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Prevalence and risk factors concerning postpartum depression among women within early postnatal periods in Turkey

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Abstract
Purpose Postpartum depression (PPD) stands out as an important health issue that affects not only the mother but her partner and the entire family.

A few studies from Turkey have found the high prevalence for PPD. In the current study we aimed: (1) to report the prevalence of postpartum depression among Turkish women in Manisa province; (2) description of the association of PPD with risk factors.
Methods To achieve the goals of the current study, we employed the Edinburgh Postpartum Depression Scale (EPDS). The perceived social support (PSS) scale was used to assess social support in the postnatal period. Socio-demographic and obstetric variables were collected through a socio-demographic and obstetric questionnaire.
Results The mean EPDS scores of the study participants were 8.53 ± 4.93. The EPDS-based prevalence of PPD (a score of ≥ 13) was 28.3%. We found a significant negative correlation between EPDS scores and perceived social support from the family (PSS-Fa) and from friends (PSS-Fr) scores. The present study also revealed a significant association between postpartum depressive symptomatology and unintended pregnancy, insufficient social support, and previous history of depression.
Conclusion The findings of the current study revealed high EPDS-based PPD prevalence in a sample of Turkish women and described a number of risk factors associated with PPD. The high prevalence found in this study indicated a need for developing new interventions for early detection and treatment of PPD. A significant number of Turkish immigrants live in western countries. We believe the findings of the current study may be helpful for physicians in locations where a large number of Turkish immigrants live.

Keywords Postpartum depression · Social support · Risk factors · Unintended pregnancy · Unplanned pregnancy

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Introduction

The postpartum period is a unique period of time in a woman's life. It represents a major role change and appears with numerous transformations which are social, psychological as well as physical. A significant decrease in gonadal hormones is observed during this period [1]. In addition, childbirth is a major social and psychological disrupter of the lives of an infant's parents [2].

Postpartum depression (PPD) stands out as an important health issue that affects not only the mother but her partner [3] and the entire family [4]. It is detrimental to mother–baby interaction and can have negative impacts on the infant's emotional and cognitive development in the long-term [5–7].

Postpartum depression, which typically occurs from 2 weeks to 1 year after the birth of a child, may manifest with symptoms that may not be very apparent to untrained

health care workers [8, 9]. Depending upon how it is defined, the assessment criteria used and the geographical and cultural dimension of the study conducted, PPD prevalence is seen over a wide range of 3.5–40% [10]. Cultural backgrounds were found to greatly influence prevalence and the assessment and management of PPD [11]. A recent systematic review revealed low PPD prevalence in Western Europe and Australia (13%), medium PPD prevalence in the US (29%), whereas high PPD prevalence was reported in India (32%) and South Korea (36%) [12]. A few studies from Turkey have found the prevalence of PPD to be high and in the range of 21.8–36.9% [13].

Studies on PPD are limited, and even less research has emphasized risk factors associated with postpartum depression. Amelioration of the risk factors associated with PPD may provide a basis for developing interventions that could help mothers suffering from PPD and guide us in predicting women at risk who may benefit from early diagnosis and management of PPD. Such an approach may restore a mother's mental health and may also be beneficial in salvaging the relationship between mother and child and in ensuring healthy functional and socio-emotional development.

In the current study we aimed: (1) to report the rate of postpartum depression among Turkish women in Manisa province; (2) description of the association of PPD with risk factors. To achieve the goals of the current study, we employed the Edinburgh Postpartum Depression Scale (EPDS) [14], which is a reliable and valid measure of postpartum depressive symptomatology.

Materials and methods

This descriptive and cross-sectional study was conducted between December 2003 and February 2004. The approval of the institutional review board was obtained from the Regional Health Directorate and permissions to conduct the study were also obtained from administrators of seven primary healthcare centers.

This study was undertaken in the city of Manisa which has a geographical area of 13,810 km^2 and a total population of approximately 1,261,000 people. Manisa, where the source of income is agriculture and industry is located in the western part of Turkey.

Data were collected through face-to-face interviews during home visits. To obtain honest responses, the researchers assured the participants of the confidentiality and anonymity of the questionnaire. Seven primary health care centers out of 74 primary health care centers were selected randomly. Data were obtained from these seven primary health care centers in Manisa. Registries of the women who were in their 2nd–24th weeks postpartum were obtained and all women who were in their 2nd–24th weeks postpartum were invited to participate in the study. Participation was on a voluntary basis. All the women participating in the study gave their informed consent. All data were collected during face-to-face interviews. Face-to-face interviews have advantages over mailed questionnaires and telephone-based questionnaires including a better return rate and the researchers have the opportunity to handle problems associated with questions in the questionnaire during the interview. Interviews including completing all measures with each woman lasted about 15–20 min. Women with twin pregnancies and those who had babies with chronic health problems were not included. Out of the total of 328 women, 35 subjects were not found at home, had moved to a different area, were unable to read Turkish, had twin babies, had babies with chronic health problems or they did not want to participate. The final study sample consisted of 293 postpartum women.

EPDS

We employed the EPDS, which is a 10-item self-reporting questionnaire. EPDS is a specially designed and most commonly used tool to assess a woman's self-report of depressive symptomatology during the postpartum period.

Each question has four possible responses scoring from 0 to 3 with a maximum total score of 30 [14]. EPDS has been translated into many languages and has also been validated in many cultures. It is recommended in primary care [15]. Engindeniz et al. [16] translated and adopted the EPDS into Turkish. The Turkish version of EPDS has been validated. Engindeniz et al. found a cut-off point of 12/13 with a sensitivity of 0.84 and specificity of 0.88 and Cronbach's alpha (internal consistency reliability) was 0.79. Another validation study has also found cut-off value of 12/13 (sensitivity: 75.5, specificity: 71.5) [17]. EPDS is an easily administered, objective, reliable and valid instrument. The cut-off point of 13 was used in the study and women with EPDS scores of $\geq$13 were regarded to be at risk. The internal reliability of the EPDS in the present study demonstrated very good internal scale reliability with Cronbach's alpha coefficients $\geq$0.80 (range: 0.80–0.85). It is important to remember at this point that EPDS is only a screening tool, even though it has high specificity and sensitivity. The actual prevalence of PPD which is diagnosed by psychiatric consultation may differ slightly.

Perceived social support

The Perceived Social Support (PSS) scale, which was developed by Procidano and Heller [18], was used to assess social support in the postnatal period. The PSS scale measures a subjective assessment of social support from the

family (PSS-Fa) and from friends (PSS-Fr). These scales intend to measure the extent to which an individual believes her family and friends are meeting her/his need for emotional support. Each scale is a 20-item inventory scale, where each item is scored between +1 and 0. Each question has 3 alternative responses. "Yes," "No" and "Do not know". The response which is indicative of perceived social support is scored as +1. "The do not know" response is scored 0. The sum of the scores constitute the PSS score. Scores range from 0, meaning no perceived social support, to 20, representing a maximum perceived social support. There is no cut-off point on the PSS scale. A high score represents a high perceived social support. The reliability and validity of the Turkish form of the PSS scale was conducted by Eskin et al. [19], who have found the Turkish version of PSS-Fa and PSS-Fr highly reliable instruments for assessing social support. The internal consistency coefficient of the PSS-Fa scale was found to be 0.85 and the internal consistency coefficient of the PSS-Fr scale was found to be 0.76 in that study. Both scales have shown excellent test–retest reliability coefficients (PSS-Fa: 0.90 and PSS-Fr: 0.80). Internal consistency coefficients were 0.87 in the PSS-Fr and 0.85 in the PSS-Fr in our study.

The socio-demographic and obstetric questionnaire

Socio-demographic and obstetric variables, such as age, employment, education, gravidity, parity, number, planning of pregnancy (planned/unplanned), family type, economical status, type of delivery, sex of the newborn, history of depression, previous loss of a baby, were assessed through a specially designed socio-demographic and obstetric questionnaire.

The questionnaire was designed on the basis of previous studies in the literature and revised in accordance with the results of a pilot test which was administered to 10 respondents. The validity and reliability of the questionnaire was assessed and the questionnaire was found highly reliable and valid. Crohnbach's alpha was found to be 0.9.

Intentions concerning pregnancy were evaluated by the answers given to the question, "How did you feel about becoming pregnant in the time before you actually became so?" Responses of "I wanted to become pregnant" or "I wanted to become pregnant right away" were accepted as indications of an intended/planned pregnancy while a response of "I didn't want to be pregnant very soon" was considered an indication of an unintended/unplanned pregnancy. The response of "I never did and never will want to become pregnant" was also categorized as the sign of an unintended/unplanned pregnancy. "I don't know" was not accepted as a response option in this context.

The degree of attachment women felt toward their partners was queried and set down as "closely attached", "partially or not attached at all", as described in previous studies [15].

Data analysis

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA), version 14.0. Descriptive characteristics, such as frequency and summary were calculated for variables of interest. A bivariate analysis was performed with the potential risk factors for PPD. Multiple logistic regression analysis was then performed with the risk factors with statistical significance in bivariate analysis. Correlation analyses of EPDS scores and PSS scores were performed with the Pearson correlation analysis. A level of $p < 0.05$ was considered statistically significant. EPDS scores were used as continuous variables. But the EPDS categories (scores of $\geq$13 and scores of $\geq$13) were used as categoric variables in the study.

Results

Sample characteristics

The mean age of the participants was 26.71 $\pm$ 4.76 years. All subjects participated in the study were married. Demographic characteristics of the study participants are given in Table 1.

Relation between depression scores and factors affecting depression

There was no significant relationship between EPDS categories and the women's socio-demographic characteristics (age, educational level, income level, employment status, abortion history, history of stillbirth, mode of delivery, infant gender and infant age) ($p > 0.05$; Table 2). A significant relationship was, however, found between PPD and previous history of depression, unintended/unplanned pregnancy and partially attachment to the partner.

Then we performed a multiple logistic regression analysis and included the risk factors with statistical significance on the previous analysis. A significant relationship was found between PPD and previous history of depression and; women who had previous history of depression had a 3.9 times higher risk for experiencing PPD than those who had not ($p < 0.001$, OR: 3.9; 95% CI: 1.9–8.2.). Another risk factor for PPD was unintended/unplanned pregnancy. Mothers with unintended pregnancies were more likely to receive higher EPDS scores ($p < 0.001$, OR: 3.7; 95% CI 1.9–7.5). Women who did not report a close attachment to their partners were more likely to suffer from PPD ($p = 0.04$, OR: 2.9; 95% CI; 1.01–7.4; Table 3).

Table 1 Demographic characteristics ($n = 293$)

	N (%)
Maternal age (years) (mean ± SD)	26.71 ± 4.76
Age at marriage (years) (mean ± SD)	21.49 ± 3.42
Employed	
Yes	60 (20.5%)
No	233 (79.5%)
Education	
≥5 years	186 (63.5%)
<5 years	107 (36.5%)
Mother's age at first delivery (years) (mean ± SD)	22.97 ± 3.60
Number of living children (mean ± SD)	1.37 ± 0.23
Economic status	
Low	215 (73.4%)
Middle and high	78 (26.6%)
Family type	
Nuclear	191 (65%)
Extended	102 (35%)
Parity	
Primiparity	175 (60%)
Multiparity	118 (40%)
A planned/Unplanned pregnancy	
Intended/Planned	252 (86%)
Unintended/Unplanned	41 (14%)
A history of stillbirth	15 (5%)
A history of abortion	61 (20.8%)
A past psychiatric history (previous psychiatric disease) ($n = 277$)	34 (12.3%)
Mode of last delivery	
Vaginal delivery	225 (77%)
Caesarian section (operative delivery)	68 (23%)
Infant gender	
Male	157 (53.6%)
Female	136 (46.4%)
Attachment to the partner ($n = 287$)	
Closely attached to the partner	15 (5%)
Partially or not attached to the partner	272 (95%)

Relation between PPD and perceived social support

The mean EPDS scores of the study participants was 8.53 ± 4.93. The EPDS-based prevalence of PPD (scores of ≥13) was 28.3%. The mean perceived social support from family (PSS-Fa) was 15.2 ± 2.1 and perceived social support from friends (PSS-Fr) was 12.5 ± 1.9 (Table 4).

When correlation analysis was conducted to determine the relationship between women's EPDS scores and PSS scores, we found a significant negative correlation between the EPDS scores and PSS-Fr ($r = -0.35$, $p = 0.001$) and PSS-Fa scores ($r = -0.40$, $p = 0.001$). The correlation between the two variables was in a negative direction. As the perceived social support from family and friends support decreased, the EPDS scores increased (Table 5).

Discussion

Postpartum depression prevalence varies in women with different cultural backgrounds. The findings of the current study revealed a high EPDS-based PPD prevalence which was similar to that of Asian women [12, 20]. However, this high prevalence was consistent with previous studies conducted in Turkey [13]. For this reason, it is important to know the risk factors associated with PPD.

Postpartum depression is an important public health issue and may have negative impacts on infant's development [3–7]. Mothers with PPD were found more likely to discontinue breastfeeding during the postpartum period [21, 22]. Furthermore, a severe form of PPD may be a life-threatening condition for the mother, the family and the infant [23].

The current study has found a significant relationship between PPD and unplanned pregnancy, previous history of depression, insufficient social support from family, friends and a weak attachment to the husband/partner.

Unintended pregnancy continues to be an issue around the world despite the available methods of contraception. A few studies, mainly from developed western countries, have provided evidence that mothers with unplanned pregnancies have a higher PPD prevalence [24–26]. There is, however, insufficient evidence from developing countries which have high PPD prevalence to confirm such findings. In the current study, we found that mothers with unintended pregnancies were more likely to receive higher EPDS scores. The Turkish Population and Health Survey [27] reveals that almost half of pregnancies are unintended and that in turn, half of these unintended pregnancies are disrupted by voluntary abortion [21, 28]. The present study also pointed to a significant number of unintended pregnancies. Of the participants, 14% of the mothers reported that their pregnancies were unintended or unplanned. Unintended pregnancies result in significant degrees of morbidity and mortality, one outcome being PPD. Childbirth as the product of an unintended or unplanned pregnancy requires that women cope with an extra financial burden for which the family is not yet ready.

It is known that social support is a need that influences both physical and psychological health [19] since it is a force that acts to provide a coping mechanism and buffer against life's stresses [29]. A deficiency of social support has been linked with a variety of health issues, such as mortality, coronary heart disease, suicidal behavior, breakdown of the immune system as well as a full range of psychological problems including depression [20]. In as much as childbirth is a normal function for women, the changes it

Table 2 Relative risk of postpartum depression expressed as odds ratio with a 95% confidence interval among 293 Turkish women

Risk factor	EPDS ≥ 13 *n* (%) 83	EPDS < 13 *n* (%) 210	Total	Odds ratio (95% CI)	*p* value
Employed (*n* = 293)					
Yes	20 (33%)	40 (67%)	60	1	0.339
No	63 (27%)	170 (73%)	233	0.741 (0.403–1.364)	
Education (*n* = 293)					
≥5 years	52 (28%)	134 (72%)	186	1	0.893
<5 years	31 (29%)	76 (71%)	107	1.051 (0.621–1.779)	
Economic status (*n* = 293)					
Low	65 (31%)	150 (69%)	215	1	0.760
Middle and high	18 (23%)	60 (77%)	78	0.886 (0.481–1.633)	
Family type (*n* = 293)					
Nuclear	50 (26%)	141 (74%)	191	1	0.784
Extended	33 (32%)	69 (68%)	102	1.097 (0.643–1.874)	
Parity (*n* = 293)					
Primiparity	55 (31%)	120 (69%)	175	1	0.233
Multiparity	28 (24%)	90 (76%)	118	0.706 (0.415–1.201)	
A history of stillbirth (*n* = 293)					
No	77 (28%)	201 (72%)	278	1	0.377
Yes	6 (40%)	9 (60%)	15	1.740 (0.599–5.053)	
A history of abortion (*n* = 293)					
No	61 (26%)	171 (74%)	232	1	0.151
Yes	22 (36%)	39 (64%)	61	1.581 (0.869–2.878)	
Mode of last delivery (*n* = 293)					
Vaginal delivery	65 (29%)	160 (71%)	225	1	0.245
Caesarian section	18 (26%)	50 (74%)	68	1.444 (0.791–2.637)	
Infant gender (*n* = 293)					
Male	46 (29%)	111 (71%)	157	1	0.699
Female	37(27%)	99 (73%)	136	0.902 (0.541–1.503)	
Mothers age (year) (*n* = 293)					
<25	40 (28%)	101 (72%)	141	1	1.00
≥25	43 (28%)	109 (72%)	152	0.966 (0.599–1.656)	
Child's age (weeks) (*n* = 293)					
14–24	49 (28%)	126 (72%)	175	1	0.237
2–13	34 (22%)	84 (78%)	118	1.372 (0.821–2.294)	
Attachment to the partner (*n* = 287)					
Closely attached to the partner	73 (27%)	199 (73%)	272	1	0.038
Partially attached or not attached to the partner	8 (53%)	7 (47%)	15	3.1 (1.1–8.9)	
Previous history of depression (*n* = 277)					
No	60 (25%)	183 (75%)	243	1	<0.001
Yes	20 (59%)	14 (41%)	34	4.4 (2.1–9.2)	
A planned/unplanned (intended/unintended) pregnancy (*n* = 293)					
Intended/Planned	60 (24%)	192 (76%)	252	1	<0.001
Unintended/Unplanned	23 (56%)	18 (44%)	41	4.1 (2.1–8.1)	

EPDS Edinburg Postpartum Depression Scale

brings about may make it an emotionally traumatic event for mothers. Struggling to adapt to the role of motherhood, to the increased load of responsibilities and to the lack of time for personal interests and activities, the mother may find it difficult to cope and therefore turn to family and friends as sources of support. Adaptation to the new situa-

Table 3 Adjusted odds ratios of multiple logistic regression analysis of postpartum depression risk factors

Risk factor	AOR (95% CI)	*p* value
Attachment to the partner		
Closely attached to the partner	1	0.04
Partially attached or not attached to the partner	2.9 (1.01–7.4)	
Previous history of depression		
No	1	<0.001
Yes	3.9 (1.9–8.2)	
A planned/unplanned (intended/unintended) pregnancy		
Intended/Planned	1	<0.001
Unintended/Unplanned	3.7 (1.9–7.5)	

Table 4 EPDS scores of the participants

EPDS score	*N*	%
<13	210	71.7
≥13	83	28.3
Total	293	100.0

EPDS Edinburg Postpartum Depression Scale

tion is facilitated when sources of support or perceived social support is available to the mother [19, 29]. Research in Israel has shown that a deficiency of social support as well as marital problems can be predictive risk factors of PPD [30]. Another study originating from South Africa [31] has associated the risk of PPD with family relationships, social support and preparation for motherhood. The current study confirms the findings of previous studies which have found a higher risk of PPD among women with insufficient social support [32, 33]. In summary, the postpartum period is a special period in which the mother is in need of extra support from family members, friends and her partner in various cultures [34]. The lack of social support from these sources therefore may be a risk factor for developing PPD. These reports are in line with our suggestion that depression may be significantly influenced by family and friend-related social variables.

Several studies have found a low level of education and unemployment to be risk factors for PPD [35, 36]; others, however, have failed to find such an association. In the current study, we too failed to find a significant relation between low levels of education and unemployment [37, 38] and higher EPDS scores. Our results are also in concordance with recent literature which has found high EPDS scores related to previous history of depression [36, 39].

As regards our study, it is important to note the ramifications of our findings in terms of Turkish immigrants who live in different parts of the world and share various degrees of cultural and historical traits, including the language.

Table 5 Correlation analysis between EPDS scores, perceived family support and perceived support from friends

Women's score	PSS-Fr		PSS-Fa	
	r	*p*	*r*	*p*
EPDS	−0.35*	0.001	−0.45*	0.001

EPDS Edinburg Postpartum Depression Scale, *PSS-Fa* perceived social support from family, *PSS-Fr* perceived social support from friends

* Correlation statistical level of $p < 0.05$

Estimates of the number of Turkish immigrants in the various countries are 2,500,000–3,000,000 in Germany, 400,000 in France, 350,000 in the Netherlands, 200,000–300,000 in the UK, 250,000 in Austria, 240,000 in the US, 200,000–300,000 in Belgium, 150,000 in Australia and 80,000 in Switzerland [40]. These figures have been included here to increase awareness both in Turkish and in western clinicians about the probability of encountering high PPD prevalence among Turkish immigrants, which may amount to 2–3 times more than the actual prevalence of PPD in any particular country. In a study conducted by Small et al. [41] in Australia on Turkish immigrants, the EPDS prevalence (28.8%) found was very similar to our results (28.3%). Another study from Australia found EPDS prevalence to be 10.7% among Anglo-Celtic women and 19.5% among Muslim women living in Australia [42]. Western physicians should take into account that PPD may be more common among Turkish immigrants in locations where a large number of Turkish immigrants live.

The number of unintended pregnancies in the study is noteworthy. But the data are in accordance with the Turkish population and health survey [28]. The high number of unintended pregnancies may be due to low contraceptive method use. The characteristics of the study population are comparable with national figures [27].

Limitations

The current study has several limitations. The incidence of reported unintended pregnancies in the current study may be higher than reported because of recall bias. The mothers may have reported an unintended pregnancy at the time of conception as an intended one during the postpartum period because of the cultural expectation in Turkish society that the mother is assumed to be joyful during the postpartum period as a result of the birth of the baby. The current study was conducted in Manisa province, which we think may have limited generalizability that should be treated with caution.

Moreover, it is important to remember that findings derived from data collected about depression and perceived

social support with self-reported tools like EPDS and PSS are dependent on the reliability and sensitivity of these tools. However, both tools were validated in the Turkish samples and found to have high specificity and sensitivity values.

It is important furthermore to know that the EPDS is only a screening tool, albeit with high specificity and sensitivity. The actual prevalence of PPD based on psychiatric consultation may differ slightly. Further, the cross-sectional nature of the study hinders us from making any comment on the direction of association between social support and postnatal depression over time. Research with larger sample sizes and longitudinal design should be conducted in the future.

We mentioned some limitations of the study. But the limitations are compensated by major strengths. The instruments used in the study to asses postpartum depression and social support are valid and reliable. Another strength of the study is face-to-face administration of the questionnaires. Also the current study indicated high PPD prevalence which was also in accordance with the previous researches.

Conclusion

The findings of the current study revealed high EPDS-based PPD prevalence in a sample of Turkish women and described a number of risk factors associated with PPD. The high prevalence found in this study indicated a national need for developing new interventions for early detection and treatment of PPD. Health care workers are in key position. Health care professionals should be skilled in monitoring risk factors associated with PPD and in identifying women with increased risk for PPD, such as women with insufficient social support, previous history of depression or unintended pregnancy. A significant number of Turkish immigrants live in western countries The current study has also provided a cultural picture on PPD. We believe the findings of the current study may be helpful for physicians in locations where a large number of Turkish immigrants live.

Conflict of interest statement None.

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