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ORIGINAL ARTICLE

Can lifetime exposure to intimate partner violence predict suicidality in a sample of Egyptian pregnant women: a cross-sectional study?

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Abstract
Background and objectives: Research on suicidal behaviors during pregnancy in Egypt is limited; being apparently rationalized by pregnancy is a protective period. This study aimed to address the current suicide risk (CSR), and evaluate its correlates of among pregnant women in Egypt.
Methods: It is a cross-sectional study which included 835 of Egyptian pregnant women who were receiving their antenatal care at Zagazig University Obstetrics and Gynecology Outpatient clinics, during the period from 1 October 2017 to 30 September 2018. The sociodemographic and clinical data were collected by a simple semi-structured questionnaire. The psychometric assessment included Beck Suicidal Ideation Scale (BSS), Zagazig Depression Scale (ZDS), Hamilton Anxiety Rating Scale (HAM-A), and Structured Clinical Interview for DSM-IV-TR Axis II Personality Disorders (SCID-II) for assessment of CSR, and comorbid depression, anxiety and personality disorders, respectively.
Results: Among pregnant women, 23.4% reported CSR. This included suicidal ideation of 21.6% and suicidal attempt of 1.8%. Predictors of CSR were history of intimate partner violence (IPV) exposure (OR 8.8, 95% CI: 2.8, 27.7), identification of their current pregnancy as a female baby (OR 6.9, 95% CI: 2.0, 23.5), previous history of fetal loss (OR 3.9, 95% CI: 1.5, 10.6), and moderate-to-severe depression (OR 3.0, 95% CI: 1.0, 8.7).
Conclusions: Our findings suggest that CSR, including suicidal ideation and attempts, is not rare during pregnancy. Exposure to IPV is the most robust predictor of CSR. Pregnant women should be routinely screened for suicidal behaviors, violence exposure and depressive symptoms, as part of their antenatal assessments.

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Introduction

Suicide is a worrisome universal public health problem. Suicidal behavior is a deliberately self-injurious act with a clear intention to kill oneself. It includes ideations about, planning for, attempting, and committing suicide itself.[1] Suicide represents the 15th leading cause of death among all ages and occurs throughout the lifespan. It is the second cause of death among adolescents and young adults. In 2016, over 16 million people attempted suicide, and every two minutes approximately three persons ended their lives by suicide.[2] Also, suicide rates differ in both sexes worldwide. The suicide rate is 11/100,000 for females which is lower than that for males (18/100,000). Classically, the majority of countries, except China, report rates of suicide higher in males than females.[3] Moreover, suicide is the first leading cause of mortality in young girls between the ages 15 and 19 years globally,[4] which would be attributed to childhood adversities including physical, psychological, and sexual abuse resulting in substantially higher risk for suicide.[5] Obviously, the largest dramatic increases in rates of suicide deaths occurred in the developing countries owing to socioeconomic and behavioral etiologies.[6] It was estimated that around 78% of suicides occurred in low- and middle-income countries.[7]

Intimate partner violence (IPV) is fairly prevalent particularly in the rural societies of various developing countries.[8] Results of the prevalence of IPV in the population-based studies including Brazil, Egypt, India, Indonesia, and the Philippines were mixed. Yet, a robust relationship between IPV and increased suicidality among women exist.[9] It was stated that insecure relationships associated with IPV might create a stressful environment which would increase the incidence of suicide ideations and behaviors among abused women.[10]

Moving from pregnancy to motherhood is a distinct life experience for almost all women and can adversely affect their mental health.[11] Pregnancy was considered by some as a period of increased liability to mental disorders.[12] The prevalence of antenatal mental disorders (AMDs) ranged from 15% to 29%.[13] The nonpsychotic AMDs were estimated to be about 16% in the developing countries.[14] An Egyptian study found that 63% of pregnant women attending antenatal care reported simultaneous anxiety and depressive symptoms, whereas 11.4% and 10.4% of them reported only anxiety and only depressive symptoms, respectively.[15] Women were more vulnerable to the negative consequences of emotional instability, which was exacerbated by the hormonal changes experienced during pregnancy.[16] AMDs may negatively affect the children's cognitive and behavioral as well as physical development during childhood and adolescence.[17] It has been assumed that most relevant fetal effects of AMDs occur during the mid-gestational period and may be complicated by adverse obstetric outcomes, including preeclampsia, low-birth weight, and preterm delivery.[12] Likely, AMDs, especially major depressive disorder, would convey the highest risks for suicidal ideations and behaviors.[18] The risk factors associated with AMDs included low socioeconomic level, younger age at marriage, experiencing IPV, and lack of social support.[14]

Despite the antenatal physical and psychological burdens, studies investigated the suicidality and its associated correlates during pregnancy in Egypt were scarce. Only one study found that suicide ideation was reported in 33.5% of pregnant women in Egypt,[19] without addressing factors associated with increased suicide risk among them. To our knowledge, this study would be one of the few studies, if any, that addressed the current suicide risk (CSR), and evaluated its demographic, obstetric, and psychosocial correlates among pregnant women in Egypt.

Materials and methods

Source of data and sampling

A cross-sectional design was used for this study. The study was carried out from 1 October 2017 to 30 September 2018. A total of 875 pregnant women, at any trimester of pregnancy and aged between 20 to 40 years, were consecutively enrolled in this study, calculated according to the Epi Info 6.0, at 80% power of the study, 95% confidence level,[20] as the total number of pregnant women attending the antenatal care outpatient clinics at Zagazig University hospitals in Sharkia Province, Egypt during the last year was 3053, and the prevalence of suicide in pregnant women was 23.53%.[21] During the survey, forty women refused to participate or provided incomplete responses (dropout rate = 4.6%). Thus, the final sample size included in the study was 835 pregnant women. Exclusion criteria included (1) those with any known chronic physical and/or psychiatric illnesses, mental retardation, and current substance use disorders, (2) widowed, divorced, or single pregnant women, (3) high-risk pregnancy, (4) women who abandoned prenatal care, and (5) women who refused to participate. We obtained permission to conduct the study from the principals in the outpatient clinics and written informed consent was obtained from all participants before conducting the study. This study was approved by the Institutional Review Board of Zagazig College of Medicine, and the committees of Psychiatry and Obstetrics and Gynecology Departments.

Data collection and measures

The participants were assessed using the following assessment tools. A semi-structured questionnaire was designed to collect demographic, clinical, and obstetric data. Sociodemographic variables included personal and family-related information. Clinical data included a lifetime history of exposure to intimate partner violence (IPV), and past and family histories of suicide ideations and/or attempts. Lastly, the obstetric data investigated the possible pregnancy-related variables. The lifetime history of exposure to IPV was determined by self-report of facing ever domestic violence which could be physical, verbal, emotional, economic, and/or sexual by a current or former spouse or partner throughout their relationship. The responses, for analysis, were collapsed into a dichotomous (Yes 'if any' vs. no) variable.

Suicide, associated depressive and anxiety symptoms, and personality disorders were evaluated by an array of psychometric assessment scales. Beck Scale for Suicide Ideation (BSS) was utilized to evaluate the participant's thoughts, intent, and plans to commit suicide.[22] A 21-item self-

reported scale was applied, however, only the first 19 items are scored. Each response ranged from 0 to 2 which subjectively described how respondents had been feeling over the past week, including the current day. The Zagazig depression scale (ZDS) was a standardized self-rating instrument used to screen and assess the severity of depressive symptoms.[23] It included 52 questions covering 17 items about the symptoms of depression and was written in Arabic. The total score ranged of 0–30 (0–9 ño depressive symptoms; 10–19 mild depressive symptoms; 20–29 moderate depressive symptoms; and 30 more severe depressive symptoms). Hamilton anxiety scale (HAM-A) was widely used to assess the severity of symptoms of anxiety.[24] It comprised of 14 items. Each item is scored on a 5-point scale, which is ranging from 0 (not present) to 4 (severe). The total score range is 0–56, where 0–13 normal range, 14–17 mild severity, 18–24 moderate severity, and 25 and over severe anxiety symptoms. An Arabic version was prepared and standardized.[25] The Structured Clinical Interview for DSM-IV-TR Axis II Personality Disorders (SCID-II) was used to screen for personality disorders according to the diagnostic guidelines of DSM-IV.[26] It is a 119-item self-reported questionnaire that assesses 10 personality disorders. The Arabic version was prepared and used in a former Egyptian study.[27]

Data processing and statistical analysis

The collected data were reviewed and coded. Data analysis was accomplished using the software SPSS version 20. Means and standard deviations were used to describe the quantitative variables and the independent sample *t*-test was used to compare the means of two groups. Categorical variables were described using their absolute frequencies and to compare the proportion of categorical data and, the chi-square test and Fisher-exact test were used when appropriate. A nonparametric test (Mann-Whitney) was used to compare the means when data were not normally distributed. Multivariate logistic regression was used to assess the odds ratio of possible variables. The level of statistical significance (S) was set at 5% ($P < 0.05$).

Results

Sociodemographic, clinical and obstetric characteristics of study participants

The study included 835 pregnant women with a mean age of 28.7 ± 6.04 years. Most of them were educated ($n = 735$, 88%), rural residents ($n = 610$, 73.1%), housewives ($n = 645$, 77.2%), having a past history of suicide ideation and/or attempt ($n = 440$, 53%). About 46% of women reported a lifetime history of IPV exposure at least once throughout the relationship with their spouses ($n = 380$). Regarding the obstetric history, the mean numbers of female and male offsprings were 2.4 ± 1.5, 1.3 ± 0.6, and 1.2 ± 0.4, respectively. More than half of the multiparous women ($n = 270$) reported a history of vaginal delivery (VD). More than two-fifths of women ($n = 370$) had an unplanned pregnancy. History of abortion attempts was reported in 10.8% ($n = 90$) and the mean number of previous abortions was 1.8 ± 1.1.

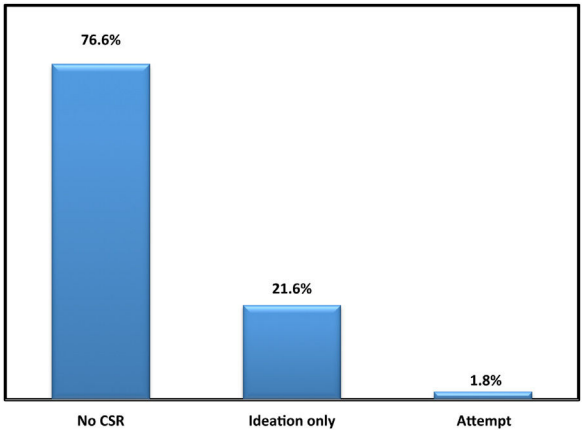

Figure 1 Prevalence of current suicide risk (CSR) in the studied population.

The prevalence of CSR in the studied population was 23.4% ($n = 195$) with the prevalence of suicidal ideation 21.6% ($n = 180$), and suicidal attempt 1.8% ($n = 15$), as shown in Fig. 1.

Factors associated with current suicide risk (CSR)

In terms of sociodemographic and clinical variables, there was a significant association between CSR and family income ($P = 0.002$), educational level ($P = 0.036$), current husband's smoking history ($P = 0.041$), and history of exposure to IPV ($P < 0.001$), as shown in Table 1. Regarding the obstetric history, there were significant associations between CSR, and identification of the current pregnancy as a female baby ($P = 0.001$) and a history of previous fetal loss ($P < 0.001$), as shown in Table 2.

Regarding the comorbid psychiatric and personality disorders, there was a significant association between CSR and moderate-to-severe depressive symptoms ($P = 0.002$). Symptoms of anxiety and personality disorders (clusters B and C) were reported in 20% and 18% of the participants, respectively. There was no association between CSR and symptoms of anxiety or clusters of personality disorders. However, borderline personality disorder (BPD) was associated with increased CSR ($P = 0.006$), while dependent personality disorder was associated with reduced CSR ($P = 0.027$), as shown in Table 3.

Predictors of current suicide risk (CSR) during pregnancy

Logistic regression analysis of all statistically significant variables which predicted CSR in pregnancy was shown in Table 4. The adjusted model illustrated that the odds of CSR among pregnant women increased with those who had a history of IPV exposure (OR 8.8, 95% CI: 2.8, 27.7), identified their current pregnancy as a female baby (OR 6.9, 95% CI: 2.0, 23.5), had a previous history of fetal loss (OR 3.9, 95% CI: 1.5, 10.6), and had moderate-to-severe depressive symptoms (OR 3.0, 95% CI: 1.0, 8.7).

Table 1 Association between sociodemographic variables and current suicidal risk (CSR) in studied population (n = 835).

	Current suicide risk (CSR)			
	Yes	No	X^2	*P*
	N (%)	N (%)		
Residence				
Rural	160 (26.2)	540 (73.8)	2.09	0.148
Urban	35 (15.6)	190 (84.4)		
Income				
Low	140 (33.7)	275 (66.3)	9.94	**0.002**
Middle-to-high	55 (13.1)	365 (86.9)		
Education				
Illiterate	25 (25.0)	75 (75.0)	8.54	**0.036**
Low education	45 (28.1)	115 (71.9)		
Moderate education	95 (32.8)	195 (67.2)		
High Education	30 (10.5)	255 (89.5)		
Occupation				
Not working	160 (24.8)	485 (75.2)	0.41	0.279
Working	35 (18.4)	155 (81.6)		
Husband occupation				
Skilled	95 (26.0)	270 (74.0)	0.77	0.681
Unskilled	60 (19.7)	245 (80.3)		
Employee	40 (24.2)	125 (75.8)		
Current husband's smoking history				
No	80 (17.6)	375 (82.4)	3.72	**0.041**
Yes	115 (30.3)	185 (69.7)		
Current husband's substance use history				
No	190 (23.5)	620 (76.5)	0.03	0.668
Yes	5 (20.0)	20 (80.0)		
History of exposure to intimate partner violence (IPV)				
No	50 (11.0)	405 (89.0)	17.08	**< 0.001**
Yes	145 (38.2)	235 (61.8)		
Past history of suicide				
No	95 (24.1)	300 (75.9)	0.04	0.492
Yes	100 (22.7)	340 (77.3)		
Family history of suicide				
No	195 (23.9)	620 (76.1)	0.26	0.341
Yes	5 (25.0)	15 (75.0)		
	Mean ± SD	Mean ± SD	*t*-test	*P*
Age	24.9 ± 5.6	25.8 ± 4.5	0.91	0.340

Bold text shows statistical significance where $P < 0.05$.

Discussion

Data extracted from the WHO mortality database indicated that 85% of the world's suicides occurred in developing countries.[28] However, most of knowledge and understanding of suicide is based on information from developed countries, which may not be applicable in various cultural contexts. This study revealed that the prevalence of CSR among pregnant women was 23.4% (suicidal ideation 21.6%, and suicidal attempt 1.8%). Suicide, as a behavior, is not only prohibited by Islam but also disapproved within the cultural and social contexts in the Islamic countries.[29] This could explain the apparent paradox (higher rates of suicidal ideations and lower rates of suicidal attempts). There is a widespread religious and cultural belief among Egyptian people that those who ended their lives would die as a so-called ''apostate''. Thus, women would experience and freely disclose suicidal ideations but refuse to act on them or disclose attempts due to this religious and social stigma. Similar results were replicated in earlier studies that found a range from 18% to 24% of pregnant women reported suicidal behaviors.[19,21,30] Other studies focusing on suicide ideation during pregnancy found prevalence ranged from 3% and 35%.[31,32] Inconsistent with our results, Da silva et al. reported that only 8% of pregnant women revealed suicidal potential.[33] Similarly, Supraja et al. found that 7.6% of pregnant women reported suicidal ideation and 2% attempted a suicide attempt at least once during their current pregnancy.[34] These inconsistencies were attributed to the

Table 2 Association between obstetric variables and current suicidal risk (CSR) in the studied population ($n = 835$).

	Current suicide risk (CSR)			
	Yes	No	X^2	*P*
	N (%)	N (%)		
Gestational age				
1st trimester	20 (16.0)	105 (84.0)	1.13	0.569
2nd trimester	85 (26.6)	235 (73.4)		
3rd trimester	90 (23.1)	300 (76.9)		
Baby gender				
Unidentified	60 (30.8)	135 (69.2)	13.11	**0.001**
Identified as a female baby	90 (37.5)	150 (62.5)		
Identified as a male baby	45 (11.2)	235 (88.8)		
Parity				
Nulliparous	90 (28.6)	225 (71.4)	1.54	0.215
Multipara	105 (20.2)	415 (79.8)		
Type of previous labor				
Vaginal	55 (20.4)	215 (79.6)	0.00	0.963
Caesarian	50 (20.0)	200 (80.0)		
Plan for pregnancy				
Unplanned	110 (29.7)	280 (70.3)	2.02	0.082
Planned	85 (18.3)	380 (81.7)		
History of previous fetal loss				
No	85 (13.7)	535 (86.3)	25.02	**< 0.001**
Yes	110 (51.2)	105 (48.8)		
	Mean (SD) Range	Mean (SD) Range	MW	*P*
Number of pregnancies	2.5 (1.4) 1 – 5	2.4 (1.5) 1—10	−0.74	0.461
Number of female offsprings	1.1 (0.4) 1- 2	1.4 (0.7) 1—4	−0.98	0.328
Number of male offsprings	1.0 (0.0) 1 -2	1.1 (0.2) 1—2	−0.42	0.672

Bold text shows statistical significance where $P < 0.05$.

differences in methodology, settings, and patients' criteria of the former studies.

Of interest, there was a lot of evidence that the family and past histories of suicide could predict future suicide.[35,36] However, the current study failed to reveal significant associations between either family or past history of suicide and CSR among pregnant women. This would be explained as previously mentioned, in Egypt, as one of the Middle East Islamic countries, suicide was widely perceived as an unaccepted behavior with a religious and social stigma. Therefore, we believed that very often families of suicide victims would deny or avoid mentioning that a family member has ended his/her own life. These families did not want people to remember that the deceased died as a so-called ''apostate'', so that the reputation of the deceased, and even the family would be humiliated.

The relationship between obstetric factors and women's mental health has drawn considerable interest. This study found CSR was 7 and 4 times higher in pregnant women who had identified their current pregnancy as a female baby and had a history of previous fetal loss, respectively. In Egypt, it is culturally accepted that having male offsprings may increase women feeling of self-worth, possibly based on their apparent perception of being more fertile, and was generally perceived as a source of power and domination to the family. Also male children, especially in rural communities, can financially support their parents when they become older.[37] Our results were also consistent with a Taiwanian study revealing that the risk of suicide was higher in women who had a history of fetal loss, and the risks of completed suicide were 5.2, 3.81, and 3.12 times higher in the women who experienced a stillbirth, miscarriage or termination of pregnancy, respectively.[38] Also, the prevalence of suicidal ideation, as well as depression, anxiety, and substance use disorders, was increased among women who had induced abortions.[39,40] Abortion itself, as one of several causes of fetal loss, is a traumatic life event that increases liability to suicidal behavior.[41]

Our study screened for the life history of IPV and found that pregnant women exposed to IPV were more likely associated with CSR. Exposure to IPV, after adjusting other significant variables, was the most robust predictor of CSR by increasing its odds by 9 folds. How the recurrent exposure to IPV would progress to self-harming thoughts or behaviors

Table 3 Association between associated psychiatric history, personality disorders, and current suicidal risk (CSR) in the studied population ($n = 835$).

	Current suicide risk (CSR)		X^2	P
	Yes N (%)	No N (%)		
Depressive symptoms				
No-to-mild	35 (10.6)	295 (89.4)	9.91	**0.002**
Moderate-to-severe	160 (31.7)	345 (68.3)		
Anxiety symptoms				
Absent	140 (20.9)	530 (79.1)	2.29	0.130
Present	55 (33.3)	110 (66.7)		
Personality disorders				
No	165 (24.1)	520 (75.9)	0.63	0.415
Yes	30 (20.0)	120 (80.0)		
Clusters			1.51	0.471
Cluster B	15 (33.3)	30 (66.7)		
Cluster C	15 (14.3)	90 (85.7)		
Types				
Histrionic	2 (11.8)	15 (88.2)	1.39	0.239
Borderline	9 (52.9)	8 (47.1)	7.41	**0.006**
Narcissistic	4 (36.4)	7 (73.6)	0.89	0.346
Avoidant	7 (25.9)	20 (74.1)	0.05	0.827
Obsessive	6 (12.5)	42 (87.5)	3.37	0.067
Dependent	2 (6.7)	28 (93.3)	4.87	**0.027**

Bold text shows statistical significance where $P < 0.05$.

Table 4 Predictors of current suicidal risk (CSR) in the studied population ($n = 835$).

Current Suicide Risk (CSR)	Model 1[a] OR (95% CI)	Model 2[b] OR (95% CI)
	1.0	1.0
Income (moderate-to-high)		
Low	**3.4 (1.5–7.4)**	2.9 (0.9–8.9)
Education (high education)		
Illiterate	2.8 (0.8–10.6)	0.9 (0.2–4.8)
Low education	**3.3 (1.1–10.4)**	0.7 (0.1–3.6)
Moderate education	**4.1 (1.5–11.3)**	2.5 (0.6–9.5)
Current husband's smoking history (no)		
Yes	**2.0 (1.0–4.2)**	1.0 (0.4–2.7)
History of intimate partner violence (no)		
Yes	**5.0 (2.2–11.2)**	**8.8 (2.8–27.7)**
Baby gender (male)		
Unidentified	**3.5 (1.3–9.3)**	3.3 (0.9–11.1)
Female	**4.7 (1.9–11.7)**	**6.9 (2.0–23.5)**
History of previous fetal loss (no)		
Yes	**6.6 (3.0–14.5)**	**3.9 (1.5–10.6)**
Depressive symptoms (no-to-mild)		
Moderate-to-severe	**3.9 (1.6–9.5)**	**3.0 (1.0–8.7)**

Bold text shows statistical significance where the 95% confidence intervals do not include the null value (1.0).
[a] Model 1: unadjusted.
[b] Model 2: adjusted for other statistically significant variables.

could be explained according to the Interpersonal Psychological Theory of Suicide which proposed two prerequisites for a potential suicidal behavior: 1) a strong wish to die and 2) a capability for self-harm.[42] Women exposure to violence either physical, psychological, or even sexual abuse might lead them to experience feelings of psychological distress, lack of self-efficacy and social support, failure to cope, and hopelessness. As a consequence, such individuals would become apathetic and indifferent toward others, to the point of thinking to harm themselves. As these indi-

viduals continued to experience psychological pain, loss of relatedness with other people, social dysfunction, and a persistent feeling of mental exhaustion, their self-harm thoughts would progress to more life-threatening suicidal ideations and behaviors.[43] Our results were in line with the earlier studies that found a close relationship between women's exposure to IPV and experiencing depression[31] and suicidal ideation[44] and behaviors.[45] In a population-based study, Coelho et al. found increased odds for suicide among Brazilian physically abused pregnant teens as compared with their non-abused counterparts.[46] Also, Copersino et al. found that drug-dependent physically abused pregnant women were associated with increased odds of antenatal suicidal ideation.[47] However, Gavin and colleagues examined the correlates of suicidal ideation during pregnancy and failed to find any relation between IPV exposure and suicidal ideation.[32] This inconsistency was attributed to sampling size, cultural, and legislation differences (unlike Egypt, there are strict punishment laws against the abusive partners in the US). The fact that the majority of women chose to remain quiet and not to talk to others when subjected to violence suggested that there might be obstacles in seeking help among those who were already marginalized.[48] In Egyptian culture, a woman might resist sharing information with the authorities about her husband's violent behaviors to avoid social disapproval and protect her family. Another barrier to sharing might be the lack of well-developed social support services for the abused or suicidal women.[49]

The psychiatric comorbidities were one of the most frequently reported risk factors for suicide. Depression conveyed one of the highest risks for suicidal ideation.[50] The study revealed that from all comorbid psychiatric and personality disorders investigated, only associated depressive symptoms and borderline personality disorder (BPD) were associated with CSR in pregnant women. Women who suffered from moderate-to-severe depressive symptoms had a 3-fold increase in their odds of CSR. Although Onah et al. found that more than fifty percent of women who reported suicide were not depressed,[10] other studies investigating the risk factors for antepartum suicidal ideation identified depression as a potential risk factor.[30,46,51] Alhusen et al. found that antenatal depression increased the odds of suicidal ideation during pregnancy by 17 folds even after adjusting for demographic factors and IPV exposure.[51] Besides, Coelho et al. stated that the occurrence of depression doubled the odds of suicidal ideation among pregnant teens.[46] The pregnant woman is more vulnerable to the negative consequences of depressive symptoms, exacerbated by hormonal changes experienced during pregnancy.[16] On the other side, the relationship between BPD and increased suicide risk was replicated in several studies. Kolla and colleagues estimated that 9–33% of all suicides were diagnosed as patients with BPD.[52] It was also claimed that self-injurious behaviors, including suicide, were common among people with BPD, and 50–80% reported absence of pain experienced during these behaviors.[53] Women with BPD might attempt suicide as they thought that it would make others better off. Besides, the suicide attempts as a reaction to the negative emotional experiences might be perceived by individuals with BPD as an alternative to the non-suicidal self-injurious behaviors.[54]

There were several limitations to our study. First, the cross-sectional nature of the study design limited an investigation into the progression of suicide and other psychiatric disorders before the conception. We were also not able to follow the long-term suicide-related outcomes of our sample. Second, our data were self-reported, which could lead to recall bias or even underreporting attributed to the stigma related to suicidal behaviors. Third, although validated screening measures for depressive and anxiety symptoms were applied, it was better to use the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) or other similar structured tools for accurate diagnosis of comorbid depressive and anxiety disorders. Lastly, the exposure to intimate partner violence (IPV) was assessed using a single item, dichotomously answered as ÿesör ño:. This would result in the possibility of missing other essential dimensions of violence and abuse. Thus, using multi-faceted validated measures for screening various dimensions of IPV would be advisable in future research. Despite the aforementioned limitations, this study exhibits much strength as one of the few studies, if any, that have investigated the prevalence, psychiatric and personality comorbidities, and associated risk factors of suicide during pregnancy in one of the Middle East developing countries. Furthermore, this study is unique in precisely evaluating a wide array of potential demographic, obstetric, and psychosocial confounders to establish a more comprehensive model for suicidal risk during pregnancy.

In conclusion, the current suicide risk during pregnancy is not rare. About twenty-three percent of Egyptian pregnant women reported CSR. Pregnant women, who were suffering from exposure to IPV, had identified their current pregnancy as a female baby, had a history of previous fetal loss, and had moderate-to-severe depressive symptoms, were more prone to suicide during pregnancy. This study highlights the need to develop programs that allow screening for violence exposure and associated depression as a part of antenatal care for early management and prevention strategies of suicidal behaviors during pregnancy. Governmental attention should be directed to adopt and ensure hot-lines that can offer help, once needed, to depressed women or those who were victims of violence, which would be expected to contribute to improving the maternal mental, as well as, physical health and the pregnancy outcome.

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Conflict of interest

The authors declare that they have no conflict of interest.

Ethics approval

All procedures performed in studies involving human participants were following the ethical standards of the institutional and/or national research committee and with

the declaration of Helsinki and its later amendments. This study protocol was approved by the Institutional Review Board of Zagazig College of Medicine, and the committees of Psychiatry and Obstetrics and Gynecology Departments. Written informed consent was obtained from all participants before conducting the study.

Availability of data and material

Data will be made available to interested individuals upon formal request made to authors.

Authors' contributions

M. A. was responsible for conceptualization, work design, and writing the original draft. A. S. and Y. S. were responsible for sample selection and conducting the interviews. M. A. I. and M. S. B. were responsible for the interpretation of data and formal analysis. Y. K. and M. S. H. were responsible for writing, editing, and final revision.

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