

## RELATIONSHIP OF PERCEIVED STRESS WITH MUSCULOSKELETAL PAIN IN MOTHERS OF NEONATES AND INFANTS ADMITTED TO NEONATAL UNITS

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**Abstract: INTRODUCTION:** Prematurity is normally accompanied by long periods of hospitalization of the newborn in the Intensive Care Unit. The mother who had prepared to leave the hospital with her son has this cycle broken and has to go through a difficult and challenging experience. This new context of separation and doubts requires, in most cases, a separation from their family and social context, great responsibility and situations of maternal stress, causing anxiety, panic, anguish, insomnia, interpersonal difficulties, excessive worry, irritability, depression, difficulty relaxing or muscle tension and consequently musculoskeletal pain. **OBJECTIVE.** To analyze the relationship between stress and musculoskeletal pain in mothers of newborns admitted to neonatal units. **METHODOLOGY.** Retrospective and quantitative research. Sample collection took place from May to September 2021 in the neonatal units of ``Maternidade Escola Assis Chateaubriand`` – MEAC. The study included 31 mothers of newborns who were characterized using an instrument produced by the researchers and evaluated using instruments for identifying stress (Perceived Stress Scale) and characterizing pain (McGill Pain Questionnaire). **RESULTS.** The mothers evaluated in the present study had an average age of 27.58 years, were mixed race, had completed high school, lived in their own home, lived in a stable union and had a family income of up to 1 minimum wage. A high perception of stress was found, reflecting pain in body areas such as the lumbar spine, surgical incision, thoracic spine, legs and feet. **CONCLUSION.** The present study showed that the studied population presented perceived stress, which was related to the occurrence of musculoskeletal pain. The importance of multidisciplinary team action is highlighted to better guide and provide maternal support, in order to prevent or treat

bad feelings such as stress, which can cause or intensify musculoskeletal pain.

**Keywords:** Mothers; Neonatal Intensive Care Units; Stress; Musculoskeletal pain.

## INTRODUCTION

Childbirth is a moment of transition between pregnancy and the postpartum period, that is, the pregnant woman needs to assume the role of mother. The puerperium or immediate postpartum period is considered a precursor to attachment, as it is the first opportunity that the mother has to be sensitized by her child and begin the social exercise of motherhood, occurring a kind of closure of the gestational process (Mota et al, 2019).

In premature birth, the previously mentioned cycle is broken and the woman does not assume motherhood, as this newborn (NB) often needs technological and human support, available in the Neonatal Intensive Care Unit (NICU) (Gomes; Pereira; Rodrigues, 2021).

The need for hospitalization of the newborn generates a sudden separation between the mother and her child and dual feelings such as doubt about death or life, whether it will get worse or better, added to the anxiety of waiting, the unpredictability of the prognosis, the lack of knowledge about therapeutic approaches and equipment, promote an unpleasant experience for these women (Nascimento, 2021; Souza et. al, 2021).

Francisco et al (2020), Azevedo; Hemesath and Oliveira (2019) highlight that long periods of hospitalization have been reported as an unexpected experience for the mother, who finds herself faced with difficult and challenging circumstances. This new context of separation and doubts requires, in most cases, a separation from their family and social context, great responsibility and situations of maternal stress, causing anxiety, panic, anguish, insomnia, interpersonal difficulties,

excessive worry, irritability, depression, difficulty relaxing and muscle tension.

The emotional pressure, the feelings involved, the changes in family dynamics, the reduction in free time, concerns about the conditions with the newborn, make mothers more predisposed to experiencing a high level of stress, which is perceived in different and personal ways, and is also related to the sensation of pain (Lima et al, 2023; Vieira et al, 2019).

Nogueira (2023) highlights that pain is a common component in the pregnancy and puerperal cycle and occurs due to the physical and physiological changes that occur during this period. From this perspective, the objective of this study was to evaluate the relationship between stress and musculoskeletal pain in mothers of newborns admitted to neonatal units, based on the characterization of the population according to socioeconomic aspects, verification of stress situations in mothers of newborns admitted to the Units Neonatal (NU) and identification of musculoskeletal pain in the study population.

The assessment of the level of stress and musculoskeletal pain in women who have their children hospitalized presents itself as a relevant proposal that can contribute to the construction of protocols that optimize the action of care provided, in order to enable appropriate interventions for a better adaptation of this mother to this new reality.

## METHODOLOGY

The research was field based, with retrospective collection and quantitative data analysis, carried out with mothers of newborns hospitalized in Neonatal Units (Neonatal Intensive Care Units (NICU) and Intermediate and Conventional Care Units (UCINCO) of the Maternity School Assis Chateaubriand (MEAC)/ Brazilian Company of Hospital Services (EBSERH).

Mothers who did not voluntarily accept to participate in the research and those who made sporadic visits (less than 2 per week) were excluded from the research. The sample consisted of 31 mothers and was selected consecutively and for convenience during the months of May to September 2021.

To begin data collection, an active search was carried out through the medical records of hospitalized newborns in order to identify mothers who met the inclusion criteria. After identifying the subjects (mothers), invitations were made to participate in the research and the Free and Informed Consent Form (TCLE) was signed to be included in the study.

As instruments, a sociodemographic questionnaire prepared by the researchers, the application of the Perceived Stress Scale (PSS) and finally the McGill questionnaire were used.

The PSS scale is an instrument validated in Brazil and in more than 20 countries, which initially had 14 items (PSS 14), and was also validated with ten (PSS 10) and four questions (PSS 4). The items are designed to check how unpredictable, uncontrollable and overwhelmed respondents perceive their lives to be. In this study, the version with 14 questions was used, which addresses the interviewee's feelings and thoughts in the last 30 days with answers divided into "Never, Almost Never, Sometimes, Infrequent and Very Frequent (Schiavo et al, 2021; Luft et al., 2007).

To assess pain, the McGill questionnaire was used, created by Ronald Melzack, translated, validated in Brazil in 1996. This instrument is made up of 20 categories of words used to describe the patient's pain or painful experience. At the time of application, the subject investigated is asked to indicate the words that best describe their symptoms at the moment. The words are divided into four categories (sensory, emotional qualities,

subjective global intensity and miscellaneous descriptors) and subdivided into columns. The results collected indicate the pain classification index (if it is of sensory, effective, evaluation origin), the number of words chosen and the intensity of the current pain. The higher the number, the greater the patient's perception of pain (Almeida; Conceição, 2013).

The collected data were tabulated in a spreadsheet in Microsoft Office Excel Version 2010 and exported to the Statistical Package for The Social Science (SPSS) version 20.0 software, in which the analyzes were performed with 95% confidence. Quantitative data were expressed as mean and standard deviation, subjected to the Kolmogorov-Smirnov normality test and compared using the Mann-Whitney test (non-parametric data). Categorical data were expressed as absolute and percentage frequencies and compared using Fisher's exact or Pearson's chi-square tests. All associations were made with the perceived stress scale, which was categorized based on the median presented by the group (low stress: up to 30; high stress: greater than 30).

The research complied with all the ethical precepts of research with human beings that govern confidentiality, secrecy, anonymity, autonomy, beneficence, non-maleficence, justice and equity, regulated by Resolution 466/12 of the National Health Council/ Ministry of Health/ MS (Brazil, 2013). The mothers who agreed to participate in the research signed the Free and Informed Consent Form. The project was submitted to the MEAC Ethics Committee and approved under number: 4,621,650.

## RESULTS

The present study had a sample of 31 mothers with an average age of 27.58 years, with a minimum age of 13 years and a maximum of 41 years, where 25 (80.6%) referred to themselves as mixed race, with a predominance of having completed high school 19 (61.3%) and 18 (58.1%) lived in their own home. Regarding marital status, the majority 17 (54.8%) declared a stable union, followed by 8 (25.8%) who were married and with a family income of up to 1 minimum wage, 16 (51.6%) (Table 1).

	Total	p-Value
<b>Age</b>	27.58±6.97	0,137 <sup>a</sup>
<b>Color</b>		
White	2 (6.5%)	0,685 <sup>b</sup>
Black	4 (12.9%)	
Brown	25 (80.6%)	
<b>Education</b>		
Illiterate	1 (3.2%)	0,559 <sup>b</sup>
Elementary school	7 (22.6%)	
High school	19 (61.3%)	
University level concluded	4 (12.9%)	
<b>Home</b>		
Own home	18 (58.1%)	0,130 <sup>b</sup>
Rented	9 (29.0%)	
The person lives with relatives	4 (12.9%)	
<b>Marital status</b>		
Single	6 (19.4%)	0,624 <sup>b</sup>
Married	8 (25.8%)	
Stable union	17 (54.8%)	
<b>Family income</b>		
1 salary	16 (51.6%)	0,591 <sup>b</sup>
1-2 salaries	12 (38.7%)	
3 or more salaries	3 (9.7%)	

Table 1: Characterization of mothers according to sociodemographic variables.

\*p<0,05, <sup>a</sup>Mann-Whitney test; <sup>b</sup>Fisher's exact test or Pearson's chi-square (n, %)

Regarding prenatal data, 100% of the mothers interviewed had prenatal consultations with an average of 7.42 consultations, 15 (48.4%) planned the pregnancy, 26 (83.9%) wanted their babies, 13 (41.9%) were in their first pregnancy, 15 (48.4%) declared it was their first birth, 23 (74.2%) had a cesarean section, 18 (58.1%) reported a urinary infection at some point during the pregnancy and 26 (83.8%) had a premature birth.

All 31 (100%) mothers indicated that they had perceived stress, with 22 (70.97%) having a high perception and 9 (29.03%) with a low perception of stress.

When correlating prenatal data with the level of stress, it was seen that the majority of women who presented a higher level of stress were those who underwent prenatal care, who wanted pregnancy, were primiparous and primiparous (they gave birth and gave birth for the first time). Situations such as childbirth and the occurrence of infections were not related to causing stress in the women evaluated (Table 2).

When investigating the presence of pain, 26 (83.87%) women reported pain in places such as the lumbar spine 14 (45.16%), the surgical incision 12 (38.70%), thoracic spine 11 (35.48%) and legs and feet 10 (32.25%). The present study related perceived stress with pain and it was observed that of the 5 (16.12%) mothers who said they did not feel pain, 3 (60%) had a perception of low stress and 2 (40%) of high stress.

When characterizing the pain classification index and relating them to perceived stress, it was seen that in the sensitive dimension 6 (23.1%) women used 6 descriptors, of which 2 (18.2%) were related to low stress and 4 (26.7%) ) with high perceived stress. In the affective dimension, 6 (23.1%) used 2 descriptors, 5 (33.3%) being related to high perceived stress. The evaluative dimension

	Perceived stress			p-Value
	Total	Up to 30	>30	
<b>Medical appointment</b>	7.42±4.06	7.07±2.53	7.71±5.05	0,672 <sup>a</sup>
<b>Pre- natal</b>	31 (100.0%)	14 (100.0%)	17 (100.0%)	1,000 <sup>b</sup>
<b>Planned gestation</b>	15 (48.4%)	6 (42.9%)	9 (52.9%)	0,576 <sup>b</sup>
<b>Desired gestation</b>	26 (83.9%)	11 (78.6%)	15 (88.2%)	0,467 <sup>b</sup>
<b>Gestation</b>				
1	13 (41.9%)	4 (28.6%)	9 (52.9%)	0,393 <sup>b</sup>
2	9 (29.0%)	6 (42.9%)	3 (17.6%)	
3	6 (19.4%)	3 (21.4%)	3 (17.6%)	
4	3 (9.7%)	1 (7.1%)	2 (11.8%)	
<b>Birth</b>				
1	15 (48.4%)	6 (42.9%)	9 (52.9%)	0,739 <sup>b</sup>
2	11 (35.5%)	6 (42.9%)	5 (29.4%)	
3	5 (16.1%)	2 (14.3%)	3 (17.6%)	
<b>Type of birth</b>				
Vaginal	8 (25.8%)	2 (14.3%)	6 (35.3%)	0,183 <sup>b</sup>
Cesarean	23 (74.2%)	12 (85.7%)	11 (64.7%)	
<b>Infection: U</b>	18 (58,1%)	8 (57.1%)	10 (58.8%)	0,925 <sup>b</sup>

Table 2: Prenatal data

\*p<0,05, <sup>a</sup>Mann-Whitney test; <sup>b</sup>Fisher's exact test or Pearson's chi-square (n, %)

	Perceived stress			p-Value
	Total N=26	Up to 30	>30	
<b>Sensitive</b>	7.15±1.97	6.82±2.32	7.40±1.72	0,469 <sup>a</sup>
4	2 (7.7%)	2 (18.2%)	0 (0.0%)	0,583 <sup>b</sup>
5	4 (15.4%)	2 (18.2%)	2 (13.3%)	
6	6 (23.1%)	2 (18.2%)	4 (26.7%)	
7	3 (11.5%)	1 (9.1%)	2 (13.3%)	
8	2 (7.7%)	0 (0.0%)	2 (13.3%)	
9	5 (19.2%)	2 (18.2%)	3 (20.0%)	
10	4 (15.4%)	2 (18.2%)	2 (13.3%)	
<b>Affective</b>	1.81±1.67	1.64±1.86	1.93±1.58	0,664 <sup>a</sup>
0	8 (30.8%)	5 (45.5%)	3 (20.0%)	0,416 <sup>b</sup>
1	4 (15.4%)	1 (9.1%)	3 (20.0%)	
2	6 (23.1%)	1 (9.1%)	5 (33.3%)	
3	4 (15.4%)	2 (18.2%)	2 (13.3%)	
4	1 (3.8%)	1 (9.1%)	0 (0.0%)	
5	3 (11.5%)	1 (9.1%)	2 (13.3%)	
<b>Evaluative</b>	0.92±0.56	0.91±0.83	0.93±0.26	0,916 <sup>a</sup>



0	4 (15.4%)	3 (27.3%)	1 (6.7%)	0,149 <sup>b</sup>
1	22 (84.6%)	7 (63.6%)	14 (93.3%)	
<b>Miscellaneous</b>	1.92±1.32	1.73±1.79	2.07±0.88	0,530 <sup>a</sup>
0	5 (19.2%)	4 (36.4%)	1 (6.7%)	0,102 <sup>b</sup>
1	4 (15.4%)	2 (18.2%)	2 (13.3%)	
2	8 (30.8%)	1 (9.1%)	7 (46.7%)	
3	7 (26.9%)	2 (18.2%)	5 (33.3%)	
4	1 (3.8%)	1 (9.1%)	0 (0.0%)	
5	1 (3.8%)	1 (9.1%)	0 (0.0%)	
Total	11.88±4.34	11.27±5.90	12.33±2.87	0,549 <sup>a</sup>
Intensity of pain	24.04±8.46	22.27±10.52	25.33±6.68	0,373 <sup>a</sup>

Table 3: Pain and Stress Relationship

\*p<0,05, <sup>a</sup>Mann-Whitney test; <sup>b</sup>Fisher's exact test or Pearson's chi-square (n, %)

was marked by 22 (84.6%) mothers, among which 14 (93.3%) had high perceived stress and in the miscellaneous dimension 8 (30.8%) used 2 descriptors and 7 (46.7%) had high perceived stress. Finally, it can be observed that greater pain intensity was related to greater perception of stress (Table 3).

The women investigated also highlighted symptoms such as headache 17 (54.8%), drowsiness 9 (29.0%) and dizziness 8 (25.8%), all of which are related to a high perception of stress. It is noteworthy that the average length of stay was 30 days, with the shortest time being 6 days and the longest being 153 days, where 17 (54.8%) newborns were hospitalized for more than 15 weeks, and it was observed that the high length of stay hospitalization was related 9 (52.9%) to the perception of stress. On average, mothers visited 7 days a week and stayed in the hospital for around 7 hours a day.

## DISCUSSION

In a study on maternal emotional health and length of stay of newborns, Montanhaur, Rodrigues and Arenales (2021) observed that the mothers interviewed were under 25 years of age, 52% had two or more children, 58% had more than education completed high school and 54% lived in a stable union. In the study

by Schiavo et al (2021), mothers of premature babies were adults (89%), with education above elementary school (75%), had at least one other child already born (53%) and did not plan the pregnancy (66%).

Regarding socioeconomic characteristics, Martins et al (2022) observed that among 11 women investigated, 4 had incomplete secondary education, 5 had completed secondary education, 2 had higher education and the monthly income was around two to three minimum wages. There is a large socioeconomic difference between the mothers in the study cited and the present study, mainly with regard to education and monthly family income, so it is believed that this may be related to the regions where the studies were carried out, Central-West and Northeast respectively.

The World Health Organization (WHO) recommends that for a positive gestational experience it is necessary that at least 8 consultations be carried out during the prenatal period (1 in the first trimester, 2 in the second trimester and 5 in the third trimester). In the present study, all mothers received prenatal care, however, the majority 26 (83.8%) experienced a premature birth, which reduced the average number of

consultations to 7.42. In the study by Soares, Zotz and Motter (2022), 97.56% of mothers underwent prenatal consultations with an average of approximately 8 consultations and the number of desired pregnancies was greater than those planned, corroborating the present study.

Froés (2019) evaluated maternal stress experienced in the NICU of a maternity hospital in Porto Alegre, found data similar to the present research, that is, he observed that mothers may have compromised emotional health due to the impossibility of carrying out motherhood widely, due to unexpected hospitalization your son's. It is currently recommended that the mother's stay at the bedside for longer helps in the healthy development of her parental relationship and improves her perception of stress in the NICU.

Physiologically, there is evidence that stress releases hormones such as cortisol and adrenocorticotrophic hormones, increasing pain perception and causing muscle tension. Tension in turn reduces blood flow between tissues, reducing the exchange of oxygen and nutrients between them, resulting in fatigue and muscle pain, which can lead to reduced muscle strength and limited range of motion and altered sleep (Baracho, 2018; Manzo, 2018).

The present study demonstrated a significant relationship between stress and

the occurrence of musculoskeletal pain in the mothers studied. Studies such as those by Morais et al (2021); Brito; Lucena; Lucena (2021) and Mattos et al (2021) also prove this relationship, however, in populations of undergraduate health students, caregivers of children with neurological sequelae and teachers, respectively, confirming the study hypothesis.

## **CONCLUSION**

By observing the aspects analyzed, 100% of the population had some level of perceived stress, which was related to the occurrence of musculoskeletal pain among mothers of newborns in intensive care units, confirming the study hypothesis. In addition, areas of painful complaints occur in the lumbar, thoracic, surgical and lower limb regions.

The findings indicate that the prevention of musculoskeletal symptoms also involves the psychological aspects of mothers. In this sense, it becomes important for the multidisciplinary team to provide better guidance and maternal support, through mother care programs, contributing to better adaptation to the challenges posed by mothering a decoy baby in the NICU, preventing the triggering of feelings such as stress, which can cause the development or intensify musculoskeletal pain.



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