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Recognition and management of perinatal depression and anxiety by general practitioners: A systematic review.

Running Head: GPs' management of perinatal depression

Article Category: Systematic Review

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Summary

Background: Perinatal anxiety and depression are widespread, with up to 20% of women affected during pregnancy and after birth. In the UK, management of perinatal mental health falls under the remit of general practitioners (GPs). We reviewed the literature on GPs' routine recognition, diagnosis and management of anxiety and depression in the perinatal period.

Method: A systematic search of Embase, Medline, PsycInfo, Pubmed, Scopus and Web of Science was conducted. Studies were eligible if they reported quantitative measures of GPs' or Family Physicians' assessment, recognition and management of anxiety or depression in pregnancy or postpartum.

Results: Thirteen papers, reporting ten studies, were identified from the US, Australia, UK, Netherlands and Canada. All reported on depression; two included anxiety disorders. Reported awareness and ability to diagnose perinatal depression among GPs was high. GPs knew about and used screening tools in the UK but less so in US settings. Antidepressants were the first line of treatment, with various SSRIs considered safest. Counseling by GPs and referrals to specialists were common in the postnatal period, less so in pregnancy. Treatment choices were determined by resources, attitudes, knowledge and training.

Conclusions: Data on GPs' awareness and management of perinatal depression was sparse and unlikely to be generalizable. Future directions for research are proposed; such as exploring the management of anxiety disorders which are largely missing from the literature, and understanding more about barriers to disclosure and recognition in primary care. More standardized training could help to improve recognition and management practices.

Keywords: postnatal depression, general practice, pregnancy, mental health, systematic review.

Background

The perinatal period for mental illness lasts from the onset of pregnancy until twelve months after birth. Perinatal depressive and anxiety disorders are common: about 18% of pregnant women have depression during pregnancy [1] and 13-19% of new mothers have major or minor depression in the first year after delivery.[1,2] Anxiety is also common, with 8% experiencing generalized anxiety disorder (GAD), 3% experiencing panic disorder and 3% experiencing obsessive compulsive disorder (OCD) in pregnancy. Following birth, up to 8% experience GAD, 9% of women experience panic, 2-3% experience new onset OCD and 3% experience post-traumatic stress disorder (PTSD).[3-6]

Perinatal anxiety and depression can have a damaging impact on women and their families if left untreated. Mental illness is one of the leading indirect causes of death for women 6 weeks to one year postpartum.[7-9] The United Kingdom's (UK) National Institute for Health and Care Excellence (NICE) has clear guidance about effective management.[10] Perinatal mental health is a strategic priority for health policy: while much data on costs are still missing, a recent UK report found that the annual cost to UK society of perinatal depression was £73,822 per case ($104,574) [11], of which 70% was due to the increased risk of psychological and developmental disturbances in children.[12]

In the UK National Health Service (NHS), primary care is the first and continuing point of care for patients. It comprises general practitioners (GPs), midwives for pregnant women, and health visitors (UK community nurses specialized in maternal and child heath) for new mothers. Women mostly see their midwife for routine antenatal care. Midwives usually discharge women 10-14 days after birth when health visitors and GPs become the women's primary contact for health care. Women generally see their GP for a routine check-up at 6-8 weeks postpartum. Guidelines from NICE recommend that all primary care practitioners ask about possible depression and anxiety when women first have contact in pregnancy and at all subsequent perinatal contacts.[10] If a possible perinatal mental illness is identified by any health professional, NICE recommends the GP as the first line of assessment and management.[10]

Despite GPs being in the front line of care available in the UK for the mental health of perinatal women, and the UK Royal College of General Practitioners (RCGP) recognizing perinatal mental health as a clinical priority,[13] very little research has looked directly at what GPs know about perinatal depression and anxiety disorders; how well they recognize and differentiate disorders; and how they treat and manage them. A small study assessing the use of the Edinburgh Postnatal Depression Scale (EPDS) [14] for identifying depression in primary care suggested that GPs missed many cases of depression in postnatal women (recognizing 13 cases out of 30), although they did recognize more cases than any other professional group.[15] One study used GP patient records to investigate prevalence rates of depression as recorded in general practice and found 13.3% of perinatal women had depression noted in their medical records, and 3.7% had anxiety.[16] This rate of depression is consistent with survey-based studies, but anxiety rates are lower than expected.

Historically, studies have suggested that many cases of perinatal depression and anxiety are missed in general practice [15,17-19] and those that are identified are undertreated [15,17-22]. The aim of this review was to synthesize the available information from quantitative observational studies on general practitioners' (or the equivalent, family physicians, in the US and Canada) routine practice for the assessment, recognition, and management of perinatal depression and anxiety. Studies reporting on severe mental illness such as psychosis are not considered, and results from qualitative studies are assessed and reported elsewhere. Understanding GPs' current routine activity in this area will highlight avenues for improvement in identification and treatment of women with these perinatal disorders.

Method

Search Strategy

A systematic search was conducted conforming to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement [23], between October and December 2014 on Embase, Medline, PsycInfo, Pubmed, Scopus and Web of Science. No protocol was registered. A

second search was made in May 2016 for papers published from 1st Jan 2015 to 10th May 2016 to ensure the results presented were current. Broad search terms were used to identify anxiety and depressive disorders, related to pregnancy and the postnatal period, specifying general practitioners and the themes of diagnosis and treatment to ensure as many articles as possible were identified (Appendix 1). Forwards and backwards searches of reference lists and citations were made, which identified one further paper to be considered for the review.

The first search returned 8210 papers and the second returned 2439 (Figure 1). After removing duplicates and inspection of the title of each paper for relevance, the abstracts of 730 papers were screened and 33 papers were scrutinized in full. Screening of titles and abstracts was performed by FE, full text screening by FE & EF and eligibility of papers was agreed among all authors.

Eligibility

Papers were eligible for inclusion if they reported quantitative measures of General Practitioners' (GPs; UK, Australia and Netherlands) or Family Physicians' (FPs; US and Canada) recognition, assessment or management of perinatal depression or anxiety in primary care (all results are reported using the term "GPs"). Papers were ineligible if they were published before 1990 (as these would not reflect current practice), did not report original research, were not published in English, did not included GPs or FPs as main participants, did not report GP or FP findings as a separate group, reported trials or interventions rather than routine practice, reported results qualitatively rather than quantitatively (these are reviewed elsewhere), or if they addressed multiple perinatal illnesses (including physical). No papers were rejected solely on the basis of not being published in English.

- Figure 1 about here -

Quality Assessment

The methodological quality of each paper was assessed based on a revised version of the "STROBE" rating scale for evaluating quantitative studies (Strobe-statement.org, 2015). The rating scale was revised to include only items relevant to the papers being reviewed (Appendix 2). Two authors independently assessed quality (EF and FE). Response rates in the surveys used were examined as a proxy for risk of bias within studies.

Data extraction process

Data from studies was extracted into a table in Excel. The following information was extracted: Study title, country of origin, quality score, response rate, number of participants, study design, focus on pregnancy or postpartum, any results pertaining to diagnosis/recognition; attitudes or experience; treatments; and barriers and facilitators. No meta-analysis was performed as included studies did not use comparable measures.

Results

Studies

Thirteen papers were found which met inclusion criteria, reporting ten separate studies (Table 1).[24-36] Eleven out of thirteen papers investigated depression only; two papers reported on anxiety disorders in addition, but did not separate results for anxiety and depression.[34,35] Papers were published between 2005 and 2016. Four papers were based on UK data,[24,30 34,35] four papers were from the USA,[28,31,32,36] four from Australia (one combined with data from Canada) [25-27,29] and one from the Netherlands.[33] Nine papers reported survey results from a combined total of 915 GPs or FPs and one reported survey results from 199 GP practices.[24] Three studies reported on data from GP patient records; one examined 411 entries in GP records,[29] and another two papers reported data from GP records of 8991 and 2234 women from the same cohort.[34,35] Where several types of health-care professionals were surveyed, results are reported from GPs and FPs only. Three papers

reported on care during pregnancy,[25,33,35] five papers focused on the postpartum period,[28,29,31,32,36] and five studied both pregnancy and the postpartum period.[24,26,27,30,35]

Ten papers used a questionnaire or survey to gather information from participants, of which four papers also included a vignette. All the studies developed and used their own measures. One study reported on data from the Australian "Bettering the Evaluation and Care of Health" study (BEACH) in which 1000 randomly selected GPs annually record details of 100 consecutive encounters.[37] Two papers reported on GP data from the "Born in Bradford Cohort" which recruited 12,450 women at 26-28 weeks of pregnancy.[34,35]

- Insert Table 1 about here –

Quality Assessment and Risk of Bias

Quality scores ranged from 10-23; 10 of the 13 papers were methodologically well conducted and reported, scoring ≥19 out of 24. Three papers scored 10 to 15.[26,29,30] These papers were short reports with little methodological information. No papers were excluded from the review on the basis of quality scores due to the small number of studies in this area. No unpublished studies were included.

Survey response rates, and dropout rates are shown in Table 1, and ranged from 18% to 79% suggesting low external validity both within studies and across the included studies as a group. There is therefore a high risk that results are not representative of the source populations of GPs or FPs within each country.

Themes from the included studies

Results from the included studies were arranged into three main themes, with seven subthemes. The studies contributing to each subtheme are shown in Table 2.

- Insert Table 2 about here -

Theme 1: Assessment and Recognition

Prevalence of perinatal depression and anxiety in general practice

Three studies reported on how often GPs saw women or recorded perinatal anxiety and depression, and one on whether GPs felt these disorders were their responsibility. In an Australian study, 95% of GPs had cared for perinatal women in the past 6 months, and over half of the sample had seen 10-19 perinatal women in that time.[26] The Australian BEACH GP study reported data from GP patient records. Postnatal depression was recorded during 411 encounters between 1998 and 2005, representing a rate of 30 per 1000 encounters in women aged 25-44 years.[29] Depression was coded as the *main reason* in 60% of encounters, with other reasons being documented as postnatal check-up (7%), weakness/tiredness (6%) and psychological follow up (6%) [29]. A British study of GP records found a recorded prevalence rate for anxiety and depression of 9.5% during pregnancy and 13.1% in the first postnatal year [34]. White British women had double the rate of recorded disorders compared with minority ethnic women [34]. The recorded incidence rate was 37.5 per 1000 person years at risk in pregnancy and 102.4 per 1000 person years at risk in the first postnatal year[34].

One study found the majority of GPs felt responsible for diagnosing and treating postnatal depression [31]. GPs agreed that recognizing and treating maternal depression was their responsibility, and strongly agreed that they felt comfortable talking about depression with mothers.[31]

Awareness

Awareness of depression was reported in two papers by presenting a vignette to GPs and scoring them based on recognition that "Mary" was depressed, needed help and on the ability to choose appropriate treatments.[26,27] To the question "What's wrong with Mary?" 95% of GPs selected at least one depression diagnosis.[26] When compared to midwives and maternal child health nurses, GPs were significantly more likely than midwives to think help was needed for mood disorder (92% v 83%; $p<0.05$) and GPs were significantly more likely than midwives to endorse prescribing

antidepressants (antenatally, 77.8% vs 50.2% p<0.05; postnatally, 97% v 90.4% p<0.05).[27] Depression was more likely to be recognized postnatally compared to antenatally by all health care professionals.[26,27]

Routine enquiry and assessment

A UK study surveyed GP practices about how adherent they were with national policy.[24] With regard to antenatal enquiry about previous history of depression, psychosis, psychopathology or a family history of affective psychosis, they found that 88% of GP practices undertook routine assessment of previous history of depression, 81% asked about a history of puerperal psychosis, 65% about a history of psychopathology and 65% about a family history of affective psychosis.[24] Ninety-five percent of practices used the EPDS [14] as a screening tool for depression postnatally. [24] In contrast to this, a US based study[36] found that while 70% of GPs always or often screened at women's postpartum checkups, only 10% of those who screened used the EPDS and 8% used the Postpartum Depression Checklist.[38] Others (82%) preferred to use a diagnostic interview technique for screening.[36]

A UK study looking at GP records found that fewer than 13% of women had codes indicating screening and case-finding for anxiety and depression in the first postnatal year, and twice as many white British women had these codes compared to minority ethnic women.[34] When women in this study were checked for anxiety and depression using the General Health Questionnaire-28, it was estimated that between 31% and 46% of individuals with anxiety and depression in pregnancy were missed by GPs.[34]

Two US studies reported on familiarity with screening tools such as the EPDS, the postpartum depression screening scale (PDSS),[39] and the Patient Health Questionnaire-9 (PHQ-9),[40] and determinants of physician screening practices.[28] Familiarity with screening tools was low in these studies, with the majority of physicians never having used them.[28,36] The majority of physicians preferred symptom review inquiring directly about the patient's mood, prior psychiatric history and observing the mother's interaction with her baby. [28,36] Senior doctors were more familiar with

screening tools than doctors in training [28]. Being female, having training in postnatal depression, and agreement that PND is common enough to warrant screening were all associated with more frequent screening [36].

Theme 2: Management of Depression and Anxiety in Pregnancy

Medication choices

Five papers looked at the management of depression in pregnancy. One study compared GPs in Australia and Canada, asking them what they would prescribe for a woman using antidepressants at the time of becoming pregnant.[25] This found 60% of Australian GPs and 72.4% of Canadian GPs said they would continue the antidepressant medication.[25] This study found that the perceived safety of antidepressants in pregnancy, and confidence in giving advice, was higher in Canada, with 83% of Canadian GPs perceiving antidepressants as safe in pregnancy compared to 42% of Australian GPs.[25]

In a sample of Dutch GPs, opinions on continuing antidepressant medication for pregnant women, lowering the dose, or stepping down, varied widely, although 92% of GPs never advised substituting one drug for another, and 55% never advised substitution of psychotherapy for medication.[33] Paroxetine and fluoxetine were the first choice drugs in the Dutch study.[33] Ninety-six percent of GPs believed antidepressants were associated to some extent with increased risk of birth defects and that the negative effects on the child were a reason to avoid antidepressants.[33]

A Scottish study looked at the treatments offered by GP practices for *new* cases of depression in pregnancy.[24] The common choices were medication (68%), cognitive behavioral therapy (CBT; 46%), interpersonal therapy (IPT; 41%), complementary therapies (23%) and St John's Wort (9%).[24] In a second Scottish study of drugs chosen in the first trimester of pregnancy, the first choice was fluoxetine, recommended by 63% GPs and avoided by 6%.[30] Amitriptyline, sertraline and citalopram were also recommended, whereas, paroxetine, venlafaxine and mirtazapine were

primarily avoided.[30] Reasons for choosing drugs were given as: low teratogenicity risk or considered safe (53%), experience with the drug (38%), and good efficacy (9%). The reasons given for avoiding certain drugs were given as: risk to the baby (31%) or a lack of experience with the drugs (22%).[30]

A British study examining GP patient records identified 2234 women with anxiety and depression during pregnancy or postnatally.[35] In pregnancy, 298 (13%) of these women had prescriptions issued for anxiety or depression; 86% of these women had an antidepressant (69% were SSRIs) and 23% of them had an anxiolytic prescribed. 174 women (58%) did not have a prescription issued after the end of the first trimester.[35] Only 26 of these 174 women (15%) had a subsequent code indicating provision of a non-pharmacological treatment during their pregnancy [35].

Information on medication choices

Two studies reported on GPs' sources of information about the safety of medication in pregnancy. In a Dutch study, GPs consulted the teratogen information service, pharmacists, the Dutch national formulary, drugs manufacturers, and looked on the internet for guidelines and scientific evidence.[33] However, only 1 of 130 of these GPs (<1%) had a written policy for depression or anxiety medication in pregnancy.[33] In a Scottish study, GPs reported consulting the British National Formulary (31%), manufacturer's advice (28%) and specialists (16%).[30]

Theme 3: Management of Postnatal Depression

Seven papers reported on the treatment of postnatal depression.

Treatment choices

The main options for treatment which were reported in four studies were antidepressant medication, counseling, and referral to others, such as psychiatrists, psychologists, psychotherapists, social workers or support groups (Table 3). Medication was the most common option (57-92%), followed by counseling (57-85%) and referrals (1-85%).[24,26,29,31] Between 7 and 61% reported giving advice on behavior change.[29,31] In addition to the treatment options in Table 3, 64% of GP practices

in a Scottish study offered support to family members and 39% of GP practices said they could refer women to an inpatient mother and baby unit.[24]

- Insert Table 3 about here –

A range of antidepressants were endorsed as suitable for postnatal depression. In an Australian study, sertraline was prescribed at 22% of encounters, citalopram at 7% and paroxetine at 5%.[29] In a Scottish study on prescribing during breastfeeding, fluoxetine was both chosen (44%) and avoided (28%) by GPs, with citalopram, doxepin and venlafaxine being the next most commonly chosen, and avoided, drugs.[30] The reasons given for drug choices were their perceived safety (50%), the GP's experience of drug (28%), and the perceived effectiveness of the drug (9%). The reasons given for avoiding certain drugs were a lack of data regarding safety (44%), a lack of experience (9%), or the drug not being effective (6%).[30]

Determinants of Treatment Choices

Two studies reported on determinants of treatment choices (1 American and 1 Australian). Perceived barriers to treatment choices were resources being unavailable, the reluctance of patients, family, language or beliefs, financial constraints on the part of the patient, and denial by the patient of the condition.[26] Physician attitudes, namely a favorable perception of mental health services, self-efficacy, knowledge, and level of postgraduate training, influenced depression management practices.[32] Physicians with better training and higher levels of knowledge were more likely to actively manage postnatal depression as they were more confident, more comfortable and felt greater responsibility.[32]

Discussion

To our knowledge, this is the first systematic review of studies looking at how GPs recognize and treat perinatal anxiety and depression in the course of their routine practice. A central finding is that there is a lack of evidence in this area and, crucially, the majority of results describe how GPs recognize and manage perinatal depression, with no studies reporting separately on anxiety

disorders. The lack of research on GPs' routine practice highlights many opportunities for new research avenues.

Goldberg and Huxley proposed a model of levels of recognition or management of mental illness in the primary care setting, which is relevant to countries where GPs act as a gatekeeper to more specialist services, such as in the UK, Australia or Netherlands.[41] The first level is the presence of mental health problems in the community, the next two levels represent patient presentation and then recognition in primary care, and the highest two levels are referral and admission to specialist psychiatric care. In order to pass from one level to another the patient must pass through various "filters", such as attending in primary care and having the symptoms identified by the GP.

If we consider this model for perinatal anxiety and depression, we can see clear opportunities for future research to understand more about each of the "filters". For example, results from studies which explore the issues that facilitate or hinder patient self-identification, help-seeking and disclosure in primary care should be integrated with the GP perspective on patient disclosure. Many qualitative studies have looked in-depth at women's barriers to help-seeking, but there is little literature which describes barriers to disclosure from GPs' perspective.[22,42]

Recognition

A second avenue for intervention is the potential for increased recognition of symptoms by GPs when patients first present, by using screening tools, improving communication skills, or changing GPs' training. Well-validated screening tools exist for perinatal depression, which have been used in primary care populations,[15,43,44] but a majority of GPs are not using these particular tools routinely [36,45]. Our findings suggest that GPs regularly see perinatal women, and appear to be aware of and take responsibility for recognizing and managing perinatal anxiety and depression. Respondents in the survey studies reported high rates of screening in their clinics, however, examination of UK GP records showed screening was recorded in only 13% of patient records,[34] highlighting a discrepancy between the two sources of data, potentially due to high response bias in

the survey studies. One study using GP records reported an estimated rate of missed cases of 31-46%,[34] suggesting there is still a diagnosis gap for perinatal depression in general practice, and research suggests that women from black and ethnic minority groups have their perinatal mental health needs missed more than white women.[46]

Population-based screening has been criticized for not being cost-effective due to the large number of false-positives.[47] Several trials have examined the benefits of incorporating screening tools into general practice, but found only modest improvements in clinical outcomes. [48,49] Finding women who "screen positive" for depression is only helpful if those women are appropriately assessed, diagnosed and successfully treated.[50] Qualitative research suggests that women prefer to only disclose symptoms, even on a screening tool, in a context of integrated and continuous care, with a known and trusted professional.[42] Future research could therefore be directed towards GPs' communication skills training, to boost the chance of symptom disclosure by perinatal women at both routine and opportunistic consultations.

Effective Treatment

Given recognition of perinatal depression and anxiety, effective treatment will depend on GP resources, attitudes or knowledge, patient reluctance or desire for treatment, and locally available specialist services. Some studies have suggested that even when depressive symptoms are disclosed or recognized, many women fail to receive effective treatment.[21,22]

Studies have shown that psychological interventions delivered in primary care are effective in reducing depressive symptomatology,[51-53] but in the UK at least, GPs report having few avenues to refer women for timely non-pharmacological treatment.[54] In our findings, antidepressant medication was the primary method of treatment in pregnancy, although there was some evidence that antidepressant medications were stopped during pregnancy, with few non-pharmacological alternatives being offered, which could lead to a significant risk of relapse.[55] Postnatally, GPs favored a range of treatments, endorsing both medication and psychological therapies for depression, with a

smaller number reporting that they would refer to other mental health specialists and support groups. Although SSRIs were largely favored, there was no consensus among practitioners about the exact choice of antidepressant in either pregnancy or breastfeeding, with respondents both favoring and avoiding the same range of drugs. The range of information sources consulted by GPs on the safety of drugs in pregnancy and breastfeeding suggests that the majority of GPs do not have clear guidelines easily to hand.

GPs described prescribing anti-depressants in the absence of other options,[54] but women are often reluctant to take them if pregnant or breastfeeding,[56] which could impact on adherence to treatment. In real world primary care settings, the rate of complete recovery from depression is low, at around 30% following antidepressant treatment and slightly higher following psychological interventions.[43] One review suggested that given the current drop-offs in the care pathway at the filters of clinical recognition, and adequate treatment, only 3-6% of women with perinatal depression are achieving full remission.[43]

There is therefore room for substantial improvement in current provision of primary care for women with perinatal depression and anxiety. Better continuity of care, together with more timely access to non-pharmacological therapy, would appear likely to produce the greatest gains in women's quality of life, due to aiding disclosure of symptoms and adherence to treatment. Additionally, more research is also critically needed to extend our understanding to all common perinatal mental illnesses, such as anxiety and PTSD, given that their combined prevalence among perinatal women equals or exceeds the prevalence of depression. Finally, more research is required to understand the gap between detection levels in white and black or ethnic minority women.

Clinical Implications

Confidence in recognizing and managing perinatal depression was predicted by favorable attitudes, levels of knowledge and postgraduate training. More research to understand attitudes, motivators and barriers to recognition and treatment of perinatal depression in general practice,

and the role of additional training, would be valuable. In the UK, the RCGP recently published a report that recommends specific perinatal mental health training provision for qualified GPs, and incorporation of competencies relating to perinatal mental health into GP training programs.[13] However, it is important that when training programs are developed they are adequately evaluated to assess their impact on outcomes including rates and recovery from perinatal depression.

The finding that there is no consensus among GPs about which antidepressants to prescribe to perinatal women may reflect the fact that national guidelines, such as UK NICE guidelines, recommend classes of drugs, such as SSRIs, rather than specific drugs.[10] Also of interest is the range of sources of information consulted by GPs when choosing a suitable drug. It would be useful if GPs knew that this information were readily available from one source. Good information regarding specific drug use in pregnancy is available in the UK from http://www.uktis.org/html/maternal_exposure.html, in the US from www.mothertobaby.org and in Canada from www.motherisk.org. Information on drug use in breastfeeding is available from Lactmed, a US website: http://toxnet.nlm.nih.gov/newtoxnet/lactmed.htm.

Limitations of the study

This review was based on a comprehensive search of six databases, but did not search the grey literature systematically, and did not attempt to collect any unpublished data, therefore results may be subject to a reporting bias, and relevant studies could possibly have been missed. Response rates in many of the studies were low, suggesting as a whole the review may have low external validity. It is possible that GPs most interested in perinatal mental health responded to the surveys, and the views of those who were less interested, or aware, are not represented. This is reflected in the differences found, for example, in reported rates of screening, between the survey studies and the GP patient record studies. Additionally, the studies included used diverse methodologies, so their results were not readily comparable, and no meta-analysis was possible. Differences between countries were evident suggesting that findings from one health system might not generalize to

other systems or countries. We also included low quality studies in the review, which may affect the results.

Conclusions

This review of observational studies of GPs' recognition and treatment of perinatal anxiety and depression has exposed substantial gaps in the literature, particularly in relation to anxiety disorders and PTSD. GPs reported taking responsibility for recognizing and managing perinatal depression, and offering a range of suitable treatments. However, there was substantial variability between studies' methods, outcome measures and geographical location, and low response rates in studies mean it is not possible to generalize these results to GPs as a whole. A limited amount of evidence suggested that GP training and knowledge may be potential determinants of positive attitudes towards mental health. Future research should examine whether training programs, service developments, and improvements to continuity of care have the potential to improve recognition and treatment of perinatal depression, and therefore improve outcomes for women.

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Conflicts of Interests

None to declare

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Figure 1. Flow diagram of study selection

Table 1: Studies included in the review

Study	Quality Score	Response Rate	Country	N GPs	Main Aim	Design	Pregnancy/ postpartum
Kean et al., 2011. *Scottish Medical Journal* [30]	12	41%	UK	32 GPs	Prescribing decisions in pregnancy and postpartum	Postal survey with vignettes, questions	Both
Alder et al., 2008. *Archives of Women's Mental Health* [24]	22	72.9% for GP practices	UK	199 GP practices	Adherence to policies around PMI in general practice	Questionnaire	Both
Leiferman et al., 2008. *Journal Of Women's Health*[31]	21	23.9%	USA	87 family physicians	Beliefs and practices towards postnatal depression	Online Survey or postal questionnaire	Postpartum
Leiferman et al., 2010. *Depression Research and Treatment*[32]	20	23.9%	USA	87 family physicians	Predictors of postnatal depression management	Online survey	Postpartum
Chadha-Hooks et al., 2009. *Journal of Psychosomatic Obstetrics & Gynecology* [28]	21	59%	USA	26 family physicians	Screening practices for postnatal depression	Survey	Postpartum
Bilszta et al., 2011. *Archives of Women's Mental Health* [25]	21	79.2% Australia 31.5% Canada	Australia and Canada	96 GPs	Antidepressant use in pregnancy	Scenario plus questionnaire	Pregnancy
Buist et al., 2005a. *Women and Birth* [27]	22	22.9%	Australia	246 GPs	Knowledge and awareness of postnatal depression	Vignette and knowledge questionnaire	Both
Buist et al., 2005b. *Australian Family Physician* [26]	15	22.9%	Australia	246 GPs	Recognition and management of perinatal depression	Vignette and knowledge questionnaire	Both

Charles et al., 2006. *Australian Family Physician* [29]	10	N/A	Australia	411 entries in GP records	Management of PND	GP patient records	Postpartum
Ververs et al., 2009. *BMC Health Services Research* [33]	20	19%	Netherlands	130 GPs	Antidepressant use in pregnancy	Questionnaire	Pregnancy
Prady et al., 2016a. *Br J Psych* [34]	22	60.2% of women recruited in 1 year sample	UK	GP records from 7494 women	Prevalence of anxiety and depression, number of cases missed in general practice, effect of ethnicity	GP patient records	Both
Prady et al., 2016b. *BMC Psychiatry* [35]	23	17.9% of women recruited	UK	GP records from 2,234 women	Prescriptions for anxiety and depression in pregnancy and replacement therapies, effect of ethnicity	GP patient records	Pregnancy
Seehusen et al., 2005. *J Am Board Fam Pract* [36]	19	60.9%	USA	298 GPs	Screening for postnatal depression	Questionnaire	Postpartum

Table 2: Themes and sub-themes drawn from the included studies

Theme	Sub Themes	Kean 2011	Alder 2008	Leiferman 2008	Leiferman 2010	Chadha-Hooks 2009	Bilszta 2011	Buist 2005 Women and Birth	Buist 2005 Aus Fam Phys	Charles 2006	Ververs 2009	Prady 2016 Br J Psych	Prady 2016 BMC Psych	Seehusen 2005
Assessment and Recognition of Disorders	Prevalence of perinatal depression and anxiety in general practice			x					x	x		x		
	Awareness							x	x					
	Routine enquiry and assessment		x			x						x		x
Management of Depression and Anxiety in Pregnancy	Medication choices	x	x				x				x		x	
	Information on medication choices	x									x			
Management of Postnatal Depression	Treatment choices	x	x	x					x	x				
	Determinants of Treatment Choices				x				x					

Table 3: Proportions of general practitioners and family physicians regularly choosing various treatment options for postnatal depression

Study	Buist et al., 2005 [26]	Alder et al., 2008 [24]	Leiferman et al., 2008 [31]	Charles et al., 2006 [29]
Sample	246 GPs	199 GP practices	87 FPs	411 GP encounters
Country	Australia	UK	USA	Australia
Medication	85% [a]		92%	57%
Counseling/Listening by GP	85% [a]		70%	57%
Referral				
To mental health specialist not otherwise specified	32% [a]		83%	
To psychiatrist				4%
To support group			38%	1%
For specialized CBT or other psychotherapy	32% [a]	51% IPT 49% CBT		5%
Advice on behavior change or exercise			61%	7%

a. Proportions derived from those who would prescribe a combination of medication, counseling and or referral.
IPT: Interpersonal Therapy; CBT: Cognitive Behavior Therapy