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Perception of Social Support and its Relationship With the Biological Rhythm of Women in the Postpartum Period

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Abstract

It is known that social support is one of the main protective factors in the postpartum period. In addition, studies report the association between biological rhythm disruption and its consequences on health, especially mental, but little is known about the possible causes of this disruption. Thus, the objective of this study was to evaluate the association between the perception of social support and the biological rhythm in women at three months postpartum in the city of Pelotas, Brazil. This is a cross-sectional study nested within a population-based cohort study, using data from an assessment performed 90 to 120 days postpartum. The mother's perception of social support was assessed by the Medical Outcomes Study Social Support Scale (MOS-SSS), while biological rhythm was measured by the Biological Rhythms Interview of Assessment in Neuropsychiatry (BRIAN). Sample composition was based on data from 755 women. After adjusting by linear regression for the potential confounders of schooling and economic class, all domains of social support (material support, affective support, emotional support, informational support and positive social interaction) remained negatively associated with biological rhythm ($p < .001$). Thus, regression analysis shows for each increment of one point in the domains of social support, there was a decrease between 0,160 and 0,189 points in the maternal biological rhythm. All domains of social support were associated with disruption of the biological rhythm, which reinforces the need for adequate support, especially in a period of many demands, for good maternal health.

Keywords

social support, perceived social support, biological rhythm, circadian rhythm postpartum

Social support in the postpartum period serves both as a protective factor in motherhood, and also influences the improvement of maternal and child well-being (Appleton et al., 2019). It is characterized by the resources made available by other people and can be seen as a good deed within a relationship, which can result in a positive reaction for the individual who receives it. It can also be understood as information that will indicate that the person is loved, well-liked and dear within their social network (Chor et al., 2001).

Regarding maternal health, research indicates that perceived social support has an important influence, and women's satisfaction with it is a fundamental factor for the emotional and cognitive processes related to the quality of life of the mother-infant dyad (Appleton et al., 2019; Dessen & Braz, 2000). However, it is known that several other aspects also influence the experience of the postpartum period. Among these is the human biological rhythm, defined by biological activities and functions that are repeated daily with a regular frequency and that are synchronized according to the cycles of nature (eating pattern, sleep and wake cycle and secretion of a hormone, for example), being associated with the level of alertness, cognitive performance and mood of the human being (Karatsoreos, 2012).

The dysregulation of biological rhythm occurs due to the difficulty of aligning behavioral and biochemical processes with the day/night cycle and impairment in adults is associated with poor functioning and quality of life, which can lead to sleep problems, metabolic disorders, and other health issues. Therefore, understanding and respecting the biological rhythm is important for promoting health and proper bodily functioning (Almondes, 2006). Thus, a deregulation of circadian rhythms can trigger psychiatric disorders, such as depression, where sleep/wake symptoms, appetite and social rhythms are out of adjustment (Boivin, 2000). When the biological rhythm is associated with the social support perceived by the woman in the postpartum period, the literature emphasizes the importance mainly of the partner for a lesser disruption in the biological rhythm domains (Evenson et al., 2014; Karademas, 2006; Sheeran et al., 2016; Smith et al., 2005).

It is noteworthy that the postpartum period is a period that requires a lot of clinical attention, due to its great biological, social and emotional vulnerability (Rojas et al., 2010). Therefore, it is understood the need for studies on the perception of social support of mothers in the postpartum period for a better understanding and prevention of the impact that the lack of it can generate in the disruption of the biological rhythm, and, consequently, in future disorders and illnesses. Given the above, this study aimed to evaluate the association between the perception of social support and the disruption in the biological rhythm pattern of mothers at three months postpartum.

Method

Design and Participants

This is a cross-sectional study nested within a cohort study with pregnant women in the city of Pelotas, southern Brazil. Sampling was carried out by drawing lots of 244 census sectors in the city (50% of the total), according to the 2010 census by the IBGE (Brazilian Institute of Geography and Statistics). Between May 2016 and August 2018, women with up to 24 weeks of gestation and residing in any of the sectors selected for the research were visited in their homes and invited to participate in the study. Participants initially answered a questionnaire in a household interview, providing sociodemographic information that was considered in our analysis. The evaluation of the main variables of this study (social support as the main exposure and biological rhythm as the outcome) were collected in a follow-up evaluation performed at three months postpartum.

Instruments

Perceived Social Support

The Medical Outcomes Survey Social Support Scale (MOS-SSS) was the instrument used to assess perceived social support, using the validated version in Brazilian Portuguese developed for the Medical Outcomes Study by Sherbourne and Stewart (1991), and adapted for the Brazilian population by Griep et al. (2005) in the "*Pró-Saúde*" study in Rio de Janeiro, with Cronbach's alpha greater than 0.70 in all dimensions. It is a self-administered instrument that assesses the extent to which the individual relies on the support of other people to face different situations in his or her life. This consists of 19 items that contain 5-point Likert-type responses with options ranging from 0 (*never*) to 4 (*always*), to obtain scores related to five dimensions of social support: tangible (material) support, affective support, emotional support, informational support and positive social interaction. The higher the score in each of the domains, the greater the perceived social support.

Biological Rhythm

The Biological Rhythm Interview of Assessment in Neuropsychiatry (BRIAN) was used to assess the disruption of mothers' biological rhythm, the outcome variable of this study. The 18 items of the scale are divided into 4 specific areas: sleep, activities, social rhythm and eating pattern. The scores range from 1 (no difficulty) to 4 (severe difficulty) for maintaining the usual rhythm in each area. The total score can range from 18 to 72 points, and the higher the score, the greater the disruption of the biological rhythm, that is, individuals have greater difficulty in maintaining the same circadian pattern. The study by Giglio and collaborators shows that BRIAN scale presents a consistent profile of validity and reliability, with Cronbach's alpha from to 0.93 (Giglio et al., 2009).

Socio-Demographic Data

The socioeconomic status was assessed using the Brazil Economic Classification Criteria, prepared by the Brazilian Association of Research Companies (ABEP). This classification places the subjects in economic levels (A, B, C, D or E). For this study, the levels were grouped as follows: high (A+B), medium (C) and low (D+E) levels (ABEP, 2015). A self-report questionnaire was also used, which included variables such as: schooling in complete years of study (up to 3 years/4 to 7 years/8 to 10 years/11 years or more), age (up to 23/24 to 29 years/over 29 years old), lives with a partner (no/yes) and is currently breastfeeding (no/yes).

Ethical Aspects

Regarding ethical issues, all participants gave written informed consent for the analysis and anonymous publication of the research results. This research is part of a larger project, which focused on evaluating the effectiveness of therapeutic interventions to prevent and treat gestational and postpartum depression, as well as the impact of this on children's development. Some results can be observed in Pinheiro and colleagues (2021), and Pinheiro et al. (2022). The larger project was approved by the Research Ethics Committee of the Catholic University of Pelotas under protocol 47807915.4.0000.5339.

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) 22.0 software was used to execute statistical analyses. The descriptive analysis was obtained by absolute and relative frequency, and means and standard deviations. Since the dependent variable (biological rhythm) is continuous, bivariate analyses were conducted through *t*-test, ANOVA and Pearson correlation, according to the type of the independent variable.

Multiple regression was performed using Linear Regression. The variables that presented $p \leq .20$ in the bivariate analysis were included in the adjusted analysis that aimed to control possible confounding factors and followed a conceptual hierarchical model, proposed for the approach of variables determined in two levels. Level 1 included education and economic level and Level 2 included the domains of perceived social support, entered individually to avoid interference from collinearity. *p*-values < .05 were considered statistically significant.

Results

Data from 755 women followed up during the postpartum period were analyzed. Table 1 presents the sample distribution as well as the bivariate analysis considering the other independent variables and social support (main exposure) with the biological rhythm (outcome) of women at three months postpartum.

Table 1

Sample Distribution and Bivariate Analysis Between Independent Variables and the Biological Rhythm Outcome at Three Months Postpartum

Variable	*N* (%)	Biological Rhythm *M* (*SD*)	*R*	*p*
Economic class				.019
High class (A+B)	203 (27.4)	33.30 (9.95)		
Middle class (C)	412 (55.6)	31.83 (9.68)		
Low class (D+E)	126 (17.0)	30.23 (9.33)		
Education (years of study)				.007
Up to 8 years	230 (30.5)	32.66 (9.81)		
9 years or more	525(69.5)	30.57 (9.63)		
Maternal age (years)				.831
Up to 23 years	232 (30.7)	31.88 (9.11)		
24–29 years	250 (33.1)	31.84 (9.87)		
Above 30 years	273 (36.2)	32.31 (10.30)		
Lives with partner				.805
No	112 (14.8)	31.81 (9.48)		
Yes	643 (85.2)	32.06 (9.86)		
Breastfeeding				.777
No	158 (21.0)	32.36 (9.37)		
Yes	596 (79.0)	32.01 (9.92)		
Perceived Social Support				
Material		90.32 (15.92)	-0.286	< .001
Affective		94.60 (12.71)	-0.245	< .001
Positive Social Interaction		91.83 (14.61)	-0.296	< .001
Emotional		90.70 (15.81)	-0.276	< .001
Information		91.13 (14.95)	-0.287	< .001
Total	755 (100)	32.02 (9.80)		—

Of the total sample analyzed (N = 755), 32.2% were 30 years old or older (N = 273), 69.5% (N = 525) had studied for at least 9 years and more than half of the sample (55.6%), belonged to the medium economic level (level C) (N = 412). Participants who lived with a partner totaled 85.2% (N = 643), and 79% (N = 596) of the women were breastfeeding. The general mean of the biological rhythm was 21.02 points (SD = 9.80, see Table 1). When asked about how many family members or close friends the participants had, considering the people they would think to answer the questions about social support, the answers ranged from zero to 50 people, with a mean of 6.06 (SD = 5.18) and a median of 5.

In the bivariate analysis, the sociodemographic variables that were associated with the disruption of the biological rhythm were the lowest level of education (p = .007) and

the highest economic classes (p = .019). Regarding the maternal perception of social support received, all dimensions (Material, Affective, Positive social interaction, Emotional and Information) were negatively correlated with biological rhythm (p < .001), that is, the lower the perception of social support, the greater the disruption in biological rhythm. The variables age (p = .831), living with a partner (p = .805) and current breastfeeding (p = .777) did not show statistically significant differences with the means of the total biological rhythm (Table 1).

Still in the bivariate analysis, regarding education, women who had 9 years of schooling or more had a higher mean, therefore, greater disruption in the biological rhythm (32.66 points; *SD* = 9.81) in relation to mothers who had up to 8 years of age of study (30.57 points; *SD* = 9.63). Higher socioeconomic levels (A/B) also had higher means (33.30; *SD* = 9.95) compared to classes C (31.83; *SD* = 9.68) and D/E (30.23 points; *SD* = 9.33).

The general averages of each domain of social support can also be observed in Table 1. All dimensions (Material, Affective, Positive Social Interaction, Emotional and Information) showed significant, negative and weak correlations with biological rhythm (r < 0.31 and p < .001), that is, the lower the social support perceived by mothers in the postpartum period, the greater the disruption in the biological rhythm in the same period.

As an additional analysis, taking into account secondary objectives foreseen in the project of this work, the association of the sleep domain of biological rhythm with some sociodemographic variables (age, schooling, socioeconomic class) was investigated, but no statistically significant association was found (p > .05).

Table 2 presents the correlations between all domains of social support and all domains of biological rhythm.

Table 2

Correlations Between the Types of Perceived Social Support and the Domains of Maternal Biological Rhythm in the Postpartum Period

	Disruption in Biological Rhythm			
Support Perception (Domain)	**Sleep disruption**	**Activity disruption**	**Social disruption**	**Food disruption**
Material	-.231*	-.201*	-.288*	-.264*
Affective	-.203*	-.142*	-.292*	-.217*
Emotional	-.235*	-.158*	-.321*	-.249*
Information	-.249*	-.149*	-.319*	-.281*
Positive social interaction	-.260*	-.164*	-.330*	-.270*

*p < .001.

After adjusting by linear regression for the potential confounders of schooling and economic class, all domains of biological rhythm remained negatively associated with biological rhythm ($p < .001$), showing a decrease of about 0.2 points for each increment in the mean of the outcome. The domains were entered individually in the regression model to avoid collinearity interference (Table 3).

Table 3

Multiple Linear Regression Analysis of r Biological Rhythm Associated With the Domains of Social Support

	Biological Rhythm		
Variable	**β**	**95% CI**	***p***
Material Support	-0.163	[-0.2, 0.1]	< .001
Affective Support	-0.165	[-0.2, 0.1]	< .001
Emotional Support	-0.160	[-0.2, 0.1]	< .001
Information Support	-0.183	[-0.2, 0.1]	< .001
Positive Social Interaction Support	-0.189	[-0.2, -0.1]	< .001

Discussion

This study aimed to understand the association between the perception of social support and biological rhythm, among other factors, such as sociodemographic characteristics, living with a partner and breastfeeding in women in the postpartum period.

Our findings corroborate the literature regarding the relevance of a partner's support in this very important period for women (Cohen et al., 2014; Rubertsson et al., 2015; Rusanen et al., 2018; Tichelman et al., 2019). The partner represents an important bond and can influence satisfaction in all domains of social support. However, no studies were found to date that specifically evaluated the observed association of social support as a whole and the disruption of biological rhythm.

In a study conducted in Massachusetts from 1999 to 2002, the objective of which was to investigate associations of social support six months postpartum with women's health behaviors, partner social support was associated with higher levels of walking, fiber intake, and lower trans-fat intake. Support from family/friends was marginally related to healthy levels of light/moderate physical activity and watching television. The authors concluded that partners seem to have great importance in collaborating in the puerperal woman's daily activities, providing support for a healthy life and in the daily routine, such as, for example, food intake or as instrumental support in daily walking (Faleschini et al., 2019). Such results are in agreement with our findings, since the social support perceived by the mother is closely linked to a better pattern of food, activity, social, collaborating with the puerperal woman in encouraging her to deal with situations

and achieve goals, and positively influencing others. healthy habits (Karademas, 2006; Sheeran et al., 2016). In addition, when associated with the support perceived by women in the postpartum period, the literature emphasizes the importance mainly of the partner for less disruption in the biological rhythm domains (Evenson et al., 2014; Karademas, 2006; Sheeran et al., 2016; Smith et al., 2005).

Given that the birth of a child affects caregivers' sleep, it is important to emphasize that there are other factors that can also influence healthy sleep. According to Goyal et al. (2010), poor sleep quality can be amplified in women living at a socioeconomic disadvantage. However, this information differs from the results found in our study, as the women who had the greatest disruption in biological rhythm were at the highest economic level. A possible explanation for this finding may be the likely perception of sleep quality by a higher class woman to be more demanding than a lower economic class mother in which the environment is not so conducive to healthy sleep.

In general, we found that the lower the perception of women's social support in the postpartum period, regardless of the domains, the greater the disruption of the biological rhythm. Some studies that also used BRIAN at 6 to 12 weeks in the postpartum period reported that mothers who had disrupted rhythms during this period had an increased risk of mood disorder, both in women with and without a history of the disorder, or that is, the disruption of the biological rhythm can affect this mother's mental health in the future. (Krawczak et al., 2016).

A recent systematic review was performed including summaries of studies on circadian rhythms associated with sleep problems and maternal distress among postpartum women, in which the authors highlight that circadian rhythm disturbances were strongly correlated with depressive symptoms in postpartum women (Gallaher et al., 2018). One of the studies was that of Krawczak and colleagues, who evaluated self-reported biological rhythm interruptions in 45 healthy women in the third trimester of pregnancy and 6–12 weeks postpartum. The authors reported an increase (worsening) in the scale scores from pregnancy to postpartum. As in our study, the BRIAN scale was also used to assess postpartum biological rhythm. In addition, the authors found rhythm disruption to be a key factor in worsening mood disorders.

Some limitations in the findings should be noted. First, because it is a cross-sectional design, it is not possible to assess causality. Another limitation is due to the scarcity of studies on the subject, and no study was found that evaluated this association. It is also known that the postpartum period already has changes in the functioning of women common to the period itself, which in itself can influence the regulation of biological rhythm.

On the other hand, the methodological rigor for the selection of the sample and the size of the sample must be considered as strengths of this study, as they allow the ability to generalize and compare the results, considering that our sample is population-based.

In addition, this is an innovative subject that little is known scientifically, therefore, these results may encourage and support further studies on the subject.

Our findings corroborate the evidence that the postpartum period is a period that requires more clinical attention, due to its great biological vulnerability (Rojas et al., 2010). This study shows how important it is to evaluate and work on women's perception of their postpartum support network, since the lack of it can have consequences for health, such as psychological disorders and illnesses.

Some prevention strategies that can be included in prenatal services are suggested, such as, for example, guidance services for families and pregnant women that clarify the role of each individual within the family system. Recognizing the needs of the pregnant woman and future mother can provide a healthy family organization to meet the demands and care for her and the baby. Therefore, health strategies in prenatal environments must be reinforced and implemented, emphasizing the importance of a support network for pregnant women, especially for people close to them, such as their partners.

Conclusions

The results of the present research have practical implications for both clinical psychologists and for other health professionals who monitor the new mother's walk. Our data suggest that there is a relationship between social support and biological rhythm, therefore, it is valid understand the importance of the support network for women's health in the postpartum period. It is known that as individuals living in society we have a real need for the “other”.

This "other" serves both to recognize myself as a person—to belong—as well as for a better coexistence with the world and the environment. Within psychotherapy, whether in individual or couple therapy, most of the demands arise from relationships. The individual is dependent on acceptance, validation, and look at the other. It is no coincidence that in more vulnerable moments, such as postpartum, it is expected on the other, support as a way of demonstrating care and affection. Like this, clinical management and listening to the family system can be efficient to prevent possible psychological disorders and adjust the definition of new roles, reorganizing for a better quality of life.

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Competing Interests: The authors have declared that no competing interests exist.

Ethics Statement: Regarding ethical issues, all participants gave written informed consent for the analysis and anonymous publication of the research results. This research is part of a larger project, which focused on evaluating the effectiveness of therapeutic interventions to prevent and treat gestational and postpartum depression, as well as the impact of this on children's development. Some results can be observed in Pinheiro and colleagues (2021), and Pinheiro et al. (2022). The larger project was approved by the Research Ethics Committee of the Catholic University of Pelotas under protocol 47807915.4.0000.5339.

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