

# Prevalence and Factors Associated with Anxiety and Depression in Expectant Mothers at Parakou in 2018

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## Abstract

**Background:** Anxiety and depressive disorders can disturb the development of pregnancies. The goal was to study the prevalence and factors associated with anxiety and depression in expectant mothers followed in public maternity wards of Parakou in 2018. **Population and methods:** It was a cross-sectional study which consisted in an exhaustive census and a consecutive recruitment of 835 expectant mothers from June 14th to September 14th, 2018. Data collection was realized through interview between the investigator and the respondent basing on a questionnaire in which were integrated Edinburgh Postnatal Depression Scale-3 (EPDS-3), EPDS and modular Integrated Household Living Conditions Survey (IHLCS-2015) to assess respectively anxiety, depression and expectant mothers' socio-economic level. **Results:** The prevalences of anxiety and depression were respectively 44.91% and 35.33%. Many factors were associated with anxiety and depression. Low socio-economic level increased 6.7 times the risk of developing anxiety (OR = 6.70; IC<sub>95%</sub> [2.83 - 13.00];  $p = 0.000$ ) and 8.64 times the risk for the onset of depression (OR = 8.64; IC<sub>95%</sub> [3.09 - 17.18];  $p = 0.000$ ). Celibacy increased 2.67 times the risk of developing anxiety (OR = 2.67; IC<sub>95%</sub> [1.19 - 5.98];  $p = 0.000$ ) and 2.18 times the one of depression (OR = 2.18; IC<sub>95%</sub> [1.07 - 4.40];  $p = 0.000$ ). Low economic level and celibacy were the main psychosocial determinants of anxiety and depression in expectant mothers. **Conclusion:** The implementation of multidisciplinary action program centred on improving purchasing power would reduce the risk of anxiety and depression in expectant mothers.

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## Keywords

Anxiety, Depression, Social Determinants, Expectant Mothers

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### 1. Introduction

Pregnancy and childbirth allow women to access the status of mother. But, the physiological and psychosomatic modifications induced during that period weaken the woman and expose her to many psychiatric disorders including anxiety and depression. Their onset during pregnancy constitutes a risk for both the mother and the child. About 10% of pregnant women are affected [1] [2]. At least, one expectant mother out of ten coming at the regular appointments for pregnancy follow-up is or will be depressed. However, very few of them are diagnosed. They refrain from revealing their feelings or consulting a health care professional due to the symptoms minimization or the stigma attached to mental health issues. During pregnancy, the pre-existing psychotic disorders can resurface, like a substance abuse or a suicide attempt when they are combined with an undesired pregnancy. According to Gourine *et al.* [3], more than 15 years as duration of diabetes is predictive of developing a depression during pregnancy. Depression rates are also high at the end of the pregnancy and during postpartum. Postpartum depression affects more than 15% of new mothers [4].

In Benin and particularly at Parakou, no study was submitted on psychiatric disorders during pregnancy and puerperium. That is the reason for this study.

### 2. Population and Methods

#### 2.1. Type and Period of the Study

It was a cross-sectional study with analytical aim and prospective data collection of all the expectant mothers followed from June 14th to September 14th, 2018 in Parakou maternity wards.

#### 2.2. Population and Inclusion Criteria

The sample size was the sum of the encountered expectant mothers who have given their prior consent during data collection. Non available expectant mothers were excluded. A total number of 835 expectant mothers was retained.

#### 2.3. Study Variables

The dependent variables were related to anxiety and depression.

The independent variables were related to sociodemographic and gynaecological factors; a previous psychological vulnerability such as personal and family history of psychiatric disorders, abuse or rape in childhood; psychosocial factors during pregnancy and personal history such as the desire of pregnancy, existence of marital conflicts, a child or a close relative death, a stressful life event during pregnancy, the absence of social support, Difficulties or pathologies

about the current pregnancy, the lesser follow-up of the pregnancy; risky maternal behaviour; alcohol, tobacco and others psychoactive substances consumption.

#### **2.4. Data Collection Tools and Technique**

Data collection was realized through individual semi-structured interviews basing on a questionnaire in which were integrated the scales: Edinburgh Postnatal Depression Scale-3 (EPDS-3), EPDS [5] and modular Integrated Household Living Conditions Survey (IHLCS-2015) [6] to assess respectively anxiety, depression (the threshold value used to assess depression was 11 and 4 for anxiety) and expectant mothers' socio-economic level 5 (SEL: high SEL = total score  $\geq$  85%, average SEL =  $50\% \leq$  total score  $\leq$  85%, low SEL = total score  $\leq$  50%). The scales used in the study were translated and validated for local population.

#### **2.5. Ethical Considerations and Data Processing**

The study follows a medical thesis. It has been conducted after the approval from the local research ethics board and biomedical research of Parakou University. The data collection was carried out through a semi-structured individual interview using a pre-tested questionnaire, in accordance with the ethical principles set out in the Helsinki Declaration of the Medical World [7]; the informed consent of the respondents was required, as well as the preservation of their anonymity. Data have been collected on a sheet survey by the personnel who usually perform the childbirth at the survey location and recycled for the circumstance.

For the study of association's stability between anxiety, depression and the different factors, a univariate analysis ( $p < 0.05$ ) was simultaneously included in a logistic regression model using a downward and step by step successive iterations. The comparison of factors percentages between dependent variables and the factors associated was made basing on a "chi-2" test. The association strength, meaning and stability were estimated using Odd ratios and 95% as their confidence intervals. The significance level was set at 5%.

### **3. Results**

#### **3.1. Prevalence of Anxiety and Depression in Encountered Expectant Mothers**

According to the scales EPDS 3A and EPDS, the number of the survey respondents having an anxiety or a depression was respectively 375 (**44.91%**) and 295 (**35.33%**).

#### **3.2. Factors Associated with Anxiety**

The mean age of the interviewed expectant mothers was  $25 \pm 5.1$  years with the extremes 15 and 45 years. The age group 15 to 24 years was the most represented (47.12%). The socioeconomic level and the previous onset of a spontaneous

miscarriage is associated with anxiety in the interviewed expectant mothers. **Table 1** and **Table 2** present the factors associated with anxiety in encountered expectant mothers.

### 3.3. Factors Associated with Depression

The educational level and difficulties during pregnancy were associated with depression in expectants mothers. **Table 3** and **Table 4** show the factors associated with depression in the encountered expectant mothers.

### 3.4. Determinants of Anxiety in Encountered Expectant Mothers

In the multivariate logistic regression, low socioeconomic level, third trimester of pregnancy respectively increase 6.70 times and 2.47 times the risk of developing anxiety. **Table 5** shows the determinants of anxiety during pregnancy in expectant mothers.

### 3.5. Determinants of Depression in the Encountered Expectant Mothers

In this multivariate logistic regression, low socioeconomic level increases 8.64 times the risk of developing depression. **Table 6** presents psychosocial determinants of depression during pregnancy in expectant mothers.

**Table 1.** Distribution of patients by profession, marital status, socioeconomic level and previous onset of spontaneous miscarriage, according to anxiety. (Parakou, 2018; N = 835).

	ANXIETY				Total (N)	P
	Yes		No			
	n	%	n'	%		
<b>Profession</b>						<b>0.016</b>
Official	8	26.67	22	73.33	30	
Private sector worker	32	32.65	66	67.35	98	
Trader/Reseller	115	43.56	149	56.44	264	
Artisan	108	47.79	118	52.21	226	
Pupil/student	45	48.91	47	51.09	92	
Unemployment	60	53.10	53	46.90	113	
Others	7	58.33	5	41.67	12	
<b>Marital status</b>						<b>0.005</b>
Single	17	45.95	20	54.05	37	
cohabitation	162	38.85	255	61.15	417	
Married	195	51.45	184	48.55	379	
divorced	1	100.00	0	0.00	1	
Widow	0	0.00	1	100.00	1	

## Continued

<b>Socioeconomic Level</b>					<b>0.000</b>
Low	251	47.36	279	52.64	530
Average	116	47.74	127	52.26	243
High	8	12.90	54	87.10	62
<b>Spontaneous Miscarriage</b>					<b>0.001</b>
Yes	50	29.41	120	70.59	170
No	119	44.74	147	55.26	266

**Table 2.** Distribution of encountered expectant mothers by previous onset of an induced abortion, absence of social support, gestational age, dear parent or perinatal death, abuse or rape in childhood, according to anxiety. (Parakou, 2018; N = 835).

	<b>ANXIETY</b>				<b>Total (N)</b>	<b>P</b>
	<b>Yes</b>		<b>No</b>			
	<b>n</b>	<b>%</b>	<b>n'</b>	<b>%</b>		
<b>Induced Miscarriage</b>					<b>0.023</b>	
Yes	18	26.47	50	73.53	68	
No	151	41.03	217	58.97	368	
<b>Absence of social support</b>					<b>0.022</b>	
Yes	32	60.38	21	39.62	53	
No	343	43.86	439	56.14	782	
<b>Gestational age</b>					<b>0.000</b>	
1st trimester	54	31.03	120	68.97	174	
2nd trimester	143	44.27	180	55.73	323	
3rd trimester	178	52.66	160	47.34	338	
<b>A dear parent or a child death</b>					<b>0.003</b>	
Yes	42	61.76	26	38.24	68	
No	333	43.42	434	56.58	767	
<b>Abuse or rape in childhood</b>					<b>0.032</b>	
Yes	39	35.45	71	64.55	110	
No	336	46.34	389	53.66	725	

**Table 3.** Distribution of expectant mothers according to the educational level, socio-economic level and a previous spontaneous miscarriage, according to depression. (Parakou, 2018; N = 835).

	<b>DEPRESSION</b>				<b>Total (N)</b>	<b>P</b>
	<b>Yes</b>		<b>No</b>			
	<b>n</b>	<b>%</b>	<b>n'</b>	<b>%</b>		
<b>Educational Level</b>					<b>0.004</b>	
Out of school	85	44.27	107	55.73	192	

## Continued

Primary	55	27.50	145	72.50	200	
Secondary	131	36.09	232	63.91	363	
Higher	24	30.00	56	70.00	80	
<b>Socioeconomic level</b>						<b>0.000</b>
Low	198	37.36	332	62.64	530	
Average	93	38.27	150	61.73	243	
High	4	6.45	58	93.55	62	
<b>Marital status</b>						<b>0.000</b>
Single	14	37.84	23	62.16	37	
Cohabitation	91	21.82	326	78.18	417	
Married	188	49.60	191	50.40	379	
Divorced	1	100.00	0	0.00	1	
Widow	1	100.00	0	0.00	1	
<b>Spontaneous miscarriage</b>						<b>0.000</b>
Yes	100	58.82	70	41.18	170	
No	74	27.82	192	72.18	266	

**Table 4.** Distribution of expectant mothers by onset of previous induced abortion, gestational age, difficulties during the current pregnancy, alcohol consumption, according to depression (Parakou, 2018; N = 835).

	DEPRESSION				Total (N)	P
	Yes		No			
	n	%	n'	%		
<b>Induced abortion</b>						<b>0.000</b>
Yes	43	63.24	25	36.76	68	
No	131	35.60	237	64.40	368	
<b>Gestational age</b>						<b>0.032</b>
1st trimester	57	32.76	117	67.24	174	
2nd trimester	101	31.27	222	68.73	323	
3rd trimester	137	40.53	201	59.47	338	
<b>Difficulties during the current pregnancy</b>						<b>0.000</b>
Yes	116	50.00	116	50.00	232	
No	179	29.68	424	70.32	603	
<b>Alcohol consumption</b>						<b>0.012</b>
Yes	28	50.91	27	49.09	55	
No	267	34.23	513	65.77	780	

**Table 5.** Determinants of anxiety in encountered expectant mothers (Parakou, 2018; N = 835).

	n	ANXIETY		OR	IC <sub>95%</sub>	p-value
		Yes	%			
<b>Marital status</b>						
Single	37	17	45.95	1.33	0.68 - 2.63	0.397
Cohabitation	417	162	38.85	1		
Married	379	195	51.45	1.66	1.25 - 2.21	0.001
<b>Socioeconomic level</b>						
Low	530	251	47.36	6.07	2.83 - 13.00	0.000
Average	243	116	47.74	6.16	2.81 - 13.50	0.000
High	62	8	12.90	1		
<b>Profession</b>						
Official	30	8	26.67	1		
Private sector worker	98	32	32.65	1.33	0.53 - 3.32	0.535
Trader/ Reseller	264	115	43.56	2.12	0.91 - 4.94	0.075
Artisan	226	108	47.79	2.51	1.07 - 5.89	0.029
Pupil/Student	92	45	48.91	2.63	1.06 - 6.51	0.032
Unemployment	113	60	53.10	3.11	1.27 - 7.57	0.009
Others	12	7	58.33	3.85	0.94 - 9.67	0.053
<b>Trimester of pregnancy</b>						
1st trimester	174	54	31.03	1		
2nd trimester	323	143	44.27	1.76	1.19 - 2.60	0.004
3rd trimester	338	178	52.66	2.47	1.68 - 3.64	0.000
<b>Spontaneous miscarriage</b>						
Yes	170	50	29.41	0.51	0.34 - 0.77	0.001
No	266	119	44.74	1		
<b>Induced abortion</b>						
Yes	68	18	26.47	0.52	0.29 - 0.92	0.025
No	368	151	41.03	1		
<b>Abuse or rape in childhood</b>						
Yes	110	39	35.45	0.64	0.42 - 0.98	0.039
No	725	336	46.34	1		
<b>A close one or perinatal death</b>						
Yes	68	42	61.76	2.10	1.26 - 3.50	0.003
No	767	333	43.42	1		
<b>Absence of social support</b>						
Yes	53	32	60.38	1.50	0.85 - 2.66	0.157
No	782	343	43.86	1		

**Table 6.** Determinants of depression in expectant mothers (Parakou, 2018; N = 835).

	n	DEPRESSION		OR	IC <sub>95%</sub>	p-value
		Yes	%			
<b>Marital status</b>						
Single	37	14	37.84	2.18	1.07 - 4.40	0.026
Cohabitation	417	91	21.82	1		
Married	379	188	49.60	3.52	2.59 - 4.79	0.000
<b>Educational level</b>						
Out of school	192	85	44.27	1.85	1.06 - 3.23	0.028
Primary	200	55	27.50	0.88	0.50 - 1.56	0.674
Secondary	363	131	36.09	1.31	0.78 - 2.22	0.301
Higher	80	24	30.00	1		
<b>Socioeconomic level</b>						
Low	530	198	37.36	8.64	3.09 - 17.18	0.000
Average	243	93	38.27	5.93	2.26 - 15.51	0.000
High	62	4	6.45	1		
<b>Spontaneous miscarriage</b>						
Yes	170	100	58.82	3.70	2.46 - 5.56	0.001
No	266	74	27.82	1		
<b>Induced abortion</b>						
Yes	68	43	63.24	3.11	1.81 - 5.32	0.000
No	368	131	35.60	1		
<b>Trimester of pregnancy</b>						
1st trimester	174	57	32.76	1.07	0.72 - 1.58	0.733
2nd trimester	323	101	31.27	1		
3rd trimester	338	137	40.53	1.49	1.08 - 2.06	0.013
<b>Difficulties during the current pregnancy</b>						
Yes	232	116	50.00	2.36	1.73 - 3.23	0.000
No	603	179	29.68	1		
<b>Alcohol consumption</b>						
Yes	55	28	50.91	1.99	1.15 - 3.44	0.012
No	780	267	34.23	1		

## 4. Discussion

### 4.1. Limitations of the Study

A depression screening strategy in expectant mothers should take into account the potential chronicity of depression symptoms through repeated assessment in



order to provide an intervention to the vulnerable women.

## 4.2. Prevalence of Anxiety and Depression

### 4.2.1. Prevalence of Anxiety

The prevalence of anxiety disorders in expectant mothers was 44.91%. Unemployed pregnant women were more affected (see **Table 1**). Studies on maternal anxiety prevalence reported rate from 12% to 59% during pregnancy [8] [9]. Basing on *Hospital Anxiety and Depression Scale*, Lee *et al.* [10] found a prevalence of anxiety close to 54% in a Chinese population. However, a lower prevalence of anxiety at 23% has been reported by Heyningen *et al.* [11], in South Africa basing on the *Mini International Neuropsychiatric Interview scale*. The variability of those prevalences confirm the extent of anxiety during pregnancy. All the authors agree with adverse effects of anxiety on the pregnancy outcome, mother-child interaction and the infant development. According to Capponi *et al.* [12], mothering approaches are modified by a high level of anxiety “even non pathological”, and reflect in mother-child relationships quality. In general, the anxiety specific to pregnancy has numerous consequences on both mother and foetus [1].

### 4.2.2. Prevalence of Depression

Depressive syndrome prevalence in expectant mothers of Parakou was 35.33%. The third trimester of pregnancy was more depressogenic (see **Table 2**). And marriage did not protect against depression (see **Table 3**). In a meta-analysis, Ayano *et al.* [13], reported a higher antenatal depression (32.10%) during the third trimester of pregnancy. Although close to the prevalence found in Parakou, that number rather assesses depression particularly at the third trimester (see **Table 4**). By contrast, Dukou *et al.* [14], reported 21.5% as prevalence after a similar study in Ethiopia. Basing on Life Event Scale for Pregnancy Women (LESPW) to assess stress at 12 - 16 weeks of pregnancy and at 32 - 36 weeks of pregnancy, 11.1% and 10.3% of expectant mothers developed respectively anxiety and depressive mood in Shanghai MCPC District [15]. The fluctuation of depression prevalences reported in expectant mothers is related to the different tools and the threshold values used.

## 4.3. Social Determinants of Anxiety and Depression in Expectant Mothers at Parakou

### 4.3.1. Deficit in Education and Economic Resources

Lack of education (OR 1.85; IC<sub>95%</sub> [1.06 - 3.23];  $p = 0.028$ ) and low socioeconomic level (OR 8.643; IC<sub>95%</sub> [09 - 17.18];  $p = 0.00$ ), have been identified as risk factors for depression in expectant mothers at Parakou (see **Table 1** and **Table 5**). Unemployed expectant mothers are mostly dependent on their partner/spouse and could suffer from deprivation. Van Heyningen *et al.* [11], observed that a high social support seemed to reduce the risk for prenatal anxiety in South African expectant mothers who had a low income (OR 0.95; IC<sub>95%</sub> [0.91 - 0.99]).

Therefore, a good socioeconomic level protects from anxiety and depression during pregnancy [16]. Kinser *et al.* [17], reported the income and stressful events as the most important predictors of depression during pregnancy.

Educational levels in the sample varied. The majority had a secondary level (47%). Chan *et al.* [18] found similar results in China in 2013 (52.4%). Silva *et al.* [19], also got the same results (41.1%) in Brazil, in 2017. Whereas Giardinelli *et al.* [16] reported almost the same frequencies of both secondary (47%) and high level (46.4%) in Italy in 2012. That difference with the observations made at Parakou is due to the fact that this study has been conducted only in public maternities which are not frequented by intellectual expectant mothers.

#### 4.3.2. Celibacy as Risk of Developing Anxiety and Depression in Pregnancy

In the multivariate logistic regression, celibacy was a risk factor (celibacy: OR = 2.18; IC<sub>95%</sub> [1.07 - 4.40];  $p = 0.026$ ) for depression in expectant mothers (see **Table 6**). Räisänen *et al.*, [20] in Finland (2014), achieved the same conclusions; (celibacy: OR = 2.86; IC<sub>95%</sub> [2.62 - 3.11]). Besides Weobong *et al.* in Ghana [21] and Duko *et al.*, [14], reported the lack of social support as a factor significantly associated with depression in pregnancy. So, single expectant mothers can be considered as vulnerable because of their poor support.

#### 4.3.3. Gynaecological and Obstetrical Factors

The risk of developing anxiety during the third trimester of pregnancy is 2.47 times higher (OR = 2.47; IC<sub>95%</sub> [1.68 - 3.64];  $p = 0.000$ ) than the one at the 1st trimester (see **Table 5**). The third trimester is for sure very critical for the management of risky pregnancies. Moreover, the third trimester is the period in which the expectant mother intensively lives the problem of “imaginary/real child” before the childbirth.

A previous spontaneous miscarriage potentiates 3.70 times (OR = 3.70; IC<sub>95%</sub> [2.46 - 5.56];  $p = 0.001$ ) the risk of developing depression during pregnancy in expectant mothers at Parakou. Zhu *et al.* [22], in Singapore (2018) found a similar result (OR = 2.70; IC<sub>95%</sub> [1.55 - 4.71];  $p < 0.001$ ). A previous induced abortion had the same potential risk for the onset of depression in pregnancy (OR = 3.11; IC<sub>95%</sub> [1.81 - 5.32];  $p = 0.000$ ). Pregnancy in women is a particular moment for the recurrence of past traumas and bereavements. Here, the underlying psychological constructions for the bereavement are the same [23]. In retrospective and observational study using a large sample including 38,000 pregnancies, Wallwiener *et al.* [24], reported 9.3% of depression and 16.9% of anxiety disorders.

#### 4.3.4. Stressful Life Event and Alcoholism during Pregnancy

A close one or a perinatal death during pregnancy was a risk factor for anxiety (see **Table 5**). It increases 2.10 times (OR = 2.10; IC<sub>95%</sub> [1.26 - 3.50];  $p = 0.003$ ) the risk of developing anxiety during pregnancy. Van Heyningen *et al.* [11], in South Africa (2017), made the same observation. All those losses assimilated to

stressful events had been identified by Bayrampour *et al.* [25] as predictive factors of anxiety and depression during pregnancy. Alcohol consumption (see **Table 6**) during pregnancy, was associated with a higher risk of depressive mood (OR = 1.99; IC<sub>95%</sub> [1.15 - 3.44];  $p = 0.012$ ). This study doesn't provide information on the impact of maternal addiction to alcohol on the foetus. Easey *et al.* [26], reported through a meta-analysis, a positive association between prenatal exposure to alcohol and children with mental health problems proved by more than half of analysis.

## 5. Conclusion

The risk factors found during pregnancy such as: single status, low educational level, low socioeconomic level are to be considered as true social determinants of anxiety and depression during pregnancy. They have harmful consequences on the mother and her child. Past history of spontaneous miscarriage or induced abortion, stressful life events; all those difficulties during pregnancy lead expectant mothers to alcohol consumption without regard for its damage for the unborn child. The implementation of social support seems necessary in order to help and accompany women suffering from anxiety and depression during the perinatal period.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- [1] Reymond, C., Derguy, C., Wendland, J. and Loyal, D. (2019) Validation française d'une échelle d'anxiété spécifique à la grossesse (PRAQ-R2). *Pratiques Psychologiques*. <https://doi.org/10.1016/j.prps.2018.11.008>
- [2] Mourabbih, M., Serhier, Z., Arazakou, M., Agoub, M. and Bennani, M.O. (2017) Prévalence de la dépression et de l'anxiété en fin de grossesse au Maroc. *Revue d'Épidémiologie et de Santé Publique*, **65**, S84. <https://doi.org/10.1016/j.respe.2017.03.078>
- [3] Gourine, M., Abdelouahab, A., Arrar, M., Cherrak, A., Halimi, S. and Belhadj, M. (2019) Facteurs associés à la dépression chez la femme diabétique de type 2: Etude cas-témoin. *Médecine des maladies Métaboliques*, **9**, 418-422. [https://doi.org/10.1016/S1957-2557\(15\)30151-6](https://doi.org/10.1016/S1957-2557(15)30151-6)
- [4] Lambert, M. and Gressier, F. (2019) Biomarqueurs de L'inflammation et Dépression du Post-Partum. Une Revue Systématique De la Littérature. *The Canadian Journal of Psychiatry*. <https://doi.org/10.1177/0706743719828970>
- [5] Guille, C. and Newman, R. (2018) Perinatal Mental Health: An Issue of Obstetrics and Gynecology Clinics Vol. 45-3. Elsevier, Amsterdam. [https://doi.org/10.1016/S0889-8545\(18\)30053-6](https://doi.org/10.1016/S0889-8545(18)30053-6)
- [6] UNICEF (2011) Enquête modulaire intégrée sur les conditions de vie des ménages Cotonou.
- [7] General Assembly of the World Medical Association (2014) World Medical Associa-

- tion Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects. *Journal of the American College of Dentists*, **81**, 14-18. <https://www.ncbi.nlm.nih.gov/pubmed/25951678>
- [8] Skari, H., Skreden, M., Malt, U.F., Dalholt, M., Ostensen, A.B., Egeland, T. and Emblem, R. (2002) Comparative Levels of Psychological Distress, Stress Symptoms, Depression and Anxiety after Childbirth; A Prospective Population-Based Study of Mothers and Fathers. *BJOG: An International Journal of Obstetrics and Gynaecology*, **109**, 1154-1163. <https://doi.org/10.1111/j.1471-0528.2002.00468.x>
- [9] Faisal-Cury, A. and Rossi Menezes, P. (2007) Prevalence of Anxiety and Depression during Pregnancy in a Private Setting Sample. *Archives of Women's Mental Health*, **10**, 25-32. <https://doi.org/10.1007/s00737-006-0164-6>
- [10] Lee, A.M., Lam, S.K., SzeMun Lau, S.M., Chong, C.S.Y., Chui, H.W. and Fong, D.Y.T. (2007) Prevalence, Course, and Risk Factors for Antenatal Anxiety and Depression. *Obstetrics & Gynecology*, **110**, 1102-1112. <https://doi.org/10.1097/01.AOG.0000287065.59491.70>
- [11] van Heyningen, T., Honikman, S., Myer, L., Onah, M.N., Field, S. and Tomlinson, M. (2017) Prevalence and Predictors of Anxiety Disorders amongst Low-Income Pregnant Women in Urban South Africa: A Cross-Sectional Study. *Archives of Women's Mental Health*, **20**, 765-775. <https://doi.org/10.1007/s00737-017-0768-z>
- [12] Capponi, I., Bacro, F. and HalimBoudoukha, A. (2013) Effets différentiels des types de soutien social sur l'anxiété maternelle périnatale. *Bulletin de Psychologie*, **525**, 209-224. <https://doi.org/10.3917/buppsy.525.0209>
- [13] Ayano, G., Tesfaw, G. and Shumet, S. (2019) Prevalence and Determinants of Antenatal Depression in Ethiopia: A Systematic Review and Meta-Analysis. *PLoS ONE*, **14**, e0211764. <https://doi.org/10.1371/journal.pone.0211764>
- [14] Duko, B., Ayano, G. and Bedaso, A. (2019) Depression among Pregnant Women and Associated Factors in Hawassa City, Ethiopia: An Institution-Based Cross-Sectional Study. *Reproductive Health*, **16**, 2. <https://doi.org/10.1186/s12978-019-0685-x>
- [15] Ma, X., Wang, Y., Hu, H., Tao, X.G., Zhang, Y. and Shi, H. (2019) The Impact of Resilience on Prenatal Anxiety and Depression among Pregnant Women in Shanghai. *Journal of Affective Disorders*, **250**, 57-64. <https://doi.org/10.1016/j.jad.2019.02.058>
- [16] Giardinelli, L., Innocenti, A., Benni, L., Stefanini, M.C., Lino, G., Lunardi, C. and Faravelli, C. (2012) Depression and Anxiety in Perinatal Period: Prevalence and Risk Factors in an Italian Sample. *Archives of Women's Mental Health*, **15**, 21-30. <https://doi.org/10.1007/s00737-011-0249-8>
- [17] Kinser, P.A., Thacker, L.R., Lapato, D., Wagner, S., Roberson-Nay, R., Jobe-Shields, L. and York, T.P. (2018) Depressive Symptom Prevalence and Predictors in the First Half of Pregnancy. *Journal of Women's Health*, **27**, 369-376. <https://doi.org/10.1089/jwh.2017.6426>
- [18] Chan, C.Y., Lee, A.M., Lam, S.K., Lee, C.P., Leung, K.Y., Koh, Y.W., et al. (2013) Antenatal Anxiety in the First Trimester: Risk Factors and Effects on Anxiety and Depression in the Third Trimester and 6-Week Postpartum. *Open Journal of Psychiatry*, **3**, 301-310. <https://doi.org/10.4236/ojpsych.2013.33030>
- [19] Silva, M.M.D.J., Nogueira, D.A., Clapis, M.J. and Leite, E.P.R. (2017) Anxiety in Pregnancy: Prevalence and Associated Factors. *Revista da Escola de Enfermagem da USP*, **51**, e03253. <https://doi.org/10.1590/s1980-220x2016048003253>
- [20] Räisänen, S., Lehto, S.M., Nielsen, H.S., Gissler, M., Kramer, M.R. and Heinonen, S. (2014) Risk Factors for and Perinatal Outcomes of Major Depression during Pregnancy: A Population-Based Analysis during 2002-2010 in Finland. *BMJ Open*, **4**,

e004883. <https://doi.org/10.1136/bmjopen-2014-004883>

- [21] Weobong, B., Soremekun, S., ten Asbroek, A.H., Amenga-Etego, S., Danso, S., Owusu-Agyei, S. and Kirkwood, B.R. (2014) Prevalence and Determinants of Antenatal Depression among Pregnant Women in a Predominantly Rural Population in Ghana: The DON Population-Based Study. *Journal of Affective Disorders*, **165**, 1-7. <https://doi.org/10.1016/j.jad.2014.04.009>
- [22] Zhu, C.S., Tan, T.C., Chen, H.Y., Malhotra, R., Allen, J.C. and Østbye, T. (2018) Threatened Miscarriage and Depressive and Anxiety Symptoms among Women and Partners in Early Pregnancy. *Journal of Affective Disorders*, **237**, 1-9. <https://doi.org/10.1016/j.jad.2018.04.012>
- [23] Jaffe, J. (2017) Reproductive Trauma: Psychotherapy for Pregnancy Loss and Infertility Clients from a Reproductive Story Perspective. *Psychotherapy*, **54**, 380. <https://doi.org/10.1037/pst0000125>
- [24] Wallwiener, S., Goetz, M., Lanfer, A., Gillessen, A., Suling, M., Feisst, M. and Wallwiener, M. (2019) Epidemiology of Mental Disorders during Pregnancy and Link to Birth Outcome: A Large-Scale Retrospective Observational Database Study Including 38,000 Pregnancies. *Archives of Gynecology and Obstetrics*, **299**, 755-763. <https://doi.org/10.1007/s00404-019-05075-2>
- [25] Bayrampour, H., McDonald, S. and Tough, S. (2015) Risk Factors of Transient and Persistent Anxiety during Pregnancy. *Midwifery*, **31**, 582-589. <https://doi.org/10.1016/j.midw.2015.02.009>
- [26] Easey, K.E., Dyer, M.L., Timpson, N.J. and Munafò, M.R. (2019) Prenatal Alcohol Exposure and Offspring Mental Health: A Systematic Review. *Drug and Alcohol Dependence*, **197**, 344-353. <https://doi.org/10.31234/osf.io/yk865>