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Research paper

Breastfeeding and mental health in adulthood: A birth cohort study in Brazil



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Background: Breastfeeding is negatively associated with behavioral and internalization problems, psychological stress, and depressive/anxiety symptoms. However, studies evaluating specific mental health disorders are scarce. We aimed to assess the association between breastfeeding and mental health outcomes in young adults.

Methods: In 1982, hospital deliveries in Pelotas (Southern Brazil) were identified; liveborns were examined and their mothers interviewed (n=5914). Information on breastfeeding was collected in early childhood. In 2012–13, at 30 years of age, we used the Mini International Neuropsychiatric Interview (MINI) for the diagnosis of major depression (MD), generalized anxiety disorder (GAD) and social anxiety disorder (SAD). In addition, we used the Beck Depression Inventory (BDI-II) and the Self-reported Questionnaire (SRQ-20), to evaluate depressive symptoms severity and common mental disorders (CMD), respectively. We used multivariable regression models to evaluate the association between breastfeeding and mental health outcomes.

Results: We evaluated 3657 individuals. Prevalence of CMD, MD, GAD and SAD was 24.3%, 7.9%, 12.7% and 3.6%, respectively. In multivariable models the odds of having a more severe case of depression (BDI-II) was smaller among those breastfed for 6 or more months (OR=0.69 95%CI [0.53–0.89]). We observed a similar pattern for MD and CMD, however, confidence intervals included the reference.

Limitations: We had no information on home environment characteristics during childhood. Lack of power and a small effect size could explain why we did not detect an association between breastfeeding and MD.

Conclusion: Breastfeeding reduced the odds of having more severe depressive symptoms.

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1. Introduction

Besides the short-term benefits of breastfeeding, evidence shows that been breastfed for a longer time has long-term consequences. It has been reported that breastfeeding may reduce the likelihood of obesity and type-2 diabetes (Horta et al., 2015a; Kelishadi and Farajian, 2014), increase performance in cognitive tests (Horta et al., 2015a) and it is associated with a higher income in adulthood (Victora et al., 2015).

In addition, breastfeeding is negatively associated with behavioral and internalization problems (Hayatbakhsh et al., 2012; Heikkila et al., 2011; Liu et al., 2006, 2014; Yi et al., 2005) as well as psychological stress (Montgomery et al., 2006) and other mental health outcomes like depressive and anxiety symptoms (Hayatbakhsh et al., 2012; Oddy et al., 2010; Reynolds et al., 2014), major depression (Allen et al., 1998, Peus et al. 2012a) and attention deficit disorder (ADHD) (Mimouni-Bloch et al., 2013; Stadler et al., 2015).

Merjonen et al. (2010) reported that breastfeeding might decrease the risk of depression possibly associated with the C/C genotype of the estrogen receptor 1 gene. However, other studies have failed to observe an association between breastfeeding and later mental health (Anselmi et al., 2008; Kramer et al., 2008;

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Kwok et al., 2013; Lind et al., 2014).

Most of the studies on the association between infant feeding and mental health have been done in high-income settings, where breastfeeding duration is positively associated with income (Brion et al., 2011). Because mental health outcomes are negatively associated with socioeconomic status (Muntaner et al., 2004) most of these studies are subject to residual confounding. (Kramer et al., 2011) However, when the 1982 Pelotas birth cohort started, there was little awareness of the benefits of breastfeeding, in Brazil, and breastfeeding was independent of socioeconomic status. (Brion et al., 2011).

This study was aimed at assessing the association between breastfeeding, and mental health outcomes in young adults, including depression (major depression and depression severity), generalized anxiety disorder (GAD), social anxiety disorder (SAD) and common mental disorders (CMD).

2. Methods

In 1982, maternity hospitals in Pelotas, a southern Brazilian city, were visited daily and all births were identified. The 5914 liveborns whose families lived in the urban area of the city were examined and their mothers interviewed. These individuals have been followed in several occasions. (Barros et al., 2008) From June 2012 to February 2013, at a mean age of 30.2 years, we tried to follow the whole cohort and participants were invited to visit the research clinic to be interviewed and examined. (Horta et al., 2015b).

In the 30 years visit, we used the self-reported questionnaire (SRQ-20); validated for Brazil (Mari and Williams, 1986), to assess the presence of CMD. Males with a score of six or more and females with eight or more were considered as positive for CMD (Mari and Williams, 1986). In addition, we performed psychological interviews using the Mini-international psychiatric interview (MINI) V5.0 validated for Brazil (Amorim, 2000) and assessed the presence of a major depressive episode during the last two weeks, a lifetime episode of mania/hypomania, generalized anxiety disorder (GAD) in the last 6 months, and social anxiety disorder (SAD) in the last month. In addition, we used the Beck Depression Inventory (BDI-II) to evaluate the intensity of depressive symptoms.

We considered an individual as having major depression (MD) if a major depressive episode was reported in the last two weeks, and there was no evidence of a lifetime episode of mania/hypomania according to the MINI.

Those individuals whose BDI-II score was between 0 and 13 points were considered as minimal/no depression, mild depression was defined by a score of 14–19, moderate from 20 to 28 and severe from 29 to 63 points (Beck et al., 1996).

Information on duration of breastfeeding was gathered in the 1984 (mean age of 19 months) and 1986 (mean age of 42 months) visits, and the earliest available data on age at weaning was used to minimize recall bias. We divided the time of breastfeeding in four categories, less than 1 month, 1–2.9 months, 3–5.9 months, and 6 months or more.

Poisson regression with robust adjustment of the variance was used in crude and multivariable analysis to estimate prevalence ratios (PR) (Barros and Hirakata, 2003) of mental health outcomes using the MINI and CMD. For the BDI-II, we estimated the proportional odds ratios (OR) using ordinal regression and the Brant test was used to evaluate the proportional odds assumption.

Multivariable models were adjusted for the following confounding variables: sex; genomic ancestry (percentage of African ancestry); birth weight; type of delivery (information was gathered from the hospital records); maternal age at birth; maternal marital status (married/living with partner or not married);

parental schooling (highest grade achieved at school); number of previous gestations; maternal smoking during pregnancy; family income at delivery; assets index; mother reference of nerve problems (proxy of mothers general mental health); father living in the same house and paternal history of psychiatric problems. Genomic ancestry was estimated from DNA samples that were genotyped using the Illumina Omni 2.5 M array (Illumina, San Diego, CA, USA). Admixture analyses were based on 37,0539 single nucleotide polymorphisms shared by samples from the HapMap Project, the Human Genome Diversity Project (HGDP), and the Pelotas cohort. The following HapMap samples were used as external panels: 266 Africans, 262 Europeans (American and Italian), 77 admixed Mexican Americans, 83 African Americans, and 93 Native Americans from the HGDP. For each individual, the proportion of European, African American, and Native American ancestry was estimated. (Lima-Costa et al., 2015) We tested the interaction between sex and breastfeeding over the evaluated outcomes, in multivariable models.

We obtained ethical approval for the study from the ethics committee in the 'Universidade Federal de Pelotas', all participants signed an informed consent.

3. Results

In the 2012–13 visit, 3701 subjects were interviewed, which added to the 325 subjects known to have died, represented a follow-up rate of 68.1%. Of the 5914 livebirths included in the cohort, 5332 had information on breastfeeding, of these, 3524, 3459, 3456, and 3445 individuals, had information on CMD, MD, GAD, and SAD at 30 years, respectively. Data on at least one mental health outcome was available for 3661 individuals, 97% of which had information on duration of breastfeeding (n=3542). The follow-up rate at 30 years was higher among females, those whose mothers had between 5 and 8 years of schooling and whose family income ranged from 1 to 6 minimum wages. (Supplementary Table 1) Table 1 shows that 52% of the individuals included in the analysis were females; about one in every three subjects had a

Table 1

Sociodemographic characteristics at birth, breastfeeding and mental health outcomes at 30 years in individuals from the 1982 Pelotas birth cohort.

Variable	N ^a	Mean (s.d.)/Median [IQR]	Prevalence %
Female	1841		52
Mother's with four or less years of schooling	1135		32.1
Mother's age at birth (years)	3541	26.0 (6.2)	
Birth weight (grams)	3541	3224 (526)	
Breastfeeding			
< 1 month	753		21.3
1–2.9 months	909		25.7
3–5.9 months	816		23.0
≥ 6 months	1064		30.0
CMD	853		24.1
MD	272		7.9
GAD	438		12.7
SAD	127		3.7
BDI-II			
Mild	375		10.8
Moderate	270		7.8
Severe	179		5.2

s.d.=standard deviation. IQR=Interquartile range. CMD=Common mental disorders. MD=Major depression. GAD=Generalized anxiety disorder. SAD=Social anxiety disorder. BDI=Beck depression inventory.

^a Number of individuals with data on at least one mental health outcome and breastfeeding.

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