

Physiotherapeutic performance in neonatal intensive care units in Rio Grande do Sul

Atuação fisioterapêutica em unidades de terapia intensiva neonatal do Rio Grande do Sul

Actuación de la fisioterapia en unidades de cuidados intensivos neonatales en Rio Grande do Sul

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ABSTRACT | The neonatal intensive care unit (NICU) is organized to care for newborns who have difficulty in adapting and surviving in the extrauterine environment, due to disturbing pathology, respiratory dysfunction, and prematurity. Rio Grande do Sul (RS) has a high rate of prematurity, above the national average. To assist the newborn, the physical therapist stimulates the respiratory and motor functions with specific techniques. This descriptive observational study aimed to identify the physiotherapeutic techniques used in NICUs in the state of RS. An online questionnaire was applied to physical therapists working in NICUs in RS, with 32 questions related to training and professional performance, working hours, unit data, multiprofessional relationship, and physiotherapeutic technique used. In total, 22 professionals answered the questionnaire, all females (100%), mean age of 30.6 years, mean period since undergraduate education of 6 years, years of professional practice in the NICU ranging from 6 to 15 years (22.7%), and with a graduate degree in the field of Neonatal Physical Therapy (73.3%). Prematurity was the main reason for hospitalization (100%) and the physiotherapeutic conduct most study participants mentioned were therapeutic positioning and aspiration (95.5%) and encouraging crossing the midline (90.9%). We concluded that the physiotherapeutic conducts in this study are consistent with the literature, being relevant and appropriate for the treatment of newborns.

Keywords | Neonatal Intensive Care Unit; Newborn; Premature; Physical Therapy Techniques.

RESUMO | A unidade de terapia intensiva neonatal (UTIN) é organizada para o atendimento ao recém-nascido que tenha dificuldade de adaptação e sobrevivência no ambiente extrauterino, devido à patologia perturbadora, disfunção respiratória e prematuridade. O Rio Grande do Sul (RS) detém uma alta taxa de prematuridade, acima da média nacional. Assistindo ao neonato, o fisioterapeuta executa o papel primordial de estimular as funções respiratória e motora através de técnicas específicas. Este estudo observacional descritivo objetivou identificar as técnicas fisioterapêuticas utilizadas em UTINs no estado do RS. Assim, aplicou-se um questionário on-line aos fisioterapeutas atuantes em UTINs do RS, com 32 questões sobre formação e atuação profissional, jornada de trabalho, dados da unidade, relacionamento multiprofissional e técnicas fisioterapêuticas utilizadas. Ao final, 22 profissionais responderam ao questionário, havendo prevalência do sexo feminino (100%), idade média de 30,6 anos, tempo de formação médio de 6 anos, tempo de atuação em UTIN entre 6 e 15 anos (22,7%) e com pós-graduação na área de fisioterapia neonatal (73,3%). Prematuridade foi o principal motivo de internação (100%) e as condutas fisioterapêuticas mais citadas foram: posicionamento terapêutico e aspiração (95,5%); e incentivo à linha média (90,9%). Conclui-se que as condutas fisioterapêuticas identificadas no estudo são condizentes com a recomendação na literatura, sendo pertinentes e adequadas ao tratamento do paciente neonato.

Descritores | Unidade de Terapia Intensiva Neonatal; Recém-Nascido; Prematuridade; Técnicas de Fisioterapia.

Study developed at the Physical Therapy course of the Catholic University of Pelotas - Pelotas (RS), Brazil.

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RESUMEN | La unidad de cuidados intensivos neonatales (UCIN) brinda cuidados a los recién nacidos que tienen dificultad para adaptarse y sobrevivir en el ambiente extrauterino, debido a una patología perturbadora, disfunción respiratoria y prematuridad. Rio Grande do Sul (Brasil) tiene una alta tasa de prematuridad por encima de la media nacional. En la asistencia al neonato, el fisioterapeuta juega un papel clave al estimular las funciones respiratorias y motoras a través de técnicas específicas. Este estudio observacional descriptivo tuvo por objetivo identificar las técnicas fisioterapéuticas que son utilizadas en las UCIN del estado de Rio Grande do Sul. Para ello, se aplicó un cuestionario en línea a los fisioterapeutas que actúan en las UCIN de este estado, que contenía 32 preguntas sobre formación y desempeño profesional, jornada laboral, datos de la unidad, relación multidisciplinaria y

técnicas fisioterapéuticas utilizadas. En total 22 entrevistados respondieron al cuestionario, con predominio del sexo femenino (100%), edad media de 30,6 años, tiempo de formación promedio de 6 años, tiempo de actuación en la UCIN entre 6 y 15 años (22,7%) y con posgrado en fisioterapia neonatal (73,3%). La prematuridad fue el principal motivo de hospitalización (100%), y los procedimientos fisioterapéuticos más citados fueron la conducta terapéutica y aspiración (95,5%); e incentivo a la línea media (90,9%). Se concluye que la actuación fisioterapéutica identificada es consistente con lo que recomienda la literatura, además de ser pertinente y adecuada para el tratamiento del paciente recién nacido.

Palabras clave | Unidad de Cuidado Intensivo Neonatal; Recién Nacido; Prematuridad; Técnicas de Fisioterapia.

INTRODUCTION

Prematurity is the main cause of mortality in the first 28 days of life¹ in Brazil and worldwide. The state of Rio Grande do Sul (RS) has a 12.26% prevalence rate of premature birth, above the national average of 11.5%². The preterm newborn (PTNB) is born before 37 gestational weeks³ and vulnerable to environmental conditions due to body and systemic immaturity. Thus, clinical risk is present due to their weakness at birth and the procedures necessary for their assistance. The main pathologies to which a PTNB is exposed are bronchopulmonary dysplasia, retinopathy of prematurity, and neurological sequelae^{4,5}.

Intrauterine fetal movements are precursors of locomotor development and control of objects afterbirth, occurring in the third trimester of pregnancy. Thus, the premature newborn, suffering the interruption of their gestation, may have their development compromised. However, physical therapy helps the PTNB by stimulation appropriate to their continuous physical development⁶.

The neonatal intensive care unit (NICU) provides support and conditions to the PTNB that shows difficulty in adapting or has a pathology that disturbs their extrauterine survival⁷. As part of the multiprofessional team of the NICU, the physical therapist has exclusive techniques and resources that promote patient care and encouragement of respiratory and motor functions⁸, minimizing the effects of the NICU stay⁹. Coherence among the patient's needs, the conducts chosen for care, and their correct execution is necessary for an efficient treatment, so that, when this

does not occur, the patient is exposed to unnecessary stress, limiting their clinical evolution⁵. Procedures of sensory-motor stimulation correspond to the infant's needs and are performed by experienced professionals¹⁰.

Given the importance of physical therapy care in the intensive care environment, this study purpose is to identify the techniques used in NICUs in the state of Rio Grande do Sul.

METHODOLOGY

A descriptive cross-sectional observational study was conducted, with convenience sampling, from August to September 2021.

After consulting the DATASUS website, hospitals with NICU in RS were identified, as well as the list of physical therapists from these facilities. Then, listed professionals were invited to participate via Instagram and Facebook. The researchers elaborated the data collection instrument on the Google Forms platform[®].

The self-administered online questionnaire was addressed to physical therapists working in the NICU for more than three months in RS, with 32 questions regarding demographic data, professional training, working shift, NICU data, multiprofessional relationships, and physiotherapeutic techniques used in the NICUs. The research committed to the information confidentiality by the informed consent form.

The answers were organized in tables and graphs, and the results analyzed with the Stata 14. Statistical

package 0 and were presented by mean, standard deviation, and relative and absolute frequencies.

RESULTS

In total, 22 physical therapists responded to our questionnaire, who work in 17 NICUs located in 10 municipalities in RS, namely: Pelotas (n=5); Porto Alegre (n=5); Caxias do Sul (n=3); Rio Grande (n=3); Santa Rosa (n=1); Cachoeira do Sul (n=1); Bento Gonçalves (n=1); Ijuí (n=1); Esteio (n=1); and Canoas (n=1).

All participants were women (100%), with a mean age of 30.6 ± 5.2 years, who have finished their undergraduate studies for 6 ± 5.1 years, and 18.2% (n=4) have professional residence. A total of 68.2% (n=15) graduated in Physical Therapy, and out of these 73.3% (n=11) are graduated in Neonatal and Pediatric Physical Therapy, and 26.7% (n=4) in Adults Physical Therapy. Regarding complementary training, 72.7% (n=16) reported having concluded at least one, of which 50% (n=8) had concluded one less than six months ago. The time of professional practice in NICU ranged from 6 to 15 years for 22.7% of the participants, and 86.4% worked in only one hospital. In the 17 hospitals included, the NICU has a mean of 13 ± 5.64 beds, and in 27.3% the legislation (RDC No. 7/2010) on the sizing of one physical therapist for every 10 ICU beds is not respected.

Table 1 shows the demographic and academic characteristics of physical therapists working in NICUs and data on the units.

Table 1. Characteristics of the neonatal intensive care units and physical therapists working in the state of Rio Grande do Sul (n=22)

Characteristic	%	N
Sex		
Female	100	22
Age (years)		
24-30	54.5	12
31-37	36.4	8
38-44	9.1	2
Period since undergraduate education (years)		
1-4	54.5	12
5-8	13.6	3
9-12	22.8	5
13-16	0	0
17-19	9.1	2

(continues)

Table 1. Continuation

Characteristic	%	N
Time working in the NICU		
3 to 11 months	18.2	4
1 year	18.2	4
2 years	13.6	3
3 years	18.2	4
4 years	9.1	2
6 to 15 years	22.7	5
RDC Compliance No. 7/2010		
Yes	72.7	16
No	27.3	6

RDC: Collegiate Board Resolution; NICU: neonatal intensive care unit.

In the NICUs included the mean number of beds was 13, with a minimum of nine and a maximum of 31. Porto Alegre and its metropolitan area have the largest number of beds available in NICU, where four hospitals offer 20 beds each and one hospital offers 31 beds. Therapeutic care is provided from Monday to Friday in the morning and afternoon (100%, n=22) and at night (77%, n=17). During weekends, care is provided in the morning (95.5%), afternoon (77.3%), night (22.7%), and early morning (4.5%), with no other assistance in this period.

The main reasons for hospitalization were prematurity (100%, n=22), low birth weight (81.8%, n=18), and respiratory distress syndrome (81.8%, n=18). Table 2 presents the other reasons for hospitalization.

Table 2. Reasons for hospitalization in neonatal intensive care units of Rio Grande do Sul

Reason for hospitalization	%	N
Preterm birth	100	22
Low birth weight	81.8	18
Respiratory distress syndrome	81.8	18
Respiratory disorders	72.7	16
Early neonatal sepsis	63.6	14
Meconium aspiration syndrome	59.1	13
Neonatal anoxia	59.1	13
Hyaline membrane disease	45.5	10
Congenital malformations	27.3	6
Myelomeningocele	13.6	3
Hydrocephalus	9.1	2

The question "What techniques were used during physical therapy care?" had 31 answer options. Of these,

participants marked 26 techniques. The open answer “others,” in which the participant could mention an unlisted technique, was unused. The most frequently mentioned techniques were therapeutic positioning and aspiration (95.5%, n=21), help crossing the midline (90.9%, n=20), and tactile stimulation and thoracoabdominal support (86.4%, n=19).

Table 3 shows the other techniques and their response frequency.

Table 3. Physiotherapeutic techniques used in neonatal intensive care units in Rio Grande do Sul

Physiotherapeutic technique	%	N
Therapeutic positioning	95.5	21
Aspiration	95.5	21
Help crossing the midline	90.9	20
Tactile stimulation	86.4	19
Thoracoabdominal support (TAS)	86.4	19
Waist dissociation	77.3	17
Proprioceptive stimulation	77.3	17
Encouraging suction reflex	72.7	16
Alternating reach of upper limbs	68.2	15
Encouraging palmar grasp reflex	63.6	14
Encouraging plantar reflex/plantar grasp	63.6	14
Encouraging hand-to-mouth reflex.	63.6	14
Increased expiratory flow (IEF)	59.1	13
Visual stimulation	59.1	13
Alternating kicks	54.5	12
Vestibular stimulation	54.5	12
Plantar flexion	54.5	12
Dorsiflexion	54.5	12
Diaphragmatic incentive	54.5	12
Vibrocompression	54.5	12
Passive Manual Expiratory Technique (PMET)	50	11
Encouraging search reflex	50	11
Functional diagonal	45.5	10
Vibration	36.4	8
Self-stretching	36.4	8
Labyrinthine stimulation	31.8	7

The relationship with the multiprofessional team was considered “good” by 36.4% and “great” by 27.3% of the participants. Table 4 shows the other variables related to autonomy and the possibility of case discussion.

Table 4. Multiprofessional relationship and physiotherapeutic autonomy in the neonatal intensive care units of Rio Grande do Sul

Characteristic	%	N
Multiprofessional relationship		
Bad	4.5	1
Regular	13.6	3
Good	36.4	8
Great	27.3	6
Excellent	18.2	4
Opportunity for case discussion		
Always	40.9	9
Sometimes	50	11
Rarely	9.1	2
Autonomy in mechanical ventilation		
No autonomy	4.5	1
With autonomy	4.5	1
Participates in intubation	68.2	15
Participates in extubation	77.3	17
Performs extubation alone	18.2	4
Discusses ventilatory weaning	90.9	20
Changes parameters with autonomy	40.9	9
Alters oxygenation and discusses other parameters with the team	4.5	1

DISCUSSION

The questionnaire allowed to identify the physical therapist’s performance and the physiotherapeutic techniques used in NICUs of RS.

NICU is an essential ward for newborns health care. The physical therapist is part of the multiprofessional team and can offer and broadly contribute to health care. Their professional skills contribute to the reduction of neonatal morbidity, in the prevention and treatment of respiratory and motor complications due to prematurity¹¹.

A recent study on the analysis of the profile of physical therapists working in NICUs in hospitals in Florianópolis metropolitan area¹² found that the professionals were all female (n=20), 50% were aged 36 to 45 years, 45% had professional specialization, and 55% in the field of Intensive Physical Therapy. These results are similar to ours; however, the most prevalent specialization in our study was in Neonatal and Pediatric Physical Therapy. Even including municipalities in the inland Rio Grande do Sul, we observed a good rate of professional training in the field of Neonatal Physical Therapy, although specialization in adult intensive care is more frequently offered.

The years since undergraduate education of the participants in a study conducted with eight NICU physical therapists in the city of Goiânia¹³ had a mean of 10.12±5.74 years and work time in the NICU had a mean of 7.37±4.5 years. The results of this research show that the period since undergraduate education ranges from 1 to 4 years for most participants (54.5%). This data may be related to the fact that probably those who have a shorter period since undergraduate education are more likely to respond to online surveys.

According to Rodrigues¹², the multiprofessional relationship in the NICU was classified as “good” by 60% of the participants, followed by “great” by 40%, similarly to our findings, in which 36.4% and 27.3% of physical therapists indicated it as “good” and “great,” respectively. As ICUs are restricted sectors, the team creates bonding and maintains a good relationship during work. This adequate interaction among the multiprofessional team favors work performance because the harmony and support between colleagues create positive effects for the professional and the patient¹⁴.

This study identified the physiotherapeutic techniques used in the NICUs in RS, and therapeutic positioning was the most used technique (95.5%). With early intervention, physical therapists assist in tonus modulation, general movements, and normal postures since childbirth based on physiotherapeutic approaches adequate to the neonate. However, the patient may adopt abnormal postures and movements in their development, interacting with the external environment in atypical patterns, hindering and limiting their quality of life¹⁵, which justifies the aforementioned conduct.

Respiratory physical therapy aims to maintain the airways pervious, prevent pulmonary complications, and improve the respiratory function of premature newborns. The most mentioned respiratory physiotherapeutic approaches were aspiration (95.5%), thoracoabdominal support (86.4%), and increased expiratory flow (59.1%). Corroborating this study, Santos et al.¹⁶ cited the maneuvers to increase expiratory flow, vibrocompression, and aspiration as the most used for bronchial hygiene, in a study aimed at investigating the effects of respiratory physical therapy on premature newborns. Also, the authors mention the passive manual expiratory technique (PMET), thoracoabdominal support, and vibration for removal of secretions without invasive procedures¹⁷. Antunes and Rugolo¹⁸ also cited vibrocompression,

increased expiratory flow, and aspiration as appropriate techniques for neonates.

The main conducts of motor physical therapy mentioned in the study were therapeutic positioning (95.5%), help crossing the midline (90.9%), and tactile stimulation (86.4%). Theis, et al.¹⁹ state that techniques that stimulate vestibular, visual, and tactile perception within the newborn’s tolerance limit, besides the decrease in harmful stimuli, contribute to minimize possible development disorders in long-term hospitalized preterm infants.

Silva and Formiga¹³ indicate the most used techniques in their study, in descending order, were therapeutic positioning, passive mobilization, sensory stimulation (visual, auditory, among others), and stretching. Theis, Gerzson, and Almeida¹⁹ mention joint mobilization as a way to encourage the newborn’s motor development, exemplifying it with the movement of head, trunk, shoulder and pelvic girdles, hands and feet, changing the decubitus position. Ferreira and Abreu⁹ support the exercises of trunk dissociation, alternating reach, feeling the head and hands, alternating kicks, and plantar placement. The authors also suggest tactile, visual, auditory, vestibular, and proprioceptive stimulation. Johnston et al.¹⁰ corroborate that vestibular, tactile, and visual stimulation have a beneficial effect for patients hospitalized in the NICU, normalizing the vital sign of this population. They also mention active or passive mobilizations in the maturation of muscle tonus¹⁰.

Finally, other studies confirm our findings: fetal prematurity is the main cause of hospitalization in NICUs²⁰⁻²³.

The study found barriers to contact the target population, as well as obtaining responses, which corresponded mostly to professionals allocated in four of the seven subregions of RS. The lack of similar studies conducted in RS limits the generalization of findings for this state.

However, it creates an initial basis of information for studies on this theme. Moreover, the results obtained are solid because the sample included responses from professionals working in 17 different NICUs, which corresponds to 38% of all NICUs in RS. The most common physiotherapeutic techniques are well-described in the literature, thus, the study finds consistent results for evidence-based practice, enriching knowledge and guiding neonatal physical therapists in the choice of their conducts.

- em unidades de terapia intensiva neonatal em hospitais universitários no extremo Sul do Brasil. *Vittale*. 2020;32(2):46-54. doi: 10.14295/vittalle.v32i2.9815.
21. Marques GM, Pieszak GM, Arrué AM, Rodrigues AP, Gomes GC, et al. Perfil epidemiológico de neonatos de uma unidade de terapia intensiva. *Revista Eletrônica Acervo Saúde*. 2018;10(6):2320-8. doi: 10.25248/REAS426_2018.
22. Ferraresi MF, Arrais AR. Perfil epidemiológico de mães de recém-nascidos admitidos em uma unidade neonatal pública. *Rev RENE*. 2016;17(6):733-40.
23. Lima SS, Silva SM, Avila PES, Nicolau MV, Neves PFM. Aspectos clínicos de recém-nascidos admitidos em unidade de terapia intensiva de hospital de referência da região norte do Brasil. *ABCS Health Sci*. 2015;40(3):62-8. doi: 10.7322/abcshs.v40i2.732.