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Original Research

Suicidal ideation and depressive symptoms in an urban post-partum maternity setting: a retrospective cohort study

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Abstract

Background: Fifteen percent of women worldwide experience depression in the perinatal period. Suicide is now one of the leading causes of maternal mortality in developed countries. Internationally, many healthcare systems screen post-natal women for depressive symptoms and suicidal ideation to facilitate early assessment and intervention. To our knowledge, no Irish data exists on the prevalence of suicidal ideation in this cohort.

Aims: To evaluate the prevalence of suicidal ideation and depressive symptoms using the Edinburgh Postnatal Depression Scale (EPDS) in post-natal women attending a large Dublin maternity hospital.

Methods: A retrospective cohort study was conducted. Women were randomly selected by delivery date over a 6 month period. Demographic and medical information was collected from their booking visit and discharge summary data. EPDS results at discharge post-partum were examined.

Results: Data was collected on 643 women. Post-partum, 19 women (3.4%) had experienced suicidal ideation in the previous 7 days. Just over half of these women also had high EPDS scores (>12). Overall, 29 women (5.2%) screened positive for depression (EPDS score > 12).

Conclusions: The rate of suicidal ideation is in line with the published international data and emphasises the need for all clinicians to inquire about such thoughts. Training of midwifery and obstetric staff is required. Maternity units should have a policy on the management of suicidal ideation and risk. The prevalence of depressive symptoms post-partum was comparatively low in our study. This could suggest that antenatal screening and early intervention, which are integral parts of the perinatal mental health service, are effective. However, due to limitations of the study, it could also reflect an under-representation of depressive symptom burden in this cohort.

Keywords: Depression; Edinburgh Postnatal Depression Scale; mass screening; maternal health; post-partum; suicidal ideation

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Introduction

The impact of post-natal mental health problems is well documented. In addition to post-natal women, the child (Josefsson & Sydsjö, 2007; Stein *et al.* 2014) and wider family can also be affected (Ramchandani *et al.* 2011; Arieas *et al.* 1996). However, there is a good evidence base for the successful treatment of these conditions.

The estimated prevalence of post-natal depression in clinical settings varies from 10–16% (Gaillard *et al.* 2014). A large recent study of antenatal depression in the Irish population attending maternity hospitals, found rates up to 15.8%, with the highest rates observed in the third trimester (Jairaj *et al.* 2019). Among individuals with depression in the post-partum period, onset occurs before or during pregnancy in around 50 percent of cases (Gaillard *et al.* 2014; Yonkers *et al.* 2001). Cryan *et al.* (2001) identified rates of post-natal depression of up to 14.4%, in women in an urban community setting in Dublin based on an elevated Edinburgh Postnatal Depression Scale (EPDS) score. However, these data are 20 years old and are based on a small population.

The EPDS is an internationally used, 10 item screening tool for the detection of major depressive disorder in pregnant and post-partum women. Possible scores range from 0 to 30 with higher scores indicating higher levels of psychological distress. All scores are based on symptoms experienced in the preceding 7 days. Question 10 addresses suicidal ideation. The EPDS score is a widely accepted measure of symptom burden but it is not diagnostic. Rather, it is a useful tool to identify a need for further assessment and intervention. The EPDS has an established sensitivity and specificity of between 0.66–0.85 and 0.84–0.95, respectively, for identifying depression, depending on the cut-off used (10–13) (Levis *et al.* 2020).

Internationally, some health services use the EPDS throughout pregnancy and post-natally for up to 12 weeks. Many of the large scale international studies that screened for post-natal depression and suicidality used the EPDS at 6 weeks post-partum (Wisner *et al.* 2013; Kim *et al.*, 2015; Howard *et al.* 2011).

In industrialised countries, suicide has been reported as a leading cause of death in post-natal women (Centre for

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Maternal and Child Enquiries, 2011; Fuhr *et al.* 2014; Esscher *et al.* 2016; Johannsen *et al.* 2016). However, the absolute rate of suicide during the post-partum period is low, with ranges of 1–5 deaths per 100,000 live births (Khalifeh *et al.* 2016).

In the UK, a study of post-partum women who had died by suicide ($n = 80$) between 1997 and 2012 found that most of the women were married and living with a partner, most were receiving mental health treatment, and 51% had a primary diagnosis of depression but did not describe suicidal ideas or endorse recent self-harm at the time of the last clinical contact (Khalifeh *et al.* 2016). Howard *et al.* (2011) estimated the prevalence of suicidal ideation post-natally at 9%, with a smaller cohort of 4% experiencing frequent suicidal ideation.

In North America, up to 3% of post-natal women experience suicidal ideation (Kim *et al.* 2015; Wisner *et al.* 2013). However, clinical assessments on follow-up demonstrated that very few of the women were at high risk, as demonstrated by active suicidal ideation with plans, intent and access to means (Kim *et al.* 2015). A recent cross-sectional, population-wide study of suicidal ideation and self-harm in women of child bearing age, with health insurance and living in the United States, identified a threefold increase in levels of suicidal ideation and self-harm over a 12 year period (Admon *et al.* 2021). The prevalence rose from 2 per 1000 individuals in 2006 to 6 per 1000 individuals in 2017.

To date, there is no published data on the prevalence of suicidal ideation among post-partum women in an Irish Maternity Hospital setting. And while Ireland experienced no suicides in the first post-partum year between 2015 and 2017, in the UK, suicide remained the leading cause of direct deaths in the first year following the end of pregnancy (O'Hare *et al.* 2019). Although an uncommon event, the early detection and intervention around known risk factors for completed suicide, which includes but is not limited to major depressive disorder, is vital to reduce the occurrence of these tragic events.

Methods

Design

A retrospective cohort study was conducted in a large Dublin maternity hospital with 9500 deliveries per annum. The charts of women who delivered a baby at the maternity hospital over a 6 month period in 2016 were reviewed. Since 1999, an EPDS is given to all women post-natally, prior to discharge. In general, this is 1–3 days after delivery. The completed EPDS form is stored in the patient chart and the score recorded on the discharge summary to inform Public Health Nurses and General Practitioners. All women with a score above 12 or anyone who indorses suicidal ideation are routinely referred to the Specialist Perinatal Mental Health Service (SPMHS) for assessment and a management plan.

Participants

A random sample was selected using the delivery date of women during the 6 month period from January to July 2016. The sample was generated independently at the Rotunda based on date of delivery within a 6 month period from Jan 2016 to July 2016. Patient records were obtained from storage and reviewed in the medical records office. Data on 643 subjects were obtained.

Data collection

In each of the randomly selected participants, the following demographic information was gathered from the antenatal booking visit information: age, ethnicity, and public or private healthcare. Ethnicity was described in line with the Irish census data. Based on the numbers of each ethnic group, the categories 'white Irish' and 'any other white background' were retained and all other categories were amalgamated into 'minority ethnic group'. This minority ethnic group included Irish travellers who often face significant barriers in accessing health care.

Other information obtained included gravidity and parity, history of past mental health problems, the outcome of past pregnancies including termination of pregnancy and if a referral to the social work department occurred at the antenatal booking visit. Referral to social work was recorded as a binary variable. Being in need of additional support, with housing, addiction issues or social isolation as common reasons for such referrals. Past mental health problems were classified as a binary variable. History of pregnancy loss was also categorised into a binary variable of either no history or with any history of pregnancy loss, including termination of pregnancy. Women were considered to be attending privately if there was any cost to the individuals (i.e. private and semi-private individuals).

Post-natal information was obtained from the patient discharge summary and included method of delivery, and EPDS score.

The two primary outcomes analysed were any positive response to question 10 on the EPDS and screening positive for depression with an EPDS of >12. An EPDS score of >12 was chosen as the cut-off point as it has been established as the most specific cut-off (Levis *et al.* 2020; Cox *et al.* 1987; Usuda *et al.* 2017) and it has previously been used in an Irish population (Jairaj *et al.* 2019).

Data analysis

Frequency distributions and cross tabulations with chi-squared tests were used to identify variables associated with outcomes. This was undertaken using SPSS v26.

Results

Six hundred and forty three women's charts were reviewed. Of these, 556 women had completed the EPDS. The characteristics of these 556 women are described in Table 1.

The mean EPDS score for the 556 women was 4.94 (SD 4.19). Using the cut-off >12, 29 women (5.2%) screened positive for depression in the 1–3 day period following delivery. Among the 556 individuals, 19 women (3.4%) had experienced suicidal ideation in the last 7 days. Of these 19 women, just over half had an EPDS greater than 12.

Due to the low level of positive screens, a post hoc analysis with a cut-off of greater than 11 was carried out. The only change observed in this analysis concerned public and private care, where there was a non-significant trend towards lower levels of positive screening in private patients ($p = 0.061$). Even with this lower cut-off, eight women who endorsed some level of suicidal ideation did not screen positive for depression.

Variables associated with an elevated EPDS score of greater than 12 within 3 days post-partum are described in Table 2. Elevated scores were associated with having a past mental health problem, being from an ethnic minority and being in need of social work support from the earliest stage of pregnancy. Of the 109 women with any form of mental health history, 12 (11%) had an elevated EPDS within 3 days post-partum ($p = 0.002$). Being from an ethnic minority was also associated with an EPDS over 12. Seventy-one women identified themselves as from an ethic

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Table 1. Demographic profile of women included in our study

Variable	Overall population
Mean age	32.1 (SD=5.8)
Ethnicity[a]	
'White Irish'	357 (64.2%)
'Any other white background'	123 (22.1%)
'Minority ethnic group'	71 (12.8%)
Medical insurance	
Private	122 (21.8%)
Public	434 (78.1%)
Prior mental health history	
Yes	109 (19.6%)
No	447 (81.4%)
Referred to social work at booking	
Yes	28 (5.0%)
No	528 (95%)
Gravidity	
Primigravida	174 (31.3%)
Multigravid	382 (68.7%)
Parity	
Nulliparous	233 (41.9%)
Para ≥ 1	323 (58.1%)
Delivery	
Spontaneous vaginal delivery/elective CS	402 (72.3%)
Instrumental/emergency	154 (27.7%)
Any past pregnancy loss	
Yes	197 (35.4%)
No	359 (64.6%)

[a]Missing data on five subjects.

minority at booking, and 11 (15.5%) screened positive for depression following delivery ($p < 0.001$). Twenty eight women were in need of social worker support from the earliest stage of pregnancy, and 4 (14.3%) had an EPDS greater than 12 post-partum ($p = 0.027$) .

Variables associated with the occurrence of suicidal ideation within the early post-partum period are described in Table 3. A positive answer to question ten was associated with an EPDS score greater than 12 ($p < 0.001$), being from an ethnic minority ($p = 0.005$) and with being in need of social worker support from early in pregnancy ($p = 0.029$).

Discussion

The finding of a rate of 3.4% of women experiencing suicidal ideation in the immediate post-partum period is consistent with international data of a rate of 3% up to 6 weeks post-partum (Kim *et al.* 2015; Howard *et al.* 2011). However, although suicidal ideation was associated with an EPDS score greater than 12, not all women with suicidal ideation had an elevated score, with around 47% (9 women) having an EPDS below 13. Hence, although suicidal ideation is strongly associated with being depressed, it can also occur in the absence of a depressive illness or an elevated EPDS score.

The other variables associated with endorsing suicidal ideation in this study were being from an ethnic minority and being in need of social support early in pregnancy. In a recent large scale population study in the United States, ethnicity and lower levels of income, along with younger age, were variables associated with increased suicidal ideation in the year before and after childbirth (Admon *et al.* 2021).

It is important to note that in general, suicide cannot be predicted on an individual level (Large *et al.* 2016; Chan *et al.* 2016; Kelly, 2018) and the proportion of people with suicidal thoughts who go on to complete suicide is less than 1 in 200 (Gunnell *et al.* 2004; Kelly, 2018). Nevertheless, the emphasis of suicide prevention strategies in Ireland on taking a multi-level, multi-strand approach (Kelly, 2018) should also include consideration of perinatal mental health factors.

Jairaj *et al.*, found that 15.8% of antenatal women in an Irish sample screened positive for depression, using an EPDS cut-off score of >12, and that these rates were highest (17.2%) in the third trimester (2019). Other studies of post-natal populations have also demonstrated higher levels of depressive symptoms (Gaillard *et al.* 2014; Rallis *et al.* 2014) than the 5.4% found in our study. At the Rotunda Hospital, where this study was based, women are asked about both depression and anxiety, and their past mental health history at their booking clinic visit. The SPMHS at the Rotunda hospital receives referrals from midwives, public health nurses, GPs and hospital doctors. Consequently, almost 20% of women attending the hospital are reviewed by the SPMHS. Treatments at both an individual and group basis are offered. The goal of the service is to provide timely access to high quality mental health care and treatment to women who are pregnant and up to 1 year post-partum. In 2016, the timeframe which the study data relates to, the Perinatal Mental health service at the Rotunda had not yet developed into the SPMHS. However, it is possible that the lower rate of depressive burden in the early post-partum period identified in this study could be due to the early identification and intervention for women at risk of mental health difficulties at the Rotunda by the Perinatal Mental health service at that time.

On the other hand, it must be acknowledged that early screening post-partum may underestimate mental health difficulties. The finding of a lower prevalence of depressive symptoms at 5.4% compared to other studies which measure symptoms at 6 weeks post-partum, may highlight a danger of overreliance on early EPDS levels. It indicates a need for repeated screening outside of the maternity hospital setting in the community by other professionals who are involved such as community midwives, public health nurses, and GPs. A further limitation of the study, is that due to screening 1–3 days post-partum, for symptoms over the preceding 7 days (which would include time before delivery), women who were symptomatic antepartum are perhaps over-represented.

The finding that being from an ethnic minority and in a socially vulnerable situation increases the risk of experiencing both depression and suicidal ideation is consistent with other large scale recent research (Admon *et al.* 2021). The need for specific supports for women during the perinatal period, including the provision of translation services, specific supports for ethnic minorities within health services and adequate housing are clear.

In November 2017, the National Model of Care for SPMHSs was launched and implementation of the hub and spoke model commenced in early 2018 (Health Service Executive, 2017). Since then, the work of the National Programme for SPMHSs has focussed on developing the six recommended Maternity Hospital Hubs. Nationally all six are in place and in the 13

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Table 2. Variables in relation to Edinburgh Postnatal Depression Scale (EPDS) scores

Variable	Screened positive population (EPDS > 12)	Screened negative population (EPDS < 13)	Chi-squared-based *p*-value
Mean age	31.66 (5.8)	32.09 (5.79)	0.396
Ethnicity			
'White Irish'	12 (3.4%)	345 (96.6%)	**<0.001**
'Any other white background'	6 (4.9%)	117 (95.1%)	
'Minority ethnic group'	11 (15.5%)	60 (84.5%)	
Medical insurance			
Private	3 (2.5%)	119 (97.5%)	0.125
Public	26 (6%)	408 (94.0%)	
Prior mental health history			
Yes	12 (11.0%)	97 (89.0%)	**0.002**
No	17 (3.8%)	430 (96.2%)	
Referred to social work at booking			
Yes	4 (14.3%)	24 (85.7%)	**0.027**
No	25 (4.7%)	503 (95.3%)	
Gravidity			
Primigravida	6 (3.4%)	169 (96.6%)	0.204
Multigravid	23 (6.0%)	358 (94.0%)	
Parity			
Nulliparous	8 (3.4%)	225 (96.6%)	0.108
Para ≥ 1	21 (6.5%)	302 (93.5%)	
Delivery			
Spontaneous vaginal delivery	14 (4.9%)	271 (95.1%)	0.485
Instrumental	3 (3.5%)	82 (96.5%)	
Elective C-section	6 (5%)	113 (95%)	
Emergency C-section	6 (9%)	61 (61%)	
Any past pregnancy loss			
Yes	7 (3.6%)	190 (96.4%)	0.192
No	22 (6.1%)	337 (93.9%)	

Table 3. Variables in relation to suicidal ideation

Variable	Suicidal ideation present	Suicidal ideation absent	*P*-value for test of difference
Mean age (SD)	32.95 (4.44)	32.02 (5.83)	0.393
Ethnicity[a]			
'White Irish'	6 (1.7%)	351 (98.3%)	**0.005**
'Any other white background'	7 (5.7%)	116 (94.3%)	
'Minority ethnic group'	6 (8.5%)	65 (91.5%)	
Positive prior mental health history			
Yes	5 (4.6%)	104 (95.4%)	0.453
No	14 (3.1%)	433 (96.9%)	
Referred to social work at booking			
Yes	3 (10.7%)	25 (89.3%)	**0.029**
No	16 (3.0%)	512 (97.0%)	
Gravidity			
Primigravida	5 (2.9%)	170 (97.1%)	0.630
Multigravid	14 (3.7%)	367 (96.3%)	
Medical insurance			
Private	1 (0.8%)	121 (99.2%)	0.76
Public	18 (4.1%)	416 (95.9%)	
Parity			
Para 0	7 (3.0%)	226 (97.0%)	0.649
Para ≥ 1	12 (3.7%)	311 (96.3%)	
Delivery			
Spontaneous vaginal delivery	10 (3.5%)	275 (96.5%)	0.207
Instrumental	0 (0.0%)	85 (100%)	
Elective C-section	5 (4.2%)	114 (95.8%)	
Emergency C-section	4 (6%)	63 (94%)	
Past pregnancy loss			
Ever	5 (2.5%)	192 (97.5%)	0.398
None	14 (3.9%)	345 (96.1%)	
EPDS > 12			
Yes	10 (34.5%)	19 (65.5%)	**<0.001**
No	9 (1.7%)	518 (98.3%)	

[a]Missing data on five subjects.

remaining maternity hospitals, there is a Perinatal Mental Health Midwife, the aim being that all women during the perinatal period have access to a service when they need it. The SPMHS is based on an integrated approach in which mental health services are embedded within the 19 maternity services in Ireland. The service is designed as a hub and spoke model with larger multi-disciplinary teams at hub sites, that is in UMHL, CUMH, GUH and the three Dublin maternity hospitals Rotunda, Coombe and NMH Holles Street. In the smaller hospitals, there are perinatal mental health midwives available who are supported by liaison psychiatrists where available, and the Hub SPMHS team for second opinions.

Conclusion

The level of depressive symptoms in the early post-natal period highlights the need for all involved in the care of those who are pregnant to be aware of the risk of depression throughout and beyond pregnancy. This is particularly relevant for women who have already been identified at an early stage of pregnancy as being socially vulnerable, and for those with mental health problems in the past. All clinicians should make themselves aware of available services, which include both primary and secondary level services and voluntary sector services.

Suicidal ideation occurs in women with high EPDS scores, though it can occur in those with a low EPDS scores also. The majority of women do not act on these thoughts, however, it remains vitally important to assess, identify and manage modifiable risk factors for completed suicide, as suicide remains a leading cause of maternal mortality internationally. Our findings highlight

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the importance of inquiring about suicidal ideation in a perinatal population and the need for clinicians to be able to seek appropriate support to manage risks that are identified.

Training of midwifery and obstetric staff is required in this area. Each maternity unit should have a policy on the management of suicidal ideation. Furthermore, as many women present to their GP, public health nurse or Community Mental Health Team, there is a need for widespread clinical training in the recognition of and early intervention in perinatal mental health difficulties. This research provides valuable Irish information that confirms the need for SPMHS and it is important that the Model of Care is realised in full and implemented throughout all our Maternity Hospitals. The research also identifies social and environmental factors that require a multi-level and multi-strand approach.

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Conflict of interest. The authors have no conflict of interest to declare.

Ethical standards. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committee on human experimentation with the Helsinki Declaration of 1975, as revised in 2008. This study was approved by the Ethics Committee at the Rotunda Hospital.

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