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# Paternal Postnatal Depression and its Risk factors: A systematic review of cross-sectional studies

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## Abstract

**Background and Aim:** Postnatal depression (PND) can affect both genders, but the common misconception is that it only affects mothers. Increasing literature reports that 10% of the fathers experience PND after childbirth. This systematic review aims to ascertain the prevalence of PND in fathers and its risk factors.
**Materials and Methods:** The electronic databases PubMed, BASE, DOAJ, Research Gate Semantic Scholar, and BioMed Central were searched for related open access articles published between 2010 to December 2021. Finally, 12 articles met inclusion criteria.
**Results:** The findings reported that the prevalence of PND in fathers ranged from 5.7% to 59.8%. Partner's depression, lack of social support, poor marital relationship, low income, and low education were all shown to raise the risk of PND in fathers.
**Conclusion:** PND in fathers is a serious concern. Early identification and treatment decrease the detrimental impact on mother and child while further improving quality of life.

**Keywords:** Father, Postnatal Depression, Postpartum Depression, Edinburgh Postnatal Depression Scale, Prevalence, Risk factors

## Background

Postnatal depression (PND) or Postpartum depression (PPD) is a non-psychotic depressive disorder that occurs within the first year after childbirth[1-2]. PND can affect both parents but it has been associated primarily with mothers[3-4]. However, increasing literature shows that PND is not uncommon in fathers and 10% or 1 in 10 fathers around the world experience depression after childbirth[5]. The prevalence of PND in fathers during the first year after childbirth has been found to range from 4% to 25%, with a 50% rise when the mother is also depressed[4-6]. A more recent meta-estimate recorded for PND in fathers within the postpartum period was 8.4%[7]. This rate is higher than the depression rate (4.7%) in the general male adult population[8].

Several factors that precipitate PND in fathers have been reported by researches including partner's depression, previous history of depression, unemployment, low education, poor marital relationship, lack of social support, and an unplanned pregnancy [9-11]. The partner's depression during the postnatal period was found to be the best predictor of PND in fathers[11].

PND has a detrimental influence on fathers' health and well-being, as well as that of their families. It involves failure to fulfill obligations at home and at work, a loss of interest, fatigue, stress, and a higher risk of suicide in fathers[12-14]. Complications in marital relationships and the development of behavioral and emotional problems in their children are some of the negative impacts of PND in fathers on their families[15-17].

PND in fathers is a clinically significant problem with higher community-based care costs[18]. Despite this, PND in fathers is under-screened, under-diagnosed, and under-treated[19-20]. Various scholars and countries have investigated PND in fathers, but it is still in its early stages in India. The goal of this review is to raise the understanding regarding PND in fathers and its associated risk factors. Thus this review aims to ascertain the prevalence of PND in fathers and to determine its risk factors.

## Methodology

The systematic review reporting follows Preferred Reporting Items for Systematic reviews and Meta-analyses (PRISMA) guidelines.

### Search strategy

PubMed, BASE, DOAJ, Research Gate Semantic Scholar, and BioMed Central electronic databases were searched for articles published between 2010 to December 2021 by using the following terms with Boolean operators (‘OR’/‘AND’): “father” OR “paternal” AND “Postnatal depression” OR "postpartum depression".

### Inclusion and exclusion criteria

Articles were chosen for inclusion based on the following criteria: 1) Journal articles that examined the prevalence of PND in fathers and its associated factors, 2) Cross-sectional research design, 3) Published in the English language, 4) Published between 2010 to December 2020, 5) Original research articles and 6) Full free and open access articles. Exclusion criteria were: 1) Journal articles abstracts, Review articles, Commentaries, Conference Reports, and Thesis, 2) Interventional articles, 3) Duplication, and 4) Articles not relevant to the study.

### Data Extraction

The data was extracted by the author with the help of experts. The data extracted from the eligible studies were: year of citation, author, country, research design, sample size, response rate, recruitment setting, assessment points, assessment instrument, cut-off score, and prevalence.

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### Methodological quality Assessment

Two independent authors used the Mirza and Jenkins checklist to determine the methodological quality of the included studies[21-22]. The critical appraisal checklist included the following criteria: 1) clear study objectives, 2) adequate sample size (or justification), 3) representative sample (with justification), 4) clear inclusion and exclusion criteria, 5) depression measure used is reliable and valid, 6) reported response rate and/or losses explained, 7) adequate description of data, 8) appropriate statistical analyses and with additional criterion 9) appropriate informed consent[23]. Each criterion of the checklist is answered by 'yes' (1 point) or 'no' (no point). Based on the points obtained by the studies were graded between 1to 9. Regardless of their quality, all of the studies were included.

## Results

### Search results and inclusion of articles

A total of 1085 articles were found through a database search. 998 articles were excluded after an initial screening for a variety of reasons (Figure 1). A total of 43 full free text articles were chosen and screened against inclusion criteria. Finally, 12 articles met the inclusion criteria.

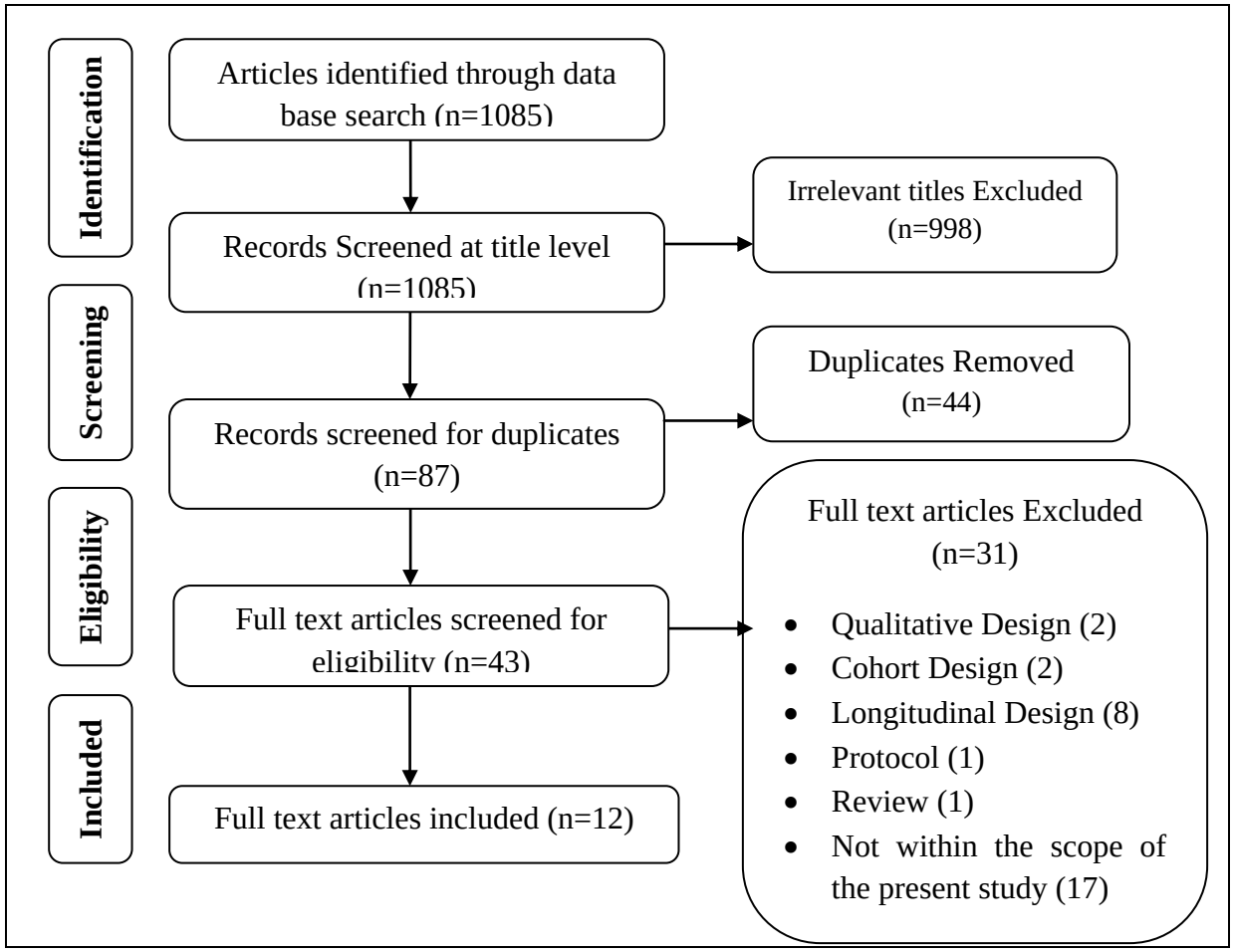


**Figure 1: PRISMA: Literature Search Flow Chart**

**Study characteristics**

All the 12 cross-sectional studies selected [24-35], investigated the prevalence of postnatal depression and its associated factors. Included studies were conducted in Iran (3)[24, 26, 29], Japan (1)[25], Italy (1)[27], Sweden (1)[28], Ethiopia (1)[34], Saudi Arabia (3)[32, 33, 35], Ireland (1)[30], and Chile (1)[31]. The key features of the studies included are briefly listed in Table 1.

**Quality assessment**

According to the previously stated criterion, the quality of the included studies varied from 6 to 9 out of a possible maximum of 9, suggesting that these studies were of high methodological quality in general. Table 2 summarizes the findings of this assessment.

**Description of study subjects**

Only fathers were the research subjects in eight of the twelve studies[24,26,28,30,32-35] (two of which included the first-time fathers[24,26]), while couples were the study subjects in the remaining studies[25,27,29,31] (one of which included first-time parents[27]).

**Sample size and Sampling technique**

In studies with only fathers as a sample, the sample size ranged from 100 to 8011[24,26,28, 30,32-35] and in studies with couples as a sample, the sample size ranged from 75 to 2032[25,27,29,31]. Five of the 12 studies used probability sampling techniques[24,28,30,32,34], two used non-probability sampling techniques[26,33], and the others didn't mention.

**Study setting and time of recruitment of participants**

The studies included in this review varied in terms of the time and setting in which participants were recruited. The participants of the studies were recruited at different time points from childbirth to 12 months of postpartum. Participants were recruited in five studies within 3 months of postpartum[24,26,27,29,35], two studies between 3 and 6 months[25,28], and two studies between birth and 12 months[30,33]. Of the remaining studies, one study enrolled participants after two months of childbirth[31], one study from childbirth to 6 months[32], and one study after 4 weeks of postpartum[34]. Three studies recruited a sample from health centre[24,28,33], and 3 studies from hospital[26,31,35]. Out of the remaining six studies, one study recruited a sample from population registry[28], one study directly from the community[25], one study from private pediatric ambulatories[27], one study from primary health care centre[30], one from tertiary care[31] and one study recruited its sample from health care centre[34] .

**Tool used to measure paternal postnatal depression.**

The Edinburgh Postnatal Depression Scale (EPDS) was used in all of the studies to screen fathers for PND. However, the cut-off score for the PND screening varied. For positive PND screening, four studies used an EPDS cut-off score of ≥ 12[24,26,27,29], three studies used a cut-off

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**Table 1: Methodological characteristics of studies included in the systematic review**

| Year of citation/ Authors / Country | Study Design | Sample size | Response Rate | Recruitment setting | Assessment time | Assessment Instruments | Cut-off score | Prevalence |
|---|---|---|---|---|---|---|---|---|
| 2014<br>Kamalifard et al.<br>Iran | Cross-sectional | 205 New fathers | 97% | 7 Health centers | -At 6$^{th}$ to 12$^{th}$ week postpartum | EPDS | ≥ 12 | 11.7% |
| 2015<br>Nishimura et al.<br>Japan | Cross-sectional | 2032 couples. | 39.7% couples | 4 Wards of Kobe city | -At 4 months of postpartum | EPDS | ≥ 8 | 13.6. % |
| 2015<br>Ahmadi Z et al.<br>Iran | Cross-sectional | 328 New fathers | 100% | Hospital | -At 8$^{th}$ week of postpartum | EPDS | > 12 | 59.8% |
| 2015<br>Epifanio MS et al.<br>Italy | Cross-sectional | 75 couples (first-time parents) | 70.6% | Private pediatric ambulatories | -At first month of child's birth | EPDS | > 12 | 5.7% |
| 2018<br>Carlberg M et al.<br>Sweden | Cross-sectional | 8,011 fathers | 46% | Population registry. | -3 to 6 months postpartum | EPDS<br><br>GMDS | ≥ 10<br>≥ 12<br>≥ 13 | 13.3%<br>8.1%<br>8.6% |
| 2018<br>Kamalifard M et al.<br>Iran | Cross-sectional | 205 couples | 90% | 7 Health centers | - At 6$^{th}$ to 12$^{th}$ weeks after childbirth. | EPDS | ≥ 12 | 11.7% |
| 2018<br>Philpott LF and Corcoran P<br>Ireland | Cross-sectional | 100 fathers | 77% | Primary care center | -Birth to a child in the last 12 months | EPDS | ≥ 9<br>≥ 12 | 28%<br>12% |

**(Table 1 continued)**

| Year of citation/ Authors / Country | Study Design | Sample size | Response Rate | Recruitment setting | Assessment time | Assessment Instruments | Cut-off score | Prevalence |
|---|---|---|---|---|---|---|---|---|
| 2018<br>Francisca Perez C et al.<br>Chile | Cross-sectional | 382 couples | 33.5% | Hospital | -2 months after child birth | EPDS<br>BDI | ≥ 10<br>13/14 | 18.5<br>10.5 |
| 2019<br>Shaheen et al.<br>Saudi- Arabia | Cross-sectional | 347 fathers | 83.57% | Tertiary care | -From child's birth to 6 months postpartum | EPDS<br>DSM-5 criteria | 8/9 | 16.6% |
| 2019<br>AlHaisoni MS<br>Saudi Arabia | Cross-sectional | 226 fathers | 85.2% | Health care Center | -Up to 12 months of postpartum | EPDS | ≥ 9 | 32.7% |
| 2020<br>Markos and Arba<br>Ethopia | Cross-sectional | 423 fathers | 97% | 25 public health centers | ≥ 4 weeks of postpartum | EPDS | ≥10 | 17% |
| 2020<br>Alghamdi et al.<br>Saudi Arabia | Cross-sectional | 182 fathers | 82.41% | Hospital | -Between 4 and 8 weeks of postparum | EPDS | >10 | 27.3% |

**EPDS** - Edinburgh Postnatal Depression Scale; **BDI** - Beck Depression Inventory; **GMDS** - Gotland Male Depression Scale; **DSM-5** - Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

score of ≥ 10[31,34,35], two studies used a cut-off score of ≥ 9[32,33], and one study used an EPDS cut-off score of ≥ 8[25]. The other two researches used two cut-off scores: one used a cut-off score of ≥10 and ≥12 for positive screening of minor and major depression[28], and the other used a cut-off score of ≥9 and ≥12 for positive screening of minor and major depression[30]. The Beck Depression Inventory (BDI) with a cut-off score of 13/14[31] and the Gotland Male Depression Scale (GMDS) with a cut-off score of ≥13[28] were also used as screening measures. To compare the screening findings, two studies used the BDI and GMD with EPDS[28,31]. After screening with EPDS, one study used the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) to determine a PND diagnosis[32].

**Prevalence of PND**

According to studies, the overall prevalence rate of PND in fathers ranges between 5.7%and 59.8% [24,35]. The lowest prevalence was reported in Italy[27] and the highest was in Iran[26]. PND was observed in 5.7% to 59.8% of fathers between the childbirth to 3 months[24,26,27,29,35], 13.3% to 13.6% between three and six months[25,28], and 28% to 32.7% between childbirth and 12 months of postpartum[30,33]. The prevalence ranged from 5.7% to 59.8% when using an EPDS cutoff score of ≥ 12[24,26-29], 13.3%to 27.3% when using a cutoff score of ≥ 10[28,31,34,35], and 16.6% to 32.7% when using a cutoff score of ≥ 9[32,33]. When two cutoff scores were used, the prevalence ranged from 8.1% to 13.3% in one study[28] and from 12% to 28% in another[30].

| Study | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ | $C_7$ | $C_8$ | $C_9$ | Total score |
|---|---|---|---|---|---|---|---|---|---|---|
| Kamalifard M et al .[24] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 |
| Nishimura A et al .[25] | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 8 |
| Ahmadi Z et al .[26] | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 6 |
| Epifanio, M. S et al .[27] | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 7 |
| Carlberg M et al.[28] | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 8 |
| Kamalifard M, et al.[29] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 |
| Philpott LF & Corcoran P[30] | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 7 |
| Francisca Pérez C et al.[31] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 |
| Shaheen NA et al.[32] | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| AlHaisoni MS[33] | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 8 |
| Markos M & Arba A[34] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 |
| Alghamdi W A et al.[35] | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |

**Table 2: Methodological quality assessment of studies included in the systematic review**

**$C_1$-**Clear study objectives; **C2-**Adequate sample size or justification; **$C_3$-**Representative Sample (with justification); **C4-** Clear inclusion and exclusion criteria; **C5-**Depression measure used is reliable & valid; **$C_6$-**Reported response rate and/or losses explained; **C7-**Adequate description of data; **C8-**Appropriate statistical analyses; **C9-**Appropriate informed consent.

### Risk factors

Out of 12 studies, 11[24-32,34,35] studies reported risk factors for PND in fathers. Partner's depression[25,28,29,31], lack of social support[24,30,34], poor marital partnership satisfaction[25,34,35], low income[28,30,34], low education[26,28], perceived stress[24,35], and infant sleep problems[30,34] were the most frequently identified risk factors. Other factors reported were history of infertility treatment, economic anxiety, the experience of visiting medical institutions due to mental health problems[25], unemployment[26], maternal distress[27], family livelihood situation[29], history of depression, no paternity leave[30], feeling isolated and disconnected from partner[32], substance use, unplanned pregnancy[34], family and work-related related problems, trouble sleeping, and low self-esteem [35].

## Discussion

In the present study, the prevalence of PND in fathers was found to range from 5.7% to 59.8%. This wide variation may be attributed to varying cut-off points, sample sizes, cultural contexts, and assessment time [5,7]. The other reason for the wide variation in the prevalence rates was the use of self reporting measures. It has been observed that self-reporting tools provide high prevalence estimates than the diagnostic tools and interview[37,38].

The most frequently found risk factors in the current review were partner's depression, lack of social support, poor marital partnership satisfaction, low income, and low education, which is consistent with previous findings [9-11].Other common risk factors identified by previous researches such as unemployment and previous history of depression[39,40] were not reported by the majority of the studies (10/12) under the current review.

## Limitations

The review's limitations include the small number of identified studies, cross-sectional prevalence studies, and the variability in research methodology.

## Conclusion

According to a systematic review undertaken in India, 22% of mothers experience PND[41]. Mothers' PND is a strong indicator of PND in their partners. Furthermore, when their partners

were depressed in the postpartum period, PND in fathers ranged from 24% to 50%[4]. Nonetheless, PND in mothers gains more emphasis. PND in fathers is a serious concern and must be regarded as a public health issue. The mental health of fathers should be included in postpartum mental health assessments as early diagnosis and treatment decrease the detrimental impact on mother and child while further improving quality of life.

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Nil

## Conflict of Interest

There are no conflicts of Interest

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