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Postpartum Depression in Fathers and Associated Risk Factors: A Systematic Review

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SUMMARY

Objective: The postpartum period is a process that affects mothers and fathers mentally. In this systematic review, we aimed to investigate the literature on postpartum depression and elucidate the factors associated with depression in fathers/men; and eventually to draw attention to the subject.

Methods: A literature search was conducted between April-May 2019 including qualitative and quantitative research articles published between 2009-2019 in Pubmed, Science Direct, EBSCOhost, Turkish Psychiatric Index and Ulakbim Medical Databases. A total of 18 articles in English (n = 17) and Turkish (n = 1) were included.

Results: The majority of studies were quantitative (n=17) and 1 had a qualitative design. 22.2% were carried out in the Americas, 61.1% in Europe and 16.7% in Asia. In 16 of the studies, Edinburgh Postpartum Depression Scale was used to diagnose postpartum depression in fathers, and 4 of them assessed psychometric properties. According to the results of the findings, unemployment, age, economic status and social support were among the factors affecting postpartum depression in fathers.

Conclusion: Besides the factors affecting the mothers such as age, education, social support, whether the pregnancy was planned, parenting stress, parental stress/sense of competence, quality of the relationship with the spouse, history of depression, number of people living at home; factors such as housing status, economic situation and unemployment affect postnatal depression in fathers. Since there was only one research article from Turkey, we believe that there is a need for research on this subject in our country.

Keywords: Postpartum depression, paternal postpartum depression, paternity, fathers.

INTRODUCTION

Depression is a syndrome characterized by cognitive, behavioural and physical symptoms, manifested by staticity or slowing down of speech, thinking and actions, feelings and notions of smallness, worthlessness, pessimism and avolition and slowing down of physiological functions, alongside deep sorrow (Engin and Ergün 2014). During the postpartum period, a majority of women experience "maternity blues", regarded as a physiological phenomenon increased by lack of sleep, nutritional problems and stress resulting from endocrinological changes. This is a normal reaction that decreases and disappears in a few weeks. However, if it turns into a depressive episode accompanied by severe anxiety and panic attacks, it is called "postpartum depression" (American Psychiatric Association 2013, Engin and Ergün 2014). In the DSM-5 section on the descriptive characteristics for depressive disorders, this condition is desribed as a depressive disorder with peripartum onset, either when still in the gravid state or in the 4th week postpartum, but does not meet the major depression criteria (American Psychiatric Association 2013).

A new baby joining the family is one of the important events in the life cycle (Ahlborg et al. 2009). Causes such as stressful life events, marital problems, care for the child and economic problems are effective in this period. The postpartum period can be as challenging for the father as much as it is for the mother. Research results have shown that not only mothers but also fathers experience depressive symptoms during this

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period (Serhan et al. 2013). Studies show that the incidence of postpartum depression in fathers varied between 1.2% to 26% (Goodman 2004, Ramchandani et al. 2005, Kim and Swain 2007, Paulson and Bazemore 2010, Biebel and Alikhan 2016). Also, it is reported that postpartum depression observed in fathers progresses slower than in mothers, and that it may occur in the first year with the highest incidence being between the third and sixth months postpartum (Matthey et al. 2000).Although the prevalence of paternal postpartum depression varies across the world, it is reported to increase generally during the pregnancy and the first 6 months postpartum and to decrease within a year postpartum (Field 2018). The factors related to postpartum depression were reported to involve economic difficulties, advanced age and low education level and relationship problems with spouse and child in fathers (Edward et al. 2015) while depression and poor marital relations were seen to be effective on mothers (Weeve et al. 2011, Giallo et al. 2013). When the signs of maternal postpartum depression were observed, some fathers were found to experience depression symptoms such as "anxiety, sleep disorders, fatigue, restlessness, sadness, change in appetite and thoughts of harming themselves or the baby" (Letourneau et al. 2011).

Paternity is a role and an important turning point that brings along various excitements and difficulties in human life. However, little is known about the needs and the mental health of fathers in this process (Thomas et al. 2011). There is evidence that the process of transition to fatherhood can lead to anxiety and depression and that men are at risk for mental disorders which adversely affect other family members (Bergström 2013).

It has been proposed that the father's experience of depression in the postpartum period adversely affected the father-child attachment, and that this could later lead to behavioral disorders, delayed speech, hyperactivity, anxiety and depression in the child (Goodman 2004, Ramchandani et al. 2005, Ramchandani et al. 2008, Musser et al. 2013).

On the other hand, some studies have reported that increased postpartum paternal support and participation in child care is related to reduced likelihood of maternal depression and positive child development (Kahn et al. 2004, Mezuliset al. 2004, Lung et al. 2009). Therefore, paternal postpartum depression is an important issue not only for fathers but for the whole family.

It has been aimed in this systematic review to draw attention to the subject by examining postpartum depression and related risk factors in fathers/men in the light of the literature.

METHOD

The research was conducted between April 2019-May 2019 by scanning qualitative and quantitative research articles published in the Pubmed, Science Direct, EBSCOhost, Turkish Psychiatry Directory and Ulakbim Medical Databases between the years 2009 and 2019. The data collection form and checklist developed by the Cochrane Collaboration, which are preferred for systematic reviews, were used when analyzing the articles.

The keywords during scanning were "babalık, postpartum, depresyon, postpartum depresyon" in Turkish, and "father, postpartum, depression, new fathers, first-time fathers, postpartum depression" in English.

The inclusion criteria of this research were restricted to Turkish and English research articles published between 2009-2019 in national or international refereed journals, conducted with postpartum fathers, addressing fatherhood and postpartum depression, the texts of which were accessible online. On the other hand, studies and reviews effectively on the etiology of depression but not directly including the characteristics of the father, studies focusing on preterm infants, newborns requiring hospitalization, the father's experience related to birth, maternal depression or depression in fathers during the prenatal period, adoption and research and reviews without accessible texts on line were excluded from this review.

The research process is given in Figure 1. Firstly, the titles/abstracts of the articles accessed by the keywords were examined and articles suitable for the purpose of the research were determined. Subsequently, repetitive research articles were identified and those with accessible full texts compatible with the inclusion criteria were analysed. After the scanning process, 18 research articles were found to meet the inclusion criteria (Figure 1).

Statistical Analysis

Since the data obtained did not present homogeneous properties, meta-analysis was not performed. The researches were evaluated with respect to the year, research design, purpose, number of samples, measurement tools used in evaluating paternal postpartum depression and their results, and their frequency distributions were calculated.

RESULTS

A total of 18 studies investigating postpartum depression and related factors in fathers published in national or international journals in English (n = 17) and Turkish (n = 1) were included in this systematic review.

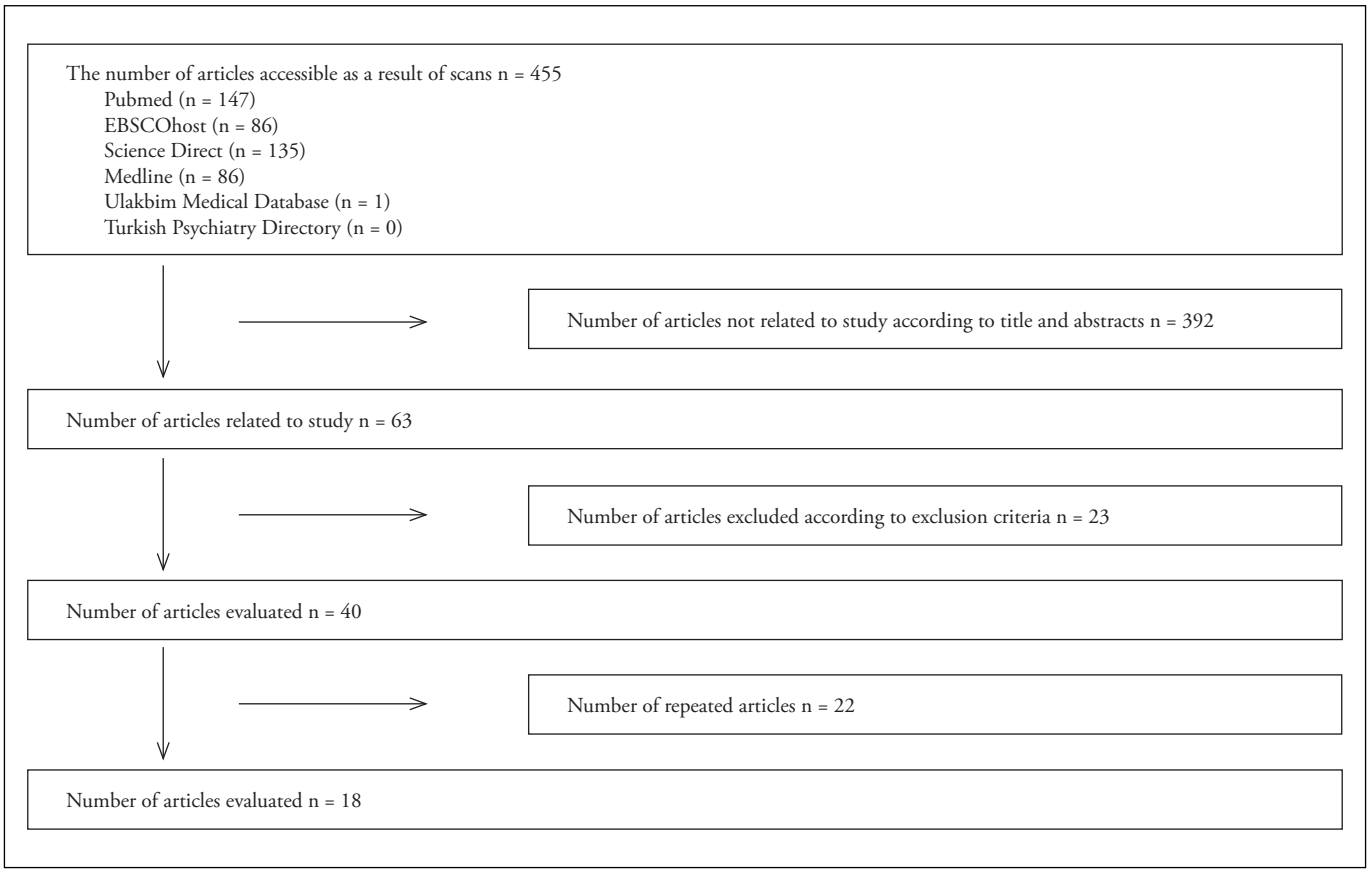

Figure 1. The Procedure of Selecting the Studies for the Review / PRISMA Flow Chart

Of the included articles, 3 were cohort, 5 were cross-sectional, 3 were longitudinal, 3 were methodological, 1 was randomized cohort, 1 was descriptive and path analysis, 1 is longitudinal-cohort studies and 1 was qualitative research. In other words, while 17 (94.4%) of the studies were quantitative, only 1 (5.6%) was conducted qualitatively (Table 1).

Of the studies examined 44.4% (n = 8) were published between 2010-2015 and 55.6% (n = 10) were published between 2016-2019; 22.2% (n = 4) were conducted in America (Jamaica, Canada, the USA), while 61.1% (n = 11) were conducted in Europe and 16.7% (n = 3) in Asian countries (Hong Kong, China and Japan) (Table 1).

The included researches were carried out with the participation of a total of 21.174 fathers aged between 30 and 36 years. In general, the studies cover the period between the 5th and 48th weeks postpartum. However, in longitudinal studies, this range was extended up to 7 years.

In order to diagnose postpartum depression in the fathers participating in the research, the Edinburgh Postnatal Depression Scale (EPDS) was used in 16 of the studies, while Rutter's 9-item Malaise Inventory was used in 1 study and the Composite International Diagnostic Interview-Short Form (CIDI-SF) was used in 1 study. Also, in order to evaluate the depressive symptoms in fathers, the Beck Depression Inventory-II was used in 3 of the studies, the Gotland Male Depression Scale (GMDS) in 2 studies, the Epidemiological Research Center Depression Scale in 2 studies, the Patient Health Questionnaire-2 (PHQ-9)-Depression Module in 1 study, was used in 3 of the studies, while additionally the Structured Clinical Interview (SCID) for the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV) diagnostic criteria was used in 3 studies (Table 2).

The studies using the EPDS mostly used a cutoff score of 9 and above or the scores 10 and above (Table 3).

Investigations made in the studies on fathers included the effectiveness of EPDS in diagnosing psychometric properties/paternal postpartum depression in 4 (22.2%) of the studies, the cost of paternal postpartum depression in 1 study, and the treatment preferences of fathers in postpartum depression in 1 study. According to the results of the research, unemployment, age, economic status and social support were among the factors that most affected postpartum depression in fathers (Table 4).

Table 1. Characteristics of Studies Included in Systematic Review

Author/Year/Country	Research design	Aim	Sample	Measurement Tool	Results
(Lai et al. 2010) Hong Kong	Methodological	To compare the psychometric features of EPDS, BDI and PHQ-9 in screening postnatal depression in Chinese fathers in Hong Kong and to predict the frequency of depression in the 8th week postpartum.	551 Chinese men (in the 8th week postpartum)	• Edinburgh Postpartum Depression Scale (EPDS) • Beck Depression Inventory (BDI) • Patient Health Questionnaire-Depression Module (PHQ-9)	• EPDS was found to give significantly more accurate results than BDI and PHQ-9 in detecting postpartum depression among Chinese men. • EPDS, which has a cutoff score of 10 or more, has 91% sensitivity, 97% clarity, an estimated 57% positive, and 99% negative predictive value. • In the 8th week postpartum, approximately 3.1% of men met the depression criteria according to DSM-IV. • The prevalence of postpartum depression in Chinese men is similar to that of western men. • It was found that the Chinese version of EPDS is a valid tool to detect postpartum depression in men.
(Edmondson et al. 2010) UK	Methodological	To determine the cutoff point of the Edinburgh Postpartum Depression Scale (EPDS) in screening postpartum depression in fathers and to examine the validity of EPDS by comparing it with a structured clinical interview. Evaluating its effectiveness as a screening tool for new fathers in the UK	192 men (7 weeks postpartum)	• Edinburgh Postpartum Depression Scale (EPDS) • Structured Clinical Interview for DSM-IV	• Fathers with depression scored significantly higher in the EPDS than non-depressive fathers. • For depression screening, it was found that 89.5% had sensitivity and 78.2% had specificity over 10 points, which was the cut-off point of EPDS.
(Edoka et al. 2011) UK	Longitudinal study	Estimating the health care costs of paternal postpartum depression, providing information about cost-effective preventive and treatment interventions for this condition.	192 fathers (During the first 12 months postpartum)	• Edinburgh Postpartum Depression Scale (EPDS) • The cost of each resource use item is calculated as a resource use product quantity and the corresponding unit cost.	• Three father groups were identified: fathers with depression (n = 31), fathers with high risk of developing depression (n = 67) and fathers without depression (n = 94). • In these three groups, the average father-child binary costs were calculated as £ 1103.51, £ 1075.06 and £ 945.03 (PdsSterling, 2008 prices). • After checking the factors that potentially lead to confusion, paternal depression was found to be significantly associated with community care costs.
(Lee et al. 2012) USA	Longitudinal -cohort study	To examine the sub-samples of families with complete data in the whole study and the dependent variables evaluating fathers' depressive symptoms in the third and fifth years.	1,403 fathers	• Composite International Diagnostic Interview-Short Form (CIDI-SF) • Parenting Stress Index (PSI)	• While late adolescent paternity was significantly associated with paternal depressive symptoms in the third year, no association was found with those in the fifth year. • Those who reported low social support were more likely to be depressed in both times. • Fathers who do not work in a regular job are more likely to experience depression in their third year follow-up than fathers in the fifth year. • While parental stress and punishment/accusation for a crime were not associated with paternal depressive symptoms in fathers in the third year, they were found to be associated with depressive symptoms in the fifth year.
(Bergström 2013) Sweden	Randomized controlled	To investigate the relationship between depressive symptoms and paternity age, socio-demographic characteristics and prenatal psychological well-being in Swedish men who become fathers for the first time.	812 men (3 months after the birth of their first baby)	• Edinburgh Postpartum Depression Scale (EPDS)	• 10.3% of men participating in the research complain of depressive symptoms. • It appears that the risk of depressive symptoms increases in younger fathers when compared to fathers aged 29-33. • Low level of education and income, low quality of relationship between couples, and financial concern increased the risk of depressive symptoms, however, these factors could not explain the increased risk among young people.

Continuation of Table 1

(Demontigny et al.2013) Canada	Cross-sectional	To identify the psycho-social factors related to paternal postnatal depression.	205 fathers	• Edinburgh Postpartum Depression Scale (EPDS) • Dyadic Adjustment scale • Parent Expectations Survey • Parenting Stress Index • Paternal Involvement questionnaire • Social support was measured using a scale from 0 (help not available) to 5 (extremely helpful), indicating.	• Depression observed in fathers of lactating babies was found to be related to the loss of the baby in one of the spouse's previous pregnancies, parenting stress, the temperament of the baby (difficult child), dysfunctional interaction with the child, decreased marriage compatibility and the parent's low perception of competence. • As a result of multivariate analysis, it is revealed that psycho-social factors such as parenting stress, quality of marital relationship and perception of competence perceived by the parent have an independent effect on paternal depression.
(Roubinov et al. 2014) US	Descriptive and path analyses	To determine the prevalence of postpartum depression in low-income Mexican-origin American men, to overcome estimators, prejudices revealed by models limited to a single source, to expand existing literature by evaluating the data of maternal and paternal reports.	92 Mexican-American fathers	• Dyadic Adjustment scale • Edinburgh Postpartum Depression Scale (EPDS) • Acculturation Rating Scale for Mexican Americans II (ARSMA II)	• In the 15th and 21st week evaluations postpartum, 9% of fathers met the diagnostic criteria of postpartum depression. • Path analyses have shown that unemployment status, fewer number of biological children, lower quality marital relationships, and less adoption of Anglo culture, observing more paternal depressive symptoms in the 21st week compared to the 15th week increases the likelihood of paternal postpartum depressive symptoms. • Predictive pathways from maternal symptoms to paternal PPD were not significant.
(Loscalzo et al. 2015) Italy	Methodological	To analyze the validity and factor structure of the Edinburgh Postpartum Depression Scale in Italian fathers.	436 fathers	• Edinburgh Postpartum Depression Scale (EPDS) • Beck Depression Inventory-II • Center for Epidemiologic Studies Depression Scale (CES-D)	• As a result of the tests conducted in the research, in addition to depression, complaints such as depressive symptoms, anxiety and unhappiness were also detected. • The results showed a two-factor structure, different from the mothers. • For Italian fathers, the most appropriate EPDS cut-off score was observed to be 12/13.
(Nath et al. 2016) UK, Scotland, Wales and Northern Ireland.	Cohort	To examine the prevalence of paternal depressive symptoms and related risk factors in fathers with 9-month-old and 7-year-old children.	5,155-12,396 fathers (periods when children are 9 months, 3, 5 and 7 years old)	• Rutter's 9-item Malaise Inventory • Golombok Rust Inventory of Marital State	• The frequency of paternal depressive symptoms over time was 3.6% in the 9th month; 1.2% at 3 years old; 1.8% at the age of 5 and 2.0% at the age of 7. • Paternal depressive symptoms have been found to be correlated with unemployment, depressive symptoms in the mother and marital conflict. • Paternal depressive symptoms were found to be associated with socioeconomic factors such as living in rented accommodation when the child was 9 months old, and low family income at the ages of 5 and 7. • The depressive symptoms of fathers decreased when their children were between 9 months and 3 years old. • The father being unemployed, excessive depressive symptoms in the mother and high marital conflict are important risk factors for depressive symptoms in fathers.
(Suto et al. 2016) Japan	Longitudinal study	To examine the frequency of paternal postpartum depression between 1 December 2012 and 30 April 2013 in the regions of Japan's Aichi Province, Nishio City.	215 fathers (In the postpartum period)	• Edinburgh Postpartum Depression Scale (EPDS)	• 36 (17%) of the fathers reported symptoms of depression in the first three months postpartum. • In logistic regression analyses, it was observed from a series of demographic and psycho-social features that were previously associated with paternal postpartum depression that fathers having psychiatric treatment history during their spouse's pregnancy and previous depressive symptoms as well as paternal depressive symptoms in the postpartum period are correlated.

Continuation of Table 1

(Zhang et al. 2016) China	Longitudinal study	To investigate the presence and predictors of depressive symptoms in men in Northwest China who became fathers for the first time.	180 couples (3 days, 2 weeks and 6 weeks postpartum)	• Edinburgh Postpartum Depression Scale (EPDS) • Parenting Sense of Competence Scale (PSOC), • Kansas Marital Satisfaction Scale (KMSS)	• It was determined that paternal postpartum depression was experienced by 35 (21.1%) of the fathers on the 3rd day postpartum, 32 (20.4%) in the 2nd week, and 20 (13.6%) in the 6th week. • It was found that parental sense of competence, marital satisfaction and maternal depressive symptoms were among the main determinants of paternal postpartum depression.
(Edhborg et al. 2016)	Descriptive qualitative	To describe fathers' experiences in the 3-6 months time frame postpartum depressive symptoms are observed and in the first year postpartum.	19 fathers	• Qualitative content analysis • Edinburgh Postpartum Depression Scale (EPDS) • Gotland Male Depression Scale (GMDS)	• It has been observed that fathers lose control and power due to differences between expectations and the facts they encounter in the postpartum period, that they struggle with the sense of loss and contradictory messages due to reasons such as the turmoil of daily life, high level of stress and anxiety related to the baby, conflicts between family and work, lack of support in daily life, and problems with society and spouses. • These findings show that fathers have difficulty balancing the competitive demands of their families, jobs as well as their own needs.
(Peker et al. 2016) Turkey	Cross-sectional	To determine the postpartum depression rate and risk factors that may affect this.	252 fathers	• Edinburgh Postpartum Depression Scale (EPDS)	• The mean scores obtained from EPDS were determined as 5.35 ± 4.29 in the first interview and 5.85 ± 4.08 in the second interview. • According to EPDS, the rate of depression in fathers was 5.6% at 6 weeks. • The number of children, the increase in the number of people living and dependents at home, the history of psychiatric illness, unplanned pregnancy, problems with the spouse and lack of social support were determined as the factors that increase depression. • Depression was less common in fathers with high income and/or who had no expectation with respect to the gender of the baby.
(Psouni et al. 2017) Sweden	Cross-sectional	To evaluate depressive symptoms in fathers of 0-18-month-old children, to consider whether typical and externalized symptoms of depression called "depressive equivalent" are appropriate for evaluation.	447 Swedish fathers	• Beck Depression Inventory-II (BDI-II) • Edinburgh Postpartum Depression Scale (EPDS) • Gotland Male Depression Scale (GMDS)	• It was found that 27% of the participants received depressive symptom scores above the BDI-II cutoff score. • It was found that most fathers experienced both traditional and depressive equivalent symptoms or only depressive equivalent symptoms. • Concomitant use of EPDS and GMDS has been found to be equally specific; its use in identifying fathers with high depressive symptoms has shown a more precise measurement than EPDS alone.
(Cameron et al. 2017) Canada	Survey	To investigate the correlation factors that may affect fathers' choice of treatment for postpartum depression, to determine the treatment preference for paternal postpartum depression.	140 men (In the first year after the birth of the baby)	• Credibility Scale (CS) • Personal Reactions to Rationale Scale (PRRS) • Center for Epidemiologic Studies Depression Scale (CES-D) • Edinburgh Postpartum Depression Scale-Partner (EPDS-P) • Couples Satisfaction Index (CSI) • Interpersonal Support Evaluation List (ISEL)	• Participants reported that they preferred individual and double psychotherapy instead of pharmacotherapy for the treatment of paternal postpartum depression. • Men perceived both individual and couple psychotherapy as more reliable and reported more personal/individual responses than pharmacotherapy.

Continuation of Table 1

(Molgora et al. 2017) Italy	Longitudinal study	To analyze the longitudinal trajectories of depressive symptoms from the third trimester of pregnancy to 1 year postpartum.	126 men (First time father)	• Edinburgh Postpartum Depression Scale (EPDS) (At the four-time point: 7-8th month of pregnancy, 40th day postpartum, 5-6th month and 12th month).	• The level of depressive symptoms was low in 52% of fathers, moderate 37%, and clinically high in 11%. • This study provided identification of different sub-populations in fathers who got the highest EPDS score one year postpartum based on distinctive features such as mental well-being, emotional distress, and high-risk conditions.
(Gray et al. 2018) Jamaica	Cohort	To address the cultural dimensions of paternal depression by investigating the prevalence and signs of depressive symptoms in Jamaican fathers.	3,425 fathers of newborns	• Edinburgh Postpartum Depression Scale (EPDS)	• 9.1% of Jamaican fathers scored 10 or above, which is the EPDS score indicator of possible depression. • A weak negative correlation was found between the age of fathers and EPDS. • There was no relationship between level of education and EPDS scores, however, a negative relationship was observed between economic status and EPDS scores. • Although the relationship with the mother was not related to depressive symptoms, a negative relationship was found with respect to the quality of the relationship. • Social support (close friend group, family or friends to assist during troubling times) was found to be related to EPDS.
(Philpott ve Corcoran 2018) Ireland	Cross-sectional	To investigate the prevalence of postnatal depression of fathers and to examine their relationship with various demographic and clinical factors.	100 fathers (Whose spouse has birth in the past 12 months)	• Edinburgh Postpartum Depression Scale (EPDS)	• The prevalence of paternal postnatal depression, measured using EPDS, is 12% in those with a score of 12 and above, while it is 28% in those 9 and above. • Factors that increase the risk of postpartum depression include having a baby with sleep problems, history of depression, low social support, low economic status, lack of paternity leave and not being married.

Table 2. Measurement Tools and Frequency Distributions Used in Research to Diagnose Depression

Measurement Tool	n	%
Edinburgh Postpartum Depression Scale (EPDS)	16	88.9
Rutter's 9-item Malaise Inventory	1	5.6
Composite International Diagnostic Interview-Short Form (CIDI-SF)	1	5.6
Beck Depression Inventory-II	3	16.7
Gotland Male Depression Scale (GMDS)	2	11.1
Center for Epidemiologic Studies Depression Scale (CES-D)	1	5.6
Structured Clinical Interview (SCID) for Diagnostic and StatisticalManual of Mental Disorders Forth Edition (DSM-IV)	2	11.1
Patient Health Questionnaire-Depression Module (PHQ-9)	1	5.6

Table 3. Variation of the Edinburgh Postpartum Depression Scale (EPDS) Users with respect to the Cut-off Scores

	User		Non-user	
	n	%	n	%
8 and above	1	5.6	17	94.4
9 and above	5	27.8	13	72.2
10 and above	5	27.8	13	72.2
11 and above	1	5.6	17	94.4
12 and above	2	11.1	16	88.9

DISCUSSION

According to the research articles examined, the factors affecting postnatal depression in fathers were age, level of education, economic status, unemployment, social support, ethnicity, number of people living/dependents at home, living in rented premises, the number of children, whether pregnancy was planned, presence of a history of depression in the father and the mother, baby's temperament, parenting stress and sense of competence, marital status, quality of the relationship with the spouse, adopting the current culture, abortion history and mental well-being.

When analysing national and international publications, the studies conducted with mothers showed that factors affecting postnatal depression included low education and socio-economic level, unwanted pregnancy, history of depression during the prenatal and postpartum periods, physical health problems, age (adolescent motherhood), family problems, stress in child care, inadequate social support, social isolation, restless (problematic) baby, dissatisfaction with marriage, family conflicts, early labour and losing the baby (Bingöl and Tel 2007, Arslantaş et al. 2009, Durukan et al. 2011, Gümüş et al. 2012, Erdogan et al. 2015, Demir et al. 2016, Eddy et al. 2019). In a study on the depressive symptoms observed in mothers and fathers in the period up to the end of the 24th

Table 4. Variation in the Effects of Potentially Predisposing Factors on Postpartum Depression (Based on the Results of the 18 Reviewed Studies)

Variable	Affects paternal postpartum depression		Does not affect paternal postpartum depression		Effect not indicate	
	n	%	n	%	n	%
Age	5	27.8	-	-	13	72.2
Education level	3	16.7	1	5.6	14	77.8
Economic status	5	27.8	-	-	13	72.2
Ethnicity	1	5.6	-	-	17	94.4
Unemployment	7	38.9	-	-	11	61.1
Number of people living/dependents at home	1	5.6	-	-	17	94.4
Living in rent	2	11.1	1	5.6	15	83.3
Number of children	2	11.1	-	-	16	88.9
Unplanned pregnancy	2	11.1	-	-	16	88.9
Gender expectation	2	11.1	-	-	16	88.9
Presence of history of depression	3	16.7	-	-	15	83.3
Presence of depressive symptoms in the mother	2	11.1	2	11.1	14	77.8
Temperament of baby/Problematic baby	3	16.7	-	-	15	83.3
Paternity leave	1	5.6	-	-	17	94.4
Parenting stress	3	16.7	-	-	15	83.3
Parent sense of competence	2	11.1	-	-	16	88.9
Marital status	1	5.6	1	5.6	16	88.9
Quality of relationship with spouse	7	38.9	-	-	11	61.1
Marriage conflict	1	5.6	-	-	17	94.4
Social Support	5	27.8	1	5.6	12	66.7
Adopting the current culture	1	5.6	-	-	17	94.4
Abortion history	1	5.6	-	-	17	94.4
Mental well-being	1	5.6	-	-	17	94.4

month postpartum, it was detected that insomnia, history of depression, anxiety, stress and negative family environment were signs of moderate and highly depressive symptoms in both mothers and fathers (Kiviruusu et al. 2020). It can be said on the basis of the analysed research results that there is parallelism between these results given in the literature on mothers and the risk factors for paternal postpartum depression, that the reviewed research was carried out in accordance with this information in the literature, but that economic factors such as unemployment, the number of people/dependents living at home, living in rented housing have a greater affect on paternal depression during the postpartum period. In another study investigating postpartum depression experiences of the fathers, it was reported that their expectations concerning gender roles are also effective in paternal postpartum depression (Eddy et al. 2019). In our study, it was determined that there was only one study examining the relationship between postpartum depression in fathers and the acceptance of the culture they lived in. This finding suggests that there is also a need in our country for studies examining the relationship between cultural gender roles and paternal postpartum depression.

Having a personal or family history of depression is among the risk factors for an individual to develop depression in the postpartum period (Arslantaş et al. 2009). High level of depressive symptoms in the mother during the postpartum period was found to correlate with the high level of depressive symptoms observed in the father (Kiviruusu et al. 2020). Furthermore, in the studies included in this evaluation, the previous history of depression determined in 16.7% of the fathers and 11.1% of their spouses was related to postpartum depression. These findings show parallelism between the history of postpartum depression data on fathers and the data of the research conducted with mothers. Finally, given that a history of depression in fathers is related with paternal postpartum depression, taking a good anamnesis from both the father and mother during the perinatal period is important in determining the risk of depression during the postpartum period.

Some of the investigations reported in the literature found a positive correlation between the mother's education level and postpartum depression (Gümüş et al. 2012), while others reported a negative correlation (Bingöl and Tel 2007) or the lack of correlation (Altınay et al. 2002, Arslantaş et al.

2009, Battaloğlu et al. 2012). The level of education affected paternal postpartum depression in 16.7% of the studies reviewed, but it was without any effect in 5.6% of the studies and was not taken into consideration in 77.8% of the studies. On the basis of these results, a relationship between the level of both maternal and paternal education and postpartum depression has a high likelihood.

The relationship between the mother's employment status and postpartum depression has been investigated in studies conducted with mothers. For example, in contrast to the inner and eastern regions of Turkey, where mothers are not employed, having to work in the western regions is seen to increase the incidence of maternal postpartum depression (Ekuklu et al. 2004, Nur et al. 2004, Inandi et al. 2005, Bingöl and Tel 2007, Durukan et al. 2011). A study focusing on the prevalence, effects and risk factors of postpartum depression in fathers, reported unemployment history to be associated with paternal postpartum depression (Field 2018). As indicated in the studies included in this review, unemployment, economic status, the number of people living/dependent at home are important factors affecting paternal postpartum depression.

Studies in the literature report that the risk of postpartum depression increases in women with insufficient family support (Inandi. et al. 2002, Arslanet al. 2006, Bingöl ve Tel 2007, Gümüş et al. 2012, Nebioglu et al. 2013, Biebel and Alikhan 2016). In a study conducted with fathers, low level of social support was found to be a factor related to the depression of participants (Field 2018). The level of social support was found to affect paternal postpartum depression in 27.8 % (n=5) of the studies reviewed in our research , while it was found to be without any effect in 5.6% (n = 1) of the studies. Living in a large family and without the support of the spouse was found to increase by 3.53 fold the maternal postpartum depression (Arslantaş et al. 2009). Accordingly, it can be said that low level of the needed social support increases the incidence of postpartum depression in fathers as well as the mothers.

In a study conducted in Canada and France, it was reported that the Edinburgh Postpartum Depression Scale (EPDS), which is effective in determining postpartum depression in 80-85% of women, can be used to screen depression in women from the first week postpartum (Arslantaş et al. 2009). In 22.2% of the studies scanned in our review, the psychometric features of the EPDS had been tested in postpartum fathers and found to be reliable. It was observed that the EPDS was used mostly in the diagnosis of paternal postpartum depression. Accordingly, it is possible to say that the EPDS is a suitable tool for screening the risk of postpartum depression in fathers as well as mothers and can be used to evaluate paternal postpartum depression.

In our review it was also observed that, in addition to the EPDS, the Beck Depression Inventory II and the Gotland Male Depression Scale were used in, respectively, 16.7% and 11.1% of the studies in order to evaluate the classical and masculine depressive symptoms. On the basis of the reviewed studies, it can be said that ascertaining whether paternal postpartum depression is experienced with the classical masculine depressive symptoms is also important for the diagnosis and correct evaluation of the disorder.

CONCLUSION

It was seen in the studies reviewed in this research that the Edinburgh Postpartum Depression Scale was the most commonly used measurement tool in diagnosing paternal postpartum depression. The EPDS was found to be a valid and reliable tool in the diagnosis of paternal postpartum depression after investigations on its psychometric features in 22.2% of the reviewed studies. However, there is not any study examining the validity and reliability of the Turkish language format of the EPDS in Turkish fathers.

It can be concluded on the basis of the research results reviewed here that factors such as age, education level, social support, unplanned pregnancy, the temperament of the baby, parenting stress and the perceived competence, quality of the relationship with the spouse, loss of the baby during pregnancy, and previous history of depression, which are effective in maternal postpartum depression, are also valid for paternal postpartum depression which is also affected by factors such as adjustment to or adopting the culture one lives in, ethnicity, the number of people living/dependents at home, living in rented accomodation, economic situation and unemployment.

Knowing the risk factors of paternal postpartum depression, will help early diagnosis and treatment of postpartum depression in fathers; and also guide healthcare professionals for the protection and improvement of men's mental health by means of postpartum programs. Moreover, having found in the databases scanned within the scope of this research only one research article on the subject conducted in the Turkish society shows that there is a need in our country for further studies on this subject.

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