

Perinatal mental health during COVID-19 pandemic: A Nordic perspective

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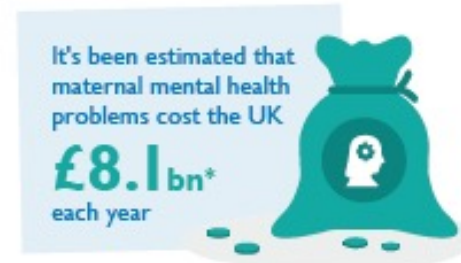


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I have no conflict of interest to declare

Scope of the problem



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2017

Perinatal Maternal Mental Health: Causes & Associations

The underlying biological mechanisms have not been fully understood



Prevalence of perinatal mental ill-health is high but varies widely

Collins et al. Arch Womens Ment Health 2011;14:3–11.

- | | |
|--|--|
| • High income countries | 13% |
| • Low and middle-income countries (LMIC) | 20% |
| • Immigrants | 42% |
| • Systematic review of studies from LMIC * | 17% (major depressive disorder)
31% (any depressive disorder) |

* Fellmeth G, Fazel M, Plugge E. Migration and perinatal mental health in women from low- and middle-income countries: a systematic review and meta-analysis. BJOG 2017;124:742–75.

Prevalence of antenatal depressive symptoms in non-pandemic period

Author	Year	Country	Measurement	Prevalence
Gavin <i>et al.</i> (Review) ^[5]	2005	Developed countries	Structured clinical interview	18% depressed mood, 13% DSM-IV major depressive episode
Rubertsson <i>et al.</i> ^[8]	2005	Sweden	EPDS	13.7% depressive symptoms
Anderson <i>et al.</i> ^[9]	2006	Sweden	EPDS	29.2% depressive symptoms
Bowen <i>et al.</i> ^[3]	2006	Canada	EPDS	27% depressive symptoms
Kitamura <i>et al.</i> ^[6]	2006	Japan	<i>Ad-hoc</i> structured diagnostic interview	12% one or more DSM-III-R psychiatric disorders
Rich-Edwards <i>et al.</i> ^[7]	2006	United States	EPDS	9% depressive symptoms
Van Bussel <i>et al.</i> ^[8]	2006	Belgium	GHQ-12	21% and 25%, prevalence of CMDs before and during pregnancy
Lee <i>et al.</i> ^[11]	2007	Hong Kong	HADS	54% anxiety, 37% depressive symptoms
Woods <i>et al.</i> ^[10]	2010	United States	PPPSS	84% antenatal stress
Faisal-Cury <i>et al.</i> ^[13]	2007	Brazil	STAI and BDI	STAI-state anxiety=60%, trait anxiety=45%, depressive symptoms=20%
Bunevicius <i>et al.</i> ^[12]	2009	Lithuania	CIDI-SF	6% depressive disorder (12–16 weeks), 4% in the 3 rd trimester
Gausia <i>et al.</i> ^[16]	2009	Bangladesh	EPDS	33% depressive symptoms
Karmaliani <i>et al.</i> ^[14]	2009	Pakistan	AKUADS	18% anxiety/depressive symptoms (20–26 weeks)
Imran <i>et al.</i> ^[15]	2009	Pakistan	EPDS	42.7% depressive symptoms

*Developed countries are listed first and in chronological order

Prevalence of postnatal depressive symptoms in non-pandemic period

Author	Year	Country	Measurement	Prevalence
Massoudi <i>et al.</i> ^[29]	2007	Sweden	EPDS	12.5% and 8.3% depressive symptoms at 8 and 12 weeks, respectively, period prevalence – 4.5%
Buist <i>et al.</i> ^[30]	2008	Australia	EPDS	7.5% depressive symptoms (6–8 weeks)
Monti <i>et al.</i> ^[31]	2008	Italy	EPDS	13.8% (1–3 months), 4.8% (9 and 18 months respectively), 23% at least once
Patel <i>et al.</i> ^[17]	2002	India	EPDS	23% postnatal depression (6–8 weeks)
Chandran <i>et al.</i> ^[40]	2002	India	CIS-R	19.8% had depression (incidence=11%)
Limlomwongse <i>et al.</i> ^[34]	2005	Thailand	EPDS	16.8% depressive symptoms
Agoub <i>et al.</i> ^[39]	2005	Morocco	EPDS/MINI	18.7% had depression diagnosis at 2 weeks, 6.9% at 6 weeks, 11.8% at 6 months, 5.6% at 9 months
Ho-Yen <i>et al.</i> ^[35]	2006	Nepal	EPDS	4.9% depressive symptoms
Alami <i>et al.</i> ^[36]	2006	Morocco	EPDS/MINI	17% depression
Edwards <i>et al.</i> ^[38]	2006	Indonesia	EPDS	22% depressive symptoms
Tannous <i>et al.</i> ^[37]	2008	Brazil	EPDS	20.7% depressive symptoms (6–8 weeks)
Klainin and Arthur (review) ^[32]	2009	Asia	–	3.5–63.3% depressive symptoms
Sawyer <i>et al.</i> (review) ^[33]	2010	Africa	–	Depression – 18%, anxiety – 14%
Savarimuthu <i>et al.</i> ^[41]	2010	India	EPDS	26.3% had postpartum depression

*Developed countries are listed first and in chronological order



POLICY & ETHICS | OPINION

COVID Misinformation Is Killing People

This “infodemic” has to stop

By Amir Bagherpour, Ali Nouri on October 11, 2020

Disparity Health Policies & Healthcare



NYHETER

Fagfolk advarer: – Mange vordende og nybakte mødre har det veldig tøft nå

Henvendelsene til Landsforeningen 1001 dager – mental helse under graviditet og etter fødsel, har eksplodert som en følge av koronaepidemien.

02/04/2020 06:00– I februar hadde vi rundt 600 unike brukere på hjemmesiden vår. I mars økte dette tallet til nær 13.000, forteller Lena Yri Engelsen, leder i [«Landsforeningen 1001 dager»](#).





Severe maternal morbidity and mortality associated with COVID-19: The risk should not be downplayed

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Nordic countries have a long tradition of collecting health-related population data meticulously and reporting them transparently. Such data provide firm grounds for making good decisions and as a result the public health institutions in Scandinavia enjoy the trust of society. The COVID-19 pandemic has, however, resulted in a completely new situation, as we are now exploring in uncharted waters. Based on reports from China,¹⁻³ Italy,⁴ USA⁵ and perhaps with the good intention of reducing anxiety among this vulnerable population group, it has been widely publicized that pregnant women are not at increased risk of susceptibility, infectivity and severity of COVID-19 compared with the general population or non-pregnant women, although a systematic review of 108 cases of laboratory-confirmed pregnancies with COVID-19 has reported the possibility of increased risk of severe disease among pregnant women.⁶

Recently, the Public Health Agency of Sweden released a report on pregnant and early postpartum women diagnosed with COVID-19 who required intensive care during the period between 19 March and 20 April 2020 (reference number: 01907-2020). This report is based on rigorously collected surveillance data that were extracted from the Swedish National quality registry on Intensive Care (SIR), and a summary has been published in AOGS.⁷ A total of 53 women with COVID-19 between the ages of 20 and 45 years received intensive care. Of those women, 13 were or had recently been pregnant. Six of these 13 women required invasive mechanical ventilation. An analysis based on an estimate of the total number of pregnant and non-pregnant women in the population of Sweden revealed that the relative risk (RR) for pregnant and early postpartum women (<1 week) with COVID-19 to receive intensive care was 5.4 (95% confidence interval [CI] 2.89-10.08) and the RR to require invasive mechanical ventilation was 4.0 (95% CI 1.75-9.14) compared with non-pregnant women of similar age. This risk remained higher (RR 3.5, 95% CI 1.86-6.52) even after accounting for 50% more

pregnancies in the denominator to include possible miscarriages and early intrauterine deaths. Although the results are based on a relatively small number of COVID-19 cases and details regarding comorbidities are lacking, the risk is significant enough not to be ignored.

Published case series from China have not reported any maternal deaths related to COVID-19.¹⁻³ However, maternal mortalities associated with COVID-19 have been reported recently from several other countries in the mainstream news and social media (<https://ripe-to-mato.org/2020/04/05/covid-19-in-pregnancy-news-reports/>) as well as in the scientific literature.^{8,9} The Public Health Agency of Sweden has also reported one maternal death, which was not included in the data analysis of pregnant women admitted to intensive care. Maternal deaths due to COVID-19 are happening not only in low-income countries with restricted resources and poorer healthcare systems^{8,9} but also in highly developed countries with excellent resources and healthcare facilities and traditionally very low maternal mortality ratios. Furthermore, it is very likely that maternal deaths are under-reported.

If and why pregnant women may be at risk of developing more severe disease has not been elucidated yet. Physiologically, one would expect pregnant women to be more vulnerable than non-pregnant women of reproductive age. Increased susceptibility to hypoxemia due to pregnancy-associated anatomical and physiological changes in the cardio-respiratory system leading to high oxygen demands, a hypercoagulable state increasing the risk of pulmonary microvascular thrombosis, and altered immune function causing unfavorable inflammatory response could all have an important role in the pathophysiology and impact the clinical course/outcome of COVID-19 in pregnant women.¹⁰⁻¹² However, it may also be possible that the highly adaptive immune system in pregnancy may be potentially advantageous in defending against the infection. Further studies are needed to explore these possibilities.

Maternal mental health in the time of the COVID-19 pandemic

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With the pandemic of Coronavirus disease-19 (COVID-19) spiraling out of control, the world is desperately frazzled at the moment. A few empirical studies related to this pandemic have reported higher prevalence of mental health problems among women compared to men.¹ In this context, pregnant women and new mothers could certainly be more vulnerable. Are there psychological repercussions of this outbreak on maternal health? Are perinatal maternal mental health disorders an inevitable burden of this pandemic? Could this be averted with a proactive, multidisciplinary, integrated health services approach targeting the vulnerable population of pregnant women?

Although pregnancy is commonly believed to be a joyous time for most women, some women experience a range of negative emotions during pregnancy leading to anxiety and depression. Maternal mental health problems are associated with short-term and long-term risks for the affected mothers' overall health and functioning, as well as their children's physical, cognitive and psychological development. Conditions such as extreme stress, emergency and conflict situations, and natural disasters can inflate the risks of perinatal mental health morbidity. Therefore, it is plausible that pregnant women are vulnerable to mental ill-health during the COVID-19 pandemic.

Several studies on COVID-19 and pregnancy have been published recently, but the impact of this pandemic on maternal mental health has not yet been properly evaluated. However, the importance of considering the possibility of increased risk to avoid adverse effects has been highlighted.² The risk may be related to concerns regarding the wellbeing of the unborn child, but aggravated by unintended consequences of preventive measures, such as quarantine, physical distancing, home isolation, remote consultations with healthcare professionals, and inability to obtain expected level of

support and care prenatally as well as during the intrapartum and postnatal periods.

The World Health Organization and several professional societies of obstetricians and gynecologists have come up with guidelines in managing COVID-19 during pregnancy and delivery, but the recommendations vary due to lack of solid evidence.³ Although initial data from China suggested no increased risk of infection and morbidity among pregnant women compared to the general population,³ a different picture is emerging as the outbreak has escalated into a global pandemic. Pregnant women may be at risk of having more severe disease, preterm deliveries are more common, and maternal and neonatal mortalities have been reported.^{4,5} Furthermore, risk of miscarriage associated with COVID-19 remains unclear although the presence of severe acute respiratory syndrome corona virus-2 (SARS-COV-2) in a second trimester placenta has been demonstrated.⁶ These uncertainties are likely to add to psychological stress and may even lead to increased rates of pregnancy terminations.

As many hospitals have put restrictions on visits by partners and relatives to pregnant women admitted to hospitals for delivery, some women may choose to deliver at home. This could create a problem as availability of qualified birth attendants and midwives to support home deliveries is limited, even in affluent countries, and may lead to increased maternal and neonatal complications. Although transmission of SARS-COV-2 through breast milk is unlikely,⁷ some infected women may choose not to breast-feed temporarily to avoid direct contact with the newborn and reduce the risk of neonatal infection. However, such practices and early cessation of breastfeeding may contribute to poor health among mothers and infants.⁸

Strict public health measures directed towards mitigating the spread of disease are necessary, but known to have negative

Focus on maternal mental health during COVID-19 pandemic has been limited



Country	Considered as risk group or not	Vaccination
Denmark	Risk group (30)	No vaccine for pregnant women (30)
Finland	At higher risk for disease, but not defined as a risk group (31)	No general vaccination advice, individual recommendations. Pregnant women can get the vaccine, if in risk group or at high risk of infection (32)
Iceland	Not a risk group (33)	Vaccination for pregnant women (33)
Norway	Not a risk group (29)	No general vaccination advice, individual recommendations. Pregnant women can get the vaccine (29)
Sweden	Risk group between gestational week 20 and 36 (34)	No general vaccination advice, individual recommendations. Pregnant women can get the vaccine (35)
Switzerland	Risk group (36)	No general vaccination advice, individual recommendations. Pregnant women can get vaccine (37)
UK	Moderate risk group (38)	Vaccination for pregnant women (39)
USA	Risk group (40)	Vaccination for pregnant women (40)

Variation in pandemic mitigation measures among countries has been substantial

Latest systematic review includes 24 studies (19 included in meta-analysis)

Summary of basic information of the studies included for meta-analysis based on the PRISMA method.

Author and Year	Country	Study Population	Assessment	Cut-off	Results	
					Depression % (n)	Anxiety % (n)
Sade et al. (2020)	Israel	84	EPDS	EPDS \geq 10	25.0 %(21)	N.A.
Patabendige et al. (2020)	Sri Lanka	257	HADS	A total score of on the depression or Anxiety \geq 8	19.5%(50)	17.5 %(45)
Yue et al. (2020)	China	308	SAS	SAS > 50	N.A.	14.3 %(44)
Gu et al. (2020)	China	126	N.A.	N.A.	38.1 %(48)	28.6 %(36)
Liu et al. (2020)	China	1947	SAS	SAS \geq 50	N.A.	17.2 % (334)
Durankuş and Aksu (2020)	Turkey	260	EPDS	EPDS > 13	35.4%(92)	N.A.
Lebel et al. (2020)	Italy	1987	EPDS	EPDS \geq 13	37.0%(653)	Unable to get
Wu et al. (2020)	China	1285	EPDS	EPDS \geq 10	29.6%(381)	N.A.
Mappa et al. (2020)	Italy	178	STAI	STAI-S \geq 40	N.A.	77.0 % (137)
Ceulemans et al. (2020)	Belgium	2421	EDS; GAD-7	EDS \geq 13 GAD-7 \geq 5	25.3 %(612)	53.0 % (1275)
Parra-Saavedra et al. (2020)	Colombia	941	self-created questionnaire	N.A.	25.0 %(235)	49.9 % (469)
Suzuki (2020)	Japan	117	the tale of Whooley two questions; GAD-2	at least one of the two questions is 'yes'	29.9 %(35)	25.6 %(30)
Matsushima and Horiguchi (2020)	Japen	1777	EPDS	EPDS \geq 13	17.0%(302)	N.A.
Thayer and Gildner (2020)	the United States	2099	EPDS	EPDS \geq 15	23.6%(496)	N.A.
Effati-Daryani et al. (2020)	Iranian	205	DASS-21	N.A.	32.7 %(67)	43.9 %(90)
Silverman et al. (2020)	the United States	485	DPDS	EPDS \geq 9	15.1%(73)	N.A.
Zhou et al. (2020)	China	544	PHQ-9 GAD-7	PHQ > 10; GAD-7 \geq 7	5.3 %(29)	6.8 %(37)
Preis et al. (2020)	the United States	788	GAD-7	GAD-7 \geq 5	N.A.	78.8 % (621)
Ayaz et al. (2020)	Turkey	63	BAI	BAI \geq 10	N.A.	90.5 %(57)

EPDS: Edinburgh Postpartum Depression Scale; HADS: Hospital Anxiety and Depression Scale; SAS: Self-Rating Anxiety Scale; STAI: State-trait anxiety inventory; STAI-S: one separate sub-scales of STAI; PHQ-2: the Patient Health Questionnaire-2; GAD-7 and GAD-2: Generalized Anxiety Disorder 7-item Scale; DASS-21: Depression, Anxiety and Stress Scale-21; BAI: Beck Anxiety Inventory.

Psychological effects caused by COVID-19 pandemic on pregnant women: A systematic review with meta-analysis



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ARTICLE INFO

Keywords:
COVID-19
Pregnant women
Anxiety
Depression
Psychological intervention

ABSTRACT

Aim: This study aimed to investigate and monitor the mental health status of pregnant women during the COVID-19 pandemic.

Materials and methods: The meta-analysis was used to study the literatures on the psychology of pregnant women in four databases until Sep 27, 2020.

Results: A total of 19 articles were included in the final meta-analysis. The overall prevalence of anxiety was 42 % (95 %CI 26 %–57 %) with substantial heterogeneity ($I^2 = 99.6$ %). The overall prevalence of depression was 25 % (95 %CI 20 %–31 %) with substantial heterogeneity ($I^2 = 97.9$ %). Age, family economic status, social support, and physical activity seem to correlate with the mental health status of pregnant women.

Conclusion: The prevalence of anxiety and depression among pregnant women increased significantly during the COVID-19 epidemic. Pregnant women are more concerned about others than themselves during COVID-19, and younger pregnant women seem to be more prone to anxiety, while social support and physical activity can reduce the likelihood of anxiety and depression. It is necessary to take some psychological intervention measures for pregnant women to help them go through this special period safely and smoothly.

A GOOD NORDIC INITIATIVE THAT FALLS SHORT OF MATERNAL MENTAL HEALTH PERSPECTIVE



Nordic Federation of Societies of
Obstetrics and Gynecology

NFOG ▾

Journal

Congress

Fund ▾

Thesis

Guidelines

NFYOG

Nordic research collaboration on COVID-19 in pregnancy

🕒 October 1, 2020

👤 Lars Ladfors

📁 General

Nordic research collaboration on COVID-19 in pregnancy

The Nordic Obstetric Surveillance Study (NOSS) group is currently running a prospective study including pregnant women with COVID-19 infection admitted to hospital. The aim is to assess the maternal and perinatal outcomes of infection during pregnancy, to guide clinical care and the health system response.

ORIGINAL RESEARCH ARTICLE

COVID-19 in pregnancy—characteristics and outcomes of pregnant women admitted to hospital because of SARS-CoV-2 infection in the Nordic countries

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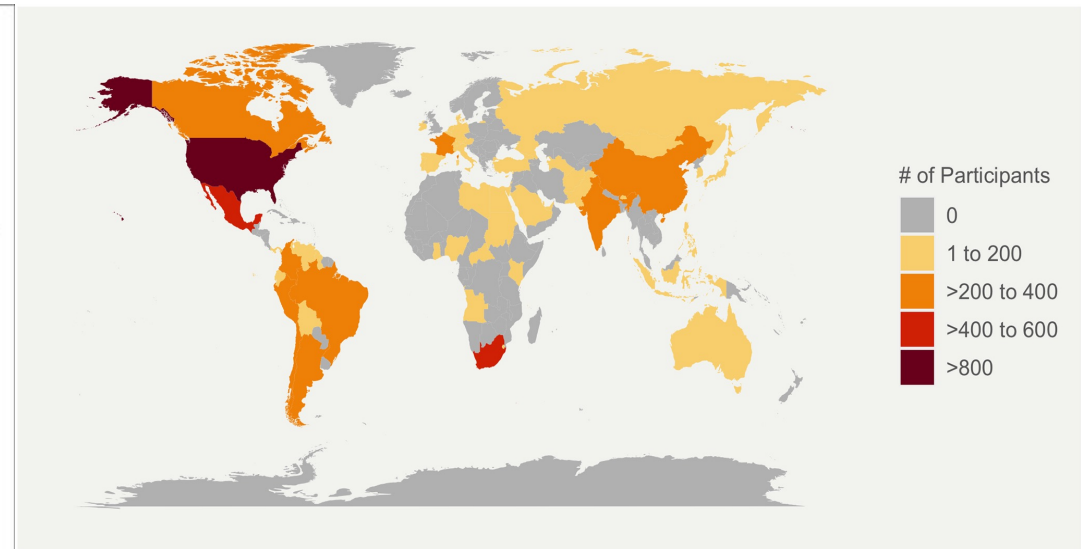
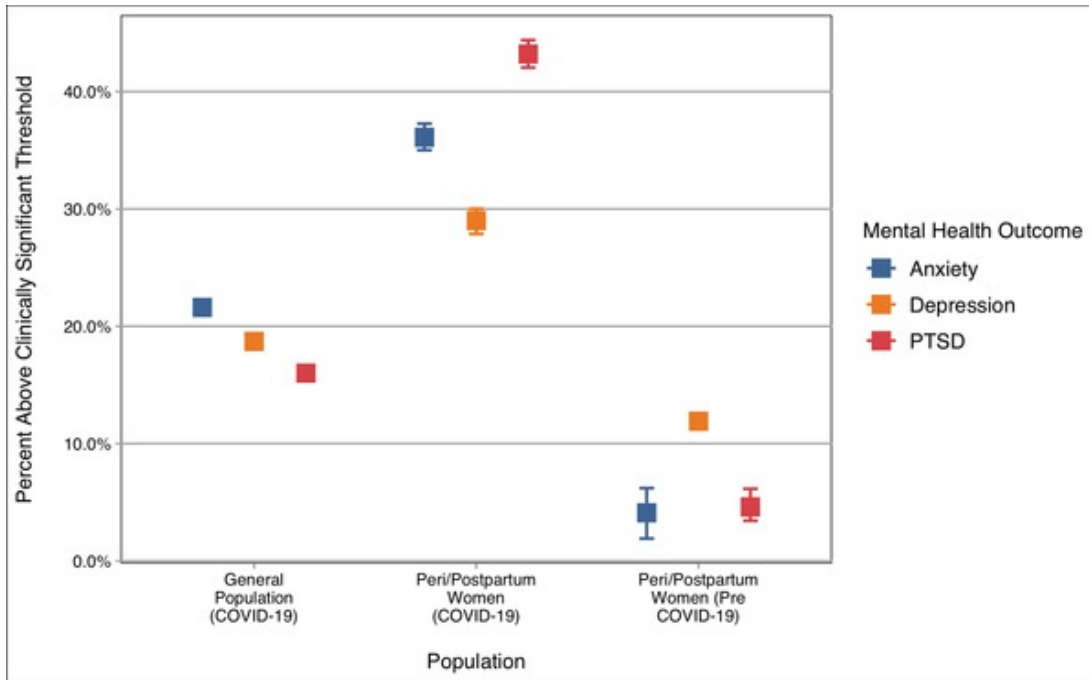
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Comparison of anxiety, depression and posttraumatic stress prevalence between the general population and peri/postpartum women during the COVID-19 pandemic, and peri/postpartum women prior to the pandemic (No participants from Nordic countries)



Basu A, Kim HH, Basaldua R, Choi KW, Charron L, et al. (2021) A cross-national study of factors associated with women's perinatal mental health and wellbeing during the COVID-19 pandemic. PLOS ONE 16(4): e0249780. <https://doi.org/10.1371/journal.pone.0249780>
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0249780>

Ignác Fülöp Semmelweis (1818–1865) Louis-Victor Marcé (1828-1864)



**Die Ätiologie, der Begriff und die Prophylaxis
des Kindbettfiebers (1861)**



**Treatise on insanity in pregnant, postpartum, and
lactating women (1858)**

Pregnant women's concerns and antenatal care during COVID-19 lock-down of the Danish society

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Dan Med J 2020;67(12):A06200449

ABSTRACT

INTRODUCTION: Pandemics are known to cause stress and anxiety in pregnant women. During the coronavirus disease 2019 (COVID-19) lockdown of the Danish society, pregnant women were considered to be at increased risk, and access to antenatal care changed.

METHODS: On 8 April 2020A, a questionnaire was sent to 332 pregnant women previously sampled by general practitioners in two Danish regions. The women were contacted via secured e-mail (e-Boks), and questionnaires were returned until 6 May.

RESULTS: The questionnaire was returned by 257 women (77%). More than half believed that they were at a high risk of infection with COVID-19, and a third of the women were concerned about the risk of serious disease – especially for their unborn child. Almost 90% isolated at home most of the time. The majority were worried about possible consequences of the pandemic for antenatal care, but very few had actually missed a scheduled preventive consultation with their general practitioner, and only 15% had missed an appointment with their midwife. The majority of the women preferred normal consultations and found no added safety in shifting the consultation from the normal clinical setting.

CONCLUSIONS: The COVID-19 pandemic and lockdown have had a major impact on Danish pregnant women. Even so, concerns were more focused on access to care than on the risk of COVID-19 infection. Contacts with the antenatal healthcare system have only been moderately affected.

FUNDING: TRYG Foundation and KEU, Region Copenhagen.

TRIAL REGISTRATION: not relevant.





DENMARK



Scandinavian Journal of Public Health, 2021; 49: 721–729

ORIGINAL ARTICLE

Depression and anxiety symptoms in pregnant women in Denmark during COVID-19

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Abstract

Aims: Maternal mental distress in pregnancy can be damaging to the mother's and child's physical and mental health. This study aimed to provide an insight into mental well-being of pregnant women in Denmark during COVID-19 by assessing symptoms of depression and anxiety. **Methods:** Data from two cohorts of pregnant women recruited from Danish general practice were compared. A COVID-19 lockdown cohort (N=330) completed questionnaires between 8 April and 6 May. Responses were compared to those from a control cohort of women from 2016 (N=1428). Mental well-being was measured with the Major Depression Inventory (MDI) and the Anxiety Symptom Scale (ASS). **Results:** Questionnaires were returned by 83% of the COVID-19 lockdown cohort and by 93% of the control cohort. Multivariable analysis controlling for age, cohabitation status, occupation, smoking, alcohol use, chronic disease, fertility treatment, parity and children living at home showed no difference in depressive symptoms (MDI). Anxiety symptoms (ASS) were slightly worse in the COVID-19 lockdown cohort (mean difference=1.4 points), mainly driven by questions concerning general anxiety. The largest differences in anxiety were seen in first trimester (adjusted mean difference=4.0 points). **Conclusions:** Pregnant women questioned during the COVID-19 pandemic showed no change in symptoms of depression and only a modest elevation of anxiety when compared to pregnant women questioned during a non-pandemic period in 2016.

Keywords: Anxiety, COVID-19 pandemic, depression, mental health, pregnancy, prenatal care

Mental health indicators in pregnant women compared with women in the general population during the coronavirus disease 2019 pandemic in Denmark

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Funding information

HSN received a grant from the Danish Ministry of Research and Education for research of COVID-19 among pregnant women: 0237-00007B. HSN received a Ferring COVID-19 Investigational Grant for salary (LFO). The data collection for the 'Standing Together at a Distance' was funded by the Velux Foundation: 36336.

Abstract

Introduction: The coronavirus disease 2019 (COVID-19) pandemic and the associated regulations issued to minimize risk of disease transmission seem to have had an impact on general mental health in most populations, but it may have affected pregnant women even more because of pregnancy-related uncertainties, limited access to healthcare resources, and lack of social support. We aimed to compare the mental health response among pregnant women with that in similarly aged women from the general population during the first wave of the COVID-19 pandemic.

Material and methods: From April 14 to July 3, 2020, 647 pregnant women in their second trimester were enrolled in this study. For comparison, 858 women from the general Danish population (20–46 years) were sampled from an ongoing observational study. Participants responded to a questionnaire including six mental health indicators (concern level, perceived social isolation, quality of life, anxiety, mental health, and loneliness). Loneliness was measured using the UCLA Three-item Loneliness Scale and anxiety by the Common Mental Health Disorder Questionnaire 4-item Anxiety Subscale.

Results: The pregnant women had better scores during the entire study period for all mental health indicators, and except for concerns, social isolation, and mental health, the differences were also statistically significant. Pregnant women were more concerned about becoming seriously ill (40.2% vs. 29.5%, $p < 0.001$), whereas the general population was more concerned about economic consequences and prospects. Many pregnant women reported negative feelings associated with being pregnant during the COVID-19 pandemic and concerns regarding social isolation and regulation-imposed partner absence during hospital appointments and childbirth. All mental health indicators improved as Denmark began to reopen after the first wave of the pandemic.

Abbreviations: COVID-19, coronavirus disease 2019; QoL, quality of life; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

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RESEARCH

Open Access



Concerns about transmission, changed services and place of birth in the early COVID-19 pandemic: a national survey among Danish pregnant women. The COVIDPregDK study

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Abstract

Background: The outbreak of the COVID-19 pandemic caused great uncertainty about causes, treatment and mortality of the new virus. Constant updates of recommendations and restrictions from national authorities may have caused great concern for pregnant women. Reports suggested an increased number of pregnant women choosing to give birth at home, some even unassisted ('freebirth') due to concerns of transmission in hospital or reduction in birthplace options. During April and May 2020, we aimed to investigate i) the level of concern about coronavirus transmission in Danish pregnant women, ii) the level of concern related to changes in maternity services due to the pandemic, and iii) implications for choice of place of birth.

Methods: We conducted a nationwide cross-sectional online survey study, inviting all registered pregnant women

Results: The response rate was 60% ($n = 17,995$). Concerns of transmission during pregnancy and birth were considerable; 63% worried about getting severely ill whilst pregnant, and 55% worried that virus would be transmitted to their child. Thirtyeight percent worried about contracting the virus at the hospital. The most predominant concern related to changes in maternity services during the pandemic was restrictions on partners' attendance at birth (81%). Especially nulliparous women were concerned about whether cancelled antenatal classes or fewer physical midwifery consultations would affect their ability to give birth or care for their child postpartum. The proportion of women who considered a home birth was equivalent to pre-pandemic home birth rates in Denmark (3%). During the temporary discontinuation of public home birth services, 18% of this group considered a home birth assisted by a private midwife ($n = 125$), and 6% considered a home birth with no midwifery assistance at all ($n = 41$).

Conclusion: Danish pregnant women's concerns about virus transmission to the unborn child and worries about contracting the virus during hospital appointments were considerable during the early pandemic. Home birth rates may not be affected by the pandemic, but restrictions in home birth services may impose decisions to freebirth for a small proportion of the population.

Keywords: COVID-19, Place of birth, Pregnancy, Pregnancy-related concerns, Survey study

ORIGINAL RESEARCH ARTICLE



Mental health status of pregnant and breastfeeding women during the COVID-19 pandemic—A multinational cross-sectional study

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Funding information

The research activities of Michael Ceulemans were supported by the Fund Maurange managed by the Royal Baudouin Foundation. Hedvig Nordeng is supported by a European Research Council Starting Grant DrugsInPregnancy (grant number 639377). Elin Ngo is supported by Dam Foundation.

Abbreviations: CI, confidence interval; COVID-19, coronavirus disease 2019; EDS, Edinburgh Depression Scale; GAD-7, Generalized Anxiety Disorder seven-item scale; OR, odds ratio; PSS, Perceived Stress Scale; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

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Norway (31% of all participants)



COVID-19 pandemic

through social media and hospital websites. The Edinburgh Depression Scale (EDS), the Generalized Anxiety Disorder seven-item scale (GAD-7), and the Perceived Stress Scale (PSS) were used to assess mental health status. Regression model analysis was used to identify factors associated with poor mental health status.

Results: In total, 9041 women participated (including 3907 pregnant and 5134 breastfeeding women). The prevalence of major depressive symptoms (EDS ≥ 13) was 15% in the pregnancy cohort and 13% the breastfeeding cohort. Moderate to severe generalized anxiety symptoms (GAD ≥ 10) were found among 11% and 10% of the pregnant and breastfeeding women. The mean (\pm SD) PSS scores for pregnant and breastfeeding women were 14.1 ± 6.6 and 13.7 ± 6.6 , respectively. Risk factors associated with poor mental health included having a chronic mental illness, a chronic somatic illness in the postpartum period, smoking, having an unplanned pregnancy, professional status, and living in the UK or Ireland.

Conclusions: This multinational study found high levels of depressive symptoms and generalized anxiety among pregnant and breastfeeding women during the COVID-19 outbreak. The study findings underline the importance of monitoring perinatal mental health during pandemics and other societal crises to safeguard maternal and infant mental health.

KEYWORDS

anxiety, breastfeeding, coronavirus, COVID-19, depression, pregnancy, SARS-CoV-2, stress

TABLE 2 Mental health status of pregnant and breastfeeding women during the COVID-19 pandemic

		Pregnant women			Breastfeeding women		
		N	%	Mean (SD)	N	%	Mean (SD)
EDS	General	3545	100.0	7.1 (5.1)	4542	100.0	7.4 (4.6)
	Score ≥ 10	1006	28.4	N/A	1287	28.3	N/A
	Score ≥ 13	533	15.0	N/A	592	13.1	N/A
	Country						
	United Kingdom (≥ 13)	48	42.1	N/A	33	42.3	N/A
	Ireland (≥ 13)	158	26.3	N/A	186	24.3	N/A
	Norway (≥ 13)	161	12.0	N/A	217	14.6	N/A
	The Netherlands (≥ 13)	115	11.5	N/A	113	9.1	N/A
	Switzerland (≥ 13)	51	10.5	N/A	102	10.4	N/A

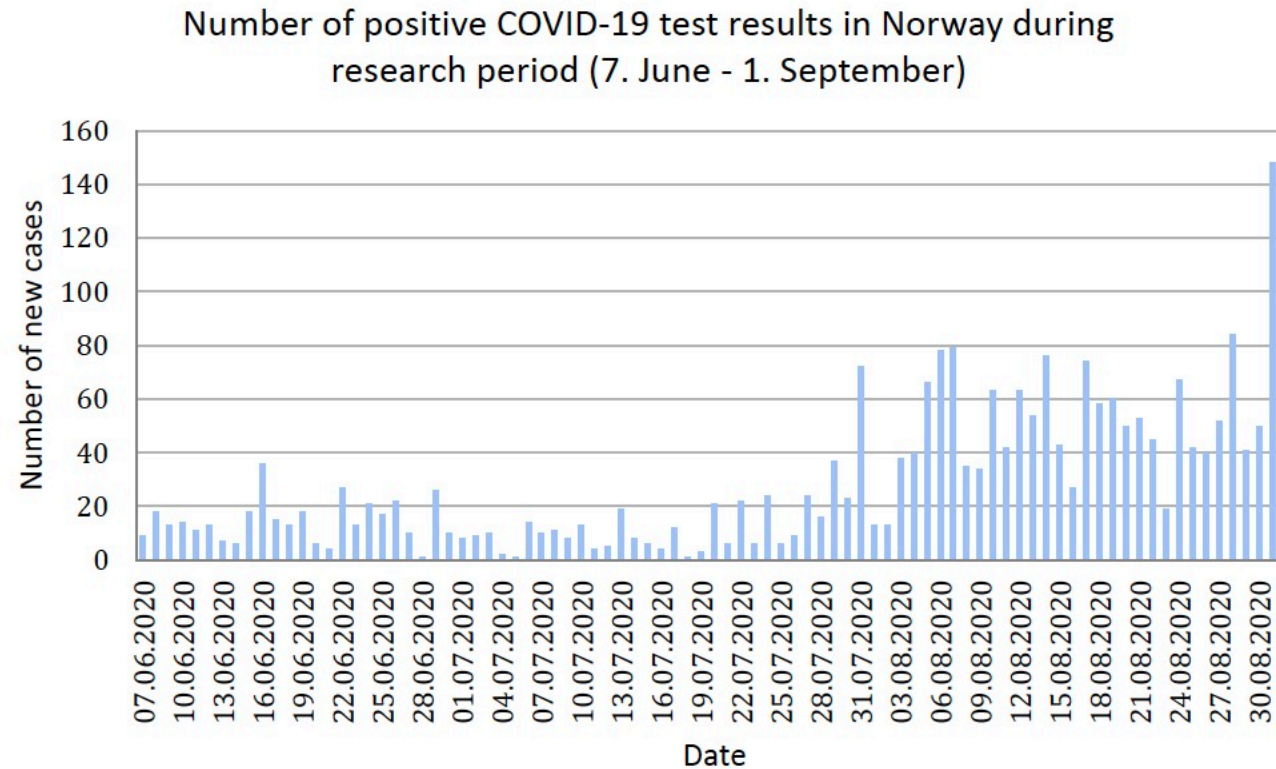
Impact of COVID-19 pandemic on maternal mental health: An observational study

- Karine Stiberg Birkelund, Student Med.
- Solrun Rassmusen, Student Med.
- Simone Schwank, Psychologist, Postdoctoral Fellow
- Ganesh Acharya, Obstetrician, Professor

Our hypotheses

- COVID-19 pandemic has a negative impact on perinatal mental health of women.
- Common risk factors (e.g., low income, lower educational level, low social support, and comorbidities) will be associated with an increased risk of anxiety/depression during the COVID-19 pandemic.
- Personality has effect on perinatal mental health status and personality may change due to a significant life event (pregnancy and childbirth) during the pandemic.

Study period



RESULTS (Participated = 796; Included in analysis = 774)

- During pandemic 14.3%(n=111) had EPDS ≥ 13 and 24.9% (n=193) had ≥ 10
Pre-pandemic EPDS ≥ 13 = 8.1 % and EPDS ≥ 10 =14.6% (Dørheim et al,2012 Nordeng et al,2012).
- 21.4 % (n=166) had GAD7 score ≥ 10
- 33 women had thoughts about self-harm
- Women worried more about their babies than themselves
- Tendency to isolate due to fear of infection
- Increased prevalence of anxiety/depression, especially among young women with low education and those working outside the healthcare sector.

EPDS & GAD7 Scores

Prenatal (blue) and Postnatal (red)

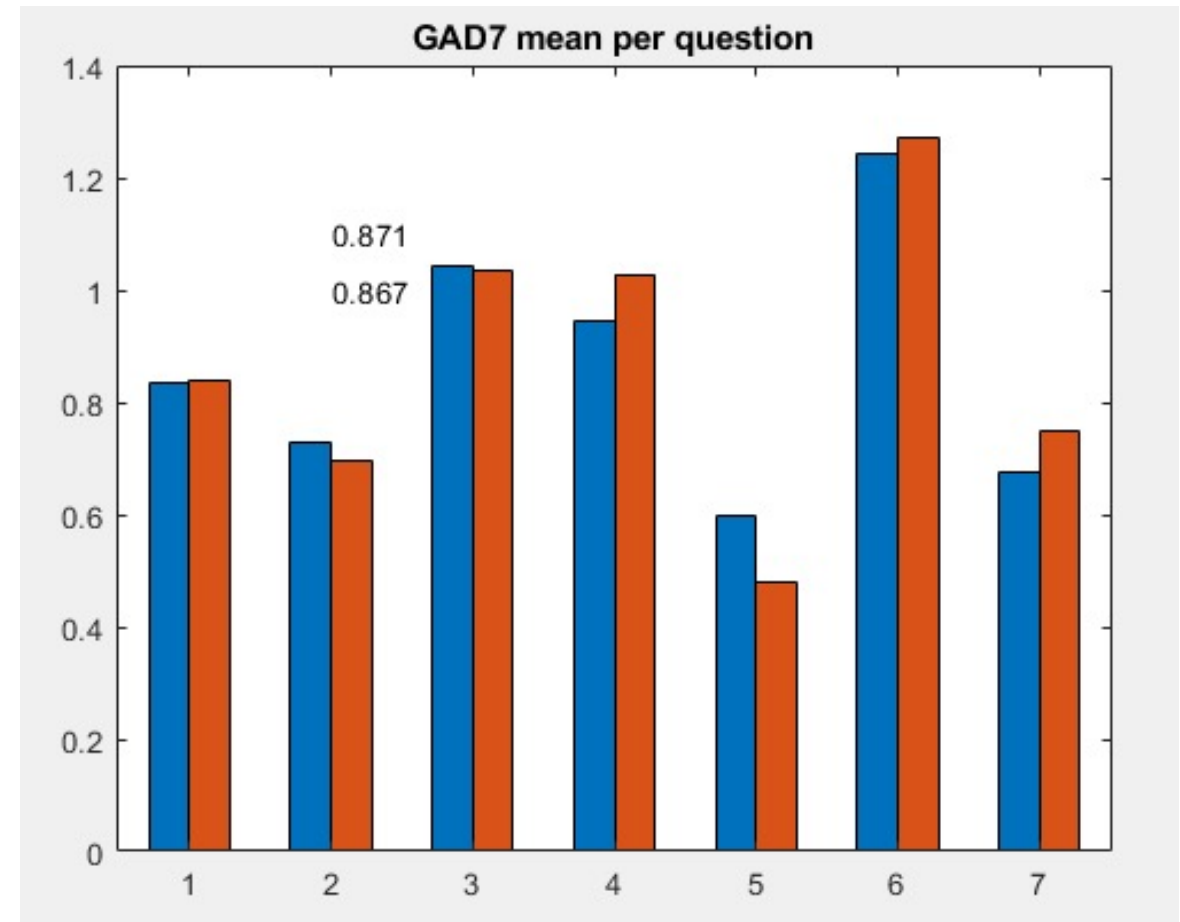
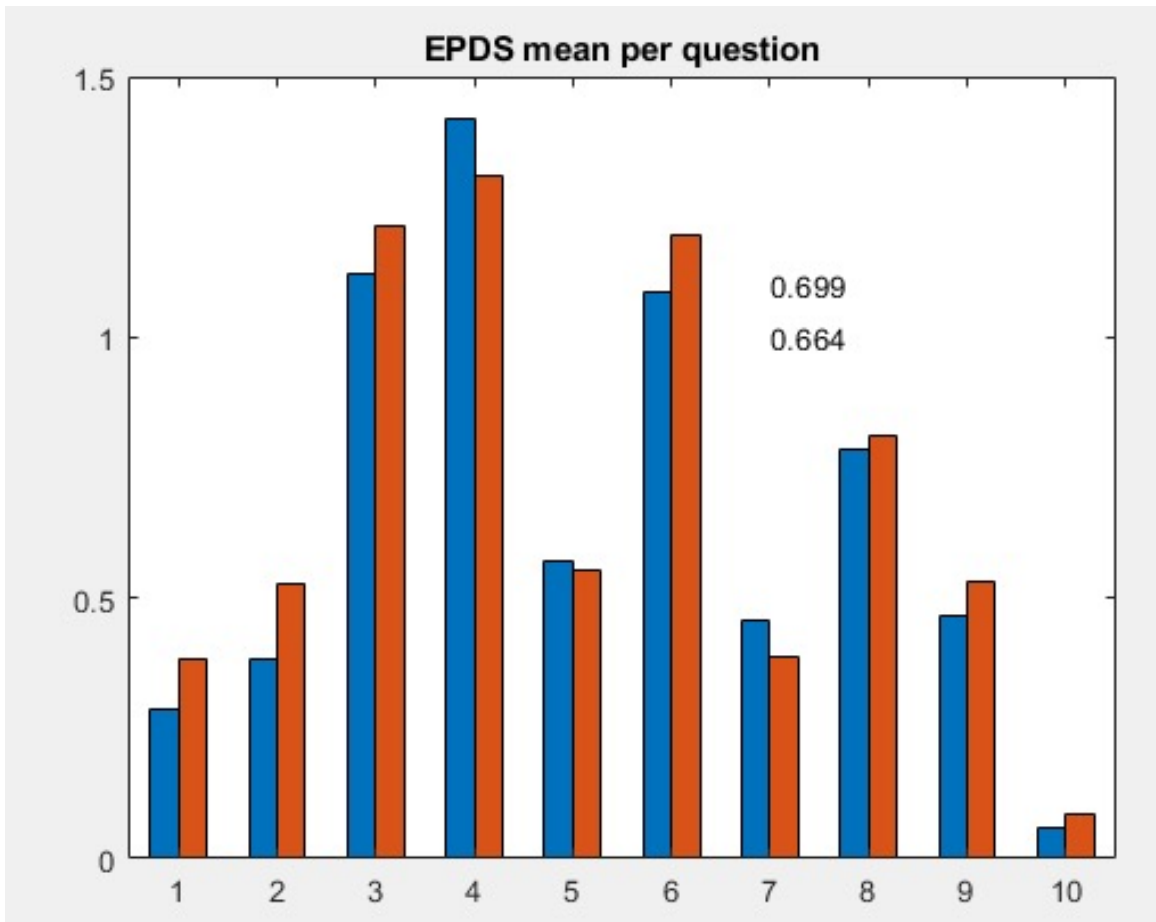


Table 3: Background characteristics of the study population (n=774)

Variable	Median (Range)
Age (years)	29 (19-44)
Week of pregnancy	26 (5-41)
	n (%)
Minority*	27 (3.5)
Marital status	
Married	220 (28.4)
Partner	532 (68.7)
Single	19 (2.5)
Other	3 (0.4)
Parity	
Nullipara	414 (53.5)
Multipara	360 (46.5)
Education	
Compulsory (1 st to 10 th grade)	17 (2.2)
High school**	216 (27.9)
University	524 (67.7)
Other	17 (2.2)
Healthcare workers	274 (35.4)
Negative economic consequences due to COVID-19	
Yes, for me	89 (11.5)
Yes, for partner	96 (12.4)
Yes, for both	59 (7.6)
No	530 (68.5)

*4 missing values

**Including Vocational education and training

Table 5: Comparison of EPDS and GAD-7 groups according to background characteristics of study participants (n=774)

Variables	EPDS<13 (n=663)	EPDS≥13 (n=111)		GAD7<10 (n=608)	GAD7≥10 (n=166)	
	n (%)	n (%)	p-value	n (%)	n (%)	p-value
Age (years)						
Under 25	72 (10.9)	22 (19.8)	0.007	58 (9.5)	36 (21.7)	<0.001
25 to 29	264 (39.8)	40 (36)	0.424	242 (39.8)	62 (37.3)	0.569
30 to 34	231 (34.8)	34 (30.6)	0.368	215 (35.4)	50 (30.1)	0.201
35 or older	96 (14.5)	15 (13.5)	0.764	93 (15.3)	18 (10.8)	0.147
Minority*						
Yes	22 (3.3)	5 (4.5)	0.575	16 (2.6)	11 (6.7)	0.013
No	637 (96.7)	106 (95.5)	0.575	589 (97.4)	154 (93.3)	0.013
Marital status**						
Married	183 (27.7)	37 (33.3)	0.230	176 (29.1)	44 (26.5)	0.516
Partner	462 (70)	70 (63.1)	0.134	418 (69.1)	114 (68.7)	0.920
Single	15 (2.3)	4 (3.6)	0.424	11 (1.8)	8 (4.8)	0.027
Parity						
Nullipara	355 (53.5)	59 (53.2)	0.939	311 (51.2)	103 (62)	0.013
Multipara	308 (46.5)	52 (46.8)	0.939	297 (48.8)	63 (38)	0.013
Education						
University	453 (68.3)	71 (64)	0.368	431 (70.9)	93 (56)	<0.001
Other	210 (31.7)	40 (36)	0.368	177 (29.1)	73 (44)	<0.001
Health care worker						
Yes	242 (36.5)	32 (28.8)	0.110	231 (38)	43 (25.9)	0.004
No	421 (63.5)	79 (71.7)	0.110	377 (62)	123 (74.1)	0.004
Negative economic consequences						
Yes, for me	70 (10.6)	19 (17.1)	0.046	56 (9.2)	33 (19.9)	<0.001
Yes, for partner	82 (12.4)	14 (12.6)	0.920	77 (12.7)	19 (11.4)	0.675
Yes, for both	41 (6.2)	18 (16.2)	<0.001	36 (5.9)	23 (13.9)	0.001
None	470 (70.9)	60 (54.1)	0.001	439 (72.2)	91 (54.8)	<0.001

The percentages shown are within EPDS and GAD-7 categories

The significant p-values are shown in bold

* Results shown from Fisher exact test and the minority variable has 4 missing values

** Other (n=3; 0.5%) is excluded from the analysis

Comparison

Ceulemans M, et al. Mental health status of pregnant and breastfeeding women during the COVID-19 pandemic-A multinational cross-sectional study. Acta Obstet Gynecol Scand. 2021 Jul;100(7):1219-29.

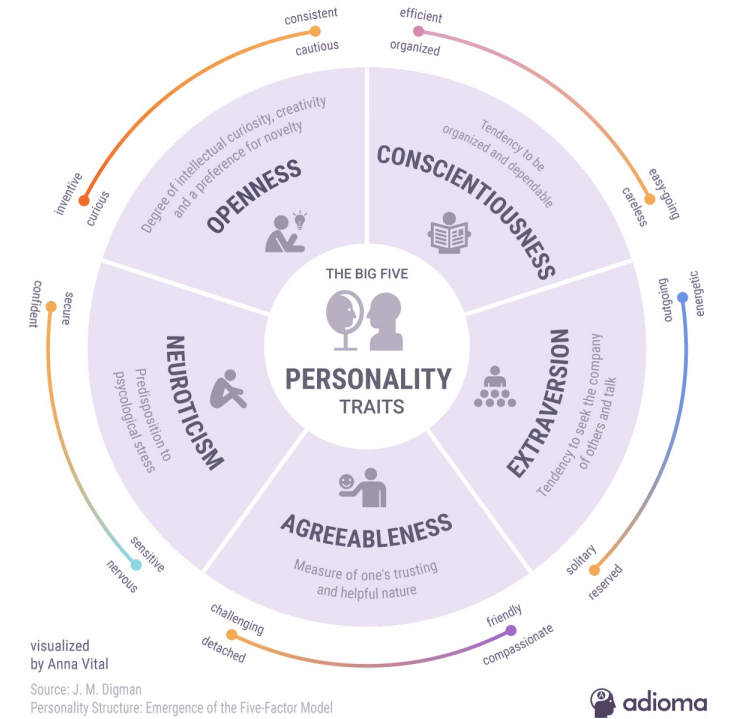
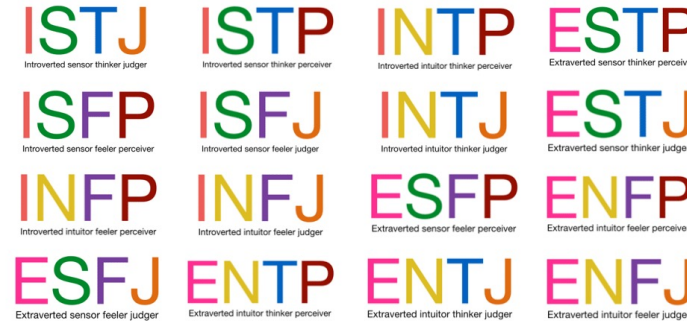
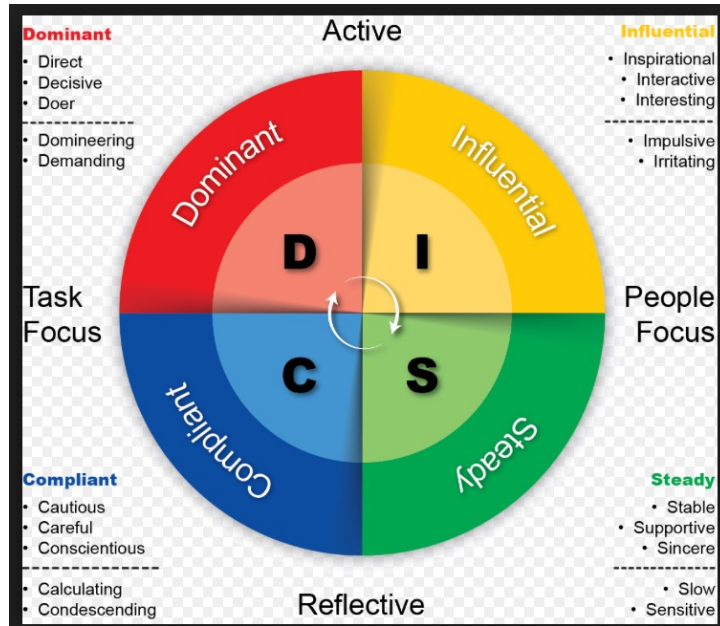
9041 women participated in a multinational survey (3907 pregnant and 5134 breastfeeding women). Norway (31%) and the Netherlands (29%), Switzerland (19%), Ireland (18%), and the UK (3%)

12 % of women had EPDS ≥ 13 and GAD7 ≥ 10 in prenataally and 11% postnatally (breast feeding women)



We performed a survey study in Sweden between May 2020 to February 2021 (Chung Ho-Fung, Ewa Andesson, Huan Hsuan-Ying, Ganesh Acharya and Simone E. Schwank)

Among a total of 522 participants, 42.5% (n=222) reported depression (EPDS ≥ 13), 25.3% (n=132) moderate to severe anxiety (GAD-7 score ≥ 10), and 23.4% (n=122) moderate to severe acute stress reaction (IES-R ≥ 33).



Does personality play a role?

Personality trait and its association with anxiety/depression

From the perspective of the Big Five model, there is evidence that neuroticism is positively associated with generalized anxiety disorder (Bienvenu et al., 2001), whilst extroversion is associated negatively to anxiety disorders (Gomez & Francis, 2003). Openness and conscientiousness negatively associate with obsessive–compulsive disorder, and agreeableness also associates negatively with post-traumatic stress disorder (Chung, Berger, Jones, & Rudd, 2006).

Among the studies specific to PPD, neuroticism is the trait that associates positively most often, along with introversion (Jones et al., 2010; Saisto et al., 2001; Verkerk, Denollet, Van Heck, Van Son, & Pop, 2005).

Swedish study on personality traits and postpartum depression

Swedish Universities Scale of Personality and EPDS was used

Non-depressed pregnant women with high neuroticism had 4-fold increased risk of postpartum depression.

Somatic trait anxiety and psychic trait anxiety were associated with 2-fold increased risk of depression 6 months postpartum.

Studies during COVID-19 pandemic are lacking.

Arch Womens Ment Health (2015) 18:539–546
DOI 10.1007/s00737-014-0478-8

ORIGINAL ARTICLE

Personality and risk for postpartum depressive symptoms

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Received: 14 June 2014 / Accepted: 18 October 2014 / Published online: 6 November 2014
© Springer-Verlag Wien 2014

Abstract Postpartum depression (PPD) is a common childbirth complication, affecting 10–15 % of newly delivered mothers. This study aims to assess the association between personality factors and PPD. All pregnant women during the period September 2009 to September 2010, undergoing a routine ultrasound at Uppsala University Hospital, were invited to participate in the BASIC study, a prospective study designed to investigate maternal well-being. Depressive symptoms were assessed with the Edinburgh Postnatal Depression Scale (EPDS) while the Depression Self-Rating Scale (DSRS) was used as a diagnostic tool for major depression. Personality traits were evaluated using the Swedish Universities Scale of Personality (SSP). One thousand thirty-seven non-depressed pregnant women were included in the study. Non-depressed women reporting high levels of neuroticism in late pregnancy were at high risk of developing postpartum depressive symptoms (PPDSs) at 6 weeks and 6 months after delivery, even after adjustment for confounders (adjusted odds ratio (aOR)=3.4, 95 % confidence interval (CI) 1.8–6.5 and adjusted odds ratio (aOR)=3.9, 95 % CI 1.9–7.9). The same was true for a DSRS-based diagnosis of major depression at 6 months postpartum. Somatic trait anxiety and psychic trait anxiety were associated with increased risk for PPDS at 6 weeks (aOR=2.1, 95 % CI 1.2–3.5 and aOR=1.9, 95 % CI 1.1–3.1), while high scores of mistrust were associated with a twofold increased risk for PPDS at 6 months postpartum (aOR 1.9, 95 % CI 1.1–3.4). Non-depressed

pregnant women with high neuroticism scores have an almost fourfold increased risk to develop depressive symptoms postpartum, and the association remains robust even after controlling for most known confounders. Clinically, this could be of importance for health care professionals working with pregnant and newly delivered women.

Keywords Personality · Neuroticism · Mistrust · Trait anxiety · Postpartum depression

Introduction

Postpartum depression (PPD) is defined as a major depressive episode with onset within 4 weeks after delivery (American Psychiatric Association 2000). However, this diagnostic window for PPD is considered too restrictive and it is generally extended in order to include the first 6 to 12 months postpartum (American Psychiatric Association 2013). The prevalence of PPD is consistently reported to vary around 10–15 % in most developed countries (Gaynes et al. 2005). Several major antenatal risk factors for the development of PPD have been identified, including previous history of depression, low social support, anxiety, depression, and stressful life events during pregnancy, history of premenstrual symptoms, and thyroid dysfunction (Gaynes et al. 2005; Robertson et al. 2004; Sylén et al. 2012, 2013). Despite the high prevalence of depression during the puerperium, it remains an underdiagnosed condition that can have a negative impact on the mother-infant attachment as well as the relationship between the mother and her partner (Beck 1995).

Several studies have established an association between personality factors and risk for depression in non-pregnant subjects. More specifically, neuroticism appears to be strongly associated with lifetime risk for major depression in adults (Berlanga et al. 1999; Enns and Cox 1997; Gershuny and Sher

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Personality traits and coping behavior during the COVID-19 pandemic: No studies among pregnant

Personality and Individual Differences 168 (2021) 110398

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

ELSEVIER

The influence of demographics and personality on COVID-19 coping in young adults

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ARTICLE INFO

Keywords:
COVID-19
Demographics
Personality
HEXACO
Coping

ABSTRACT

The global COVID-19 pandemic has had an unprecedented effect on human behavior and well-being. Demographic factors and personality traits have been shown to independently influence whether individuals adopt adaptive or maladaptive coping responses. However, to date, researchers have not considered how demographics and personality could interact to influence COVID-19 coping responses. In a sample of 516 North American young adults, we found direct links from two demographic factors (i.e., income and having children) and from multiple personality traits (as captured by the HEXACO model) to adaptive and maladaptive COVID-19 coping responses. We also found that personality indirectly linked a broader range of demographic factors (income, age, gender, having children) with COVID-19 coping responses. We encourage future research on COVID-19 coping responses to consider not just the individual contributions of demographics and personality, but their interdependent influence on whether individuals adopt more or less adaptive COVID-19 pandemic coping responses.

839

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British Journal of Health Psychology (2020), 25, 839–848
© 2020 The Authors. British Journal of Health Psychology published by John Wiley & Sons Ltd
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Brief report

Coronavirus (COVID-19) in the United Kingdom: A personality-based perspective on concerns and intention to self-isolate

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¹School of Psychology, University of Plymouth, UK
²Department of Psychology, City, University of London, UK

Objectives. Public behaviour change is necessary to contain the spread of coronavirus (COVID-19). Based on the reinforcement sensitivity theory (RST) framework, this study presents an examination of individual differences in some relevant psychological factors.

Design. Cross-sectional psychometric.

Methods. UK respondents ($N = 202$) completed a personality questionnaire (RST-PQ), measures of illness attitudes, concerns about the impact of coronavirus on health services and socio-economic infrastructures, personal safety, and likelihood of voluntary self-isolation.

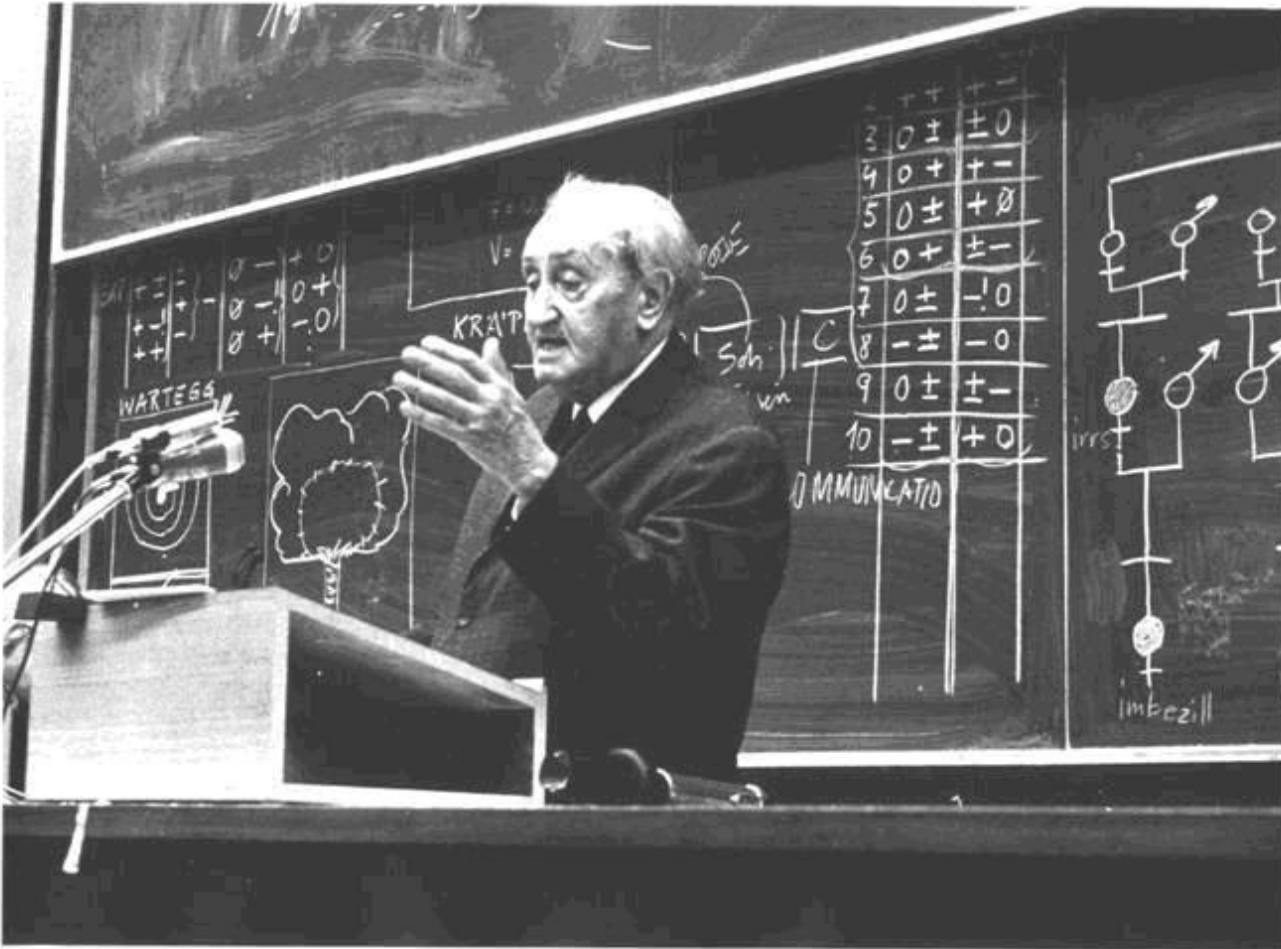
Results. Respondents most concerned were older, had negative illness attitudes, and scored higher on reward reactivity (RR), indicating the motivation to take positive approach action despite prevailing worry/anxiety. Personal safety concerns were highest in those with negative illness attitudes and higher fight-flight-freeze system (FFFS, reflecting fear/avoidance) scores. Results suggest people are experiencing psychological conflict: between the urge to stay safe (FFFS-related) and the desire to maintain a normal, pleasurable (RR-related) life. Ways of ameliorating conflict may include maladaptive behaviours (panic buying), reflecting reward-related displacement activity. Intended self-isolation related to FFFS, but also low behavioural inhibition system (related to anxiety) scores. Older people reported themselves less likely to self-isolate.

Conclusions. Interventions need to consider individual differences in psychological factors in behaviour change, and we discuss relevant literature to inform policy makers and communicators.

- Personal safety concerns are related to fight-flight-freeze system traits (FFFS, reflecting fear/avoidance).
- Intended self-isolation related to FFFS, but also low behavioural inhibition system (related to anxiety) scores.

Choice of method:

Leopold Szondi (1893 – 1986)



THE SEXUAL DRIVE

- h** Hermaphroditism (bisexuality/homosexuality)
- s** Sadism (Forceful control of others)

THE PAROXYSMAL DRIVE

- e** Epilepsy (strong emotional discharge)
- hy** Hysteria (movement storm)

THE EGO DRIVE

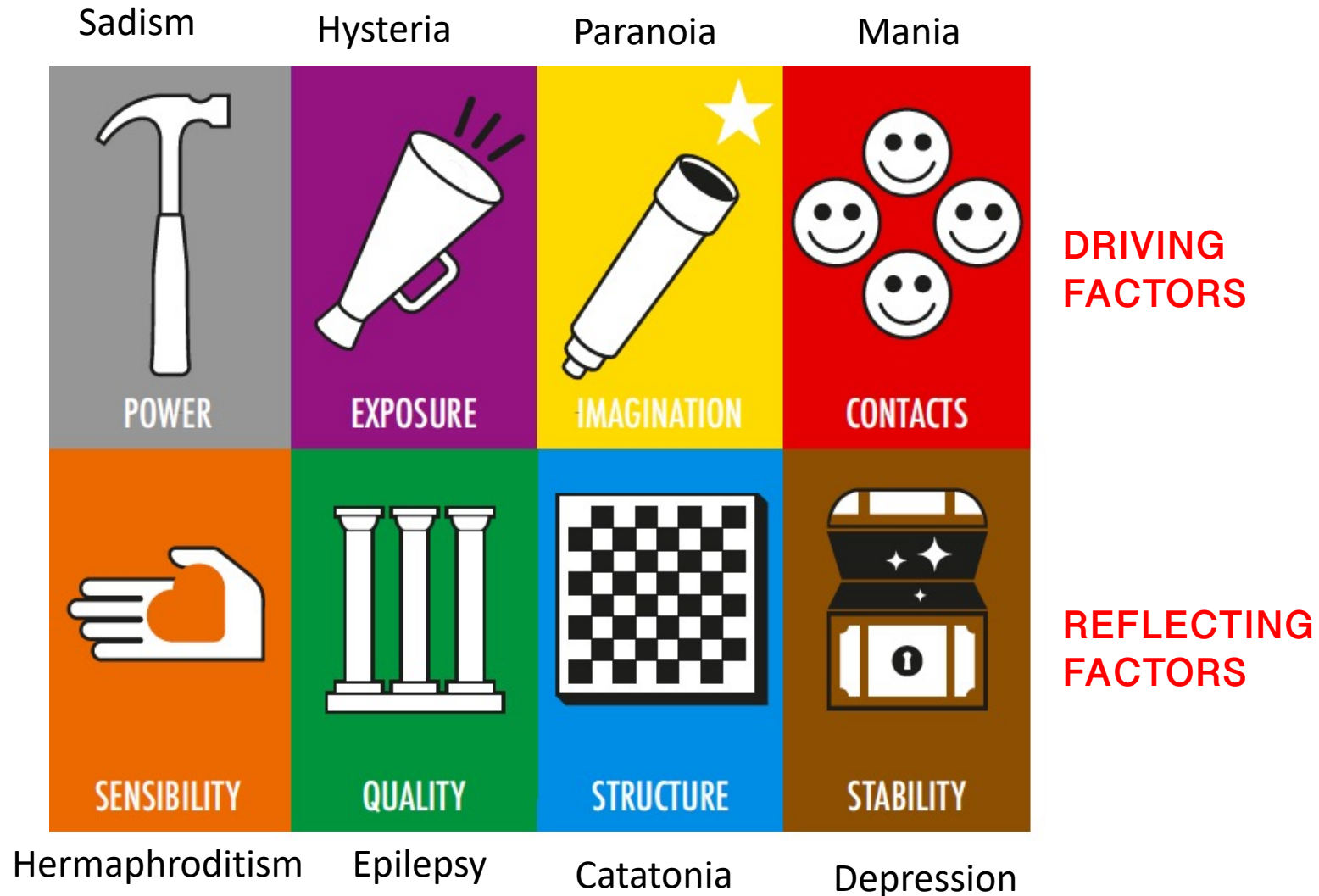
- k** Catatonia (self-withdrawal)
- p** Paranoia (loss of contact with reality)

THE CONTACT DRIVE

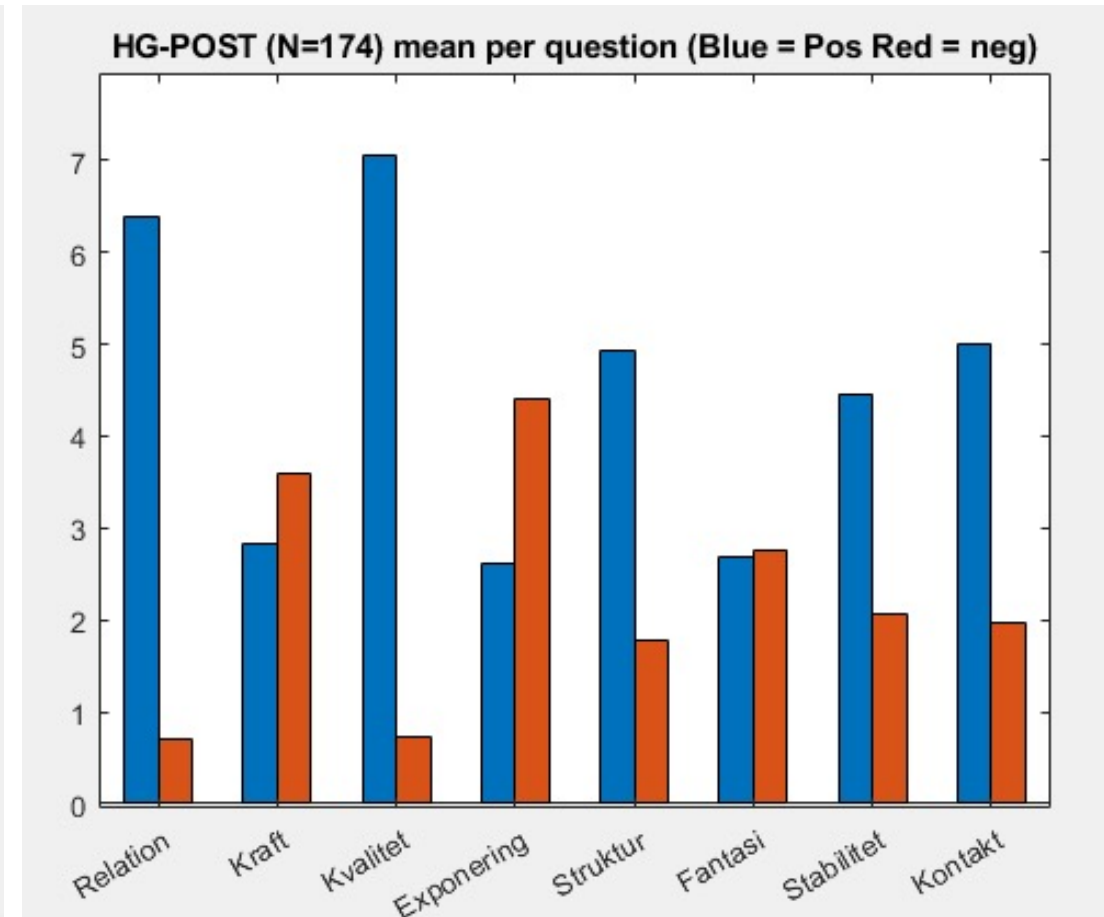
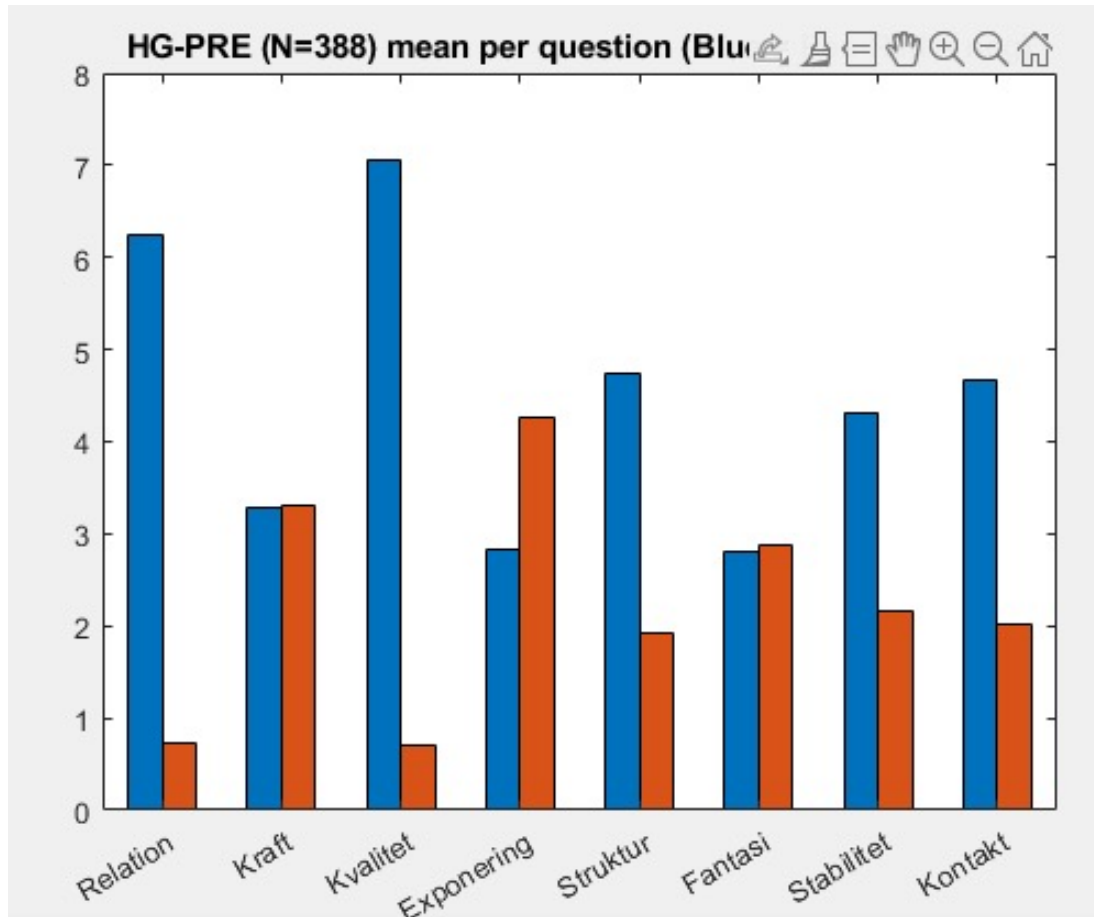
- d** Depression (reduced psychic energy)
- m** Mania (a lot of psychic energy)

HumanGuide Test based on Szondi Theory

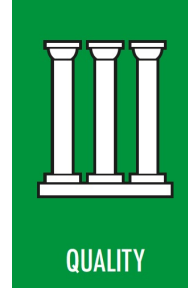
The test was provided by Rolf Kenmo



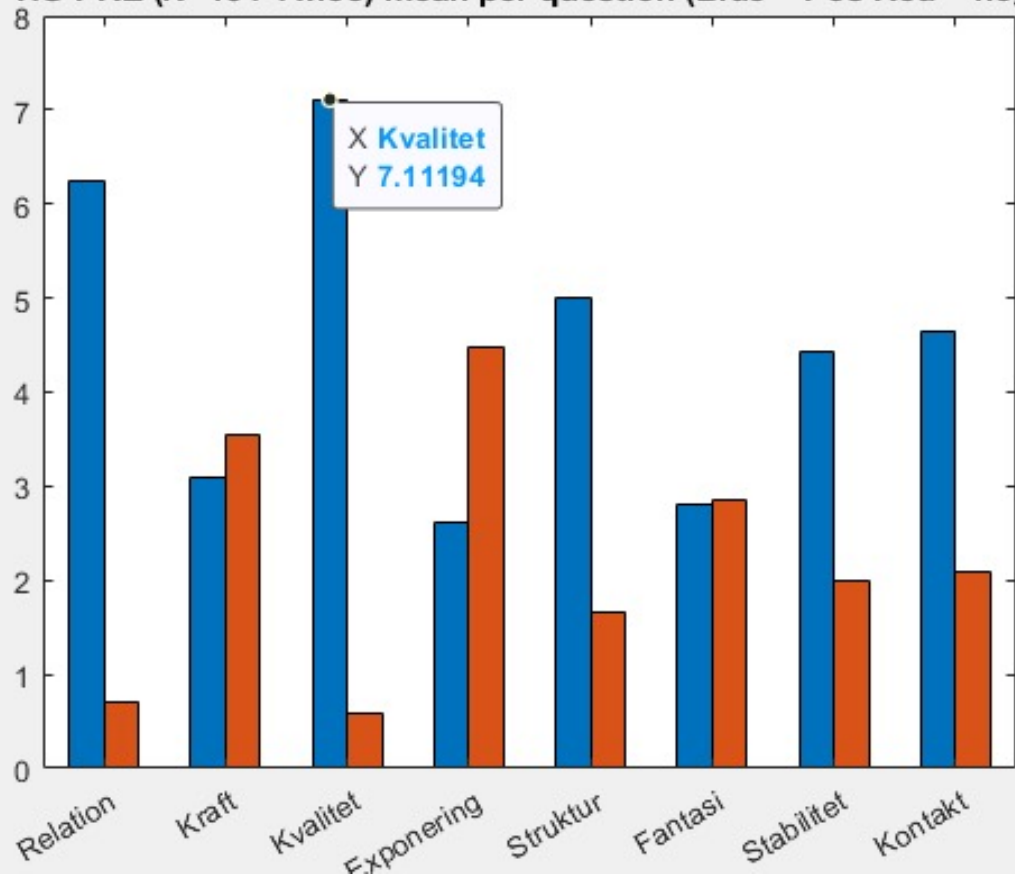
Personality test done pre- or postnatally



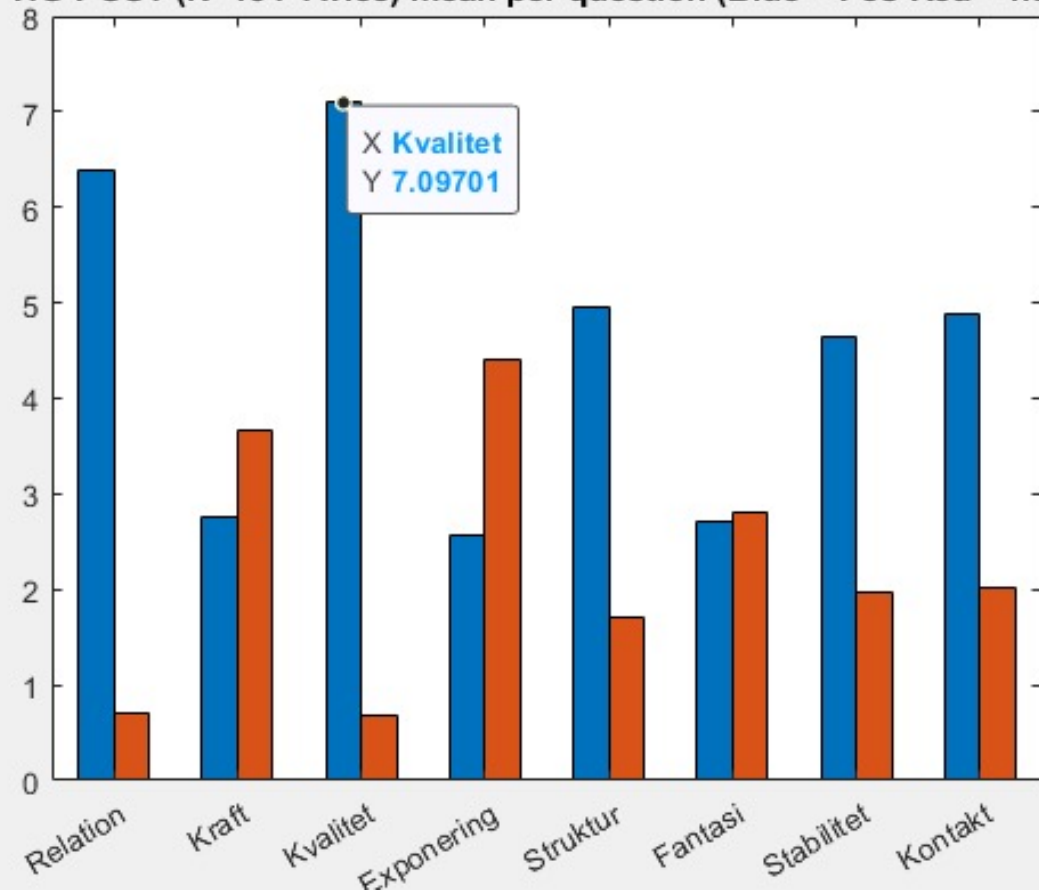
Average woman working in healthcare



HG-PRE (N=134-Twice) mean per question (Blue = Pos Red = neg)

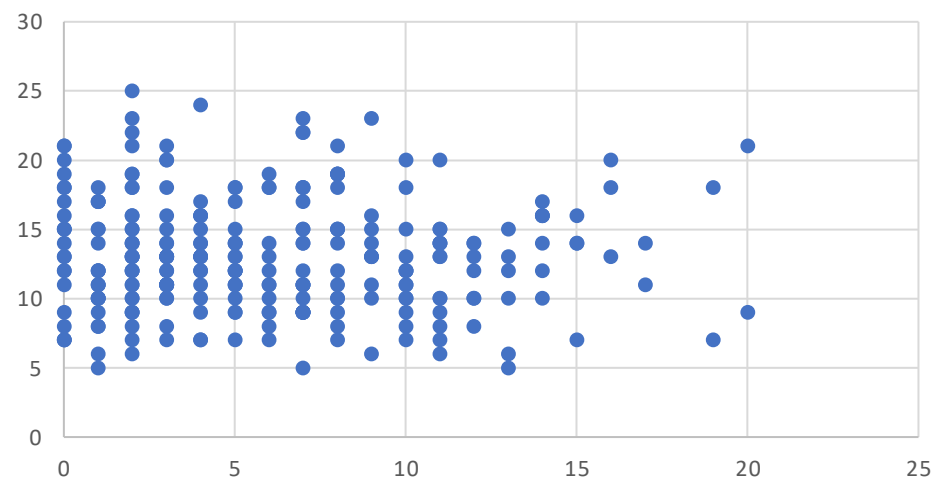


HG-POST (N=134-Twice) mean per question (Blue = Pos Red = neg)

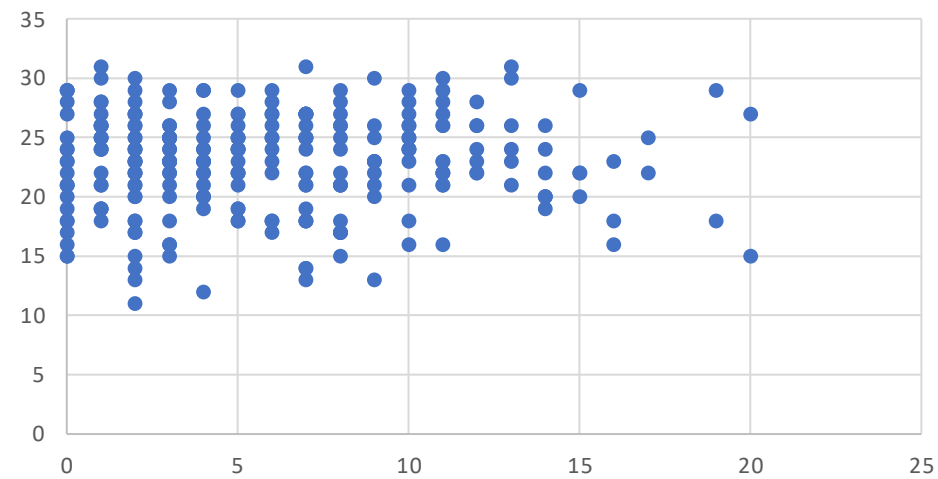


EPDS

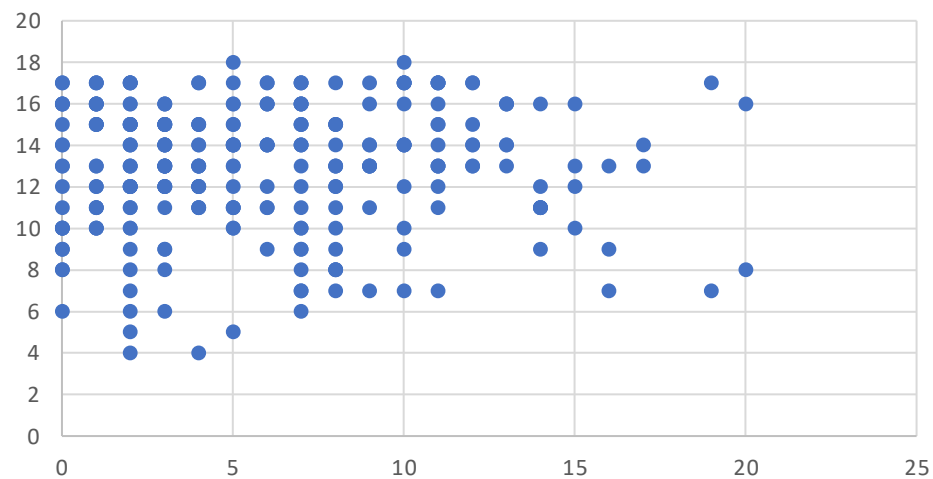
SUM_POS_DRIVE



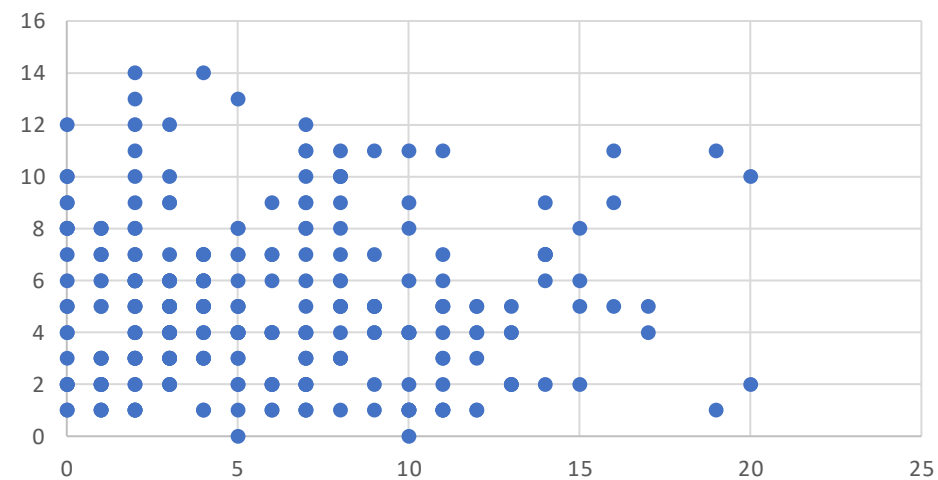
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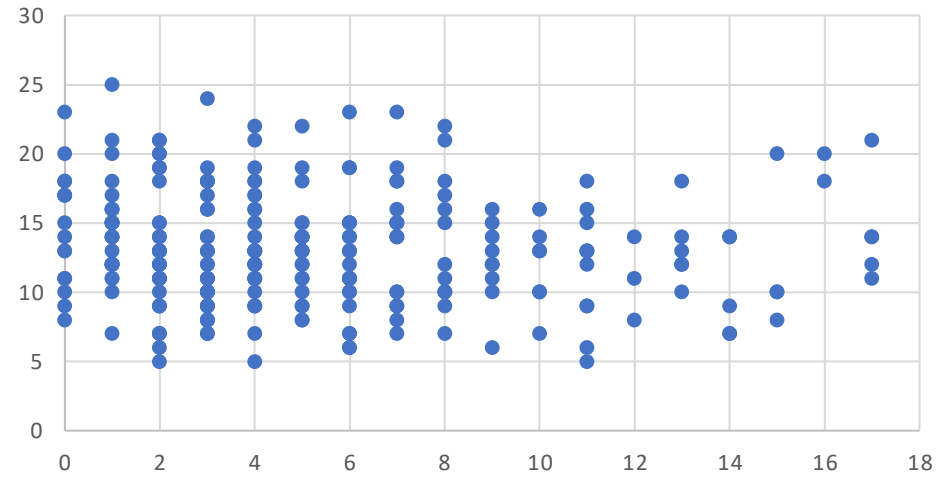


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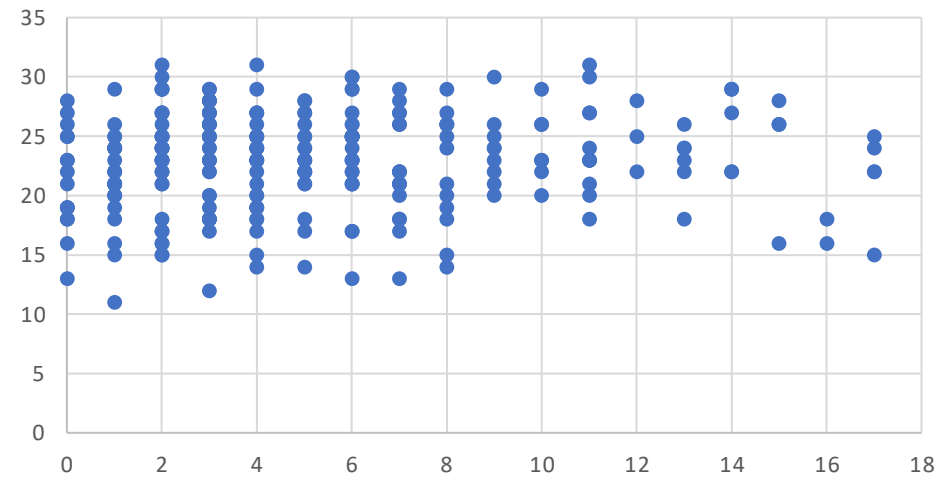


GAD7

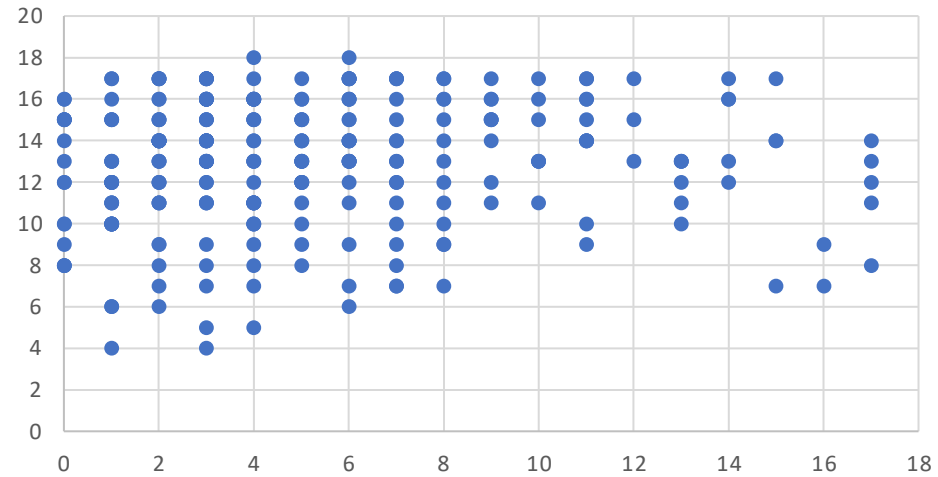
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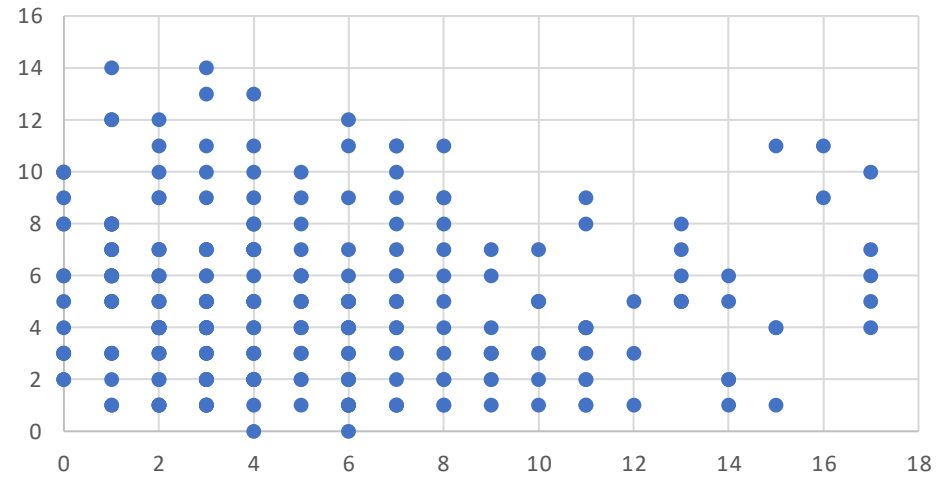
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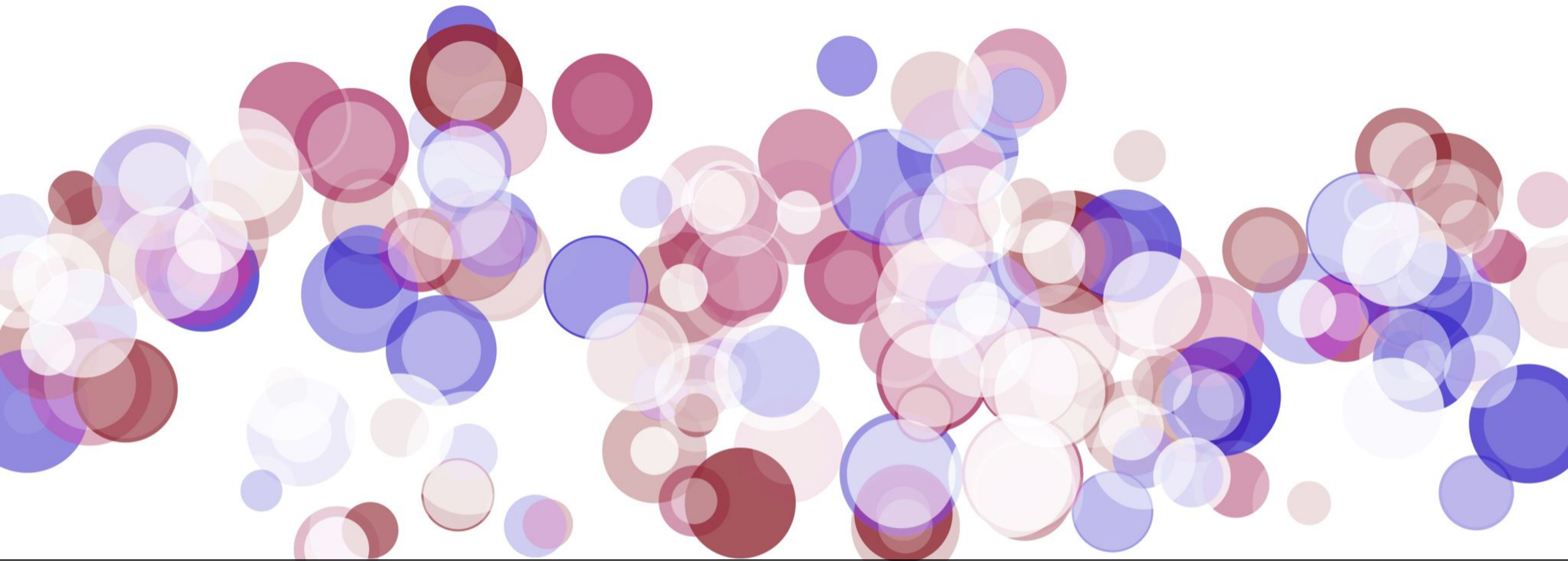


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What next?



Recognize the risk and protective factors

Risk factors for PNMDs	
PNMDs	Risk factors
AND	Previous PPD and nonperinatal depression ⁷⁵⁻⁷⁷ Recent adverse life events ^{27,76,77,101,102,105,107,235-241} Low socioeconomic status ^{15,27,76,77,90,101,102,105,107,108,110-112,235-241} Insufficient emotional/social support ^{26,105} Unplanned pregnancy ^{76,77,79} Unfavorable obstetric/pregnancy outcomes ²⁴²⁻²⁴⁴ Chronic physical illness ²⁴⁵ Previous miscarriages ²⁴⁶ Domestic violence ⁹⁵
PPD	Past history of psychiatric disorders ^{8,85,86} Depression/anxiety during current pregnancy ^{87,88} Maternity blues ²⁴⁷ Biological factors (genetic, hormonal, others) ⁹⁰⁻⁹⁴ Recent adverse life events ^{27,76,77,101,102,105,107,235-241} Low socioeconomic status ^{15,27,76,77,90,101,102,105,107,108,110-112,235-241} Insufficient emotional/social support ^{15,113,101,102,105,107,235-240} Poor marital relationship ^{101,102,105,107,235-240} Unplanned pregnancy ^{15,113} Immigration/premigration stress ^{248,249} Personality traits ^{90,101,102} Unfavorable obstetric/pregnancy outcomes ^{8,83,105} Unfavorable neonatal outcomes ^{250,251} Chronic/current physical illnesses ^{113,252} History of PMS ^{89,90} and PMDD ^{91,92} History of physical/sexual abuse ^{93,94,253,254} Multiple births ^{255,256} Domestic violence ^{15,95-100} Childcare stress/infant temperament ^{90,101,102}
PPs	Previous episodes of PPs ¹¹⁴ Personal history of psychotic disorders and BPAD ¹¹⁴ Family history of PPs and BPAD ¹¹⁴ Insufficient emotional/social support ¹¹⁵⁻¹¹⁷ Sleep disturbance ¹¹⁹
PNADs	Personal history of ADs ^{120,121} Insufficient emotional/social support ^{120,121} Previous miscarriages ¹⁴⁶ History of physical/sexual abuse ^{120,121} Multiple births ^{21,255,256} Unfavorable pregnancy ^{243,244} /neonatal ²⁵⁰ outcomes ²⁴⁷ Maternity blues ²⁴⁷
PTSD	Unfavorable obstetric/pregnancy and neonatal outcomes ^{123,124,251} Perinatal death ^{123,124}

AD, anxiety disorders; AND, antenatal depression; BPAD, bipolar affective disorder; NICU, neonatal intensive care unit; PMS, premenstrual syndrome; PMDD, premenstrual dysphoric disorder; PNAD, perinatal anxiety disorders; PNMD, perinatal mental disorders; PPs, puerperal psychosis; PPD, postpartum depression; PTSD, posttraumatic stress disorder.

Puschetta. *Perinatal Mental Health*. Am J Obstet Gynecol 2014.

“For antenatal common mental disorders include those with a history of depression, domestic violence, financial difficulties, spouse substance abuse and lack of social support”.

Lydsdottir LB, Howard LM, Olafsdottir H, Einarsson H, Steingrimsdottir T, Sigurdsson JF. Adverse life experiences and common mental health problems in pregnancy: a causal pathway analysis. Arch Womens Ment Health. 2019 Feb;22(1):75-83. doi: 10.1007/s00737-018-0881-7.

Risk factors of anxiety/depression during the pandemic

Table 3. Risk factors of depression and/or anxiety symptoms.

Perinatal care	Uncertainty and concerns about perinatal care [26,35] Alterations to prenatal appointments [53,54,57] Discomfort with hospital and ambulatory visits [34]
Social factors	Social isolation [26] Lack of social support [31,35,42] Being single [36,42] Partner's absence at delivery [31] Tension/ conflict at home [26,53]
Demographic	Being a woman of color [36,54] Being an Arab woman [48] Education level (high—[49], low—[34,53]) Younger age [36,42]
Financial	Low income, financial difficulties [25,42] COVID-19-related financial stress and income loss [45,54] Unemployment [34,42]
Factors concerning COVID-19	Stress of getting infected with COVID-19 [26,35,42,48,52,53] Suffering subjective symptoms of suspected infection [46] Perceived risk of having had COVID-19 [54] Having infected friends/families/colleagues [57] Self or family member being an essential worker [53] Living in a location with a large number of COVID-19 cases [46,53]
Health state	High-risk pregnancy [48,52,54] Chronic illness [54] Previous psychiatric diagnosis [25,31] Previous adverse experiences during pregnancy [57]
Insufficient information	No information about the effects of COVID-19 [34] Inconsistent messaging from information sources [35]

PROTECTIVE FACTORS against perinatal anxiety/depression during the COVID-19 Pandemic

Table 4. Protective factors.

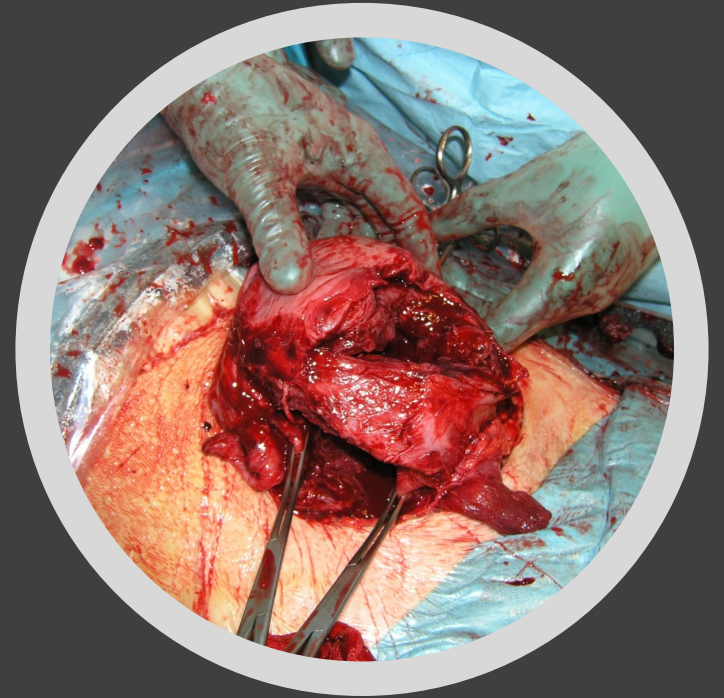
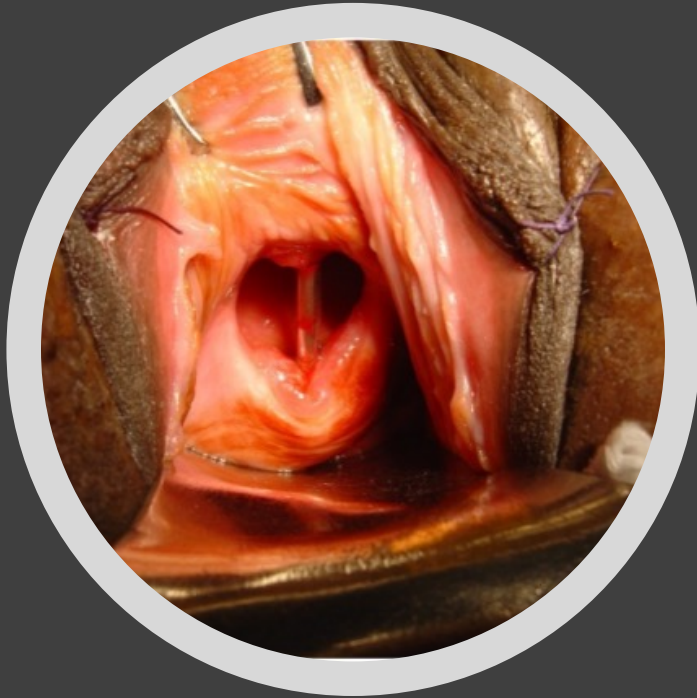
Social	Social support [26,47,48] Partner emotional support [35] Low hostility level in close relationships [36] Use of virtual communication platforms [35]
COVID-related information	Information from healthcare workers and televised pandemic-related information [37] More knowledge about COVID-19 [46] Rational perception of COVID-related risk [46,47]
Activity	Physical activity [26,34] Access to outdoor space [35,54] Engagement in various healthy behaviors [35,54]
Personal	More self-reliance [36] Better emotion regulation [36] Positive attitudes towards online medical consultation [46]

Review

Perinatal Mental Health during COVID-19 Pandemic: An Integrative Review and Implications for Clinical Practice

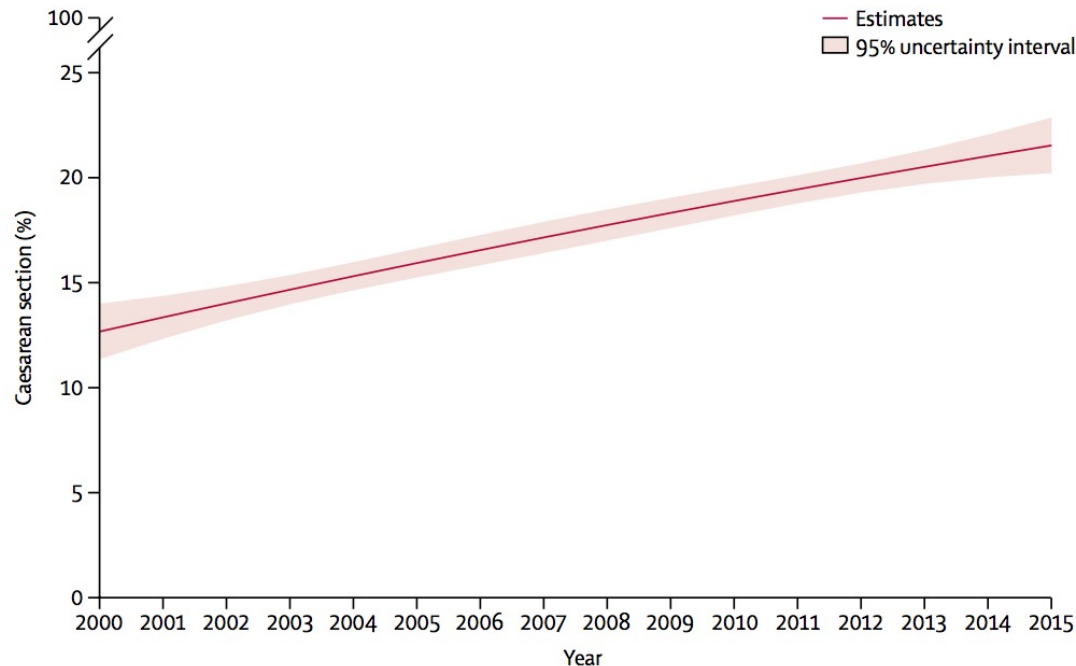
Julia Suwalska ^{1,*}, Maria Napierała ², Paweł Bogdański ¹, Dorota Łojko ², Katarzyna Wszolek ³,
Sara Suchowiak ² and Aleksandra Suwalska ²

J. Clin. Med. **2021**, *10*, 2406



Risk of perinatal mental health disorders among women with comorbidities is important to consider

Rise of cesarean section rates globally is obvious (see graph below), but only 3 percent of women elect to have CS because they are afraid of vaginal birth



- Nordic data show an increase in CS rate during the pandemic (41.7 vs 17.3%, $p < 0.001$) compared to 2018
- Risk of admission rates due to COVID-19 was low 0.4/1000 deliveries)
- 21.4% (12/56) needed ICU

Engjom H, Aabakke AJM, Klungsøyr K, et al. COVID-19 in pregnancy-characteristics and outcomes of pregnant women admitted to hospital because of SARS-CoV-2 infection in the Nordic countries. *Acta Obstet Gynecol Scand*. 2021;100(9):1611-1619.

How can we help our patients?



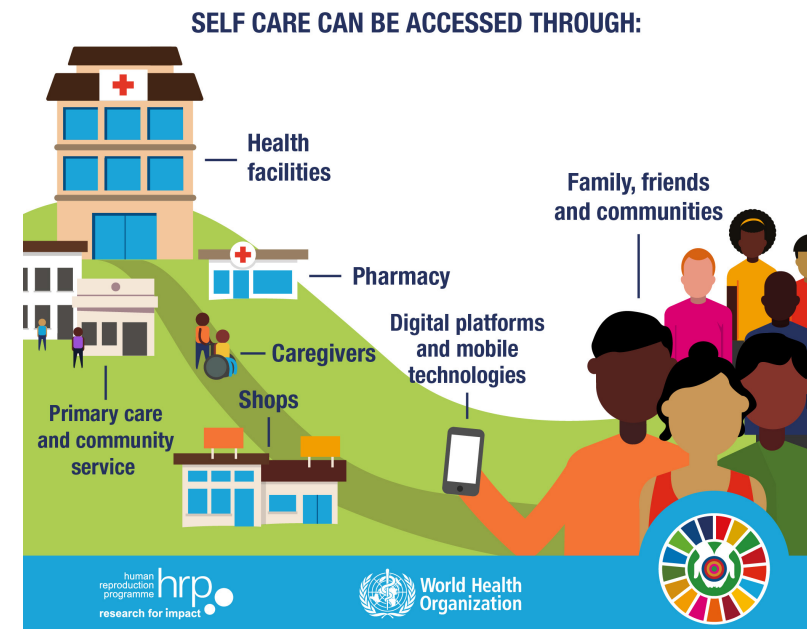
Provide support and manage them with empathy & care

PROMOTE SELF-CARE & DIGITAL SERVICES

SELF CARE IS A NEW APPROACH TO PRIMARY HEALTH CARE



ACCESS TO SELF-CARE INTERVENTIONS IMPROVE PEOPLE'S AUTONOMY



Dealing with fear: Subconsciously (fight-flight-freeze) vs. Consciously (face the situation, accept challenges, learn to cope and have patience to allow time for natural healing process)

Do not loose
hope and
optimism!





Thank you for
listening