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The prevalence of perceived stress and depression in women facing abortion and related obstetric and non-obstetric risk factors: a cross-sectional study

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Abstract

Background Available studies have limitations in identifying risk factors after abortion. Therefore, this study aimed to investigate the prevalence of perceived stress and depression in women facing abortion and to identify related obstetric and non-obstetric risk factors.

Method This is a cross-sectional study that conducted from October 2023 to March 2024, involving 250 women seeking first-trimester abortions who visited the obstetrics emergency department at Amol hospitals. After obtaining informed consent, a questionnaire that includes demographic characteristics, perceived stress scale, Patient Health Questionnaire- 4, domestic violence questionnaire, 6-question marriage quality questionnaire, Medical Outcomes Social Support and Brief Resilience Scale were filled out. Data analyzed using descriptive statistics and logistic regression with a significance level of $p < 0.05$ in SPSS software version 23.

Result The prevalence of high perceived stress and depressive symptoms was 18.8% and 15.6%, respectively. There was a significant relationship between depression and perceived stress ($p = 0.029$), as well as low social support ($p = 0.034$), history of previous abortion ($p = 0.001$), and social factors of abortion ($p = 0.045$) with perceived stress ($p < 0.05$). There was no significant relationship between other variables such as resilience, domestic violence, quality of marriage with perceived stress and depression ($p > 0.05$).

Conclusion The prevalence of perceived stress and depression was not high in this women. Previous abortion history, low social support, and abortion for social reasons were the most important factors affecting perceived stress, which was also significantly associated with depression. The findings emphasize the importance of assessing the mental health of women seeking abortion, especially those with high-risk factors for Appropriate interventions.

Plain Language Summary

There is lack of consensus on the occurrence of stress and depression after abortion, and the available studies have limitations in identifying risk factors and at-risk. Therefore, this study aimed to investigate the prevalence of perceived stress and depression in women facing abortion and to identify related obstetric and non-obstetric risk factors. In this study, perceived stress and depression were not high and reported in less than one-fifth of the referred women for pregnancy termination. Previous abortion history, low social support, and abortion for social reasons were

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the most important factors affecting perceived stress, which was also significantly associated with depression. The results show the need for assessing the mental health of women applying for abortion, especially those who present with risk factors. Therefore appropriate interventions including screening and counseling before or after abortion can be useful for all women with the mentioned risk factors and should be considered by health providers.

Keywords Perceived stress, Depression, Abortion, Risk factors

Introduction

Today, abortion is referred to as a women's health problem, the key issue of health, and a major issue raised in the context of reproductive and sexual rights [1], affecting not only women's health but also their partners, children, and the whole family [2]. Estimates indicate that 42 million abortions occur annually worldwide, 20 million of which are not safe and lead to the death of 70,000 mothers and 5 million temporary or permanent disabilities [3]. In most cases, abortion is a stressful event in life that challenges women's mental health [4]. Although some women cope well with this condition, others suffer from a wide range of mental health problems[3, 4]. Although abortion is common in reproductive age, there are conflicting opinions about the occurrence of post-abortion stress [5]. Plenty of scientific evidence is available about the relationship between abortion and mental health disorders, e.g., sadness, anxiety, depression, post-traumatic stress (PTS), suicide risk, psychosomatic disorders, and sexual health disorders [2]. An extensive study on longitudinal complications after abortion documented women's experiences of post-traumatic stress (29%), moderate-severe anxiety (24%), and moderate-severe depression (11%) after abortion [6]. In addition, their spouses were also at significant risk of symptoms of anxiety, depression, and PTS [7]. However, different results are reported on women's psychological responses to abortion in different studies [8]. A negative relationship between abortion and mental health was observed in a wide range of studies conducted among women who experienced an abortion [9]. The research reported a 7.9 and 53.5% prevalence for this relationship [10, 11]. Nevertheless, some researchers believe that abortion per se does not lead to psychological complications [12, 13].

Despite few studies on possible confounding factors, previous history of mental problems, gestational age, low self-esteem, low resilience, low understanding ability to adapt to abortion, stigma, and low social support have been reported among factors associated with psychological experiences of abortion [4]. Other influential factors include regional differences in the legal field, cultural views, and abortion-related social stigma [4, 14]. Different factors can influence perceived stress interactively, which can be used in stress management. However, it is not fully known whether these factors cause stress or a mediating or confounding factor [15]. Health systems aware of these issues can be useful for more effective prediction and prevention of psychological complications and monitoring of high-risk pregnancies [16, 17]. In this respect, there is a lack of a deeper understanding of the characteristics of post-abortion psychological complications and information about vulnerability and resilience factors. The key drivers of post-abortion psychological complications, including demographic factors or obstetric characteristics, have been reported only in some studies [18, 19]. Nonetheless, the factors on which experts should focus to more effectively prevent post-abortion psychological complications are not yet well known.

In Iran, the Forensic Medicine Organization reported 1664 abortions from 2007 to 2013, 339 and 1325 of which occurred due to maternal reasons and intentional abortions, respectively [20, 21]. The statistics provided by the Ministry of Health, Treatment, and Medical Education indicate that 80,000 abortions occur annually in Iran, which are often illegal and unhygienic [22]. In the legal system of Iran, abortion is a crime and subject to punishment, except for medical reasons [23]. Due to the abortion laws in Iran, the high prevalence of abortions in the country, and the lack of any centers for post-abortion psychological support for women, little information is available about women's apprehension of abortion, psychosocial reactions, and individual factors affecting their psychological improvement. Several studies investigated the occurrence of stress and depression after all types of abortion in Iran[4, 12, 24]. Some other investigations scrutinized the effect of effective psychological approaches to control post-abortion psychological complications [1, 25, 26]. Despite these efforts, the existing studies are limited to identifying individual risk factors related to stress and depression (other than demographic or obstetric factors) to recognize at-risk groups. In this regard, understanding women's perceptions in coping with abortion and related risk factors can be useful for health service providers to evaluate and plan effectively to deal with these complications [8]. Therefore, the present study aims to investigate the perceived stress and depression in women who experienced abortion as well as related obstetric and non-obstetric risk factors to help and follow-up identify at-risk groups for psychological support. The study also seeks to prevent the possible

short-term and long-term psychological side effects to ultimately maintain and improve the mental health of the family and society.

Materials and methods

Participants and procedure

This cross-sectional study was conducted in the obstetrics emergency department of Imam Ali Hospital and Shomal Amol Hospital (Amol City, Northern Iran) between October 2023 to March 2024. Note that these places are the only centers legally providing misoprostol tablets for abortion in the study area. The participants were women who visited these centers as outpatients with two ultrasounds from two different radiologists indicating abortion or pregnancy remnants.

The authors began their work after receiving approval from their university ethics committee and then obtaining permission from hospital authorities. Women who met the inclusion criteria were included in the study using a convenient sampling method.

The research inclusion criteria were Iranian women or residents fluent in the Persian language, reading and writing ability, seeking termination of intrauterine pregnancy, gestational age ≤ 12 weeks, outpatient status, and stable physical conditions. The exclusion criteria were a history of mental problems or taking neuroleptics, inability to present informed consent (e.g., with a severe mental disability), The patient's emergency physical condition, such as severe bleeding, reluctance to participate in the study, and not filling out more than 20% of the questionnaire.

The eligible women were informed about the research objectives, presented informed verbal consent, and filled in the questionnaire upon consent. Since the participants voluntarily completed the questionnaires in the hospital monitored by the researcher, all the questionnaires were completed with no missed data.

A sample size of 250 people was obtained using Cochran's formula according to a standard deviation of 12.67 of the unit population ratio [26] and $z = 1.96$ at an error level of $\alpha = 5\%$.

$$n = \frac{\left(Z_{\alpha}^{2} \times S^{2}\right)}{d^{2}}$$

Data collection tool

The questionnaire included several parts: demographic information (i.e., age, occupation, education, and family income), number of pregnancies, number of previous abortions, gestational age of this pregnancy, desirous or not, reason for abortion, and the contraceptive method. Other questionnaires used included the following:

Perceived stress

The perceived stress was measured using the 4-item Perceived Stress Scale (PSS- 4). The items are rated on a 5-point Likert scale from 0 to 4 (never = 0, very little = 1, sometimes = 2, high = 3, and very high = 4). The range of PSS- 4 scores is 0–16, with a higher score indicating greater perceived stress. The Persian version of this scale has satisfactory validity and reliability in infertile women [27]and asthmatic patients [28].

Depression symptoms

Depression symptoms were measured with the Patient Health Questionnaire- 4 (PHQ- 4), comprising 4 items graded on a 4-point Likert scale from 0 to 3 (never = 0, some days = 1, more than half of days = 2, and almost every day = 3). The scores obtained for the total score of PHQ- 4 and each of the depression and anxiety subscales range are 0–12 and 0–6, respectively, with a higher score indicating more depression and anxiety. The Persian version of this scale has satisfactory validity and reliability in different Iranian populations [29]. In the present study, PSS- 4 stress > 10 and PHQ- 4 depression > 10 scores were determined as high perceived stress and depression, respectively.

Potential risk factors in this study include violence against women, satisfaction with spouse and the quality of marriage, perceived social support, and resilience, each of which was measured using related questionnaires denoted below.

Domestic violence

Violence against women was screened with the domestic violence screening tool recommended by the American College of Obstetricians and Gynecologists to detect the experience of violence against women by their husbands in the past year. This tool includes three questions related to physical, mental, verbal, or sexual abuse in the past year [30]. Any positive answer indicates the presence of violence.

Satisfaction with spouse and the quality of marriage index (QMI)

The QMI questionnaire is a short self-report tool consisting of six questions with positive wording. Questions 1–5 have a 7-point Likert response scale from 1 (very strongly disagree) to 7 (very strongly agree). Also, Question 6 has a 10-point Likert response scale from 1 (very low) to 10 (very high). The obtained scores range from 6 to 45, with a higher score indicating a better marriage quality. The Persian version of this scale has satisfactory validity and reliability in infertile people

[2]. In the present study, QMI < 13.5 was specified as marital dissatisfaction.

Perceived social support (PSS)

The Medical Outcomes Study Social Support Scale (MOSSS- 5) measures the participants' perception of social support (e.g., companionship, receiving help, or other types of support). Each item is scored on a 5-point Likert scale and the total score ranges from 5 to 25. A total score of 5–16 is considered low PSS. Bakhshandeh et al. (2021) performed a psychometric analysis of its Persian version in the Iranian elderly population [31].

Resilience

The Persian version of the Brief Resilience Scale (BRS) contains six items about one's self-efficacy in facing stressful events in a 5-point Likert scale from 1= completely disagree to 5= completely agree. The average possible scores of all six items are interpreted as low (1–2.99), normal (3–4.30), and high (4.31–5) flexibility. The Persian version of BRS has good validity and reliability [32]. In this study, BRS < 3 was regarded as low resilience.

Statistical analysis

Data were analyzed using SPSS statistical software version 23. Demographic and obstetric characteristics were described with descriptive statistics. Relationships between categorical outcomes and explanatory variables were tested by chi-square. Multivariate binary logistic regression analysis measured stress and depression as dichotomous variables, respectively. A p-value < 0.05 was considered the level of significance.

Ethics approval and consent to participate

The present study is a research project approved (code of ethics IR.IAU.BABOL.REC.1402.114) by the Ethics Committee of the Islamic Azad University, Babol Branch. This research adheres to Helsinki ethical standards, ensuring respect and protection for human subjects. Participants were informed about the study's objectives, methods, confidentiality, and their right to withdraw. Informed consent was obtained before the research began.

Results

Characteristics of participants

The highest percentage (53.6%) of the subjects were in the age range of 26–35 years. Almost one-third of the subjects (32.4%) and one-fourth (24.4%) of their spouses held a bachelor's degree. In terms of obstetric characteristics, more than half of the participants (58%) were reluctant to pregnancy, and most of them (70.5%) used a natural method of contraception. The causes of abortion in the recent pregnancy were fetal growth restriction (53.6%), social factors (42.8%), and medical factors related to the mother's health (3.6%). Other characteristics are specified in Table 1.

Perceived stress and associated factors

The perceived stress score of the subjects averaged 7.5, and only 47 participants (18.8%) reported severe perceived stress (cutoff ≥ 10). Table 2 represents the relationship between the perceived stress level and the characteristics of abortion patients based on logistic regression. The results showed that higher perceived stress was reported by women with low social support ($p = 0.034$), with a history of previous abortion ($p = 0.001$), and social reasons for abortion ($p = 0.045$). No significant relationships were observed between the other variables (e.g., resilience, domestic violence, the quality of marriage, demographic, and midwifery variables) and perceived stress ($p < 0.05$).

Depression and associated factors

The depression score of the subjects averaged 5.62, and only 39 participants (15.6%) reported severe depression (cutoff ≥ 10). Table 3 shows the relationship between the depression level and the characteristics of abortion patients based on logistic regression. The results indicated that perceived stress was the only variable affecting depression ($p = 0.029$). No significant relationships were observed between the other variables (e.g., resilience, domestic violence, the quality of marriage, demographic, and midwifery variables) and depression ($p < 0.05$).

Discussion

The present study aimed to investigate the prevalence of perceived stress and depression in women faced with abortion and to identify related obstetric and non-obstetric risk factors in the hospitals of Amol, a northern city in Iran. In this research, the women reported relatively lower levels of perceived stress and depression. In a study on the intensity of stress after induced, elective, and legal abortion in women visiting the Shiraz abortion center (Alipanahpour et al. [3]), the frequencies of stress were respectively 18.35% and 9.98% in immediate and after one month of legal abortions, and 10.10 and 12.44% in induced abortions, respectively. These data are consistent with those of the present study [3]. Many studies underline no relationships between abortion, stress, anxiety, and psychological problems. Such works consider pre-abortion mental health, domestic violence, and economic status as the factors affecting the occurrence of post-abortion depression and anxiety [12]. Several studies report a high level of post-abortion stress and depression, even in Iran [4,

Table 1 Demographic and obstetric characteristics of women experienced abortion

Variable	Range	Frequency	Percentage
Age	15–25	35	14
	26–35	134	53/6
	36–45	78	31/2
	> 45	3	1/2
Education	Below diploma	51	4/220/4
	Diploma	76	43030/4
	Associate degree	19	7/6
	Bachelor's degree	81	32/4
	Master's degree and above	23	9/2
Spouse's education	< 12 years	122	48/8
	> 12 years	128	51/2
Job	Housewife	147	58/8
	Employee	52	20/8
	Freelancer	44	17/6
	Student	7	2/8
Spouse's job	Unemployed	7	2/8
	Worker	69	27/6
	Employee	66	26/4
	Freelancer	107	42/8
	Retired	1	0/4
Income	< 15	162	64/8
	15–25	63	25/2
	> 25	25	10
Number of children	**0**	81	32/4
	1–2	147	58/8
	3–4	21	8/4
	5 and above	1	0/4
History of abortion	**0**	101	40/4
	1–2	128	51/2
	3–4	20	8
	5 and above	1	0/4
Contraceptive	No method	29	11/6
Method	Withdrawall	176	70/5
	Condom	20	8
	Pill	25	10
Desire to become pregnant	Yes	105	42
	No	145	58
Weeks of pregnancy	< 9	190	76
	9–12	60	24
Reason for abortion	No Fetal growth	134	53/6
	Medical factors	9	3/6
	Social factors	107	42/8
Total		250	100

Bold indicates that variable has a significant relationship

12, 29]. For example, Alipanahpour et al. investigated short-term psychophysical complications after medical and spontaneous abortion and reported that 1.73% of the subjects suffered from moderate stress [4]. These differences can be attributed to the sociocultural structure and the surveyed population's attitude toward abortion because individual, social, economic, religious, and cultural factors influence women's attitudes toward

Table 2 Factors associated with high perceived stress in women facing abortion

Variable	Range		High perceived stress	p	B-coefficient	Confidence interval	
						Low	High
Age	15–25		7 (20%)	0/228	0/497	0/159	1/55
	26–35		22 (16/4%)	0/757	0/816	0/226	2/946
	36–45		18 (23/1%)	0/999	00	0	0
Contraceptive method	No method		3 (10/3%)	0/343	1/945	0/492	7/694
	Withdrawall		32 (18/2%)				
History of abortion	Yes		40 (16%)	**0/001**	4/662	1/881	11/55
Reason for abortion	No Fetal growth		14 (10/4%)	0/518	1/81	0/299	10/94
	Social factors		31 (29%)	**0/045**	2/01	0/859	4/7
Income	Low		29 17/9%)	0/653	1/238	0/487	3/15
	Medium and above		18 (38/2%)	0/291	0/47	0/116	1/9
Quality of married life	Good		2 (33/3%)	0/755	1/419	0/157	12/8
	Bad		45 (%)				
	Low		26 (31/3%)	**0/034**	0/428	0/195	0/938
Social support	Good		21 (12/6%)				
Violence	Phiscal	Yes	11 (44%)	0/142	0/433	0/141	0/216
		No	36 (16%)				
	Mental	Yes	6 (40%)	0/826	0/857	1/32	3/395
		No	41 (17/4%)				
Resilience	Low		0 (0%)	0/999	2/76	0	0
	High		47 (19%)				

Bold means $p < 0.05$

abortion [9]. In the present study, about 10% of women were subjected to physical violence in the last year. This value is much lower than the prevalence of domestic violence (66%) reported in a meta-analysis study in Iran in 2017 [26]. Therefore, this data can justify the lower levels of perceived stress and depression in the results of our study. Such a wide difference in stress and depression levels after spontaneous abortion in different studies can be attributed to the assessment time of post-abortion stress and depression and the assessment tools in the studies.

Our results marked a significant relationship between the depression and perceived stress variable. This finding is in line with those reported by Zhang et al. and Chen, who studied the prevalence of stress and depression and related factors [8, 33]. Additionally, psychosocial challenges caused by unwanted pregnancy and the abortion process can be influential in this regard [8]. Gender can also be an influential factor as women feel more threatened, lose control over life, and lack social support in stressful life situations [34, 35].

According to the results of the present study, low social support and a history of previous abortion can influence perceived stress, which is consistent with the results of Zhang et al. and Qu et al. [8, 36]. Zhang et al. claimed that low resilience was a more influential factor in causing stress [8]. However, resilience was not related to perceived stress and depression in our study. Meanwhile, low social support was a more prominent factor in causing perceived stress. This difference can be because of the study area, women's personality, and educational structure. In other studies, social support was a necessary protector against stress and depression during pregnancy, which is in line with our study [33, 36, 37]. Most women will need more psychological and social support later while terminating their pregnancy. Low social support and personalities with a higher tendency to react negatively to stress (such as low self-esteem, pessimism, and low intelligence) experience more mental disorders following abortion or even during pregnancy. These results demonstrate the importance of identifying high-risk women prone to later mental complications [9]. Given the impact of social support on perceived stress, the need for family support in pregnancies leading to abortion should be emphasized by health providers [3].

A noteworthy point of this study is the high prevalence of unwanted pregnancy as more than half of the samples were reluctant to be pregnant and mostly aborted due to social factors, such as the spouse's inappropriate job, insufficient income, and a

Table 3 Factors associated with high depression in women facing abortion

Variable	Range		High depression	p	B-coefficient	Confidence interval	
						Low	High
Age	15–25		4 (11/4%)	0/612	1/384	0/394	4/856
	26–35		22 (16/4%)	0/822	1/177	0/258	4/854
	36–45		13 (16/7%)	0/999	0/0	00/0	
Contraceptive method	No method		3 (10/3%)	0/632	1/395	0/357	3/457
	Withdrawall		31 (17/6%)				
Reason for abortion	Lack of Fetal growth		14 (10/4%)	0/876	0/83	0/08	0/7
	Social factors		24 (22/4%)	0/225	1/757	8/583	4/364
Income	Low		35 (30/3%)	0/999	1	0/367	2/72
	Medium and above		4 (16%)	0/884	1/1	0/282	4/35
Stress	Low		24 (11/8%)	**0/029**	2/6	1/1	6/153
	High		15 (31/9%)				
Quality of married life	Good		3 (50%)	0/37	0/345	0/047	2/912
	Bad		36 (14/8%)				
			39 (15/6%)				
Social support	Low		20 (23/1%)	0/291	0/637	0/276	1/471
	Good		19 (11/4%)				
Violence	Phiscal	Yes	11 (44%)	0/702	0/564	0/21	2/33
		No	36 (16%)				
	Mental	Yes	6 (40%)	0/561	0/421	2/33	2/29
		No	41 (17/4%)				
Resilience	Low		23 (33/3%)	0/138	0/139	0/01	1/905
	High		16 (1/13%)				

Bold means $p < 0.05$

sufficient number of children. Unwanted or unplanned pregnancy as a risk factor for depression and stress has been reported in many studies [38, 39]. The present results also revealed that women who aborted due to social factors were more exposed to perceived stress. Enough findings on the provision of post-abortion psychological care are absent in Iran, and even effective and simple screening measures are not available to prevent post-abortion psychological complications [40]. Accordingly, health providers should record a detailed history of women with abortion and refer them for psychological counseling in the case of identifying risk factors (e.g., resilience and low social support, a history of previous abortions, or performing abortions for social reasons) to prevent consequent psychological complications [41]. Since midwifery counseling can effectively reduce post-abortion stress, planning bereavement training at regular intervals will be beneficial for midwives facing such women [42]. Due to the high prevalence of abortion, policymakers and health planners are recommended to allocate a budget for special departments with the presence of a midwife and a psychologist in the service centers to take and follow up post-abortion psychophysical care.

Among the strength points of the present study is that similar studies conducted in Iran only examined the psychological effects of abortion. Moreover, a different tool was used in this research, and it positively affected the quality of women's responses because of the short choices. Besides, non-obstetrical risk factors, such as resilience, social support, couple relationships, and violence against women, were not simultaneously examined in all the reviewed studies (except for Zhang et al. [8]). Instead, they have investigated only the impact of demographic and obstetrical factors on the psychological complications of abortion. Therefore, identifying the impact of these factors can help identify high-risk women prone to mental complications, ultimately serving as a guide for service providers to give referral and counseling services.

Limitations

Abortion in Iran is considered taboo both by custom and law, leading to secret and illegal abortions by many women [43]. As a result, it is literally impossible to

properly report the levels of stress and depression, domestic violence, desire for pregnancy, the reason for abortion, and the quality of couples' relationships. This problem is also worsened by the lack of a dedicated room to fill out the questionnaire. Therefore, healthcare providers are recommended to establish a professional and correct relationship, provide patients with privacy to answer, and increase women's confidence in answering correctly.

At the sampling time, some women initially agreed to participate in the study but refused to continue cooperation due to conditions such as bleeding or pain, which can also affect our findings. Furthermore, since samples were collected in one region of Mazandaran province, the results cannot be generalized to other parts of Iran due to the differences in sociocultural and economic factors. Note that all these factors influence the occurrence of stress and depression (7). Therefore, similar research is recommended in other parts of Iran to identify non-obstetric risk factors.

Conclusion

In this study, perceived stress and depression were reported in less than one-fifth of the referred women for pregnancy termination. Previous abortion history, low social support, and abortion for social reasons were the most important factors affecting perceived stress, which was also significantly associated with depression. The results show the need for assessing the mental health of women applying for abortion, especially those who present with risk factors. Therefore, due to the illegality of abortion in Iran, appropriate interventions including screening and counseling before or after abortion can be useful for all women with the mentioned risk factors and should be considered by health providers.

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Author contributions
BJ, OM Z,, MN, FR designed and conducted the study. BJ and OM planned and undertook the analysis. BJ wrote the initial and subsequent drafts of the manuscript. BJ, OM,, MN, FR contributed to revising the manuscript. All authors read and approved the final manuscript.

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Data availability
No datasets were generated or analysed during the current study.

Declarations

Competing interests
The authors declare no competing interests.

Consent for publication
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