Prevalence of postpartum major depression and depressive symptoms in Spanish women: A longitudinal study up to 1 year postpartum

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ABSTRACT

Objective: Depression is a prevalent mental disorder in the postpartum period, with consequences for both the mother and her offspring. However, longitudinal studies determining the moments of greatest vulnerability and severity of depression during the postpartum period are scarce. The aims of this research were to determine the prevalence and trajectories of probable depression and major depression during the first year postpartum.
Design: Longitudinal study.
Setting: Interviews were conducted personally at three times: 2 months, 6 months and 1 year postpartum.
Participants: 561 postpartum women.
Measurements and findings: Depression was assessed using the Edinburgh Postnatal Depression Scale (EPDS) and the Structured Clinical Interview (SCID) for the Diagnostic and Statistical Manual of Mental Disorders (DSM). Descriptive and comparative analyses have been carried out. The prevalence of probable depression at 2 months, 6 months and 1 year postpartum, using a cut-off point ≥ 10, was 30.3%, 26.0% and 25.3%, respectively; and that of major depression using SCID was 10.3%, 10.9% and 14.8, respectively. The prevalence of probable depression was highest at 2 months postpartum and that of major depression at 1 year postpartum. Probable depression followed a downward trajectory and major depression followed an upward trajectory.
Key conclusions and implications for practice: The clinical relevance of this research is that it has made it possible to demonstrate that depression is very prevalent in the first year postpartum and that, far from subsiding, the prevalence remains very high even at 1 year postpartum. Our findings highlight the importance of taking mental health care into account throughout at least the first year postpartum.

Introduction

Although depression is one of the most prevalent psychological disorders during the postpartum period (Zivoder et al., 2019), it is often under-diagnosed. Its prevalence is usually higher than in pregnancy (Míguez et al., 2017; Míguez and Vázquez, 2021; Phoosuwan et al., 2020).

On the other hand, the prevalence of postpartum depression found in the different studies is highly variable due to the great heterogeneity in the assessment methodology used (different instruments, different cut-off points and timing of assessment). In a meta-analysis carried out by Liu et al. (2021) the range of prevalence of depression in the first year postpartum was from 5% to 26%, the overall postpartum depression prevalence being 14%. The Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987), the most widely used screening tool

internationally to detect postpartum depression, was the screening instrument used in all studies analysed. In another meta-analysis by Shorey et al. (2018) the range of prevalence found in the first postpartum year was 14% to 25%, with the overall postpartum depression prevalence being 17%. Both screening instruments and clinical interviews were included. Contrary to what might be expected, in both meta-analyses the assessment time point at which the highest prevalence of depression was found was one year postpartum.

In addition to the heterogeneity in the methodology used, the most studies published to date provides prevalence data obtained from screening instruments only (e.g., Kaydirak et al., 2022; McCall-Hosenfeld et al., 2016; Mercier et al., 2013; Molgora et al., 2022; Nakano et al., 2020; Ogbo et al., 2018; Phoosuwan et al., 2020; Xiong et al., 2018; Yörük et al., 2020). This methodology may overestimate the rate of postpartum depression if a clinical interview is not used to confirm the

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diagnosis of major depression, i.e. the most severe form of depression. Screening instruments detect depressive symptomatology and/or probable depression which, although it may cause significant psychological distress to the woman, implies a less severe state. Therefore, the two entities of depression have different implications and treatment needs.

Another gap in the research to date is the paucity of longitudinal and long-term follow-up studies. In those studies that using self-report instruments assessment were mostly conduced up to 6 months postpartum (e.g., Boratav et al., 2016; Burgut et al., 2013; Dolbier et al., 2013; Fiala et al., 2017; Iliadis et al., 2015; Kaydirak et al., 2022; Lara et al., 2015; Mohammad et al., 2011; Ngai and Ngu, 2015; Shwartz et al., 2019; Vaezi et al., 2019; Yusuff et al., 2015). In addition, some of the studies do not provide longitudinally collected data, but assess cohorts of women in, for example, the first postpartum year (e. g., Do et al., 2018; Alfayumi et al., 2015). This means that these studies provide prevalence at a specific point in time but cannot be used to determine the evolution of prevalence throughout the postpartum period.

This lack of longitudinal studies assessing the same women for at least the first year postpartum does not allow us to know the trajectory of depression throughout the postpartum period, to know when it is most prevalent, when it begins to subside or when professional help should be offered. Moreover, the few existing studies have provided mixed results. Some studies have found that the highest prevalence of depression occurred at assessment points further away from delivery (Borra et al., 2015; Molgora et al., 2022; Rosander et al., 2021; Woolhouse et al., 2015), after having declined at earlier points. In other studies, depression decreased slightly, but not significantly, suggesting that prevalence remains stable (Lara et al., 2015; McCall-Hosenfeld et al., 2016; Mohammad et al., 2011; Phoosuwan et al., 2020).

The importance of early detection of postpartum depression lies in the fact that it not only affects the woman who suffers from it, but also her children and other family members, contributing to the deterioration of marital and family relationships (Lilja et al., 2012; Vliegen et al., 2013). A consequence of maternal postpartum depression is its long-term continuity being a predictor of future mental health status (Prenoveau et al., 2013). Maternal depression is also a risk factor affecting the development of adequate maternal-filial bonding and attachment (O'Higgins et al., 2013; Lilja et al., 2012). It also affects children's development (Kingston et al., 2012), specifically delaying cognitive and language development (Nasreen et al., 2013) and leading to behavioral problems (Stein et al., 2014) and mood disorders (Netsi et al., 2018; Sanger et al., 2015).

To date, no longitudinal studies have been conducted in large samples of women to assess the prevalence of postpartum depression throughout the first year by using a screening instrument and a clinical interview to identify women with the most severe depression. These data are necessary to know the real prevalence of postpartum depression and to justify the importance of implementing perinatal mental health assessment programs, which are currently lacking in our health system.

The present study aimed to answer the following specific questions:

1. What is the prevalence of probable depression and major depression in the postpartum period, at 2 months, 6 months and 1 year postpartum?
2. Is the trajectory of depression throughout the first year postpartum the same regardless of its severity?

Methods

Participants

The sample included in this longitudinal study comprises 561 Spanish postpartum women recruited from among women who gave birth at their referral hospital (in north-western Spain) and who completed the questionnaires at each assessment time. Women were consecutively recruited, until the sample size to insure

representativeness was reach. These were the inclusion criteria: being 18 or older, participating voluntarily in the study, and speaking and reading Spanish. Exclusion criteria were: preterm birth (< 37 weeks′ gestation) and severe complications during pregnancy, birth and postpartum. The loss rate was 1.06%. The age of sample ranged from 18 to 45 years ($M = 32.80$, $SD = 4.73$). Most participants were married or lived with their partner (94.8%), were primiparous (59.5%), and 46.5% of them had university studies. Regarding personal income, 44.9% ($n = 252$) stated that they earned 1000 euros per month or less. Pregnancy was planned in 85.9% of cases (Table 1).

Procedure

Participants were first informed verbally and in writing about the objective and the methodology of the study, and their cooperation was requested. Once informed consent was signed, individual administration of the different questionnaires was carried out. The interviews were conducted at 2 months postpartum ($M = 7.15$ weeks, $SD = 0.98$), at 6 months postpartum ($M = 25.62$ weeks, $SD = 1.42$) and at 1 year postpartum ($M = 51.68$ weeks, $SD = 1.98$).

At each time, all evaluations were performed personally by one psychologist who received SCID training and was blind to the EPDS scores and the diagnosis of major depression. The average duration of each interview was about 30 min. Participants did not receive any type of incentive for study participation. The study was approved by the Ethics Committees of all institutions involved and complied with the standards and recommendations provided by the Declaration of Helsinki.

Measures

Socio-demographic and obstetric-gynecological questionnaire

An ad hoc questionnaire, elaborated specifically for this study, included information about socio-demographic variables (e.g. age, marital status, educational level, occupational status and personal monthly income), previous obstetrical history, and current pregnancy (e.g. number of previous pregnancies, planned pregnancy, complications, etc.).

Edinburgh postnatal depression scale (EPDS)

The EPDS (Cox et al., 1987) is a self-reported questionnaire designed

Table 1
Socio-demographic characteristics of the study participants.

Characteristics of participants	n	%
Age (Years)		
≤ 25	34	6.1
26–35	353	62.5
> 35	174	31.0
Marital status		
Single	15	2.7
Married/living with a partner	532	94.8
Divorced/Separated/widowed	14	2.5
Level of education		
Primary	101	18.0
Secondary	199	35.5
University	261	46.5
Employment status		
Working	423	75.4
Unemployed	99	17.6
Sick leave	30	5.3
Pensioner	1	0.2
Other	8	1.4
Personal monthly income (EUR)		
≤ 1000	252	44.9
1001–2000	202	36.0
2001–4000	27	4.8
> 4000	2	0.4
Don't know/No reply	78	13.9

to detect depressive states during the postpartum period and also during pregnancy (Vázquez and Míguez, 2019). This scale includes 10 items, with four response options, regarding how the women have been feeling over the past 7 days, with higher values indicating more severe symptoms. The Spanish version of the EPDS scale (García- Esteve et al., 2003) was used in this study. The cut-off point used to identify women with probable postpartum depression was ≥ 10 (Navarro et al., 2017). The reliability of the EPDS was 0.87 at 2 months postpartum, 0.86 at 6 months and 0.88 at 1 year postpartum.

Structured clinical interview for DSM-IV (SCID)

The SCID (First et al., 1999) is a semi-structured interview that determines a formal diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders (DSM). In order to diagnose depression, as a pre-requisite the subject must (a) be in a depressed mood or (b) have lost interest or pleasure. In addition, five or more criteria (major depression) of the symptoms must be present nearly every day during a 2-week period.

Statistical analysis

Data were analyzed using SPSS Statistics, version 25 (PASW Statistics for Windows, SPSS Inc., Chicago, IL, USA), and a significance level of $p < 0.05$ was applied. A descriptive analysis of the sample was carried out. Cronbach's alpha was calculated in order to estimate the reliability of the scales. The prevalence of probable depression (EPDS ≥ 10) and major depression (SCID) were assessed. An analysis of variance test for repeated measures (ANOVA MR) was used to test for the existence of differences between measures with each of the assessment instruments. For pairwise comparisons, the Student-t-test for repeated measures was used. The effect size was also calculated on the R^2 scale. Cochran's and McNemar's tests were used to check for the existence of differences between prevalence in repeated measures.

Results

Prevalence of probable depression in the postpartum period

The average EPDS scores were 7.05 ($SD = 4.77$) at 2 months, 6.29 ($SD = 4.56$) at 6 months and 6.00 ($SD = 4.72$) at 1 year postpartum. Comparing the overall mean scores for probable depression at the three assessment points, there was a significant decrease in depression scores throughout the postpartum period ($F = 29.89$; $p < 0.001$; $R^2 = 0.051$). Pairwise comparison of the time points revealed statistically significant differences between 2 and 6 months postpartum (t $_{(561)} = 5.64$, $p < 0.001$, $R^2 = 0.054$), as well as between 2 and 1 year postpartum (t $_{(561)} = 6.65$, $p < 0.001$, $R^2 = 0.073$). On the other hand, although significant differences in the scores were found between 6 and 1 year postpartum (t $_{(561)} = 2.29$, $p = 0.023$, $R^2 = 0.009$), the effect size was very low (<1%).

The prevalence of probable depression obtained with the EPDS was 30.3% ($n = 170$) at 2 months postpartum, 26.0% ($n = 146$) at 6 months and 25.3% ($n = 142$) at 1 year postpartum. Overall comparison of the prevalence of depression at the three assessment time points revealed a significant difference ($Q = 10.19$; $p = 0.006$), confirming changes in the prevalence of probable depression throughout the period studied. In particular, pairwise comparison of the time points revealed statistically significant differences in the prevalence between 2 and 6 months postpartum ($\chi^2 = 6.78$; $p = 0.009$), as well as between 2 months and 1 year postpartum ($\chi^2 = 6.63$; $p = 0.010$). No significant differences were observed between the prevalence at 6 months and 1 postpartum year ($\chi^2 = 0.11$; $p = 0.740$).

Prevalence of major depression in the postpartum period

The SCID interview revealed that the prevalence of major depression was 10.3% ($n = 58$) at 2 months postpartum, 10.9% ($n = 61$) at 6 months

and 14.8% ($n = 83$) at 1 year postpartum. Overall comparison of the prevalence of major depression at the three assessment times revealed a significant difference ($Q = 12.02$; $p = 0.002$), leading to the conclusion that the prevalence of depression changed during the first year postpartum. Pairwise comparison of the time points did not reveal any significant difference between the prevalence of major depression at 2 and 6 months postpartum ($\chi^2 = 0.08$; $p = 0.779$), but the other comparisons did reveal differences. Specifically, the prevalence of major depression was significantly higher at 1 year postpartum than at 2 months postpartum ($\chi^2 = 8.60$; $p = 0.003$) and than at 6 months postpartum ($\chi^2 = 6.48$; $p = 0.011$).

Trajectory of depression throughout the first year postpartum

The prevalence of depression varied according to the time of the assessment and the assessment instrument used (Fig. 1). It is observed that the period in which the highest percentage of women with probable depression was the immediate postpartum period, i.e. at 2 months postpartum (30.3%), while at 1 year postpartum the percentage was lowest (25.3%), although still very high. On the other hand, the highest percentage of major depression was observed at 1 year postpartum (14.8%), and the lowest percentage at two months postpartum (10.3%). The trajectory of probable depression therefore followed a downward pattern, while the trajectory of major depression followed an upward pattern between 2 months and 1 year postpartum.

Discussion

Prevalence of probable depression in the postpartum period

The prevalence of probable postpartum depression found ranged from 25.3% to 30.3%. It should be noted that comparing prevalence data across studies is complicated, not so much by the instrument used -as there is consensus regarding the use of the EPDS for screening- but because of the high variability in the cut-off points and times of assessment used in different studies.

At 2 months postpartum, the prevalence of probable depression was 30.3%. This is highly consistent with the value reported by Giri et al. (2015), obtained in a study in Nepal using the same instrument, cut-off point and time of assessment. Regarding other studies using the same criteria, Xiong et al. (2018) reported a much higher prevalence rate (56.2%), in a Chinese sample, while Alton et al. (2016) and Connelly et al. (2013) reported lower prevalence rates, of 11% and 20.4%, in studies carried out in Canada and the USA, respectively.

At 6 months postpartum, the prevalence of probable depression was 26.0%. This is higher than obtained in studies that used the same criteria
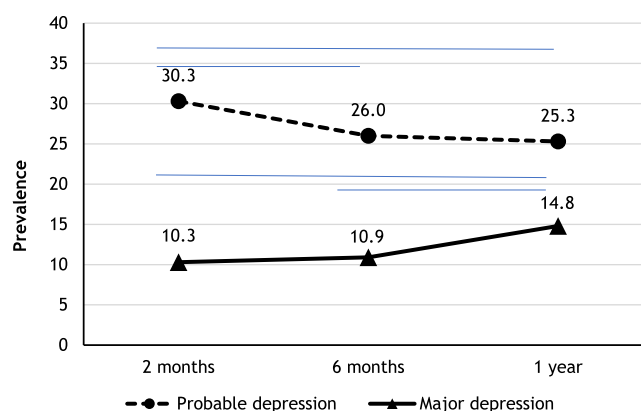

Fig. 1. Trajectory of probable depression and major depression in the postpartum period.
Note: Significant changes are represented by blue lines.

as in the present study, such as those carried out by Dolbier et al. (2013) in Canada (17.4%) and Fiala et al. (2017) in the Czech Republic (10.1%).

It should be noted that the higher prevalence of probable depression in this study may be due to the fact that studies that obtain lower prevalence often use higher cut-off points (e.g., Maliszewska et al., 2017; Woolhouse et al., 2015) or do not include women scoring > 12 (Dolbier et al., 2013). If the cut-off points used were the same as the one used in our study, the prevalence would probably be similar as well.

At 1 year postpartum, the prevalence of probable depression was 25.3%. This value is lower than those reported by Do et al. (2018) in Vietnam (27.6%). On the other hand, the rate we observed is higher than those reported by Woolhouse et al. (2015) in Australia (9.5%) and Mercier et al. (2013) in the USA (6.0%), in all the above cases using EPDS ≥ 13. These studies have used higher cut-off points than in the present study, which may explain the lower prevalence rates they obtained.

Prevalence of major depression in the postpartum period

The prevalence of major depression varied throughout the year-long postpartum period from 10.3% to 14.8%. These values are higher than those obtained in surveys carried out on the general population of women in Europe. So much so that the report Health at a Glance: Europe 2018 (OECD/EU, 2018) reports a prevalence of depression in women of 8.8%.

Considering studies that have conducted assessments between 6 and 12 weeks postpartum, the prevalence ranges from 13.8% (Lara et al., 2015) in Mexico to 15.8% (Gupta et al., 2013) in India. The prevalence determined in the present study (10.3%) is similar to that found in Portugal (11.5%) by Marques et al. (2011).

At 6 months postpartum, the prevalence ranged from 11.8% (Agoub et al., 2005) to 13.3% (Lara et al., 2015), which is consistent with the data found in the present study (10.9%). At 1 year postpartum, Ueda et al. (2006) reported a prevalence of major depression of 17.1% in a Japanese sample; this is two percentage points higher than found in the present study (14.8%).

The differences obtained with respect to the results found in previous studies may be due (in addition to the different cut-off points used) to the variability in the assessment times used and to the fact that some studies include cohorts of women that cover long postpartum periods, from the first hours postpartum to 12 months (Burgut et al., 2013; Kheirabadi and Maracy, 2010; Vaezi et al., 2019), making it difficult to establish comparisons, as the prevalence of depression varies depending on the stage of the postpartum period considered. Also, cultural differences between countries in terms of how emotions are expressed or how well accepted the expression of negative feelings associated with motherhood is, as well as the practices surrounding childbirth and childcare, must always be taken into account.

Postpartum depression trajectory

In the present study, the trajectories of probable depression and major depression are different and opposite. Specifically, from 2 months to 1 year postpartum, the prevalence of probable depression follows a downward trajectory, with significant differences in the prevalence found at 6 months (26.0%) and 1 year postpartum (25.3%) compared to 2 months postpartum (30.3%). Therefore, the risk of depression decreases significantly throughout the postpartum period, from 2 months postpartum onwards, although it remains stable (i.e. without significant changes) at between 6 months and 1 year postpartum. However, the prevalence of major depression tended to increase. Specifically, significant differences were found in the prevalence at 1 year postpartum (14.8%) relative to that at 2 months (10.3%) and 6 months (10.9%). Thus, major depression increased significantly from 6 months postpartum onwards.

Other studies that have conducted several postpartum assessments

using the EPDS (e.g., Borra et al., 2015; Woolhouse et al., 2015), concluded that the highest prevalence rates or highest mean scores occurred at times further away from the time of birth and are therefore be consistent with the trajectory of major depression observed in the present study. Specifically, a higher prevalence of depression was observed at 9–12 and 17–21 months postpartum (Rosander et al., 2021), at 1 year postpartum (Molgora et al., 2022), at 18–21 months postpartum (Woolhouse et al., 2015) and at 24 months postpartum (Borra et al., 2015), than in previous postpartum assessments. Using SCID, the pattern found in the longitudinal study conducted by Lara et al. (2015) corresponds to that observed in the present study, as major depression at 6 weeks (13.8%) and at 6 months (13.3%) postpartum remained stable. However, using the MINI, Agoub et al. (2005) found an increasing prevalence from 6 weeks (6.9%) to 6 months (11.8%), while the prevalence decreased between 12 weeks (14.0%) and 6 months (12.0%) in the study by Alami et al. (2006). We have not found any studies with which we can make comparisons of the data obtained at 1 year postpartum.

We would like to draw attention to the importance of having assessed depression simultaneously with two instruments at all-time points assessed up to 1 year postpartum. If the present study had only included the self-report instrument and stopped at 6 months postpartum, as most studies do, the conclusion would be very different, as it would be observed that women feel better as the postpartum period progresses, as probable depression decreased significantly from 2 to 6 months postpartum. However, the opposite conclusion is reached when the presence of major depression is taken into account, as the women not only did not improve over time, but depression increased significantly throughout the postpartum period and was higher at 1 year than at the previous times.

The immediate puerperium is a time of great psychological vulnerability, as it involves the woman's adaptation to her new role as a mother, with all the changes that this implies. This situation may explain the fact that in our study the 2 months postpartum was the time when the highest prevalence of probable depression was observed within the entire postpartum period evaluated. From this point onwards, the psychological distress associated with these changes would diminish as women overcome them or adapt to them as routine. However, if this does not happen and other situations of change are superimposed, this milder and more transitory symptomatology could worsen. This may explain why the prevalence of major depression is higher at one year postpartum than before. In particular, some authors have alluded to the difficulties in the change of role at the level of interpersonal relationships that motherhood entails for women, economic difficulties and a higher incidence of stressful events (Woolhouse et al., 2015). Others have attributed it to breastfeeding cessation, which may have protective effects against postpartum depression (Borra et al., 2015). On the other hand, Molgora et al. (2022) justify that the highest rates of depression one year postpartum coincide with mothers' return to work, which forces them to reconcile family and work obligations.

The findings confront the traditional idea that postpartum depression is an adaptive disorder, typical of the first weeks postpartum. This idea is still reflected in the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V; American Psychiatric Association, 2013) because the time criterion for the diagnosis of postpartum major depression is 4 weeks postpartum. Likewise, the ICD (WHO, 2000; 2019), both ICD-10 and ICD-11, use as a time criterion for diagnosis that the onset of depression occurs within 6 weeks after delivery. This situation does not help either clinicians or researchers unfamiliar with perinatal depression, as it makes it difficult for a correct diagnosis to be made and, therefore, to identify women who need help and for this to be provided.

Strengths and limitations

Interpretation of the results obtained in this research must take into

consideration the limitation that the study was carried out with a population of women in one region of Spain, and therefore, caution is necessary regarding generalizing the results. Another possible limitation is that we have not found any other studies that evaluated women at the three same times that we assessed during 1 year postpartum using a screening instrument and a clinical interview, so comparing data with our study is difficult.

The strengths of the study are mainly methodological. First, it is a longitudinal study conducted in a large sample that has included three postpartum assessment times. In addition, data were collected prospectively and individually at all assessment times by visiting the participants' homes, in order to minimize recall bias. In the era of modern technology, so much data is collected online and there is no way to ensure the participant is carefully reading questions and answering them honestly. This resulted in a low sample lost rate. It is also the only study in which the prevalence of both probable depression and major depression have been analyzed together during the postpartum period. This is very important as it provides a more realistic view of the situation. It is shown that a cross-sectional methodology would have led to erroneous and totally opposite conclusions about the evolution of depression in the first postpartum year.

Institutions such as the American College of Obstetricians and Gynecology (2018), the U.S. Preventive Services Task Force (O'Connor et al., 2016) and the NICE guidelines in the UK (National Institute for Health and Care Excellence, 2018) have recommended screening for perinatal depression in primary care services using standardized validated tools. However, this has yet to be achieved in many countries. Attention should be routinely given to the emotional state of women during the postpartum period, given the consequences that can arise and the high prevalence of depression that we have observed. However, in this period the mother often is overlooked by health services and much attention falls on the newborn.

Conclusion and implications for practice

The great contribution of this longitudinal study is the identification of a very high prevalence of depression found that still exists at 1 year postpartum: 25.3% of probable depression and 14.8% of major depression, with the rate increasing from 6 months postpartum, contrary to expectations. It is very worrying that there are 10–15% of women who have just given birth with major depression and are not receiving the treatment they need. In clinical practice it would be necessary to develop a specific protocol for depression prevention and screening. All women should be assessed with a screening instrument, such as the EPDS, at different times and for at least one year after childbirth, in order to detect women at risk and thus be able to intervene as early as possible. In addition, health professionals and in particular midwives, as the specialists in direct contact with postpartum women, should be trained to detect women at risk of depression and refer them to mental health specialists when necessary.

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CRediT authorship contribution statement

M. Carmen Míguez: Conceptualization, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – review & editing. **M. Belén Vázquez:** Formal analysis, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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