1 Title

2 **Breastfeeding avoidance following psychological intimate partner violence during**

3 **pregnancy: a cohort study and multivariate analysis**

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16 **Running title:** Breastfeeding and intimate partner violence

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26 Abstract

27 **Objective** To evaluate if the experience of psychological intimate partner violence (IPV)
28 adversely affects breastfeeding rates.

29 **Design** A cohort study.

30 **Setting** Maternities in 15 public hospitals, drawn using cluster sampling of obstetric
31 services in Andalusia, Spain.

32 **Population** A total of 779 consecutive mothers receiving antenatal care including
33 ultrasound and giving birth during February-June 2010.

34 **Methods** Trained midwives gathered IPV data using the Index of Spouse Abuse
35 validated in the Spanish language (score ranges: 0-100, higher scores reflect more
36 severe IPV; cut-off: psychological IPV=25). Socio-demographic data including lack of kin
37 support, and obstetric and neonatal outcomes were collected. Multivariate logistic
38 regression estimated adjusted odds ratios (AOR), with 95% confidence intervals (CI), of
39 the relationship between psychological IPV and breastfeeding, controlling for socio-
40 demographic characteristics and obstetric complications.

41 **Main Outcome Measure** Breastfeeding avoidance defined as lack of breastfeeding or
42 pumping of breast milk to feed the new baby in in the immediate post-partum period.

43 **Results** Response rate was 92.2%. A total of 70% (n=545) women initiated
44 breastfeeding. Psychological IPV, reported by 21.0% (n=151), increased the odds of
45 breastfeeding avoidance (AOR=2.0; 95%CI=1.2-3.3) adjusting for the presence of
46 obstetric complications (AOR=1.6; 95%CI=1.0-2.4).

47 **Conclusions** Mothers with psychological IPV avoid breastfeeding. Clinicians should be
48 aware of the risks to infant arising from this deficiency due to IPV in pregnancy.

49

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52 FEM2016-79049-R).

53

54 **Keywords** gender based violence, intimate partner violence, pregnancy, maternal
55 outcomes, risk factors, breastfeeding.

56

57 **Tweetable abstract** Psychological intimate partner violence, reported by 1 in 5
58 mothers in this study, on average doubles the avoidance of breastfeeding.

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61

62 **Introduction**

63 The World Health Organization recommends that breastfeeding, both exclusively and
64 partially, confers health benefits to infants and mothers. Ideally all babies should be
65 exclusively breast fed for the first six months of life, but breastfeeding rates are
66 suboptimal.[1] Violence against women including intimate partner violence (IPV) during
67 pregnancy, both psychological and physical, is a global public health problem and a
68 fundamental human rights breach.[2-5] Reported IPV prevalence is higher than many
69 common obstetric conditions.[6-11] Does IPV also puts infant at risk through avoidance
70 of breastfeeding?[12]

71 The literature on effects of IPV during pregnancy on breastfeeding is sparse and has
72 inconsistent results. Indirectly, IPV has been related to breastfeeding problems
73 through postnatal depression in some studies[13] but not in others.[14] Severe physical IPV
74 has been associated with early cessation of exclusive breastfeeding.[15] IPV during
75 pregnancy has been shown to be one of correlates of infant feeding modes[16] and
76 abused mothers are overrepresented among those who prematurely cease
77 breastfeeding.[17] There are studies too without any association observed.[18] Limitations
78 in statistical power due to insufficient sample sizes, risk of bias due to methodological
79 deficiencies and lack of generalizability due to single-center participation contribute to
80 variations in results. Disharmony in operational definitions, both for IPV and
81 breastfeeding, add heterogeneity to the associations observed. With some studies
82 focusing solely on physical abuse,[15] the area of psychological abuse during pregnancy
83 remains under-researched. We addressed the need to investigate the detrimental
84 effects of non-physical abuse on breastfeeding.

85 We evaluated if the experience of psychological IPV captured through validated tools
86 in pregnancy adversely affects breastfeeding in a cohort study.
87

88 Methods

89 Population, sample size and study subjects

90 A population-based study was designed using the 2009 regional health service
91 statistics for all public hospitals (n=28) in Andalusia, Spain (number of births=76,336).
92 Cluster sampling was employed to the select 15 hospitals to represent service type, i.e.
93 regional (n=5); specialized (n=10); and district (n=13). A sample 750 women,
94 consecutively enrolling 50 women per hospital,[10] provided an accuracy of ±2.5% with
95 99% confidence for IPV detection, assuming an IPV prevalence of 7.5%[19] and an
96 intraclass correlation coefficient of 5%.[20] Women registered for routine antenatal care
97 with estimation of gestational age by early ultrasound and giving birth within the study
98 period were included. Exclusion criteria were women with stillbirths, those unable to
99 communicate in the Spanish language, and those with disease or disability preventing
100 data collection.
101

102 Data collection procedures

103 Data were collected during the immediate postpartum period by midwives given
104 specific training in one-to-one interviews incorporating guarantees of strict anonymity
105 and confidentiality. Women participating signed informed consent. If evidence of IPV
106 emerged, information concerning the police, judicial, and social services and resources
107 was provided.
108

109 **Data collection instruments**

110 *Breastfeeding*:[21] Breastfeeding avoidance data were captured in the local language
111 during the immediate post-partum period defined as lack of breastfeeding or
112 pumping of breast milk to feed the new baby in the hours after the delivery.

113

114 *IPV Exposure:* IPV was defined as physical, sexual, coercion or psychological abuse, and
115 controlling behaviours perpetrated by a current or past intimate relation[2,3] during 12
116 months before giving birth. It was measured in the immediate post-partum period by
117 Index of Spouse Abuse (ISA),[22] a 30-item instrument validated for use in Spanish.[23] It
118 measured the severity and frequency of abuse using weighted items (see online
119 Appendix S1). The instrument included assessments of emotional abuse (e.g. my
120 partner screams and yells at me), psychological threats (e.g. my partner becomes very
121 angry if I disagree with his point of view), coercive tactics (e.g. my partner orders me
122 around), and physical (e.g. my partner slaps me around my face and head) and sexual
123 abuse (e. g. my partner makes me perform sex acts that I do not enjoy or like). Two
124 severity scores (ranging from 0 to 100 points) were computed, one for physical (ISA-P)
125 abuse and the other for non-physical (ISA-NP) or psychological abuse. The ISA
126 recommended cut-off scores of 10 for physical abuse and 25 for psychological abuse
127 were used in this study.[22]

128

129 *Socio-demographic measures*: Data were collected on items such as age, marital
130 status, schooling history, employment, nationality, cohabitation with partner/family,
131 and the availability of next of kin support (i.e. a relative who could be turned to when
132 needed). A non-committed relationship was considered to be one between individuals

133 who may have casual sex without demanding or expecting the commitment of a
134 formal relationship.
135
136 *Perinatal outcomes:* Outcomes extracted from the prospectively documented
137 individual health records during the pregnancy were anaemia (<10.5 g/dL), urinary
138 tract infection, vaginal infections (sexually transmitted infection, candidiasis, bacterial
139 vaginosis, etc.), vaginal bleeding (threatened abortion and antepartum haemorrhage),
140 gestational diabetes (confirmed by glucose tolerance test at 24-28 weeks),
141 spontaneous preterm labour, gestational hypertension (>140/90 mmHg), others (e.g.
142 hyperemesis, hypothyroidism, mental disorders, placental disorders, renal colic and
143 intrauterine growth retardation), prematurity (<37 weeks), low birth weight, smoking
144 in pregnancy and resuscitation.
145
146 **Statistical analysis**
147 Multiple logistic regression analysis determined the relation between IPV and
148 breastfeeding. The model was controlled for socio-demographic characteristics (age,
149 marital status, educational level, employment status, nationality, cohabitation, and kin
150 support), desired pregnancy, obstetric pathologies (any pathology during pregnancy
151 except anemia or infections), infections during pregnancy, infant sex, prematurity, low
152 birth weight, resuscitation and smoking in pregnancy. The results were summarised as
153 adjusted odds ratios (AORs) with 95% CIs.
154
155 **Ethical considerations**

156 The study protocol was approved by the research ethics committees of all participating
157 hospitals.

158 There was neither core outcome sets nor formal patient involvement in the design of
159 this research. The study was funded by the Ministry of the Economy and
160 Competitiveness of Spain (National Project I+D+I: FEM2016-79049-R). The funder had
161 no part at any stage in analysis or in writing of this manuscript.

162

163 Results

164 The response rate was 92.2% and the lost data 4.3% out of 779 mothers recruited.
165 Psychological IPV in pregnancy was reported by 21.0% (n=151) of the women. A flow
166 diagram of the participants and the socio-demographic characteristics of the sample
167 are shown in Figure 1 and Table 1, respectively. A total of 70% (n=545) women
168 initiated breastfeeding. Distribution of the various outcomes and statistical
169 associations with psychological IPV during pregnancy are presented in Table 2.
170 Psychological IPV increased the odds of breastfeeding avoidance (AOR=2.0; 95%CI=1.2-
171 3.3) adjusting for the covariate variables. The presence of obstetric complications
172 (AOR=1.6; 95%CI=1.0-2.4), low birth weight (AOR=5.3; 95%CI=2.0-13.7) and
173 resuscitation (AOR=7.3; 95%CI=4.8-11.0) were significant associated with
174 breastfeeding avoidance.

175

176 Discussion

177 Main findings

178 In this study, psychological IPV, reported by 1 in 5 mothers, was associated with
179 reduction in initiation of breastfeeding, adjusting for the confounding effect of other

180 variables available within the dataset. As mothers with psychological IPV have higher
181 odds of avoiding breastfeeding, clinicians should be vigilant about the risk to infants
182 arising from this deficiency due to IPV in pregnancy.

183

184 **Strengths and limitations**

185 The strength of our investigation is that it was a population-based study focusing on
186 capturing psychological violence with a validated tool. The sample provided data with
187 a high (>90%) response rate. The low proportion (<5%) of lost data should reassure
188 about a minimum or non-existent effect on the validity of our results.[10] Another
189 strength of the current study is the use of local language in the instrument to identify
190 IPV amongst pregnant women and the training of midwives for data collection. One
191 weakness of the study is that IPV was assessed during the immediate postpartum
192 period, when women tend to feel particularly vulnerable and violence may have
193 underreported.[24] Our analysis dataset has some limitations, e.g. lack of stratification
194 by site, though the publicly funded antenatal care setting tends to be homogeneous in
195 Andalucía. Interestingly the in-depth analyses showed that socio-demographic
196 characteristics other than employment status had no effect on outcome in the
197 adjusted multivariate models (Table S1). Moreover, the place of women's residence
198 was not significantly associated with any type of violence. Another limitation is the
199 inability to consider in the exclusion criteria women with HIV or on medications that
200 are absolute or relative contraindications to breastfeeding. A further limitation is the
201 inability to include in the model some known potential cofounders like obesity and
202 depression. Future research should incorporate these variables in design and analysis.

With the multicentre nature of the study, we are also confident about generalisability of our findings.

Interpretation

Facts indicate that IPV during pregnancy is more common than others conditions routinely tested for in antenatal care.[2,4,25] It is increasingly being recognised that psychological victimization during pregnancy contributes to poorer overall health and temperament of the child. Focus on physical IPV only in pregnancy defines the problem too narrowly for evaluating the effects on the offspring. We documented an association between psychological IPV during pregnancy and breastfeeding problems. Obstetric pathologies, low birth weight or resuscitation may also be impediments to feeding the newborn baby in the hours after the delivery. In other studies postnatal depression has been linked to breastfeeding rates.[13,16]

A range of mechanisms may be proposed to explain the association between IPV and deficiencies in breastfeeding. One pathway may be linked to the effect of the stress produced by IPV during pregnancy. Stress may affect the maternal endocrine system and mental health.[21,26,27] Future research should explore the causal biological pathways of IPV. Qualitative research shows that this problem is multifaceted, deeply personal and elusive,[28] with the need for compassion and sensitivity in screening and prevention.

Conclusion

Experience of psychological IPV during pregnancy affects breastfeeding initiation. Mothers and clinicians should be concerned about the risk of harm to the infant from

this deficiency. Obstetricians, gynaecologists, midwives and other allied health care professionals who act as active screeners[29] should find ways to offer additional breastfeeding support during antenatal and postnatal care whenever IPV is identified in pregnancy.

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Disclosure of interests

None declared. Completed disclosure of interests form available to view online as supporting information.

Contribution of authorship

SMH and CV conceived and designed the study. CV extracted and prepared the data for the analysis. JDL provided statistical analysis. SMH and KK conducted the data analysis. SMH and KK were responsible for the writing of the manuscript. All authors were involved in the drafting and revising of the article and approved the final version of the manuscript for submission.

Details of ethical approval

The study was approved by the research ethics committees of all participating hospitals: Hospital Universitario Reina Sofía (26th March, 2009), Hospital Regional Universitario Carlos de Haya (25th June, 2009), Hospital Universitario San Cecilio (27th September, 2010), Hospital Universitario Virgen del Rocío (11th March, 2010), Hospital

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264

265 ## Supporting information

266 Additional Supporting information may be found in the online version of this article.

267 **Appendix S1.** Index of Spouse Abuse instrument to detect intimate partner
268 violence.

269 **Table S1.** Full univariate and multivariate regression models for avoidance of
270 breastfeeding

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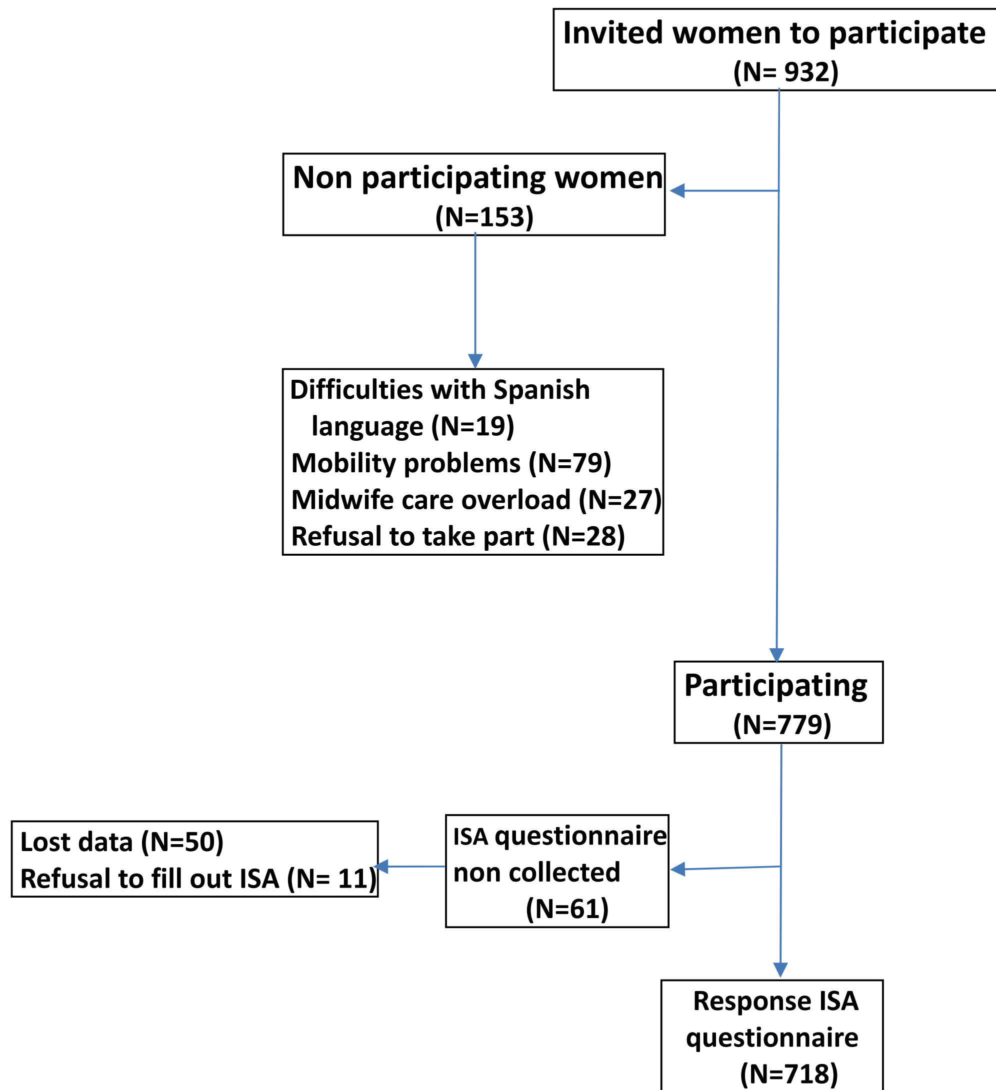

Figure 1. Flow diagram of the participants. ISA: Index of Spouse Abuse.

Table 1 Socio-demographic characteristics of the sample.

	N	Fr (%)	**Psychological IPV** N (Fr %)	**Physical IPV** N (Fr %)
Age* yrs.				
<20	26	3.7	12 (46.1)	2 (7.7)
20-24	95	13.6	29 (30.5)	2 (2.1)
25-29	187	26.8	43 (23.0)	10 (5.4)
30-34	260	37.2	39 (15.0)	8 (3.2)
35-39	104	14.9	18 (17.3)	2 (1.9)
≥40	26	3.7	5 (19.2)	2 (7.7)
Relationship status				
Married	466	65.1	67 (14.4)	8 (1.7)
Committed	102	14.2	27 (26.5)	5 (4.9)
Non-committed	148	20.7	56 (37.8)	13 (8.8)
Years of schooling				
<7	262	36.5	68 (25.9)	11 (4.2)
7-12	350	48.8	72 (20.6)	12 (3.4)
>12	105	14.6	11 (10.5)	3 (2.9)
Employment status				
Housewife	159	22.2	42 (26.4)	13 (8.2)
Unemployed	143	19.9	34 (23.8)	6 (4.2)
Employed	402	56.1	69 (17.2)	6 (1.5)
Student	13	1.8	5 (38.5)	1 (7.7)
Nationality				
Spanish	652	90.8	131 (20.1)	19 (2.9)
Other	66	9.2	20 (30.3)	7 (10.6)
Cohabitation				
Partner	657	91.5	126 (19.2)	20 (3.0)
Other	61	8.5	25 (41.0)	6 (9.8)
Kin support				
Yes	680	95.1	133 (19.6)	21 (3.1)
No	35	4.9	17 (48.6)	5 (14.3)

IPV: Intimate partner violence

*mean= 29.9 ± 5.6 yrs

Table 2: Relationship of breastfeeding avoidance with intimate partner violence.

		Avoidance of breastfeeding		
		N (%)	**OR (95% CI)**	**AOR (95% CI)**
Psychological IPV	No (N=565)	162 (28.7)	1	1
P=0.0010	Yes (N=151)	64 (42.7)	1.9 (1.3 –2.7)*	2.0 (1.2 –3.3)*
Physical IPV	No (N=689)	215 (31.2)	1	1
	Yes (N=26)	11 (42.3)	1.6 (0.7 – 3.6)	0.9 (0.3 – 2.6)
Employment	Housewife (N=168)	52 (31.0)	1	1
P=0.0424	Unemployed (N=162)	62 (38.3)	1.4 (0.9 – 2.2)	1.7 (1.0 –3.1)*
	Employed (N=429)	113 (26.3)	0.8 (0.5 – 1.2)	0.9 (0.6 – 1.6)
	Student (N=15)	4 (26.7)	0.8 (0.3 – 2.7)	0.9 (0.2 – 4.9)
Obstetric pathologies	No (N=532)	133 (25.0)	1	1
P<0.0001	Yes (N=240)	96 (40.0)	2.0 (1.5 -2.8)*	1.6 (1.0 –2.4)*
Prematurity < 37 weeks	No (N=719)	194 (27.0)	1	1
P<0.0001	Yes (N=57)	37 (64.9)	5.0 (2.8 – 8.8)*	1.1 (0.5 – 2.7)
Low birth weight	No (N=721)	192 (26.6)	1	1
P<0.0001	Yes (N=55)	39 (70.9)	6.7 (3.7 –12.3)*	5.3 (2.0-13.7)*
Resuscitation	No (N=521)	90 (17.3)	1	1
P<0.0001	Yes (N=195)	141 (72.3)	8.4 (5.2-12.5)*	7.3 (4.8-11.0)*
Smoking in pregnancy	No (N=636)	180 (28.3)	1	1
P=0.0385	Yes (N=137)	51 (37.2)	1.5 (1.0 – 2.2)*	1.5 (0.9 – 2.4)

IPV = Intimate partner violence; OR = crude odds ratio; AOR = adjusted odds ratio

Model adjusted for Age (years), Civil status, Education, Occupation, Nationality, Cohabitation, Kin support, Desired Pregnancy, Obstetric pathologies (any pathology during pregnancy except anemia or infections), Infection during pregnancy, Infant sex, Prematurity < 37 weeks, Low birth weight, Resuscitation and Smoking in pregnancy.