0.0001).

DISCUSSION

Of the total of 2,367 births evaluated, 1,629 (68.7%) resulted in some type of perineal trauma, with 1,378 (58.2%) spontaneous lacerations and 251 (10.5%) episiotomies. The perineum remained intact in 738 (31.2%) births.

A systematic review⁽²¹⁾ that analyzed more than 300,000 vaginal deliveries in low- and middle-income countries to estimate the frequency of episiotomy, second-degree lacerations, and obstetric lesions of the anal sphincter found that perineal trauma affects more than 70% of women who had a vaginal delivery, being in line with the rates observed in this study.

The prevalence verified concerning the performance of episiotomy is within the rates recommended by the World Health Organization (WHO)⁽²²⁾, which guides the selective practice and states that less than 10% of women having vaginal deliveries should receive episiotomy. However, although for the general population of pregnant women the prevalence is similar to that recommended, when the percentage of episiotomy was verified, it can be seen that the majority was performed on primiparous women, which deserves attention to the fact that all episiotomies were justified, as requested by the National Delivery Assistance Directive⁽⁶⁾, or if this would be a trend, as identified in another study⁽²¹⁾.

A cross-sectional study⁽¹⁸⁾ carried out in Rio de Janeiro, Brazil, which evaluated perineal lacerations in primiparous women, demonstrated that few women experience vaginal delivery with

an intact perineum. This study⁽¹⁸⁾ also shows an incidence of perineal trauma in 71.4% of the cases, with 45.5% spontaneous lacerations and 25.9% episiotomies. Another systematic review⁽²¹⁾ showed that primiparous women were at higher risk of undergoing episiotomy, 62% (95% CI: 40-84%), compared to populations with mixed parity, 33% (95% CI: 22-45%), and the multiparous population, 25% (95% CI: 21-30%).

In this study, a similar condition was noted when multiparous women presented more favorable perineal musculature behavior, with a higher percentage of an intact perineum and also a lower percentage of first- and second-degree trauma (<0.0001).

The delivery position most often adopted by women was the semi-seated position (n: 1,636/69.1%). This position is considered a BIF for a positive perineal musculature outcome.

Furthermore, by grouping the positions of the parturient women during birth, namely, lithotomic, semi-seated, and side-lying, a total of 1,704 (85.2%) women demonstrated a satisfactory perineal outcome, and these positions were considered in this study as BIF.

There was a higher percentage of first-degree lacerations (66.7%) in patients rotated into the Gaskin position but a lower percentage of second-degree lacerations (11.1%) and no cases of third and fourth-degree lacerations or episiotomy. Simultaneously, among women who opted for the standing position, there was a higher prevalence of intact perineum (66.7%).

The semi-seated position was also the most adopted in a research carried out with primiparous women in a maternity school in Ceará, Brazil.⁽²³⁾ This study also showed an association between episiotomy and horizontal childbirth positions.

These results demonstrate that the adoption of practices currently discouraged by scientific evidence understood in this study as practices inserted in the HIF, such as immobilization in the bed during the parturition process and lithotomic position in the expulsive period, may result in a greater number of unnecessary interventions and negative outcomes, including local complications, such as pain, vulvar edema, hematoma, and infection, in addition to injuries, such as dyspareunia and urinary and anal incontinence⁽¹¹⁾.

Encouraging the adoption of upright positions for childbirth has been pointed out as a beneficial intervening factor to reduce episiotomies. In a randomized clinical trial⁽²⁴⁾ carried out at a university hospital in Madrid, Spain, which aimed to evaluate the effects of an alternative model of childbirth on the incidence of assisted vaginal delivery and perineal trauma, it was found that the alternative model of childbirth significantly increased the rate of intact perineum compared to the

traditional model (40.3% vs. 12.2%, $p < 0.001$). Episiotomy rates were significantly reduced in the alternative delivery model (21.0% vs. 51.4%, $p < 0.001$).

Thus, it is evident that the positioning can favor low-grade lacerations, and the upright positions are related to an evolution of physiological labor, maintaining a satisfactory perineal outcome, and generating better well-being for the mother and child. Therefore, it can be inferred that encouraging women to adopt postural changes, both in the passive phase of the second period of labor and during the active phase of the expulsion period (encouraging only spontaneous pull), is related to the reduction of perineal trauma rates and instrumental delivery.⁽²⁴⁾

In this study, most women did not use medications to induce or conduct labor and expulsion, such as misoprostol and oxytocin. The relationship between such variables and perineal situation after birth was not analyzed, but there is evidence that the infusion of synthetic oxytocin during labor is related to the sudden detachment of the fetal cephalic pole, at birth, with consequent laceration of the perineum.

A study carried out in a public maternity hospital in Goiânia, Brazil,⁽⁹⁾ to analyze the occurrence of perineal lacerations associated with the use of synthetic oxytocin in labor found, by correlating the delivery positions with the type of lacerations that occurred in women who had used oxytocin, that among women who gave birth in a horizontal position, 25% had a first-degree laceration and 24.2% underwent episiotomy. Among the deliveries that took place in vertical positions, there was no record of lacerations.

When the newborn weight was analyzed, it was observed that there was a higher prevalence of intact perineum in deliveries of newborns weighing less than 2,500g. In comparison, for newborns weighing over 4000g, the percentage of second-degree lacerations was higher (< 0.0001). A retrospective descriptive study⁽¹⁰⁾ carried out at the General Hospital of Itapeceirica da Serra, São Paulo, found a relationship between newborn's weight and intact perineum only when the weight is less than 3,150 grams. It was also shown⁽¹⁰⁾ that in the deliveries of newborns weighing over 3,300 grams, there was an increase of 1.6% in the chance of second-degree laceration, corroborating the results of this study. In another retrospective study conducted in 2014 on the records of births assisted in a childbirth center located in a metropolitan region in the Federal District (DF), Brasília, it was observed that second- and third-degree lacerations occurred more frequently in the births of newborns weighing from 3,501 to 4,000 grams.⁽²⁵⁾

CONCLUSION

The results of this study, in general, allow us to conclude that the Beneficial Intervening Factors (BIF) for satisfactory perineal outcomes were expressive. During the process of giving birth, the changes in positioning show respect for the woman's choice and bring benefits, such as lower rates of perineal injury. The results also allow us to conclude that the Harmful Intervening Factors (HIF), although reduced in this study, are generators of unsatisfactory perineal outcomes, being able to reflect on the functionality of this area, such as rotating women into a lithotomic position in the expulsive period, which may generate a greater number of unnecessary interventions and negative outcomes, thus increasing the perineal injury rates.

The relevance of this study is also to present data, such as parturient age and newborn weight, and relate them to perineal injuries, bringing elements that can improve assistance to women, with a reduction in possible perineal injuries.

Perineal trauma remains a concern due to the prevalence and future consequences for women. Knowing the intervening factors in the perineal outcomes is essential to improve obstetric care since it provides professionals with means for prevention and, thus, reducing the morbidities associated with childbirth assistance.

CONTRIBUTIONS

All authors contributed equally to the design of the research project, collection, analysis, and discussion of the data, as well as in the writing and critical review of the content, intellectual collaboration, and approval of the final version of the study.

CONFLICT OF INTERESTS

None to declare.

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