

Factors associated with mental health in mothers with children under seven

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Abstract

Background: This Brazilian study investigated the prevalence of symptoms of common mental disorders (CMD) and their associated factors in mothers of children under seven years old. **Method:** Participants were 1,172 mothers who answered the SRQ-20 instrument and a questionnaire on sociodemographic and clinical data. Descriptive and inferential analyses were performed to identify the variables with a predictive power on CMD symptoms. **Results:** The variables with most predictive power were: income, health of the mother during pregnancy, pregnancy desirability and marital satisfaction. **Conclusion:** There are several personal, relational and socioeconomic factors that affect mother's mental health. Early interventions are important to reduce problems related to maternal mental health and child development is reinforced, to provide a higher quality of life for the mother-child dyad.

Keywords: Common mental disorders; SRQ-20; maternal mental health; risk factors.

Resumen

Factores asociados con la salud mental en madres con niños menores de siete años. **Antecedentes:** esta investigación brasileña investigó la prevalencia de los síntomas de trastornos mentales comunes (TMC) y sus factores asociados en madres de niños menores de siete años. **Método:** las participantes fueron 1.172 madres que respondieron el instrumento SRQ-20 y un cuestionario sobre datos sociodemográficos y clínicos. Se realizaron análisis descriptivos e inferenciales para identificar las variables con un poder predictivo en los síntomas de TMC. **Resultados:** las variables con mayor poder predictivo fueron: renta, salud de la madre durante el embarazo, deseabilidad del embarazo y satisfacción con su pareja. **Conclusión:** existen varios factores personales, relacionales y socioeconómicos que afectan la salud mental de la madre. Las intervenciones tempranas son importantes para reducir los problemas relacionados con la salud mental materna y el desarrollo infantil a fin de proporcionar una mejor calidad de vida a la diada madre-hijo.

Palabras clave: trastornos mentales comunes; SRQ-20; salud mental materna; factores de riesgo.

Depression and anxiety can be considered common mental disorders (CMD). CMD encompasses these two major dimensions of underlying symptoms, but also includes symptoms such as sleeping problems, fatigue, forgetfulness, irritability, difficulty with decision-making, and somatic complaints (Goldberg & Huxley, 1992). CMD are highly prevalent through out the world, arising in approximately 17.6% of individuals (Steel et al., 2014), and are among the most common pregnancy and perinatal morbidities (Alvarenga & Frizzo, 2017; Biaggi, Conroy, Pawlby, & Parianti, 2016). Major depression is quite prevalent in women, affecting in 20 women of reproductive age (Guo, Robakis, Miller, & Butwick, 2018), with similar figures for anxiety (Soto-Balbuena et al., 2018).

Research on perinatal mental disorders has focused mainly on postpartum depression – PPD (Howard et al., 2014), noting how

it can be harmful to the mother-baby relationship (Brockington, Butterworth, & Glangeaud-Freudenthal, 2016; Frizzo, Vivian, Piccinini, & Lopes, 2012). Silverman et al. (2017), for example, identified that PPD can be associated with a previous history of depression and obstetric and perinatal factors. However, the risk factors associated with early parenting stress have not been widely researched, despite their strong link with depression (Leigh & Milgrom, 2008). It is emphasised that all the significant changes that take place during pregnancy and the postpartum period can act as risk factors for women's mental health (Alvarenga & Frizzo, 2017), and can have long-lasting negative consequences on the developing child (Brand & Brannan, 2009) indicating the importance of considering a child's physical and mental health in relation to maternal mental health (Avan, Richter, Ramchandani, Norris, & Stein, 2010). Although there is still a prevalence of studies relating PPD to child development, recent literature states that maternal depression (in general, not only PPD) plays an important role in children's development during the preschool and school years, especially in children's capacity to internalise problems (Pizeta, Silva, Cartafina, & Loureiro, 2013).

Regarding the associated factors, income is among several variables related to women's mental health. Fisher et al. (2012)

revealed higher rates of CMD among women from low- and middle-income countries, affecting 15.6% of pregnant women and 19.8% of women who had recently given birth. In Brazil, a high prevalence (41.7%) of low-income women with symptoms of CMD was identified, but there was no information concerning whether they had children (Vidal et al., 2013). Anselmi et al. (2008), in a cross-sectional cohort study in Brazil, also found that low-income women have a higher prevalence of CMD (32.8%).

Another critical variable is health during pregnancy, especially maternal mental health (Field et al., 2010). Alvarenga and Frizzo (2017) showed that total CMD scores during pregnancy were the only significant predictor of PPD, pointing to the stability of symptoms of CMD from pregnancy to the postpartum period.

Pregnancy desirability can also be a variable that interferes with maternal mental health. Garipey, Lundsberg, Miller, Stanwood, and Yonkers (2016) recognised that a lack of planning and timing of pregnancy may be associated with psychiatric illness, psychological distress, and the degree of support during pregnancy, in a cohort of 2,654 pregnant women. Unplanned pregnancies were associated with major depressive episodes and high stress rates. On the other hand, poorly timed pregnancies were associated with a greater presence of generalised anxiety disorder and low social support. Another study (Cheng et al., 2016), with 862 Asian mothers, showed an association between unplanned pregnancy and increased anxiety in women, as well as between poorer pregnancy and birth outcomes, like shorter birth length for neonates.

Marital satisfaction can also play a role in maternal mental health. A longitudinal study (Hollist et al., 2016) conducted with 99 Brazilian women identified a bidirectional relationship between marital satisfaction and PPD. The authors highlighted that not only does depression affect marital satisfaction, but the marital relationship also has an impact on depressive symptoms in a transversal and longitudinal manner (postpartum and in the future). The presence of maternal depression may lead to difficulties in relationships with both the mother's partner and child (Piccinini, Frizzo, Brys, & Lopes, 2014). Mothers with depression and their partners pointed out that the division of tasks concerning childcare, financial concerns, and disagreements and conflicts about the child's care are some of the issues generating difficulty.

Because of their impact on child development, it is vital to identify predictors of maternal mental health. The World Health Organization (WHO, 2009) suggested that future research on women's mental health should investigate the predictors, prevalence and correlates of maternal mental health in the poorest countries. The current study, then, investigated the prevalence of symptoms of CMD and their associated factors in mothers of children under seven years old in Brazil. As predictors, we followed the four domains suggested by Reading and Reynolds (2001): (a) income, (b) mother's health during pregnancy, (c) pregnancy desirability and (d) marital satisfaction.

Method

Participants

A total of 1,172 Brazilian women from different regions of Brazil (principally the South, 67.7%, and Southeast, 21.0%) were conveniently sampled. They participated in a larger study that aimed to develop the Dimensional Inventory of Child Development Assessment (Inventário Dimensional de Avaliação

do Desenvolvimento Infantil - IDADI) to evaluate children aged between zero and seven years. The material was developed by the Group of Study, Application and Research in Psychological Assessment of the Federal University of Rio Grande do Sul (Silva, de Mendonça Filho, & Bandeira, 2019). The inclusion criteria were as follows: being a mother, having at least one child aged between zero and seven years at the time of the study, and having responded to all SRQ-20 items. The average age of the mothers was 32.62 years (SD = 6.13; range 16–58 years). The number of children per mother varied from one to six (mean = 1.49; SD 0.74), and the children's ages varied from 0.1 to 86.08 months, with an average of 35.3 months (SD = 22.53). Seventy-nine percent of the participants declared themselves to be Caucasian, followed by 14.8% African-Americans. Most of the mothers had a graduate degree (specialisation, masters or doctorate – 32.20%), 21.9% had completed undergraduate studies, whilst 14.5% had not; 25.9% were in high school, and only 11.90% of mothers had an incomplete high school education. Regarding their economic status, 37.9% of the women had a family income superior to five minimum wages; only 4.4% had an income of less than one minimum wage per month (Brazil minimum wage on data collection period was 937.00 Brazilian reais, equivalent to 297.19 USD); 69.0% of the mothers were engaged in some sort of paid work. Regarding their marital status, 86.30% of the women were married or living with a partner.

Instruments

Socio-demographic data and clinical characteristics questionnaire: This instrument contained multiple-choice questions that were answered with participant identification data. Examples of the information that were collected via the mother-report include: 1) family demographics (i.e., social, cultural [country region divided into three: South, Southeast and Others], economic [family income assessed using an 8-point scale ranging from 0= below 1 minimum wage to more than 15 minimum wages], maternal education [assessed via a 15-point scale that ranged from 0-illiterate to 15-graduate studies]); 2) mother's health during pregnancy (i.e. gestational diabetes, high blood pressure, use of alcohol tobacco or drugs, and a 5-point Likert scale of self-perceived health during pregnancy); 3) and birth conditions (i.e. pre-eclampsia, Apgar at the first and fifth minutes of life, icterus, type of birth delivery). Marital satisfaction was assessed with a 5-point Likert scale that ranged from 0 (totally unsatisfactory) to 5 (totally satisfactory); we also inquired if the gestation was desired or not.

Self-Reporting Questionnaire (SRQ-20): This scale is a psychiatric screening instrument for non-psychotic mental disorders, mainly for symptoms of depression and anxiety, i.e., CMD (Beusenbergh, Orley, & World Health Organization, 1994). The questionnaire consists of 20 yes/no questions listing symptoms in four scales – anxiety and depression, somatic symptoms, reduced vital energy, and depressive thoughts. Each affirmative answer is scored "1" and the final result is given by a total sum score. The Brazilian version was validated by Mari and Williams (1986) and re-evaluated by Gonçalves, Stein, and Kapczinski (2008). The internal consistency of the Brazilian version was .86 (Gonçalves et al., 2008). Although there are different cut-off points that could vary depending on the setting and culture, or even alternative statistical scoring methods the SRQ-20, we considered a score of 8 to be a cut-off point, a widely used one, including in

Brazil (Barreto do Carmo et al., 2018, Mari & Williams, 1986; Ventevogel et al., 2007).

Procedure

The questionnaires were answered both online through the SurveyMonkey platform (*n* = 618, 52.7%) and in person (*n* = 554, 47.2%). The online collection participants were recruited via the internet using a media release coordinated by the research team. Mothers could answer the questionnaires in one or more sessions. The in-person collection was conducted in day-care centres and research partner institutions (universities and hospitals while waiting in outpatient care). Mothers answered the questionnaires in one session, and if they had difficulty reading or comprehending a research assistant could help them. If the mother had more than one child, she was oriented to choose one and answer the full questionnaire considering the respective pregnancy and childbirth. Both types of data collection included the same set of items and instruments. This research was approved by the Ethics Committee of the Institute of Psychology at the Universidade Federal do Rio Grande do Sul, Brazil.

Data analysis

Bivariate statistical testing procedures were applied to test the differences between mothers with and without CMD. These include the χ^2 -test for dichotomous and categorical variables (i.e., *child's gender, pregnancy desirability, relationship status, type of data collection, and country region*), as well as variance analysis procedures for variables with numerical scales (i.e., *child and maternal age, maternal education, family income, number of people living with family income, number of children, health*

during pregnancy, and marital satisfaction). For self-perceived health during pregnancy and marital satisfaction, we used a 5-point Likert scale.

It is known that bivariate analyses allow a first assessment of the relevance of the included factors that have an impact on the outcome variable. However, this method cannot be used to assess whether the detected effects could have been influenced by correlations with other potential influential factors for CMD. Consequently, in a second step, multiple binary logistic regressions were conducted by including all potential covariates (*child and maternal age, child's gender, maternal education, family income, number of people living with family income, type of data collection, and country region*) in the first block and factors in the analysis, during which significant bivariate associations were observed in the second block. The absence of CMD was coded as "0" and the presence of CMD as "1." Multicollinearity of the significant variables was examined by the tolerance test calculated from the reciprocal of the Variance Inflation Factor (VIF). Finally, a Hosmer-Lemeshow test was estimated to examine the goodness of fit of the logistic model against actual outcomes, in which non-significant χ^2 -test indicated the adequate fit of the logistic regression model.

Results

Considering the SRQ-20 cut-off point of 8, 23.1% of the study participants screened positive for CMD. Amongst them, lower levels of marital satisfaction, maternal education, family income and health during pregnancy were reported (Table 1). Differences were also ascertained between maternal ages and people living with family income, in which the positive CMD group had an average age of 31.4 in comparison with 32.9 from the negative CMD group, and more people depending on the family income.

Table 1
Descriptives of studied variables as functions of Common Mental Disorders

	Negative for CMD			Positive for CMD			t / χ^2	sig	Effect size
	N	M / %	SD	N	M / %	SD			
Child's age (months)	836	35.36	22.35	248	35.10	23.15	0.16	.88	0.01
Maternal age	860	32.99	5.96	260	31.42	6.51	3.47	<.001	-0.25
Maternal education	895	13.28	2.15	269	12.62	2.52	3.90	<.001	-0.33
Family income	893	4.74	2.02	268	3.92	1.94	6.03	<.001	-0.41
Number of people living on family income	887	3.42	0.87	267	3.55	0.95	-1.98	.05	0.14
Number of children	880	1.47	0.72	264	1.55	0.78	-1.52	.13	0.11
Health during pregnancy	895	4.74	0.61	271	4.18	1.02	8.51	<.001	-0.67
Marital satisfaction	833	4.25	0.74	246	3.92	0.87	5.38	<.001	-0.41
Child's gender									
Male	452	49.3%		126	52.8%		1.03	.31	-0.03
Female	439	50.7%		141	47.2%				
Pregnancy desirability	781	87.60%		188	70.70%		41.5	<.001	0.18
Marital status (with partner)	784	87.00%		224	82.7%		3.29	.07	0.05
Type of data collection									
Online	460	74.40%		158	25.60%				
Presential	441	79.60%		113	20.40%		4.4	.05	0.06
Country region									
South	625	69.40%		168	67.70%				
Southeast	175	19.40%		71	21.00%		6.29	.04	0.07
Other	101	11.20%		32	11.30%				

A higher prevalence of wanted pregnancy was found for the non-CMD group. Finally, we found significant differences for the type of data collection and country region.

The binary logistic regression results are illustrated in Table 2. All the inter-correlations between the predictors of the model were relatively low and passed the tolerance test calculated from the reciprocal of the VIF (Cohen, Cohen, West, & Aiken, 2003). A Hosmer-Lemeshow test was calculated to examine the goodness of fit of the logistic model against the actual outcomes. This test yielded a χ^2 of 2.25 ($p > 0.05$) and the average percent of correct classification was 80.4, an adequate overall model fit.

Estimation of odds ratios (OR) showed that mothers self-reported having poor physical health during pregnancy significantly increased the odds of having a CMD (OR = 0.45, 95% CI = 0.36–0.55), as did a low satisfaction with partner (OR = 0.71, 95% CI = 0.57–0.87). Higher maternal age (OR = 0.97, 95% CI 0.94–1.00), low family income (OR = 0.89, 95% CI 0.82–0.98) and higher number of people living from the family income (OR = 1.30, 95% CI 1.06–1.60) also increased the odds of having a CMD. Desired pregnancy was also negatively associated with CMD, with mothers being 38% less likely to be classified as having a CMD (OR = 0.62, 95% CI = 0.39–1.00). The significant effect of the type of data collection was adjusted in the final model.

Of the 737 mothers negatively screened for CMD, 709 of them (96.2%) were correctly identified by the model. Of the 217 mothers who were screened positive for CMD, 58 (26.7%) were correctly identified. Together, the model accounted for 24% (Nagelkerke R²) of the variance in the CMD group.

Discussion

This study investigated the prevalence of symptoms of CMD and their associated factors in mothers with children under seven years old. Statistical analysis indicated that 23.1% of the

mothers participating in this study had CMD symptoms. This percentage confirms the prevalence estimated by the World Health Organization (WHO, 2009) of 25% CMD in women. However, it is lower than that reported in Brazilian studies, which ranged from 37–48% (Araújo, Pinho, & Almeida, 2005; Barreto do Carmo et al., 2018; Moreira, Bandeira, Cardoso, & Scalón, 2011). This difference may be explained by the characteristics of the samples. As Araújo et al. (2005) included women with both financial and housework responsibilities, it is possible that this was a factor that impacted on the higher prevalence of CMD. However, the sample in Moreira et al. (2011) had a predominantly lower income than three minimum wages (87.0%), as did the participants in Barreto do Carmo et al. (2018), collected in poor Brazilian geographical areas. On the other hand, in the present study, a very small proportion of the participants had a low income. These findings reinforce the impact of sociodemographic variables, especially income, on the prevalence of CMD symptoms in women.

Regarding the associated factors, results showed that the variables that most explained the symptoms of CMD were the health of the mother during pregnancy, family income, satisfaction with partner, number of people living on the family income, maternal age, and pregnancy desirability. Out of the six variables associated with CMD, two are related to social economic status: family income and number of people living on it. The lower income variable was associated with the presence of more clinical symptoms in mothers. Furthermore, the results showed that the greater the number of people who depended on the family income, the greater the presence of CMD symptoms. These findings confirm the literature on CMD (Anselmi et al., 2008; Fisher et al., 2012; Vidal et al., 2013), and are understandable when considering that this situation creates lower disposable income for each family member.

In relation to maternal health, the data indicate that the better the mother's health during pregnancy, the fewer CMD symptoms she will present after the child is born. Our findings

Table 2
Factors associated with CMD

	OR	OR 95% CI		B	SE	Wald
		Lower	Upper			
Intercept	3.33			8.11	1.16	49.01
Health during pregnancy	0.45**	0.36	0.55	-0.80	0.11	56.50
Type of data collection	0.31**	0.20	0.47	-1.18	0.22	28.72
Family income	0.82**	0.73	0.91	-0.20	0.06	12.57
Satisfaction with partner	0.71**	0.57	0.87	-0.35	0.11	10.26
Number of people living on family income	1.30*	1.06	1.59	0.26	0.10	6.58
Maternal age	0.97*	0.93	1.00	-0.03	0.01	4.23
Wanted pregnancy (No = 0, Yes = 1)	0.62*	0.39	0.98	-0.48	0.23	4.19
Maternal education	0.96	0.87	1.05	-0.04	0.05	0.90
Child's age	1.00	0.99	1.01	0.00	0.00	0.00
Child's sex	0.87	0.62	1.22	-0.14	0.17	0.64
Country region						
South (baseline)						0.50
Southeast	1.11	0.62	2.00	0.11	0.30	0.13
Other	1.24	0.66	2.33	0.21	0.32	0.43

Note: OR = odds ratio; CI = confidence interval; SE = Standard error
 * $p < .05$
 ** $p < .001$

are in line with the literature, which reinforces that mental health problems initiated during pregnancy are a risk factor for the later development of PPD (Alvarenga & Frizzo, 2017; O'Hara & McCabe, 2013). Thus, PPD might be the most powerful variable for predicting depression in the future of women (Hollist et al., 2016) and their offspring (Murray et al., 2011).

This research also showed an association between satisfaction with one's partner and CMD. Higher marital satisfaction was able to predict a lower incidence of CMD symptoms in the group of participants. The extant literature on this topic reveals that marital dissatisfaction is a significant risk factor for the development of depression and CMD in general (Hollist et al., 2016; Piccinini et al., 2014; Uriyo, Abubakar, Swai, Msuya, & Stray-Pedersen, 2013).

In addition, it is known that parental support during pregnancy can contribute to the child's emotional development, as well as to the quality of the mother-child relationship. Thus, it is understood that taking responsibility for a child alone can lead to some degree of suffering for women during pregnancy, and that this experience may permeate their expectations and feelings toward the child (Gomes, Marin, Piccinini, & Lopes, 2015). Having a satisfactory relationship with a partner is shown to be a protective factor for mothers, since it is associated with good mental health and a lower incidence of depressive or anxious symptoms, concluding that the better the quality of the marital relationship, the better the child-parent bond (Stutzman, Miller, Hollist, & Falceto, 2009).

Another finding of this study relates to pregnancy desirability: Participants who did not desire the pregnancy had a greater association with CMD. These data confirm Garipey et al.'s (2016) examination and emphasis of the importance of offering psychological support during the prenatal period for pregnant women, especially when symptoms of depression and anxiety related to the acceptance of pregnancy are identified. Attention should be given to the social, family and marital support the mother receives during pregnancy to prevent CMD at this point.

Initially, it was expected that the child's age would be related to maternal symptoms of CMD, that is, the younger the child, the more CMD symptoms the mother would report. Such a proposition was related to the belief that life changes and routines imposed by the presence of a baby are much more intense in the initial months of the infant's life. Throughout their growth, the child would gradually become more independent, needing less constant maternal care (Mahler, 1993). However, each stage in human development has its own difficulties, and maternal mental

health may be affected any time. If the mother presents mental issues, her offspring may be affected throughout all preschool years (Badovinac et al., 2018). In this sense, it is possible to have the opinion that raising a child is challenging not only in the early years, but also throughout childhood.

Although the SRQ-20 has no diagnostic purpose, it serves as a screening instrument that can identify signs and symptoms before they become a psychopathological condition. Therefore, the early detection of mental health symptoms may reduce the risk of later developing a mental disorder, since it is known that most of these symptoms are underdiagnosed and often do not receive adequate treatment.

We would like to highlight the potential of this study, especially considering the age range of the children in question, from zero to six years old. More studies are necessary to elucidate other related issues, since maternal mental health is still affected beyond the early years.

The limitations of this study should be pointed out. Despite the benefits relating to the confidentiality of online data collection, it is believed that this methodology could have biased the responses to some items, since it may have caused their misunderstanding. We also need to consider that, because the study was cross-sectional, it was not possible to verify whether mothers' symptoms were part of a chronic condition or if they were related to the emergence of a CMD.

The association found in the present study of the importance of pregnancy desirability and its relation to maternal mental health highlights the need for preventative strategies, such as interventions during pregnancy and throughout childhood, aimed at promoting maternal mental health and child development. Studies investigating maternal mental health can help identify preventative strategies, reinforcing the importance of interventions to reduce problems related to maternal mental health, and stimulating the development of the child and family unit.

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