

Psychologic Sequelae in Early Pregnancy Complications

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Abstract: Early pregnancy complications, including miscarriage, ectopic pregnancies, and hyperemesis gravidarum, are common discomforts accounting for about 15% to 20% of all pregnancies. A proportion of women with early pregnancy complications will experience short- and long-term psychologic sequelae in the aftermath of pregnancy complications, including anxiety, depression, and post-traumatic stress disorder (PTSD) which are the most commonly reported psychologic reactions. This review will focus on the course and impact of these psychologic sequelae in early pregnancy complications, and the noninvasive interventions to improve mental health are also briefly discussed.

Keywords: miscarriage, ectopic pregnancies, hyperemesis gravidarum, psychologic sequelae

Introduction

Many women are faced with pregnancy complications, and these adverse pregnancy outcomes are significantly related to perpetual health consequences for both newborn and mother.¹ Complications in early pregnancy, such as miscarriage, ectopic pregnancies, and hyperemesis gravidarum, are typical discomforts accounting for nearly quintile of all pregnancies.² Early pregnancy complications often prompt many patients to seek emergency evaluation and treatment.³ Women with early pregnancy complications are always exposed to long times waiting,⁴ lacking continuity care and physician responsible.⁵ Hence, it is necessary to improve hospital service delivery model for patients with early pregnancy complications.

A certain amount of literatures indicating that a portion of women will undergo short- and long-term psychologic sequelae in consequence of pregnancy complications, including depression, anxiety, and post-traumatic stress disorder (PTSD). In addition, numerous women have been reported to experience emotional well-being when interacting with health professionals in hospitals.⁶ The quality of care women received during miscarriage will influence their mental health, even after a period of miscarriage.⁷ Women's experiences involved in healthcare for early pregnancy loss are mainly adverse, especially in emergency departments.^{8,9} Much research is focused on studying adverse pregnancy complications, but less attention is devoted to the psychological outcomes associated with these outcomes. Hence, improving women's experiences should go beyond efforts to meliorate the current care structures, including psychological care. This study therefore summarizes the psychologic sequelae such as anxiety, depression, and PTSD in women with early pregnancy complications, with the aim of providing noninvasive interventions to improve mental health.

Miscarriage

Miscarriage, defined as the loss of a pregnancy before viability, was estimated to 23 million every year worldwide.¹⁰ The aftermaths of miscarriage are both physical and psychological.¹¹ The physical aftermaths of miscarriage are well obvious, but psychological sequelae are indistinct. Women with fetal loss seem to have a higher risk for mental disorders.¹²⁻¹⁴ The psychological consequences might have barely external performance, so can be unrecognized by medical staff. Patients

sought miscarriage care in the emergency departments were more likely to be disadvantaged in socioeconomic and psychosocial aspects and were less content with their nursing care, compared with a separate outpatient setting.¹⁵ Hence, hospitals need to take evidence-informed actions to promote psychological support for people experiencing miscarriage.¹⁶

Depression and anxiety were more frequent among women with miscarriage history.¹⁷ Women with previous miscarriages were more vulnerable to experiencing excessive worry (OR value = 2.01, 95% CI: 1.24 to 3.24), as well as sadness and/or drooped spirits (OR value = 1.75, 95% CI: 1.11 to 2.76) during subsequent pregnancies.¹⁸ Women who experienced recurrent miscarriages became conscious of a higher level of anxiety, stress and depression than their partners.¹⁹ Factors influencing depression screening included a younger age, lower education level, larger gestational age at miscarriage, and prior miscarriage.²⁰ For example, for patients with a low educational level and high neuroticism scores, the risk of PTSD is estimated to be about 70%, while for those with a higher education level and a low score for neuroticism, the risk was negligible.²¹ There was a positive correlation between female ostracism and post-traumatic stress symptoms.²²

A cross-sectional study recruited 182 miscarriage patients and found that the positive rate of female depression screening was 34.1% of the women 2 weeks after a miscarriage.²³ Only 8.9% of the women were diagnosed with anxiety, depression, or adaptation disorder 1 year after the index date.²⁴ Psychological problems are greater after recurrent miscarriage, which was estimated approximately 2 times greater at 1 year after the last pregnancy (OR=1.99; 95% CI: 1.42–2.78).²⁵ Among Chinese pregnant women with recurrent miscarriage history in Guangzhou, China, the incidence rate of anxiety and depression were 45.0% and 37.0%, respectively.²⁶ While in Beijing, China, the occurrence of high perceived stress and depression symptoms was 25.3% and 22.5%, respectively.²⁷ A cross-sectional survey also investigated the correlativity between post-traumatic stress symptoms, being ostracized, and recall sadness intensity in women with miscarriage in cisgender, indicating that women's ostracism was correlative positively to post-traumatic stress symptoms and negatively with sadness consistency.⁶

Women with a history of mental health problems, or having miscarriage history, may be at greater hazard of anxiety, depression and post-traumatic stress after pregnancy loss, and the overall prognostic ability was poor.²⁸ More high-quality, prospective studies were employed to investigate psychologic sequelae in women following the miscarriage. Among women with prior selective and/or spontaneous abortion, the rate of depression was 16.8%, the rate of post-traumatic stress during the later pregnancy was 12.6%, and 5.4% met the criteria for both disorders.²⁹ Among women after early pregnancy loss, 32% meeting the criteria for anxiety, 16% for depression, and 28% for probable PTSD at 1 month.³⁰ Three months after miscarriage 1.2–38% were diagnosed with anxiety disorder, 10–20% suffered depressive disorder, and 0.6–5% suffered PTSD.^{30,31} Whereas 9 months after the miscarriage, the data became 17%, 6%, and 18%, respectively.³² A high incidence of anxiety (28.7%) and depression symptoms (48.6%) were found in recurrent pregnancy loss cases,³³ and 8.6% of the women met the criteria for moderate-to-severe depression.³⁴ In Guangzhou, China, the incidence rate of anxiety in early-stage, middle-stage and late-stage pregnancy was 47.6%, 36.1% and 32.5%, respectively, whereas the incidence of depression was 38%, 34.3% and 31.3%, respectively.³⁵ While in central London, of the recurrent miscarriage women, 34% fulfilled the criteria for post-traumatic stress symptoms at first month, 26% at third month and 21% at ninth month, respectively, and that of anxiety was 30% at first month, 25% at third month and 22% at ninth month, as well as depression for 10% at first month, 8% at third month and 7% at ninth month, respectively.³⁶ Since the psychological incidence rate is common after pregnancy loss, available screening tools and treatment programs for psychological health consequences of miscarriage need to be accessible.

Ectopic Pregnancies

Ectopic pregnancy accounts for 1–2% of all pregnancies worldwide,³⁷ with an increasing incidence worldwide.^{38,39} Although ectopic pregnancies account for a tiny ratio of pregnancies, the mortality rate for ectopic pregnancy rupture accounted for 2.7% of the pregnancy-related deaths.⁴⁰ Ectopic pregnancy has a profound impact not only on corporal health but also on psychological health, with previous research indicating a negative impact on the mental health of mothers.^{30,41–43} Women diagnosed with prepregnancy depression have a bit increased risk of ectopic pregnancy.⁴⁴ Mental distress was universal among women with ectopic pregnancy, and lower self-esteem was significantly related to

depression (OR: 0.70; 95% CI: 0.60–0.80) and anxiety (OR: 0.76; 95% CI: 0.66–0.87).⁴⁵ However, studies assessing psychological sequelae in women with ectopic pregnancy are still limited.

There are two independent multicenter, prospective, cohort studies investigating depression, anxiety, and post-traumatic stress in women following an ectopic pregnancy. Jessica et al³² showed that for women who had an ectopic pregnancy, 21% fulfilled the criteria for moderate/severe anxiety at first month, 31% fulfilled the criteria at third month, and 23% fulfilled the criteria at ninth month; moderate/severe depression was reported to 7% at month 1, to 12% at month 3, and to 11% at month 9; for posttraumatic stress, the data were 23%, 28%, and 21%, respectively. According to Farren and Jalmbrant's study, in the group of women following ectopic pregnancy, 30% fulfilled the criteria for moderate/severe anxiety at first month, 25% at third month and 22 at ninth month; 10% fulfilled the criteria for moderate/severe depression at first month, 8% at third month and 7% at ninth month, while the corresponding proportions for posttraumatic stress were 34%, 26% and 21%, respectively.³⁶

Hyperemesis Gravidarum

Nausea and vomiting, affecting the physical and psychological condition during pregnancy,⁴⁶ can become tough and worse in 2% of the pregnant women to develop into hyperemesis gravidarum (HG).^{47,48} HG is defined as intractable vomiting during pregnancy, causing weight loss and insufficient capacity, leading to ketonuria and/or ketonemia,⁴⁹ hence, women need multiple hospitalizations during pregnancy.⁵⁰ HG is considered to be a psychosomatic disease generated by the interreaction of biological, psychological, and sociocultural elements.⁵¹ The incidence of severe depression and generalized anxiety disorder is higher in women with HG.^{52–54} Psychological symptoms such as anxiety and depression seem to be an outcome of the tension and the body burden of HG, rather than a reason.^{55,56}

Patients with HG were 5.5 and 6.7 times more vulnerable to fulfill the criteria for depression and anxiety disorder compared with comparative group, respectively.⁵⁷ To those with prolonged HG, several conditions including anxiety (32%) and PTSD (13%) were more likely to report.⁵⁸ Post-traumatic stress symptoms are common after HG pregnancies (18%) and are interrelated to negative life outcomes,⁵⁹ women with HG had higher post-traumatic stress symptom scores compared to women with non-nausea, mild nausea and severe nausea.⁶⁰ Contrary to the studies above, Burak et al found that the incidence rate of trait anxiety and state anxiety were 66.7% and 51.7%, respectively; however, in terms of anxiety, there was no difference between the healthy pregnant group and the HG group.⁶¹ Similarly, a comparative cross-sectional study in Malaysia also found that there were no differences in the incidence rate of any anxiety and depressive disorder among the HG patient and the comparative group, but women with HG statistically significantly reported to have more depressive symptoms than controls.⁶² Therefore, the ascertainment of the psychological status of HG women still needs more evidence to support.

Interventions

Considering the incidence and severity of psychological sequelae and their consequences on early pregnancy complications, early implementation of supportive interventions aimed to deal with moderate-to-severe psychological disorders are imminent. These supportive interventions might help clinicians to raise the cognizance of the available supportive interventions in the area of pregnancy loss, as well as to improve pregnant women's mental health and overall wellbeing.⁶³

Support from families, friends and professionals can be meaningful for decreasing the women's anxiety and depression levels.^{64,65} Psychosocial stress theory believes that social support is a protective element against anxiety and depression during pregnancy.^{35,66,67} Patient-centered counseling, including decision satisfaction and shared decision-making, has a positive influence on psychological consequences for women seeking pregnancy termination.⁶⁸ Besides, providing counseling based on health promotion awareness can decrease psychological health problems and increase self-esteem.⁶⁹ Existing evidence indicates that self-care education is effectual in the reduction of anxiety and depression in pregnant women with a history of miscarriage. Therefore, prenatal care programs with these training sessions should be enriched, and a comfortable environment should be provided for women during pregnancy.⁷⁰ As an efficient, and noninvasive treatment, the happiness counseling program had a positive consequence on abating depression, anxiety, and stress in women with recurrent miscarriages.⁷¹ A mindfulness-based intervention can remarkably decrease stress,

depression symptoms, and negative emotions, and improve positive mood and mental health in pregnant women with recurrent miscarriages.⁷² After receiving empathic care, the miscarriage participants showed notable decreases in stress and depression.^{73,74} Similarly, a comprehensive nursing program can improve the treatment result and significantly reduce the recovery time of ectopic pregnancy patients.⁷⁵ Muscle relaxation training can also effectively improve the anxiety of patients with ectopic pregnancy who received methotrexate treatment.⁷⁶

Conclusions

Women with miscarriages and ectopic pregnancy experience higher rates of anxiety, depression, and post-traumatic stress disorder compared to women in the general population. As psychological morbidity is common after pregnancy loss, effective screening instruments and treatment options for mental health consequences of miscarriage and ectopic pregnancy need to be available. The determination of the psychological status of women with HG is controversial and still needs more evidence to support. Considering the prevalence and severity of psychological sequelae in early pregnancy complications, early implementation of non-pharmaceutical supportive interventions aimed at tackling moderate-to-severe psychological disorders can effectively improve pregnant women's mental health and overall wellbeing.

Data Sharing Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflict of interest for this study.

References

- Mavreli D, Theodora M, Kolialexi A. Known biomarkers for monitoring pregnancy complications. *Expert Rev Mol Diagn*. 2021;21(11):1115–1117. doi:10.1080/14737159.2021.1971078
- Pinnaduwa L, Honeyford J, Lackie E, Tunde-Byass M. The sustained value of an early pregnancy assessment clinic in the management of early pregnancy complications: a 10-year retrospective study. *J Obstetrics Gynaecol Canada*. 2018;40(8):1017–1023. doi:10.1016/j.jogc.2017.12.002
- Wittels KA, Pelletier AJ, Brown DF, Camargo CA. United States emergency department visits for vaginal bleeding during early pregnancy, 1993–2003. *Am J Obstet Gynecol*. 2008;198(5):523.e1–6. doi:10.1016/j.ajog.2007.11.011
- Tunde-Byass M, Cheung VYT. The value of the early pregnancy assessment clinic in the management of early pregnancy complications. *J Obstetrics Gynaecol Canada*. 2009;31(9):841–844. doi:10.1016/S1701-2163(16)34302-X
- O'Rourke D, Wood S. The early pregnancy assessment project: the effect of cooperative care in the emergency department for management of early pregnancy complications. *Aust N Z J Obstet Gynaecol*. 2009;49(1):110–114. doi:10.1111/j.1479-828X.2009.00954.x
- Bellhouse C, Temple-Smith M, Watson S, Bilardi J. "The loss was traumatic... some healthcare providers added to that": women's experiences of miscarriage. *Women Birth*. 2019;32(2):137–146. doi:10.1016/j.wombi.2018.06.006
- deMontigny F, Verdon C, Meunier S, Dubeau D. Women's persistent depressive and perinatal grief symptoms following a miscarriage: the role of childlessness and satisfaction with healthcare services. *Arch Women's Mental Health*. 2017;20(5):655–662. doi:10.1007/s00737-017-0742-9
- Freeman A, Neiterman E, Varathasundaram S. Women's experiences of health care utilization in cases of early pregnancy loss: a scoping review. *Women Birth*. 2021;34(4):316–324. doi:10.1016/j.wombi.2020.07.012
- Glicksman R, McLeod SL, Thomas J, Varner C. Services for emergency department patients experiencing early pregnancy complications: a survey of Ontario hospitals. *CJEM*. 2019;21(5):653–658. doi:10.1017/cem.2019.344
- Qunby S, Gallos ID, Dhillion-Smith RK, et al. Miscarriage matters: the epidemiological, physical, psychological, and economic costs of early pregnancy loss. *Lancet*. 2021;397(10285):1658–1667. doi:10.1016/S0140-6736(21)00682-6
- Coomarasamy A, Gallos ID, Papadopoulou A, et al. Sporadic miscarriage: evidence to provide effective care. *Lancet*. 2021;397(10285):1668–1674. doi:10.1016/S0140-6736(21)00683-8
- Bellieni CV, Buonocore G. Abortion and subsequent mental health: review of the literature. *Psychiatry Clin Neurosci*. 2013;67(5):301–310. doi:10.1111/pcn.12067
- Daugirdaitė V, van den Akker O, Purewal S. Posttraumatic stress and posttraumatic stress disorder after termination of pregnancy and reproductive loss: a systematic review. *J Pregnancy*. 2015;2015:646345. doi:10.1155/2015/646345

14. He L, Wang T, Xu H, et al. Prevalence of depression and anxiety in women with recurrent pregnancy loss and the associated risk factors. *Arch Gynecol Obstetrics*. 2019;300(4):1061–1066. doi:10.1007/s00404-019-05264-z
15. Miller CA, Roe AH, McAllister A, et al. Patient experiences with miscarriage management in the emergency and ambulatory settings. *Obstet Gynecol*. 2019;134(6):1285–1292. doi:10.1097/AOG.00000000000003571
16. Galeotti M, Mitchell G, Tomlinson M, Aventin Á. Factors affecting the emotional wellbeing of women and men who experience miscarriage in hospital settings: a scoping review. *BMC Pregnancy Childbirth*. 2022;22(1):270. doi:10.1186/s12884-022-04585-3
17. Toffol E, Koponen P, Partonen T. Miscarriage and mental health: results of two population-based studies. *Psychiatry Res*. 2013;205(1–2):151–158. doi:10.1016/j.psychres.2012.08.029
18. Chojenta C, Harris S, Reilly N, et al. History of pregnancy loss increases the risk of mental health problems in subsequent pregnancies but not in the postpartum. *PLoS One*. 2014;9(4):e95038. doi:10.1371/journal.pone.0095038
19. Chen SL, Chang SM, Kuo PL, Chen CH. Stress, anxiety and depression perceived by couples with recurrent miscarriage. *Int J Nursing Practice*. 2020;26(2):e12796. doi:10.1111/ijn.12796
20. Mutiso SK, Murage A, Mwaniki AM. Factors associated with a positive depression screen after a miscarriage. *BMC Psychiatry*. 2019;19(1):8. doi:10.1186/s12888-018-1991-5
21. Engelhard IM, van den Hout MA, Schouten EG. Neuroticism and low educational level predict the risk of posttraumatic stress disorder in women after miscarriage or stillbirth. *Gen Hosp Psychiatry*. 2006;28(5):414–417. doi:10.1016/j.genhosppsych.2006.07.001
22. Wesselmann ED, Parris L. Miscarriage, perceived ostracism, and trauma: a preliminary investigation. *Front Psychol*. 2021;12:747860. doi:10.3389/fpsyg.2021.747860
23. Mutiso SK, Murage A, Mukaindo AM. Prevalence of positive depression screen among post miscarriage women- A cross sectional study. *BMC Psychiatry*. 2018;18(1):32. doi:10.1186/s12888-018-1619-9
24. Jacob L, Polly I, Kalder M, Kostev K. Prevalence of depression, anxiety, and adjustment disorders in women with spontaneous abortion in Germany - A retrospective cohort study. *Psychiatry Res*. 2017;258:382–386. doi:10.1016/j.psychres.2017.08.064
25. Adib-Rad H, Basirat Z. Psychological distress in women with recurrent spontaneous abortion: a case-control study. *Turkish J Obstetrics Gynecol*. 2019;16(3):151–157.
26. Gao L, Qu J, Wang AY. Anxiety, depression and social support in pregnant women with a history of recurrent miscarriage: a cross-sectional study. *J Reprod Infant Psychol*. 2020;38(5):497–508. doi:10.1080/02646838.2019.1652730
27. Zhang Q, Wang N. Prevalence of stress and depression and associated factors among women seeking a first-trimester induced abortion in China: a cross-sectional study. *Reproductive Health*. 2022;19(1):64.
28. Farren J, Jalmbrant M. Prognostic factors for post-traumatic stress, anxiety and depression in women after early pregnancy loss: a multi-centre prospective cohort study. *BMJ open*. 2022;12(3):e054490. doi:10.1136/bmjopen-2021-054490
29. Hamama L, Rauch SA, Sperlich M, et al. Previous experience of spontaneous or elective abortion and risk for posttraumatic stress and depression during subsequent pregnancy. *Depress Anxiety*. 2010;27(8):699–707. doi:10.1002/da.20714
30. Farren J, Jalmbrant M, Amey L, et al. Post-traumatic stress, anxiety and depression following miscarriage or ectopic pregnancy: a prospective cohort study. *BMJ open*. 2016;6(11):e011864. doi:10.1136/bmjopen-2016-011864
31. Sham A, Yiu M, Ho W. Psychiatric morbidity following miscarriage in Hong Kong. *Gen Hosp Psychiatry*. 2010;32(3):284–293. doi:10.1016/j.genhosppsych.2009.12.002
32. Farren J, Jalmbrant M, Falconieri N, et al. Posttraumatic stress, anxiety and depression following miscarriage and ectopic pregnancy: a multicenter, prospective, cohort study. *Am J Obstet Gynecol*. 2020;222(4):367.e1–e22. doi:10.1016/j.ajog.2019.10.102
33. Wang Y, Meng Z, Pei J, et al. Anxiety and depression are risk factors for recurrent pregnancy loss: a nested case-control study. *Health Qual Life Outcomes*. 2021;19(1):78. doi:10.1186/s12955-021-01703-1
34. Slot A, Krog MC. Feelings of guilt and loss of control dominate in stress and depression inventories from women with recurrent pregnancy loss. *Eur J Contraception AMP*. 2022;27(2):153–158. doi:10.1080/13625187.2021.1943740
35. Qu J, Weng XL, Gao LL. Anxiety, depression and social support across pregnancy in women with a history of recurrent miscarriage: a prospective study. *Int J Nursing Practice*. 2021;27(5):e12997. doi:10.1111/ijn.12997
36. Farren J, Jalmbrant M. Differences in post-traumatic stress, anxiety and depression following miscarriage or ectopic pregnancy between women and their partners: multicenter prospective cohort study. *Gynecology*. 2021;57(1):141–148. doi:10.1002/uog.23147
37. Farquhar CM. Ectopic pregnancy. *Lancet*. 2005;366(9485):583–591. doi:10.1016/S0140-6736(05)67103-6
38. Stulberg DB, Cain LR, Dahlquist I, Lauderdale DS. Ectopic pregnancy rates and racial disparities in the Medicaid population, 2004–2008. *Fertil Steril*. 2014;102(6):1671–1676. doi:10.1016/j.fertnstert.2014.08.031
39. Kömürçü Karuserci Ö, Sucu S. Retrospective evaluation of patients treated for ectopic pregnancy: experience of a tertiary center. *Rev Bras Ginecol Obstet*. 2020;42(12):800–804. doi:10.1055/s-0040-1718444
40. Creanga AA, Syverson C, Seed K, Callaghan WM. Pregnancy-related mortality in the United States, 2011–2013. *Obstet Gynecol*. 2017;130(2):366–373. doi:10.1097/AOG.0000000000002114
41. Benute G, Bordini DN, Juhas TR, et al. Depression, stress and guilt are linked to the risk of suicide associated to ectopic pregnancy. *Med Express*. 2016;3:3. doi:10.5935/MedicalExpress.2016.03.07
42. Kolte AM, Olsen LR, Mikkelsen EM, et al. Depression and emotional stress is highly prevalent among women with recurrent pregnancy loss. *Human Reproduction*. 2015;30(4):777–782. doi:10.1093/humrep/dev014
43. Adejumo AO, Fatokun Y. Predictors of health expectation and health anxiety among post-salpingectomy patients in Ibadan Nigeria. *J Reprod Infant Psychol*. 2017;35(2):196–206. doi:10.1080/02646838.2016.1256472
44. Wall-Wieler E, Robakis TK, Cesta CE, et al. Antidepressant use around conception, prepregnancy depression, and risk of ectopic pregnancy. *Can J Psychiatry*. 2020;65(12):845–853. doi:10.1177/0706743720927829
45. Hasani S, Aung E, Mirghafourvand M. Low self-esteem is related to depression and anxiety during recovery from an ectopic pregnancy. *BMC Women's Health*. 2021;21(1):326. doi:10.1186/s12905-021-01467-2
46. Lowe SA, Steinweg KE. Review article: management of hyperemesis gravidarum and nausea and vomiting in pregnancy. *Em Med Australasia*. 2022;34(1):9–15. doi:10.1111/1742-6723.13909

47. Matthews A, Haas DM, O'Mathúna DP, Dowswell T. Interventions for nausea and vomiting in early pregnancy. *Cochrane Database Sys Rev.* 2015;2015(9):Cd007575. doi:10.1002/14651858.CD007575.pub4
48. Jennings LK, Mahdy H. *Hyperemesis Gravidarum*. Treasure Island (FL): StatPearls; 2015.
49. Erick M, Cox JT, Mogensen KM, Practice Bulletin ACOG. 189: nausea and Vomiting of Pregnancy. *Obstet Gynecol.* 2018;131(5):935. doi:10.1097/AOG.0000000000002604
50. Power Z, Thomson AM, Waterman H. Understanding the stigma of hyperemesis gravidarum: qualitative findings from an action research study. *Birth.* 2010;37(3):237–244. doi:10.1111/j.1523-536X.2010.00411.x
51. Pirimoglu ZM, Guzelmeric K, Alpay B, et al. Psychological factors of hyperemesis gravidarum by using the SCL-90-R questionnaire. *Clin Exp Obstet Gynecol.* 2010;37(1):56–59.
52. Uguz F, Gezgin K, Kayhan F, et al. Is hyperemesis gravidarum associated with mood, anxiety and personality disorders: a case-control study. *Gen Hosp Psychiatry.* 2012;34(4):398–402. doi:10.1016/j.genhosppsych.2012.03.021
53. Mitchell-Jones N, Gallos I, Farren J, et al. Psychological morbidity associated with hyperemesis gravidarum: a systematic review and meta-analysis. *BJOG.* 2017;124(1):20–30. doi:10.1111/1471-0528.14180
54. Yıldırım E, Demir E. The relationship of hyperemesis gravidarum with sleep disorders, anxiety and depression. *J Obstet Gynaecol.* 2019;39(6):793–798. doi:10.1080/01443615.2019.1572725
55. Liu C, Zhao G, Qiao D, et al. Emerging Progress in Nausea and Vomiting of Pregnancy and Hyperemesis Gravidarum: challenges and Opportunities. *Front Med.* 2021;8:809270. doi:10.3389/fmed.2021.809270
56. Kjeldgaard HK, Eberhard-Gran M, Benth J, et al. History of depression and risk of hyperemesis gravidarum: a population-based cohort study. *Arch Women's Mental Health.* 2017;20(3):397–404. doi:10.1007/s00737-016-0713-6
57. Topal Ahmetoğlu Y, Altay MM, Akdağ Cırık D, et al. Depression and anxiety disorder in hyperemesis gravidarum: a prospective case-control study. *Turkish J Obstetrics Gynecol.* 2017;14(4):214–219. doi:10.4274/tjod.78477
58. Mullin PM, Ching C, Schoenberg F, et al. Risk factors, treatments, and outcomes associated with prolonged hyperemesis gravidarum. *J Maternal Fetal Neonatal Med.* 2012;25(6):632–636. doi:10.3109/14767058.2011.598588
59. Christodoulou-Smith J, Gold JJ, Romero R, et al. Posttraumatic stress symptoms following pregnancy complicated by hyperemesis gravidarum. *J Maternal Fetal Neonatal Med.* 2011;24(11):1307–1311. doi:10.3109/14767058.2011.582904
60. Kjeldgaard HK, Vikanes A, Benth J, et al. The association between the degree of nausea in pregnancy and subsequent posttraumatic stress. *Arch Women's Mental Health.* 2019;22(4):493–501. doi:10.1007/s00737-018-0909-z
61. Elmas B, Vatansever M. Evaluation of psychological resilience and anxiety levels of patients with hyperemesis gravidarum diagnosis and comparison with healthy pregnant women. *Turkish J Obstetrics Gynecol.* 2021;18(2):115–123. doi:10.4274/tjod.galenos.2021.05994
62. Azlan WAW, Ramalingam M, Razali R, et al. Anxiety, depression and marital satisfaction in women with hyperemesis gravidarum: a comparative cross-sectional study in Hospital Tengku Ampuan Rahimah, Klang, Malaysia. *Asia Pac Psychiatry.* 2022;14(1):e12416. doi:10.1111/appy.12416
63. San Lazaro Campillo I, Meaney S, McNamara K, O'Donoghue K. Psychological and support interventions to reduce levels of stress, anxiety or depression on women's subsequent pregnancy with a history of miscarriage: an empty systematic review. *BMJ open.* 2017;7(9):e017802. doi:10.1136/bmjopen-2017-017802
64. Fisher J. Prevalence and determinants of common perinatal mental disorders in women in low- and lower-middle-income countries: a systematic review. *Bull World Health Organ.* 2012;90(2):139g–49g. doi:10.2471/BLT.11.091850
65. Akdag Topal C, Terzioğlu F. Assessment of depression, anxiety, and social support in the context of therapeutic abortion. *Perspect Psychiatr Care.* 2019;55(4):618–623. doi:10.1111/ppc.12380
66. Friedman LE, Gelaye B, Sanchez SE, Williams MA. Association of social support and antepartum depression among pregnant women. *J Affect Disord.* 2020;264:201–205. doi:10.1016/j.jad.2019.12.017
67. Iwanowicz-Palus G, Mróz M. Social support and subjective assessment of psychophysical condition, health, and satisfaction with quality of life among women after pregnancy loss. *BMC Pregnancy Childbirth.* 2021;21(1):750. doi:10.1186/s12884-021-04093-w
68. Kerns JL, Mengesha B, McNamara BC, et al. Effect of counseling quality on anxiety, grief, and coping after second-trimester abortion for pregnancy complications. *Contraception.* 2018;97(6):520–523. doi:10.1016/j.contraception.2018.02.007
69. Hasani S, Mirghafourvand M, Esmailpour K, Sehhatie Shafaie F. The effect of counseling based on health promotion awareness on mental health and self-esteem in women with ectopic pregnancy: a randomized controlled clinical trial. *J Maternal Fetal Neonatal Med.* 2021;34(11):1687–1694. doi:10.1080/14767058.2019.1644314
70. Boryri T, Navidian A, Zehi FH. Assessing the effect of self-care education on anxiety and depression among pregnant women with a history of spontaneous abortion. *J Educ Health Promot.* 2020;9:347. doi:10.4103/jehp.jehp_465_20
71. Elsharkawy NB, Mohamed SM. Effect of happiness counseling on depression, anxiety, and stress in women with recurrent miscarriage. *Int J Women's Health.* 2021;13:287–295. doi:10.2147/IJWH.S283946
72. Wang DN, Weng XL, Gao LL. Mindfulness-based intervention in Chinese pregnant women with recurrent miscarriage: a non-randomized controlled study. *Midwifery.* 2021;103:103152. doi:10.1016/j.midw.2021.103152
73. Chang SC, Kuo PL, Chen CH. Effectiveness of empathic caring on stress and depression for women with recurrent miscarriage: a randomized controlled trial. *Complement Ther Clin Pract.* 2021;43:101367. doi:10.1016/j.ctcp.2021.101367
74. Gould H, Perrucci A, Barar R, et al. Patient education and emotional support practices in abortion care facilities in the United States. *Women's Health Issues.* 2012;22(4):e359–64. doi:10.1016/j.whi.2012.04.003
75. Zhong L, Zhao Y, Zhu H. Randomized trial of the application value of comprehensive nursing intervention in the perioperative period of ruptured bleeding of ectopic pregnancy. *Ann Palliat Med.* 2021;10(4):4593–4600. doi:10.21037/apm-21-692
76. Pan L, Zhang J, Li L. Effects of progressive muscle relaxation training on anxiety and quality of life of inpatients with ectopic pregnancy receiving methotrexate treatment. *Res Nurs Health.* 2012;35(4):376–382. doi:10.1002/nur.21486

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