Original Research Article

Observation of feto-maternal outcome in eclamptic patients

Sabera Sultana Biswas*

Department of Obstetrics and Gynecology, General Hospital, Pabna, Bangladesh

*Correspondence:
Dr. Sabera Sultana Biswas,
E-mail: dr.asmani@gmail.com

ABSTRACT

Background: Eclampsia is a severe complication of pregnancy characterized by seizures and can lead to adverse feto-maternal outcomes. This study aimed to explore the relationships between socio-demographic factors, knowledge of eclampsia, clinical history, and feto-maternal outcomes in eclamptic patients.
Methods: This prospective observational study was conducted at the Department of Gynecology and Obstetrics, 250 Bedded General Hospital, Pabna, Bangladesh, from September 2014 to October 2015, with a sample size of 48 eclamptic women who had given birth at the study hospital.
Results: Among the 48 eclamptic patients at the study hospital, most were either 20 years old or younger (43.75%) or aged 21 to 30 (50.00%), averaging 21.75 years in age. In terms of education, half were literate, and 37.50% had completed secondary school. The majority recognized the importance of pre-eclampsia (75.00%) and antenatal care (87.50%) for feto-maternal outcomes. Eclamptic seizures affected 25.00% of patients, hypertension 18.75%, and edema 6.25%. Risk factors included 43.75% in the high-risk age category, 37.50% with irregular or no antenatal check-ups, and 12.50% being nulliparous. Regarding perinatal outcomes, 62.50% of neonates survived, while 6.25% were stillborn, 6.25% experienced neonatal death, and 12.50% suffered neonatal asphyxia. Most patients (72.92%) had no complications, but 25.00% endured postpartum depression.
Conclusions: The findings underscore the importance of antenatal education programs and timely healthcare access for improving outcomes. By addressing these factors and emphasizing individualized care plans, healthcare providers can enhance maternal and neonatal well-being in eclamptic patients.

Keywords: Fetal, Maternal, Pregnancy, Eclampsia, Pre-eclampsia

INTRODUCTION

Eclampsia, a severe and potentially life-threatening complication of pregnancy, continues to pose significant challenges for obstetricians and healthcare providers worldwide.[1,2] As a progression from preeclampsia a pregnancy-specific disorder characterized by high blood pressure and damage to organ systems, such as the liver and kidneys eclampsia is defined by the sudden onset of seizures in preeclamptic patients.[3,4] Despite advances in prenatal care and the better understanding of its pathophysiology, eclampsia remains a significant cause of maternal and perinatal morbidity and mortality.[5] The global prevalence of eclampsia varies between countries and regions, with estimates ranging from 1 in 200 pregnancies in low-income countries to 1 in 2,000 pregnancies in high-income countries.[5-8] In Bangladesh, the prevalence of eclampsia is reported to be approximately 1.2% of all pregnancies, significantly higher than the global average.[2,9] This disparity in prevalence highlights the importance of understanding the unique challenges faced by healthcare providers in resource-limited settings. The pathophysiology of eclampsia is indeed complex and multifaceted, with

several interconnected factors contributing to the development and progression of the condition. Although the exact mechanisms are not yet fully understood, current research suggests that abnormal placentation, endothelial dysfunction, and an imbalance of angiogenic and anti-angiogenic factors play crucial roles in the pathogenesis of eclampsia.[10,11] Abnormal placentation leads to impaired blood flow to the placenta, resulting in placental ischemia. This ischemia triggers the release of inflammatory mediators and anti-angiogenic factors into the maternal circulation, disrupting the balance between angiogenic and anti-angiogenic factors, which contributes to endothelial dysfunction. Endothelial dysfunction, in turn, leads to increased vascular permeability, vasoconstriction, and the activation of coagulation pathways. These changes result in the clinical manifestations of preeclampsia, such as hypertension, proteinuria, and edema.[12,13] When uncontrolled, preeclampsia can progress to eclampsia, characterized by the occurrence of life-threatening seizures. Understanding these mechanisms is crucial for developing targeted interventions and strategies for the prevention and management of eclampsia. Eclampsia is associated with a myriad of adverse feto-maternal outcomes, including maternal death, preterm birth, low birth weight, intrauterine growth restriction, and neonatal intensive care unit (NICU) admissions.[14,15] Globally, hypertensive disorders of pregnancy, including preeclampsia and eclampsia, account for an estimated 14% of maternal deaths in low- and middle-income countries.[16] In Bangladesh, eclampsia is responsible for approximately 20% of maternal deaths and contributes to a significant proportion of perinatal morbidity and mortality.[2] The relationship between eclampsia and increased feto-maternal mortality rates is well-established. The severity of the condition, along with delays in diagnosis and management, can lead to life-threatening complications for both the mother and the baby. Timely intervention and appropriate management strategies are essential in mitigating these risks and improving overall outcomes. The importance of the present study lies in its potential to provide a comprehensive analysis of the Feto-maternal outcomes in eclamptic patients, with a focus on the associations between maternal demographics, gestational age, severity of the condition, and management strategies. By unveiling the mysteries surrounding these outcomes, this research endeavors to contribute to the global effort in enhancing prenatal care, optimizing management approaches, and ultimately, improving the prognosis for mothers and their babies affected by eclampsia.

METHODS

This prospective observational study was conducted at the department of gynecology and obstetrics, 250 Bedded General Hospital, Pabna, Bangladesh. The study duration was 1 year, from September 2014 to October 2015. During this period, a total of 48 pregnant women diagnosed with eclampsia, who had given birth at the study hospital were selected as the study population following inclusion and exclusion criteria. The inclusion criteria were any

eclamptic women who had been admitted and given birth at the study hospital. The diagnosis of eclampsia was based on the occurrence of seizures in the context of preeclampsia, which was defined by new-onset hypertension and proteinuria after 20 weeks of gestation. Exclusion criteria were: pre-existing medical conditions that could influence feto-maternal outcomes, such as chronic hypertension, diabetes mellitus, or renal disease; seizure disorders unrelated to preeclampsia; and incomplete medical records or insufficient information on clinical presentations and management strategies. Informed consent was obtained from the participants prior to data collection, and ethical approval of the study was also obtained from the ethical review committee of the study hospital. 2 participants had withdrawn from the study due to personal reasons, leaving a final sample size of 48 patients. Data was collected using a structured questionnaire, which included information on participants' demographics, medical history, clinical presentations, management strategies, and feto-maternal outcomes. The collected data was then analyzed using descriptive and inferential statistics to explore the associations between eclampsia and various feto-maternal outcomes, as well as the potential influence of maternal demographics, gestational age, and management strategies on these outcomes.

RESULTS

The age distribution reveals that 43.75% of the participants were aged 20 or younger, 50.00% were between 21 and 30 years old, and 6.25% were between 31 and 40 years old. The age range was 17-40 years, with a mean age of 21.75 years and a standard deviation of 5.31 years. Regarding the education level of the participants, 6.25% were illiterate, 50.00% were literate, 37.50% had completed secondary school (SSC), and 6.25% had a graduation degree. In terms of occupation, the majority (81.25%) fell into the "Others" category, while 6.25% were farmers, 6.25% worked in the private sector, and 6.25% were government employees. Religious distribution showed that 93.75% of the participants were Muslim, and 6.25% were Hindu. The participants' monthly income was categorized into four groups: 33.33% had an income of 5,000 or less, 33.33% had an income between 5,001 and 10,000, 22.92% had an income between 10,001 and 20,000, and 10.42% had an income above 20,000.

The majority of the participants were aware of the importance of pre-eclampsia (75.00%) and antenatal care (87.50%) in determining feto-maternal outcomes. Additionally, 87.50% of the participants were knowledgeable about the role of food supplements in promoting healthy outcomes. The participants also demonstrated an understanding of other factors associated with feto-maternal outcomes, with 37.50% being aware of the significance of eclampsia, and 56.25% recognizing the importance of heart rate response. However, knowledge about certain factors was less common among the participants, as only 6.25% were aware of the potential

impact of acute respiratory failure and cardiac disease on feto-maternal outcomes.

Table 1: Distribution of participants by socio-demographic characteristics (n=48).

Variables	N	%
Age		
≤20	21	43.75
21-30	24	50.00
31-40	3	6.25
Range	17-40	
Mean±SD	21.75±5.31	
Education		
Illiterate	3	6.25
Literate	24	50.00
SSC	18	37.50
Graduation	3	6.25
Occupation		
Farmer	3	6.25
Private sector	3	6.25
Govt. Service	3	6.25
Others	39	81.25
Religion		
Muslim	45	93.75
Hindu	3	6.25
Monthly income		
≤5000	16	33.33
5001-10,000	16	33.33
10,001-20,000	11	22.92
>20,000	5	10.42

Table 2: Distribution of participants by their knowledge regarding factors associated with feto-maternal outcome (n=48).

Knowledge of associated factors	N	%
Pre-eclampsia	36	75.00
Eclampsia	18	37.50
Antenatal care	42	87.50
Food supplements	42	87.50
Heart rate response	27	56.25
Acute respiratory Failure	3	6.25
Cardiac disease	3	6.25
Diabetes before pregnancy	9	18.75
Gestational diabetes	9	18.75

Furthermore, 18.75% of the participants were knowledgeable about the influence of pre-existing diabetes and gestational diabetes on feto-maternal outcomes. The data reveals that 25.00% of the participants experienced eclamptic convulsions, while 18.75% suffered from hypertension, and 6.25% developed edema. Notably, 50.00% of the participants did not report any significant complications during their pregnancies. Among these participants, 18 (37.50%) underwent further investigation, while 6 (12.50%) did not follow their doctor's advice for additional investigation.

In terms of parity, 25.00% of participants were nulliparous, 56.25% had 1-3 previous pregnancies, and 18.75% had four or more previous pregnancies. Regarding gestational age, 8.33% of participants were less than 28 weeks, 14.58% were between 28 and 33 weeks, and 77.08% were at or beyond 34 weeks. When evaluating antenatal check-ups, 6.25% of participants had no check-ups, 56.25% had irregular check-ups, and 37.50% had regular check-ups. For the timing of eclampsia, 62.50% of participants experienced ante-partum eclampsia, 6.25% experienced intra-partum eclampsia, and 31.25% experienced post-partum eclampsia. Lastly, concerning the mode of delivery, 18.75% of participants had induced vaginal deliveries, 25.00% had spontaneous vaginal deliveries, and 56.25% underwent cesarean sections.

Table 3: Distribution of participants by major complications (n=48).

Major complications	N	%
Eclamptic convulsion	12	25.00
Hypertension	9	18.75
Edema	3	6.25
No significant complications	24	50.00

Table 4: Distribution of participants by clinical history (n=48).

Clinical history	N	%
Parity		
Nulliparous	12	25.00
1-3	27	56.25
≥4	9	18.75
Gestational age (weeks)		
<28	4	8.33
28-33	7	14.58
≥34	37	77.08
Antenatal check-up		
None	3	6.25
Irregular	27	56.25
Regular	18	37.50
Eclampsia		
Ante-partum	30	62.50
Intra-partum	3	6.25
Post-partum	15	31.25
Mode of delivery		
Induced vaginal delivery	9	18.75
Spontaneous vaginal delivery	12	25.00
Caesarean section	27	56.25

In terms of the level of consciousness, 56.25% of participants were conscious Glasgow Coma Scale (GCS) >13, 37.50% were semi-conscious (GCS 9-12), and 6.25% were unconscious (GCS <8). For respiratory rate, 68.75% of participants had a rate of 17-20 breaths per minute, while 31.25% had a rate greater than 20 breaths per minute. When assessing diastolic blood pressure, 37.50% of participants had a pressure of 90-100 mmHg, 39.58%

had a pressure of 101-110 mmHg, and 22.92% had a pressure greater than 110 mmHg.

stillbirth, 6.25% had neonatal death, and 12.50% encountered neonatal asphyxia.

Table 5: Distribution of participants by symptoms of adverse outcome (n=48).

Symptoms	N	%
Level of consciousness		
Conscious (GCS>13)	27	56.25
Semi-Conscious (GCS 9-12)	18	37.50
Unconscious (GCS<8)	3	6.25
Respiratory rate		
17-20/m	33	68.75
>20/m	15	31.25
Diastolic blood pressure		
90-100	18	37.50
101-110	19	39.58
>110	11	22.92
Urine volume		
Normal	42	87.50
Oliguria	6	12.50

Table 6: Distribution of participants by observable risk factors (n=48).

Risk factors	N	%
Absent	9	18.75
Age (<20 years and >35 years)	21	43.75
Nulliparous	6	12.50
Gestational age >34 weeks	24	50.00
Irregular or No ANC	18	37.50
Antepartum and intrapartum eclampsia	18	37.50
Severe hypertension	15	31.25
Unconscious	6	12.50
>8 hours of interval between development of convulsion to hospitalization	3	6.25

Lastly, regarding urine volume, 87.50% of participants had a normal urine output, while 12.50% experienced oliguria. Among the participants, 18.75% had no observable risk factors, while 43.75% fell within the high-risk age category of either below 20 years or above 35 years. In addition, 12.50% of the participants were nulliparous. Regarding gestational age, 50.00% of participants were beyond 34 weeks. In terms of antenatal care, 37.50% of participants had irregular or no antenatal check-ups. Participants who experienced antepartum and intrapartum eclampsia made up 37.50% of the sample. Furthermore, 31.25% of participants had severe hypertension, while 12.50% were unconscious. Lastly, 6.25% of participants had an interval of more than 8 hours between the development of convulsion and hospitalization.

The data shows that 50.00% of the participants had term deliveries, and 62.50% of the neonates were alive. In terms of adverse perinatal outcomes, 6.25% experienced

Table 7: Distribution of participants by perinatal outcome (n=48)

Perinatal outcome	N	%
Term delivery	24	50.00
Alive	30	62.50
Stillbirth	3	6.25
Neonatal death	3	6.25
Neonatal asphyxia	6	12.50

Table 8: Distribution of participants by maternal outcome (n=48).

Perinatal outcome	N	%
No complications	35	72.92
Anemia	1	2.08
Postpartum depression	12	25.00

The majority of participants (72.92%) experienced no complications. However, 2.08% of participants developed anemia, and 25.00% suffered from postpartum depression.
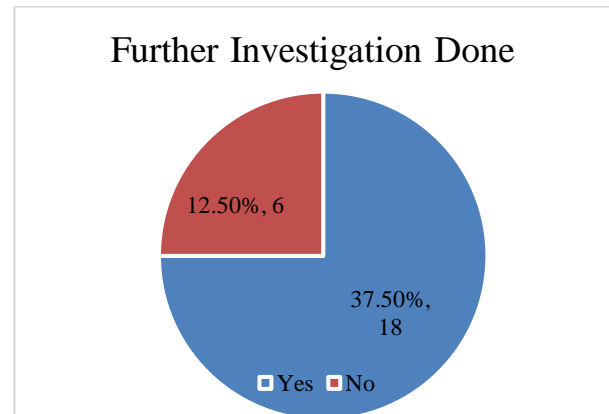
Figure 1: Distribution of participants with major complications by record of further investigation according to doctors' advice (n=24).

DISCUSSION

The study provides valuable insights into the intricate relationship between socio-demographic factors, knowledge of associated factors, clinical history, observable risk factors, and feto-maternal outcomes in eclamptic patients. One of the primary findings is the age distribution, with a significant number of participants between the ages of 20 and 30. This observation is in line with previous research, which indicates that younger women are at a higher risk of developing eclampsia.[17,18] This finding highlights the importance of targeted interventions and education programs for this age group to improve feto-maternal outcomes. Another noteworthy finding is the participants' education levels, which showed a considerable proportion of literate individuals. This

observation suggests that education may play a role in understanding the risk factors and seeking appropriate healthcare services.[19] Therefore, investing in education and improving access to information on eclampsia and its potential complications could contribute to better maternal and neonatal outcomes. The participants' awareness of pre-eclampsia, antenatal care, and food supplements' significance in determining feto-maternal outcomes was relatively high. This awareness is consistent with prior research emphasizing the crucial role of these factors in promoting healthy feto-maternal outcomes.[20] However, knowledge about specific factors such as acute respiratory failure and cardiac disease was less common, indicating a need for comprehensive antenatal education programs addressing a wide range of potential complications. By ensuring that pregnant women have a more thorough understanding of the risks associated with eclampsia, healthcare providers can empower them to make informed decisions about their care.[21] The study revealed a substantial rate of eclamptic convulsions (25%), hypertension (18.75%), and edema (6.25%), which aligns with previous research on eclampsia and its complications.[4,22] Interestingly, 50% of the participants did not experience any significant complications, suggesting that timely interventions and effective management strategies can lead to successful outcomes.[23,24] The findings emphasize the importance of early detection and intervention in managing eclampsia and preventing severe complications. The data on parity, gestational age, and mode of delivery corresponds with previous research, suggesting that nulliparous women and those with advanced gestational age are at a higher risk of eclampsia, which was supported by the findings of previous studies.[25,26] The high rate of cesarean sections observed in this study also reflects the global trend of increased cesarean deliveries in eclamptic patients due to the potential for better maternal and neonatal outcomes.[27,28] These findings underscore the importance of tailored healthcare approaches that consider patients' individual risk factors and clinical history. In terms of perinatal outcomes, the study found rates of term deliveries (50%), stillbirth (6.25%), neonatal death (6.25%), and neonatal asphyxia (12.50%) that were comparable to previous research.[14,29] These findings highlight the critical need for comprehensive management strategies and timely interventions to improve perinatal outcomes in eclamptic patients. Healthcare providers should prioritize monitoring and managing high-risk pregnancies to minimize adverse outcomes for both the mother and the neonate. Finally, while most participants experienced no maternal complications, postpartum depression was reported by 25% of the participants. This finding is consistent with previous studies demonstrating an increased risk of postpartum depression in women with eclampsia.[30,31] The management of eclampsia should extend beyond addressing immediate physical complications and also consider patients' long-term psychological well-being. Incorporating mental health support into eclampsia care plans can help improve the overall quality of care for these patients.

In summary, this study's findings contribute significantly to the growing body of literature on the complex interactions between socio-demographic factors, clinical history, and feto-maternal outcomes in eclamptic patients. Further research is required to develop targeted interventions and comprehensive management strategies that cater to this population's diverse needs. The importance of antenatal education programs and timely access

Limitations

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

In conclusion, the study offers valuable insights into the complex interplay between socio-demographic factors, knowledge of associated factors, clinical history, observable risk factors, and feto-maternal outcomes among eclamptic patients. The findings highlight the importance of targeted interventions, comprehensive antenatal education programs, and timely access to healthcare services for improving feto-maternal outcomes. Furthermore, the study emphasizes the need for individualized care plans that consider each patient's unique risk factors and clinical history. By incorporating these insights into practice, healthcare providers can better manage eclampsia and its complications, ultimately enhancing maternal and neonatal well-being.

REFERENCES

1. Magley M, Hinson MR. Eclampsia. In: StatPearls. Treasure Island: StatPearls Publishing; 2023.
2. Begum MR, Begum A, Quadir E, Akhter S, Shamsuddin L. Eclampsia: Still a Problem in Bangladesh. Medscape Gen Med. 2004;6(4).
3. Cipolla MJ, Kraig RP. Seizures in Women with Preeclampsia: Mechanisms and Management. Fetal Matern Med Rev. 2011;22(02):91-108.
4. Eclampsia: Overview, Etiologic and Risk Factors for Preeclampsia/Eclampsia, Multiorgan System Effects. Available at: https://emedicine.medscape.com/253960-overview. Accessed on 20 February 2023.
5. Das R, Biswas S. Eclapmsia: The Major Cause of Maternal Mortality in Eastern India. Ethiop J Health Sci. 2015;25(2):111-6.
6. Saftlas AF OD. Epidemiology of preeclampsia and eclampsia in the United States, 1979-1986. Am J Obstet Gynecol 1990;163(2):460-5.
7. Swain SOK. Maternal and perinatal mortality due to eclampsia. Indian Pediatr. 1993;30(6):771-3.

8. Kraig LD. The global impact of pre-eclampsia and eclampsia. Semin Perinatol. 2009;33(3):130-7.
9. Mou AD, Barman Z, Hasan M, et al. Prevalence of preeclampsia and the associated risk factors among pregnant women in Bangladesh. Sci Rep. 2021;11:21339.
10. Maynard SE, Karumanchi SA. Angiogenic Factors and Preeclampsia. Semin Nephrol. 2011;31(1):33-46.
11. Tomimatsu T, Mimura K, Matsuzaki S, Endo M, Kumasawa K, Kimura T. Preeclampsia: Maternal Systemic Vascular Disorder Caused by Generalized Endothelial Dysfunction Due to Placental Antiangiogenic Factors. Int J Molec Sci. 2019;20(17):4246.
12. Shah DA, Khalil RA. Bioactive Factors in Uteroplacental and Systemic Circulation Link Placental Ischemia to Generalized Vascular Dysfunction in Hypertensive Pregnancy and Preeclampsia. Biochem Pharmacol. 2015;95(4):211-26.
13. Bakrania BA, Spradley FT, Drummond HA, LaMarca B, Ryan MJ, Granger JP. Preeclampsia: Linking Placental Ischemia with Maternal Endothelial and Vascular Dysfunction. Compr Physiol. 2020;11(1):1315-49.
14. Jido TA. Ecalmpsia: maternal and fetal outcome. Afr Health Sci. 2012;12(2):148-52.
15. Paruk F, Moodley J. Maternal and neonatal outcome in early- and late-onset pre-eclampsia. Sem Neonatol. 2000;5(3):197-207.
16. Wang W, Xie X, Yuan T. Epidemiological trends of maternal hypertensive disorders of pregnancy at the global, regional, and national levels: a population-based study. BMC Preg Childbirth. 2021;21(1):364.
17. Sibai BM, El-Nazer A, Gonzalez-Ruiz A. Severe preeclampsia-eclampsia in young primigravid women: Subsequent pregnancy outcome and remote prognosis. Am J Obstet Gynecol. 1986;155(5):1011-6.
18. MacKay AP, Berg CJ, Atrash HK. Pregnancy-related mortality from preeclampsia and eclampsia. Obstet Gynecol. 2001;97(4):533-8.
19. Raghupathi V, Raghupathi W. The influence of education on health: an empirical assessment of OECD countries for the period 1995-2015. Arch Public Health. 2020;78(1):20.
20. Kinshella MLW, Omar S, Scherbinsky K. Effects of Maternal Nutritional Supplements and Dietary Interventions on Placental Complications: An Umbrella Review, Meta-Analysis and Evidence Map. Nutrients. 2021;13(2):472.
21. Dempsey A, Sripad P, Sultana K, Kirk K, Hossain SMI, Warren C. Pathways to service access for pre-eclampsia and eclampsia in rural Bangladesh: Exploring women's care-seeking. PLoS One. 2021;16(2):e0245371.
22. Meher S, Duley L. Exercise or other physical activity for preventing pre-eclampsia and its complications. Cochr Database Systemat Rev. 2006;(2).
23. English FA, Kenny LC, McCarthy FP. Risk factors and effective management of preeclampsia. Integr Blood Press Control. 2015;8:7-12.
24. McCaw-Binns A, Ashley D, Knight L, MacGillivray I, Golding J. Strategies to prevent eclampsia in a developing country: I. Reorganization of maternity services. Int J Gynaecol Obstet. 2004;87:286-94.
25. North RA, McCowan LME, Dekker GA. Clinical risk prediction for pre-eclampsia in nulliparous women: development of model in international prospective cohort. BMJ. 2011;342:d1875.
26. Luo J, Fan C, Luo M, Fang J, Zhou S, Zhang F. Pregnancy complications among nulliparous and multiparous women with advanced maternal age: a community-based prospective cohort study in China. BMC Preg Childbirth. 2020;20(1):581.
27. Patel A, Pusdekar YV, Prakash AA. Trends and determinants of increasing caesarean sections from 2010 to 2013 in a prospective population-based registry in eastern rural Maharashtra, India. BMJ. 2019;9(8):e024654.
28. Liabsuetrakul T, Sukmanee J, Thungthong J, Lumbiganon P. Trend of Cesarean Section Rates and Correlations with Adverse Maternal and Neonatal Outcomes: A Secondary Analysis of Thai Universal Coverage Scheme Data. AJP Rep. 2019;9(4):e328-36.
29. Onuh S, Aisien A. Maternal and fetal outcome in eclamptic patients in Benin City, Nigeria. J Obstet Gynaecol. 2004;24(7):765-68.
30. Mbarak B, Kilewo C, Kuganda S, Sunguya BF. Postpartum depression among women with pre-eclampsia and eclampsia in Tanzania; a call for integrative intervention. BMC Preg Childbirth. 2019;19(1):270.
31. Caropreso L, de Azevedo Cardoso T, Eltayebani M, Frey BN. Preeclampsia as a risk factor for postpartum depression and psychosis: a systematic review and meta-analysis. Arch Womens Ment Health. 2020;23(4):493-505.