



The relationship between conformity to male and female gender norms and depression during pregnancy

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Abstract

To analyze whether there is an association between conformity to male and female gender norms and the Edinburgh Postnatal Depression Scale (EPDS) score as an indicator of depression during pregnancy, a cross-sectional study was made to a sample of 200 pregnant women being seen at any of the public primary care centers in Segovia (Spain) for the prenatal care. A score of 13 points or higher on the Spanish version of the EPDS is considered to be an indicator of antenatal depression. The Conformity to Feminine Norms Inventory (CFNI-84) and the Conformity to Masculine Norms Inventory (CMNI-94) were used to determine the degree of conformity to gender norms. Descriptive and inferential statistics, as well as multivariate analysis, were carried out. Logistic regression analysis showed the Nice in Relationships Subscale score to be associated with a decreased risk of depression (OR = 0.88; 95%CI 0.79–0.98; $p = 0.029$). In addition, the CMNI total score, as well as the Self-Reliance subscale, were associated with an increased risk of depression (OR = 1.04; 95%CI 1.01–1.07; $p = 0.022$; OR = 1.30; 95%CI 1.08–1.55; $p = 0.004$, respectively). An association between conformity to male gender norms and nonconformity to some female gender norms in pregnant women and a score on the EPDS indicating depression during pregnancy was found. Particularly, an increase in the CMNI total score was associated to increased risk of suffering depression in the pregnant women studied.

Keywords Antenatal depression · Gender norms · Conformity to Feminine Norms Inventory · Conformity to Masculine Norms Inventory · Edinburgh Postnatal Depression Scale

Introduction

Depression during pregnancy is considered a global public health problem (Shrivastava et al. 2015). It affects about 7% of women in developed countries (Grigoriadis 2019) and around 25% in low- and middle-income countries (Gelaye et al. 2016). The most commonly used screening tool is the Edinburgh Postnatal Depression Scale (EPDS) (Grigoriadis 2019), validated for testing depression during pregnancy (Kozinszky and Dudas 2015). Negative effects of depression during pregnancy include an increased risk of postpartum depression and post-traumatic stress disorder in women (Howard et al. 2014; Kuehner 2017), premature delivery, and absence of the initiation of breastfeeding (Grigoriadis et al. 2013), as well as an increased risk of behavioral problems and antisocial behavior in the offspring (Waters et al. 2014). Although prevalence of depression does not increase during pregnancy, it can lead to serious negative effects that

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are different from those that may occur at other times in life (Kuehner 2017), so much so that the DSM-5 manual includes perinatal depression (in pregnancy and after childbirth) as one of the specifiers for depressive disorders (American Psychiatric Association 2013).

Depression is a mood disorder that affects women more than men in a ratio of about 2:1 (Kuehner 2017). Since it occurs more often in women than in men, differentiated risk factors have been studied in women, considering both biological and psychological factors, as well as sociocultural environment (Kuehner 2017). Among the biological factors are genetic inheritance, hormonal influence, and physiological response to stress (Kuehner 2017). Psychological factors include temperament, personality, coping styles, and a history of anxiety disorders (Kendler and Gardner 2014; Kuehner 2017). Finally, role conflicts, a lack of social support, problems with interpersonal relations, violence against women including gender violence, sexual abuse in childhood or youth, and a lack of gender equality in society are included in sociocultural contexts (Kendler and Gardner 2014; Kuehner 2017).

Some of the above-mentioned risk factors may be especially related to depression during pregnancy, such as hormonal influence, lack of social support, and role conflicts (Kuehner 2017). Male and female gender norms are the accepted attributes and characteristics of being a woman or a man (ideas of how men and women should be and act) at a specific point in time for a specific society or community (Zheng 2015). According to the Focus Theory of Normative Conduct (Cialdini et al. 1991), such gender norms, as all other social norms, can be prescriptive as they are used as standards and expectations to which women and men should conform (Zheng 2015).

Conventional theories of masculinity-femininity assume that all gender-related phenomena contribute to a bipolar femininity-masculinity construction, so that assessment of an individual's masculine and feminine qualities can be used to determine his or her position on a hypothetical masculinity-femininity continuum (Spence 1984). However, authors like Mahalik consider masculinity and femininity as two independent dimensions, to be separately measurable in both men and women (Mahalik et al. 2003, 2005). Therefore, it is appropriate to measure conformity to female norms and conformity to male norms in women as well as in men, since, if only female norms are measured in women, and male norms in men, the measurement would be confusing sex with gender (Owen 2011).

In recent years, research efforts have been aimed at describing how conformity to gender norms can be understood as a relevant health determinant (Brabete et al. 2013; Sánchez-López et al. 2013, 2014). Particularly, greater mental health comorbidity was found to be related to greater conformity with feminine gender norms in women (Esteban-Gonzalo

et al. 2017). Also, greater levels of anxiety were related to a higher score on several subscales in the CFNI in a sample of women (Aparicio García et al. 2018). Finally, there is evidence that nonconformity to male and female gender norms is associated with higher levels of anxiety and depression in adolescents and young adults (Gordon et al. 2017).

The relevance of depression disorder during pregnancy as well as the link between gender norms and mental health led us to explore this potential association in a specific and vulnerable collective, that is, pregnant women.

To the best of our knowledge, this issue has not been previously analyzed. For this reason, the aim of the present study is to analyze whether there is an association between conformity to male and female gender norms and the EPDS score as an indicator of depression during pregnancy.

Materials and methods

Design, participants, and sample

Cross-sectional study. The target population included all pregnant women in the province of Segovia (Spain). The inclusion criteria were the date of the last period being between July 15, 2016, and June 15, 2017, and being seen at any of the public primary care centers in the province of Segovia for prenatal care. Prenatal care in these centers is provided free of charge for all women who request it, regardless of their legal status in Spain. The exclusion criteria were a language barrier impeding communication between the woman and the health professional, and the inability to read or write Spanish.

The sample size was calculated with a confidence level of 95% and an accuracy of 5%, using a 12% prevalence of antenatal depression in high-income countries as a reference point (Grigoriadis 2016), resulting in a minimum of 162 pregnant women. A consecutive non-probability sampling method was applied.

The recruitment period was from January 25 to July 28, 2017. Participants were recruited during midwifery consultations at the following primary care centers: Segovia I, Segovia II, Cuellar, El Espinar, Villacastín, Carbonero, Riaza, La Sierra, Sepúlveda, Cantalejo, Sacramenia, and Nava de la Asunción. Recruitment took place during medical and/or nursing consultations at the primary care centers of Segovia III and Segovia Rural.

A total of 226 women met inclusion criteria and were contacted. Finally, 200 accepted to participate and were recruited. Forty-six percent of them were in the first trimester of pregnancy when the questionnaire was carried out, 40% in the second semester, and 14% in the third.

Variables and diagnostic tests

Dependent variable

The Edinburgh Postnatal Depression Scale (EPDS) was used as a screening tool for detecting postpartum depression in women (Cox et al. 1987). Subsequently, its use has been extended to detect antenatal depression (Kozinszky and Dudas 2015). It has been translated into various languages and used in several countries (Kozinszky and Dudas 2015). In the Spanish version of the EPDS, a score of 13 points or higher is considered to be an indicator of depression during pregnancy (Alvarado et al. 2015), with 76.3% sensitivity and 93.2% specificity. Cronbach's alpha for the EPDS Spanish version is 0.914 (Alvarado et al. 2015).

Independent variable

The Conformity to Feminine Norms Inventory (CFNI-84) (Mahalik et al. 2005) and the Conformity to Masculine Norms Inventory (CMNI-94) (Mahalik et al. 2003) were used to determine the degree of conformity to gender norms. Both questionnaires have been validated in Spain with good psychometric properties. Cronbach's alpha for the Spanish version of the CFNI-84 is 0.87 (Sánchez-López et al. 2009), and Cronbach's alpha for the Spanish version of the CMNI-94 is 0.90 (Cuellar-Flores et al. 2011).

The Conformity to Feminine Norms Inventory (CFNI-84) is a self-administered test of 84 items with a Likert scale of four response options (0 strongly disagree, 1 disagree, 2 agree, and 3 strongly agree) from which a total score is obtained, as well as a score in each of its eight subscales (Nice in Relationships, Thinness, Modesty, Domestic, Care for Children, Romantic Relationship, Sexual Fidelity and Investment in Appearance).

The Conformity to Masculine Norms Inventory (CMNI-94) is a self-administered test of 94 items with a Likert scale of four response options (0 strongly disagree, 1 disagree, 2 agree, and 3 strongly agree) from which a total score is obtained, as well as a score in each of its 11 subscales (Winning, Emotional Control, Risk-Taking, Violence, Power Over Women, Dominance, Playboy, Self-Reliance, Primacy of Work, Disdain for Homosexuals, and Pursuit of Status).

Covariates

Data on sociodemographic variables (income and level of education), as well as age, marital status, and self-reported previous mental health disorder, was collected via an ad-hoc self-administered questionnaire.

- Level of education was classified into primary (9 years of educational training), secondary (12 years of educational training), and university (university degree).
- Monthly household income in Euros was classified into eight different income levels: 360 or less, 361–600, 601–900, 901–1200, 1201–1800, 1801–3600, 3601–6000, and more than 6000.
- Age was recorded as official age in years.
- Marital status, asking if they were married, single, widow or divorced.
- Self-reported previous mental health disorder, asking participants if they had been previously diagnosed for a mental health disorder (yes/no).

Data collection

After being recruited, participating women were offered the paper-based questionnaire including the sociodemographic questions, the Conformity to Feminine Norms Inventory, the Conformity to Masculine Norms Inventory, and the EPDS, to be filled out and returned at the next visit.

Statistical analysis

Descriptive statistics The sociodemographic data were expressed as relative frequencies (percentages) for the qualitative variables of country of origin, education level, and monthly income level. A score of 13 points or higher on the EPDS, indicating depression, was expressed in absolute and relative frequencies (percentage). For the quantitative variable of age, adjustment to normal distribution was determined using the Kolmogorov-Smirnov test. Since the variable did not follow a normal distribution, it was expressed using the median (interquartile range).

Inferential statistics Total and subscale scores of the Conformity to Feminine Norms Inventory and the Conformity to Masculine Norms Inventory were tested for normality using the Kolmogorov-Smirnov test. The Mann-Whitney *U* test was used for detecting differences between depressed and non-depressed women. A two-tailed *p* value of < 0.05 was considered significant.

When a significant association was observed, Cohen's *d* was calculated to find the effect size (Lakens 2013), with 0.11–0.35 considered to be a “small” effect size, 0.36–0.65 a “medium” effect size, 0.66–1 a “large” effect size, and more than 1 to be a “very large” effect size (Cohen 1988).

Finally, the association between conformity to male and female gender norms and the EPDS score as an indicator of depression during pregnancy was assessed by binary logistic regression using two different regression models. The first model was crude, and the second model was adjusted for

age, income, level of education, marital status, and self-reported previous mental health disorder. All analysis was performed using SPSS statistical package (v 15.0) for Windows (IBM, Armonk, NY) with significance set at $p < 0.05$.

Results

Table 1 shows the sociodemographic characteristics of the female participants. The ages of participating pregnant women ranged from 18 to 44 years old. The majority were born in Spain, though about 20% were born in other countries. Of those, most were European (Bulgaria, Romania, Poland, France, and Switzerland) and the rest were South American (Colombia, Honduras, Ecuador, Peru, Venezuela, the Dominican Republic, Bolivia, and Brazil). Most participants had a college education level, and the most common household income level was between 1801 and 3000 Euros per month.

On the EPDS, 28 women (14%) scored at or above 13 points, indicating depression.

Table 2 shows differences in conformity to feminine norms between depressed (13 points or higher on the EPDS) and non-depressed women during pregnancy. Non-depressed women showed higher scores on the Nice in Relationships Subscale ($p = 0.016$, Cohen's d effect size 0.53).

Table 1 Characteristics of participating women ($n = 200$)

Age [median (IQR)]	33 (7)
Education level (%)	
Primary	14.0
Secondary	40.0
College	46.0
Income level (%)	
360 euros or less	0.5
Between 361 and 600 Euros	1.6
Between 601 and 900 Euros	6.6
Between 901 and 1200 Euros	15.8
Between 1201 and 1800 Euros	30.1
Between 1801 and 3000 Euros	39.9
Between 3001 and 6000 Euros	5.5
More than 6000 Euros	0
Marital status (%)	
Single	37.1
Married	61.5
Widow	0.0
Divorced	1.4
Previous mental health disorder* (%)	30.6

* Self-reported diagnose of a mental health disorder

Table 3 shows differences in conformity to masculine norms between depressed (13 points or higher on the EPDS) and non-depressed women during pregnancy. Depressed women showed higher scores on the Emotional Control, Violence and the Self-Reliance Subscales ($p = 0.014$; $p = 0.018$, $p = 0.002$, respectively; Cohen's d effect size 0.35, 0.46 and 0.72, respectively). In addition, depressed women showed higher total CMNI scores ($p = 0.014$, Cohen's d effect size 0.49).

Table 4 shows the logistic regression models for conformity to gender norms (feminine and masculine norms) and scores of 13 points or higher on the EPDS, indicating depression during pregnancy. With the non-depression group of women as reference group, on the one hand, a one-unit increase in the Nice in Relationships Subscale score was associated with a decreased risk of depression in both unadjusted and adjusted models (OR = 0.88; 95%CI 0.80–0.97; $p = 0.015$ and OR = 0.88; 95%CI 0.79–0.98; $p = 0.029$, respectively). On the other hand, a one-unit increase in the Violence Subscale and in the Self-Reliance subscales score was associated with an increased risk of depression in the unadjusted model (OR = 1.16; 95%CI 1.02–1.33; $p = 0.028$ and OR = 1.34; 95%CI 1.14–1.566; $p < 0.001$, respectively). However, only results for the Self-Reliance subscale score remain significant in the adjusted model (OR = 1.30; 95%CI 1.08–1.55; $p = 0.004$). Finally, a one-unit increase in the CMNI total score was associated with an increased risk of depression in both unadjusted and adjusted models (OR = 1.03; 95%CI 1.00–1.05; $p = 0.018$ and OR = 1.04; 95%CI 1.01–1.07; $p = 0.022$, respectively).

Discussion and conclusions

The relationship between conformity to male and female gender norms and depression during pregnancy

The percentage of women found in our study receiving a score on the EPDS indicating depression in pregnancy is slightly higher than that predicted by previous studies in other developed countries (Grigoriadis 2019).

Women with a score on the EPDS indicating depression during pregnancy show a statistically significant higher level of conformity to masculine gender norms in general (with a one-unit increase in its score, the risk of suffering depression during pregnancy increased by 4%), especially in the Violence and Self-Reliance subscales.

Regarding conformity to feminine gender norms total score, in spite of only slight differences in mean values between groups, logistic regression models indicate that with a

Table 2 Differences in *conformity to feminine norms* between depressed (13 points or higher on the Edinburgh Postnatal Depression Scale) and non-depressed women during pregnancy

	Women with scores indicating depression (<i>n</i> = 28)	Women with scores indicating NO depression (<i>n</i> = 172)	<i>P</i> ^a	Cohen's <i>d</i> effect size ^b
	Mean (SD)/median (IQR)	Mean (SD)/median (IQR)		
CFNI: Nice in Relationships Subscale Score	34.6 (3.9)/34.5(5.7)	36.9 (4.5)/37.0(6.0)	0.016	0.53
CFNI: Thinness Subscale Score	15.8(4.9)/14.5(6.0)	16.2(5.1)/16.0(7.0)	0.320	–
CFNI: Modesty Subscale Score	14.6(3.4)/14.0(4.9)	13.71(3.1)/14.0(4.0)	0.223	–
CFNI: Domestic Subscale Score	15.5(3.4)/17.5(4.7)	17.7(3.0)/18.0(5.0)	0.932	–
CFNI: Care for Children Subscale Score	22.5 (6.4)/22.0(8.7)	24.9 (4.4)/24.0(6.0)	0.050	0.44
CFNI: Romantic Relationship Subscale Score	13.3(3.7)/13.0(5.7)	13.5(2.8)/14.0(3.0)	0.853	–
CFNI: Sexual Fidelity Subscale Score	18.8(4.8)/19.0(5.5)	18.7(4.1)/19.0(5.0)	0.747	–
CFNI: Investment in Appearance Subscale Score	11.7(3.8)/11.0(4.0)	11.2(2.9)/11.0(4.0)	0.730	–
CFNI Total Score	149.1(14.6)/144.5(17.0)	153.1(14.6)/151.0(22.0)	0.133	–

CFNI conformity to feminine norms inventory

^a Mann-Whitney *U* test

^b 0.36–0.65, small effect size; 0.66–1, medium effect size; 0.66–1, large effect size

one-unit increase in the “Nice in Relationships” subscale, the risk of suffering depression during pregnancy decreased by 13%.

Since we were unable to find previous studies examining the relationship between depression during pregnancy and scales of conformity to masculine and feminine gender norms, our results could not be compared to previous findings.

The relationship between conformity to male and female gender norms and mental health

However, the relationship between conformity to gender norms and mental health problems in the general population has been studied. In a recent meta-analysis, conformity to male gender norms in women was found to be associated with poorer mental health and a lesser likelihood to seek

Table 3 Differences in *conformity to masculine norms* between depressed (13 points or higher on the Edinburgh Postnatal Depression Scale) and non-depressed women during pregnancy

	Women with scores indicating depression (<i>n</i> = 28)	Women with scores indicating NO depression (<i>n</i> = 172)	<i>P</i> ^a	Cohen's <i>d</i> effect size ^b
	Mean (SD)/median (IQR)	Mean (SD)/median (IQR)		
CMNI: Winning Subscale Score	11.4(3.6)/12.0(4.5)	10.8(3.3)/11.0(4.0)	0.422	–
CMNI: Emotional Control Subscale Score	13.6(4.4)/13.5(4.7)	12.1(4.1)/12.0(4.0)	0.014	0.35
CMNI: Risk-Taking Subscale Score	13.1(3.6)/14.0(4.5)	13.0(3.3)/13.0(4.0)	0.595	–
CMNI: Violence Subscale Score	6.4(2.8)/6.5(5.0)	5.0(2.9)/5.0(4.0)	0.018	0.46
CMNI: Power Over Women Subscale Score	7.1(3.0)/7.0(5.0)	6.6(2.6)/7.0(4.0)	0.379	–
CMNI: Dominance Subscale Score	4.6(2.1)/4.5(3.0)	4.0(1.5)/4.0(2.0)	0.142	–
CMNI: Playboy Subscale Score	10.0(3.4)/11.0(4.7)	9.6(4.0)/10.0(6.0)	0.808	–
CMNI: Self-Reliance Subscale Score	7.5(3.7)/7.5(5.0)	5.24(2.5)/6.0(3.0)	0.002	0.72
CMNI: Primacy of Work Subscale Score	7.8(3.3)/8.0(3.7)	7.5(2.7)/8.0(3.0)	0.581	–
CMNI: Disdain for Homosexuals Subscale Score	8.7(5.4)/8.5(8.7)	8.0(4.5)/9.0(7.0)	0.655	–
CMNI: Pursuit of Status Subscale Score	9.4(2.6)/10.0(2.0)	9.2(2.1)/9.0(3.0)	0.264	–
CMNI Total Score	100.2(17.2)/104.0(25.02)	91.4(17.6)/92.0(24.0)	0.014	0.49

CMNI conformity to masculine norms inventory

^a Mann-Whitney *U* test

^b 0.36–0.65, small effect size; 0.66–1, medium effect size; 0.66–1, large effect size

Table 4 Logistic regression models for conformity to gender norms (feminine and masculine norms) and score of 13 points or higher on the Edinburgh Postnatal Depression Scale (EPDS), indicating depression during pregnancy (depression status $n = 28$, non-depression status $n = 171$)

CFNI	Unadjusted model			*Adjusted model		
	OR	95%CI	<i>P</i>	OR	95%CI	<i>P</i>
Nice in Relationships Subscale Score						
Depression	0.88	0.80–0.97	0.015	0.88	0.79–0.98	0.029
CFNI total score						
Depression	0.96	0.95–1.01	0.366	0.97	0.94–1.01	0.169
CMNI	Unadjusted model			*Adjusted model		
	OR	95% CI	<i>P</i>	OR	95% CI	<i>P</i>
Emotional Control Subscale Score						
Depression	1.08	0.99–1.19	0.081	1.09	0.98–1.21	0.099
Violence Subscale Score						
Depression	1.16	1.02–1.33	0.028	1.12	0.96–1.32	0.140
Self-Reliance Subscale Score						
Depression	1.34	1.14–1.56	< 0.001	1.30	1.08–1.55	0.004
CMNI total score						
Depression	1.03	1.00–1.05	0.018	1.04	1.01–1.07	0.022

CFNI conformity to feminine norms inventory, CMNI conformity to masculine norms inventory

*Adjusted model: analyses were adjusted for age, income, level of education, marital status, and self-reported previous diagnose of a mental health disorder

psychological help (Wong et al. 2017). Examining subscales separately, greater conformity of women to the subscale of Independence within masculine gender norms is also associated with poorer mental health (Wong et al. 2017). Therefore, it appears that a higher degree of conformity to male gender norms is associated with poorer mental health in general, which is consistent with the results of our research. On the other hand, a high degree of conformity to female gender norms is associated with a higher degree of psychological morbidity (Esteban-Gonzalo et al. 2017) and greater levels of anxiety have been related to a higher score on several subscales of the CFNI (Aparicio García et al. 2018). The results of these two previous studies are not aligned with our research results, which indicate that depression during pregnancy is not associated to CFNI total scores, being only associated with a lower score on the Nice in Relationships subscale.

Limitations and strengths

This research has certain limitations. Firstly, the use of self-administered questionnaires may decrease the reliability of some measurements. Secondly, the use of the EPDS as an indicator of depression during pregnancy does not imply a clinical diagnosis of depression, since it is a screening test. Thirdly, the cross-sectional design of the study does not allow cause-effect relationships to be detected. Finally, this study focused on mothers. Although we have considered the relevance of marital status and socioeconomic variables, the fathers' perspective was not explored. Additionally, further relevant covariates were not explored.

As far as the strengths of the research are concerned, despite the known relationship between mental health and conformity to gender norms, to date no study has assessed the association between conformity to gender norms and depression during pregnancy. In addition, the findings of the present study are a first step in the detection of potential relevant gender-related risk factors influencing depression during pregnancy.

Conclusions

The present study has found an association between conformity to male gender norms and nonconformity to some female gender norms in pregnant women with an EPDS score indicating depression during pregnancy. Particularly, an increased CMNI total score is associated with increased risk of suffering depression in the pregnant women studied.

Future work should determine whether conformity to gender norms is a predisposing factor for depression during pregnancy. Future research should carefully consider conformity to gender norms of the fathers by exploring their role and potential adaptive responses to pregnancy as well as the influence these factors may have on mothers' depression during pregnancy.

Compliance with ethical standards

The study was developed in accordance with the international ethical recommendations for human research and clinical trials of the Declaration of Helsinki.

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Female participants signed a written consent form. All women scoring 13 or higher on the EPDS were referred to their primary care physician for assessment.

Conflict of interest The authors declare that they have no conflict of interest.

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