

# Early Postpartum Morbidities and the Associated Factors in the Field Practice Area of a Tertiary Care Institution in Andhra Pradesh - A Cross Sectional Study

Sunita Sreegiri<sup>1</sup>, Phani Madhavi Kajana<sup>2</sup>, Dhanalakshmi Balaga<sup>3</sup>, Kesava Lakshmi Prasad Kandipudi<sup>4</sup>, Devi Madhavi Bhimarasetty<sup>5</sup>

<sup>1, 2, 3, 4, 5</sup> Department of Community Medicine, Andhra Government Medical College, Visakhapatnam, Andhra Pradesh, India.

## ABSTRACT

### BACKGROUND

The status of maternal health in developing countries is often described in terms of maternal mortality alone. Data on maternal morbidity is inadequate as there is no proper reporting system. Improving maternal health and reducing maternal mortality has been the critical concerns of the international community. So, the present study was undertaken to identify and determine the factors associated with early postpartum morbidity among mothers in the rural field practice area of Rural Health Center (RHC), Simhachalam, Visakhapatnam.

### METHODS

A cross-sectional study was conducted among post-partum mothers in the early postpartum period, registered with Rural Health Centre (RHC), Simhachalam, from March 2019 to November 2019 using a pre-tested semi structured questionnaire. Study was conducted among 335 postnatal mothers. List of antenatal mothers registered in RHC Simhachalam was obtained. Antenatal mothers who had their expected date of delivery (EDD) between April 2019 and Aug 2019 and were available in Simhachalam in the post-partum period were contacted after getting information about their delivery from local Multipurpose Health Worker (MPHW). The mothers were visited and interviewed between day 7 and day 10 at their home and information on morbidity was obtained.

### RESULTS

Most common complaints seen in the early postpartum period among the study participants were easy fatigability [214 (63.7 %)], headache in 140 (41.66 %), pedal oedema [131 (39 %)] and facial oedema [27 (8.0 %)]. Almost 67.85 % of mothers were anaemic. Among the obstetric related complaints, lower abdominal tenderness was the most common [196 (58.3 %)] followed by heavy vaginal bleeding [138 (41.1 %)], episiotomy wound swelling / pain [90 (26.8 %)] and postpartum haemorrhage (PPH) [46 (13.7 %)]. Episiotomy wound infection [24 (7.12 %)] and Caesarean wound infection [12 (3.57 %)] were seen together constituting around 10.7 % among mothers.

### CONCLUSIONS

The incidence of morbidity in the early postpartum period was high with 82.5 % of the mothers presenting with one or more morbidities.

### KEYWORDS

Maternal Morbidity, Early Postpartum Morbidity, Post-Natal Mothers

*Corresponding Author:*

*Dr. Phani Madhavi Kajana,  
Assistant Professor,  
Department of Community Medicine,  
D. No 2-2/12, Sri Chakra, Rajeev Nagar,  
Old Dairy Farm, VIZAG - 530040.  
Andhra Pradesh, India.  
E-mail: drmadhavigvp@gmail.com*

*DOI: 10.18410/jebmh/2021/245*

*How to Cite This Article:*

*Sreegiri S, Kajana PM, Balaga D, et al.  
Early postpartum morbidities and the  
associated factors in the field practice  
area of a tertiary care institution in  
Andhra Pradesh - a cross sectional study.  
J Evid Based Med Healthc  
2021;8(18):1281-1286. DOI:  
10.18410/jebmh/2021/245*

*Submission 17-01-2021,*

*Peer Review 25-01-2021,*

*Acceptance 19-03-2021,*

*Published 03-05-2021.*

*Copyright © 2021 Sunita Sreegiri et al.  
This is an open access article  
distributed under Creative Commons  
Attribution License [Attribution 4.0  
International (CC BY 4.0)]*

## BACKGROUND

Globally, it is estimated that about 800 women die every day of preventable causes related to pregnancy and childbirth; among them, 20 % are from India.<sup>1</sup> With the surge in institutional deliveries to 78.9 %<sup>2</sup> and many government pioneering activities, there is a sharp decline in maternal mortality ratio to 130 from 2014 - 2016.<sup>3</sup> Improving maternal health and reducing maternal mortality has been the critical concerns of the international community, particularly as part of the MDG-5.

The target of 70 per one lakh live births by 2030 had been set under sustainable development goals, which requires action at the community level.<sup>4,5</sup> The status of maternal health in developing countries is often described in terms of maternal mortality alone, despite the evidence that far more women suffer from morbidities / disabilities relating to pregnancy and childbirth.<sup>6</sup> Maternal mortality denotes the tip of the iceberg, and maternal morbidity is the base. Data on maternal morbidity remains hidden as there is no reporting system and surveillance.<sup>7</sup>

The invisible part of maternal morbidity is related to 80 % of maternal deaths,<sup>8</sup> 6.0 % of maternal deaths occur in the postpartum period.<sup>9</sup> For every woman who dies due to pregnancy, childbirth or unsafe abortion, there are 20 to 30 who survive but endure injuries, infections, and disabilities that cause lifelong suffering leading to physical, psychological, social and economic consequences.<sup>10</sup> The World Health Organization (WHO) estimates that 300 million women in the developing countries suffer from short / long term complications brought about by pregnancy or childbirth.<sup>10</sup>

There is a strong need to identify and address the determinants of maternal morbidity. Govt of India, through National health mission (NHM), is investing to ensure that all women receive early postpartum care 1) After delivery at home and 2) after discharge from the institution to detect and manage maternal morbidity under home-based care.

In India, only 62.4 % of women has a postnatal check-up from doctor / nurse / Lady health visitor (LHV) / Auxiliary nurse midwife (ANM) / midwife / other healthcare personnel within two days of delivery.<sup>2</sup> The reason for the underutilization of postnatal care is generally related to unavailability, inaccessibility, and poor quality of health services.<sup>11</sup> Early post natal care can reduce maternal mortality and morbidity.

The postpartum period is considered to be a unique and most critical segment in the lives of mothers and the newborn.<sup>12</sup> Yet, it remains the neglected component in maternal and infant care. There is a lack of adequate information on the prevalence of morbidity mainly the burden of moderate-to-severe morbidity during the first postpartum week in the postnatal period. The present study was undertaken to assess the burden of early postpartum morbidity and identify factors among the mothers registered with Rural Health Centre (RHC), Simhachalam in the rural field practice area of Andhra Medical College, Visakhapatnam.

We wanted to identify and determine the factors associated with early postpartum morbidity among the

mothers in the rural field practice area of Rural Health Centre, Simhachalam, Visakhapatnam.

## Objectives

1. To identify the early postpartum morbidity among mothers registered with Rural Health Centre.
2. To determine the factors associated with early postpartum morbidity.

## METHODS

A cross-sectional study was conducted in Rural Health Centre, Simhachalam, and the rural field practice area from March 2019 to November 2019. The study population comprised of postnatal mothers who were in the early postpartum period, i.e., within 1st week of delivery.

### Inclusion Criteria

Mothers registered in RHC and planning for delivery within Visakhapatnam city and had plans to come back to Simhachalam after delivery for postpartum care were included in the study.

### Exclusion Criteria

1. Antenatal mothers not registered in Simhachalam
2. transfer in mothers
3. Mothers registered in Simhachalam but planning to stay away and not available after delivery.

### Sample Size Calculation

A pilot study was conducted among 20 mothers for testing the questionnaire for necessary modifications. Anaemia was found to be the most common morbidity with 68 % of the mothers being anaemic. Considering P as 68 %, 5 % as absolute precision and using the formula

$$\frac{Z^2 \times p(1-p)}{E^2}$$

[Z = 1.96, 95 % confidence interval)

The sample size was calculated as 334.37, which was rounded off to 335.

### Sampling Technique

1. Simhachalam is the rural field practice area with 12 sub centres. The multipurpose health worker female for each sub centre, maintains the antenatal register.
2. In the first stage, the list of antenatal mothers registered / enrolled by the MPHWS along with their Expected date of Delivery (EDD) in all 12 sub centres was obtained. Approximately 100 - 120 antenatal mothers were being registered every month in all sub centres.
3. All the antenatal mothers who had their EDDs between April 2019 and August 2019 were contacted and

enquired about their birth plan and place of postpartum stay.

- After receiving information on delivery from the MPH (F) of respective sub centres, the mothers were visited at home between days 7 - day 10 of delivery and were interviewed using a validated pretested semi-structured questionnaire. The semi-structured questionnaire was prepared and given to subject experts for validation. The Cronbach's alpha was calculated as 0.8. Pilot study was conducted among 20 postnatal mothers for making necessary modifications in the questionnaire.

### Study Variables

Sociodemographic variables such as age, education, occupation, Socio-economic status [based on B.G. Prasad S-E classification updated for 2018], age at marriage, parity, Number of antenatal check-ups, Iron folic acid (IFA) tablets consumption, type of delivery, place of delivery, post-natal visit (two visits in the first postpartum week).

### Statistical Analysis

Data entry was done using Microsoft Excel-2010. Data analysis was done using SPSS version 21. Chi-square test was applied for testing the statistical association between obstetric morbidity, various socio-demographic and other variables. P-value < 0.05 was considered as statistically significant.

Approval was obtained from the institutional ethics committee. Informed consent in local language was taken from the mothers in the study. For those who were illiterates, the consent was read out & explained to them, and consent was obtained by taking their thumb impression in the presence of a witness.

## RESULTS

| Variable  | Number (%)                                      |
|---|---|
| 1 Age of the mother(yrs)                                      | < 20 58 (17.3 %)                                |
|   | 21 - 25 162 (48.3 %)                            |
|   | - 30 102 (30.4 %)                               |
|   | > 31 13 (3.8 %)                                 |
| 2 Education   | Illiterate / primary / secondary 152 (45.37 %)  |
|   | Intermediate 97 (28.9 %)                        |
|   | Graduate & postgraduate 86 (25.6 %)             |
| 3 Socio-economic status                                       | Lower, lower-middle, middle 114 (34.03 %)       |
|   | Upper-middle, upper 221 (55.97 %)               |
| 4 Occupation  | Employed 45 (13.4 %)                            |
|   | Unemployed 290 (86.56 %)                        |
| 5 Age at marriage (yrs)                                       | < 20 95 (28.3 %)                                |
|   | 21 - 25 169 (50.44 %)                           |
|   | - 30 66 (19.7 %)                                |
|   | > 31 5 (1.5 %)                                  |
| 6 Parity  | Primiparous 214 (63.8 %)                        |
|   | Multiparous 121 (36.2 %)                        |
| 7 Type of delivery  | Caesarean section 156 (46.56 %)                 |
|   | Normal delivery with episiotomy 135 (40.29 %)   |
|   | Normal delivery without episiotomy 44 (13.13 %) |
| 8 Place of delivery   | Government 238 (71.04 %)                        |
|   | Private 97 (28.95 %)                            |
| 9 Number of antenatal check-ups                               | 325 (97 %)                                      |
| 10 IFA tablets consumption (100 tablets )                     | 321 (95.8 %)                                    |
| 11 Post-natal visit (two visits in the first postpartum week) | 112 (33.43 %)                                   |

**Table 1. Details on Socio-Demographic & MCH Variables of the Study Population**

A total of 335 mothers in their early postpartum period were interviewed and examined for any morbidity.

### Socio-Demographic Characteristics

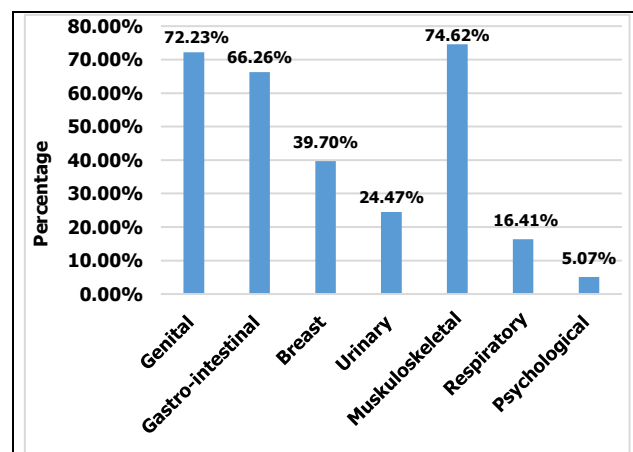
The age of the mothers ranged from 18 years to 36 years, with the mean age ( $\pm$  SD) being 24.37  $\pm$  3.4 years. Most of the mothers were educated, with 45.37 % having education up to secondary school, 28.9 % intermediate & 25.6 % up to graduation and post-graduation. Majority of the mothers [290 (86.56 %)] were Unemployed.

Morbidity profile in the early postpartum period included general and systemic complaints including obstetric conditions. Around 82.5 % of the mothers presented with at least one or more morbid condition. The prevalence of anaemia was found to be in 67.85 % mothers.

As per Table 2, Most of the mothers complained of easy fatigability [214 (63.7 %)] followed by headache, pedal and facial oedema.

| General Complaints | No (%)        |
|--------------------|---------------|
| Headache           | 140 (41.66 %) |
| Easy fatigability  | 214 (63.7 %)  |
| Pedal oedema       | 131 (39 %)    |
| Facial oedema      | 27 (8 %)      |
| High-grade fever   | 38 (11.3 %)   |

**Table 2. General Complaints Observed in the Early Postpartum Period**



**Figure 1. Morbidity Profile (System Wise) among Mothers in the Early Postpartum Period**

| Obstetric Morbidity        | Frequency (%) |
|----------------------------|---------------|
| Post-partum haemorrhage    | 46 (13.7 %)   |
| Perineal tear / swelling   | 90 (26.8 %)   |
| Increased vaginal bleeding | 138 (41.1 %)  |
| Lower abdominal tenderness | 196 (58.3 %)  |
| Itching / irritation       | 27 (8 %)      |
| Foul smelling discharge    | 20 (6 %)      |
| Wound infection-episiotomy | 24 (7.12 %)   |
| C section                  | 12 (3.57 %)   |
| Breast pain                | 77 (22.9 %)   |
| Breast engorgement         | 99 (29.5 %)   |
| Nipple discharge           | 3 (0.9 %)     |
| Flat / retracted nipple    | 36 (10.7 %)   |
| Sore nipple                | 1 (0.3 %)     |
| Constipation               | 190 (56.5 %)  |
| Bleeding per rectum        | 42 (12.5 %)   |
| Haemorrhoids               | 29 (8.6 %)    |
| Burning micturition        | 78 (95.12 %)  |
| Urinary incontinence       | 4 (4.87 %)    |

**Table 3. Obstetric and Non-Obstetric Conditions in the Early Postpartum Period**

As per the Figure 1 the incidence of genital morbidity (72.23 %) and musculoskeletal morbidity (74.62 %) are

found to be more among the mothers followed by gastrointestinal symptoms (66.26 %), breast related (39.7 %), Urinary tract related (24.47 %), respiratory (16.41 %), and psychological morbidity (5.07 %).

As per Table No: 3 Lower abdominal tenderness was the most common obstetric related morbidity during the early postpartum period [196 (58.3 %)] followed by heavy vaginal bleeding [138 (41.1 %)], episiotomy wound swelling / pain [90 (26.8 %)] and PPH [46 (13.7 %)]. Episiotomy wound infection [24 (7.12 %)] and Caesarean wound infection [12 (3.57 %)] were seen together constituting around 10.7 % among mothers. Foul-smelling discharge was found in 20 (6 %) mothers; among them, 4 (1.2 %) had fever with lower abdominal tenderness indicating the pelvic inflammatory disease. Breast pain (23 %) and breast engorgement (29.5 %) were some non-obstetric conditions followed by burning micturition complained by post-natal mothers.

Some of the variables such as socio economic status (SES), education, employment status, age of the mother, parity, place of delivery and type of delivery were further analysed to observe if there was any association with the outcome of obstetric morbidity.

| Variables                  | Obstetric Morbidity Present (N=242)  | Obstetric Morbidity Absent (93)                               | Total   | Chi square, P value   |  |
|----------------------------|--|---|---|-----------------------|--|
| Age of the mother (in yrs) | < 20<br>21 - 30<br>> 30  | 42 (72.4 %)<br>191 (72.3 %)<br>9 (69.23 %)                    | 16 (27.6 %)<br>73 (27.7 %)<br>4 (30.76 %)                   | 58<br>264<br>13       | $X^2 = 0.061$ ,<br>df = 2<br>P-value = 0.970 |
| Education                  | Illiterate / primary / secondary<br>Intermediate<br>Graduate & post graduate<br>Employed | 107 (70.39 %)<br>75 (77.31 %)<br>60 (69.76 %)<br>32 (71.11 %) | 45 (29.60 %)<br>22 (22.68 %)<br>26 (30.2 %)<br>13 (28.89 %) | 152<br>97<br>86<br>45 | $X^2 = 1.768$<br>df = 2<br>P-value = 0.413   |
| Occupation                 | Employed<br>Unemployed   | 32 (71.11 %)<br>210 (72.41 %)                                 | 13 (28.89 %)<br>80 (27.58 %)                                | 45<br>290             | $X^2 = 0.00$<br>df = 1<br>P-value = 0.998    |
| Socio-economic status      | Lower, lower middle and middle<br>Upper middle & upper                                   | 99 (72.8 %)<br>143 (71.8 %)                                   | 37 ((27.2 %)<br>56 (28.2 %)                                 | 136<br>199            | $X^2 = 0.04$<br>df = 1<br>P-value = 0.949    |
| Parity                     | Primiparous<br>Multiparous   | 155 (72.4 %)<br>87 (71.9 %)                                   | 59 (27.5 %)<br>34 (28.09 %)                                 | 214<br>121            | $X^2 = 0.001$<br>df = 1<br>P value = 0.982   |
| Place of delivery          | Government hospital<br>Private hospital  | 180 (75.6 %)<br>62 (63.91 %)                                  | 58 (24.4 %)<br>35 (36.08 %)                                 | 238<br>97             | $X^2 = 4.148$<br>df = 1<br>P value = 0.042   |
| Mode / type of delivery    | C section<br>Normal delivery with episiotomy<br>Normal delivery without episiotomy       | 116 (74.4 %)<br>93 (68.9 %)<br>33 (75 %)                      | 40 (25.6 %)<br>42 (31.1 %)<br>11 (25 %)                     | 156<br>135<br>44      | $X^2 = 1.272$<br>Df = 2<br>P-value = 0.529   |

**Table 4. Obstetric Morbidity Based on Socio-Demographic and Other Variables**

As per Table 4 the occurrence of obstetric conditions such as PPH, lower abdominal tenderness, etc. were not associated with socio-economic status, education or occupation similarly mothers age, parity were also not associated. But occurrence of obstetric complications were high among the mothers who delivered in Government Hospitals (75.6 %) compared to those in Private hospitals. Those who underwent C-section experienced more problems compared to those having normal delivery although it is not significant.

| Parity of the Women                | Breast Morbidity |                    | Urinary Tract Morbidity |               |
|------------------------------------|------------------|--------------------|-------------------------|---------------|
|                                    | Present          | Absent             | Present                 | Absent        |
| Primiparous                        | 102 (47.7 %)     | 112 (52.3 %)       | 63 (29.43 %)            | 151 (70.56 %) |
| Multiparous                        | 31 (25.61 %)     | 90 (74.38 %)       | 19 (15.7 %)             | 102 (84.29 %) |
| CHI SQUARE =14.782                 |                  | CHI SQUARE = 7.164 |                         |               |
| df = 1                             |                  | df = 1             |                         |               |
| P-value < 0.001 highly significant |                  | p-value = 0.007    |                         |               |

**Table 5. Non Obstetric Conditions in the Early Postpartum Period Based on Parity**

As per Table 5 breast morbidity was found to be statistically highly significant among primiparous mothers (47.7 %) as compared to multiparous mothers (25.61 %). (P-value < 0.001 highly significant).

Urinary tract related morbidity was also found to be highly significant more among primiparous mothers as compared to multiparous mothers.

## DISCUSSION

As per National family health survey (NFHS) V, in Andhra Pradesh, the percentage of women in the age group of 20 - 24 years married before 18 years was 29.3 %.<sup>13</sup> In the present study, it is observed that one third of the mothers were married before 20 yrs and 17.3 % of mothers were presently < 20 years age. Although there is some improvement in the age at marriage in comparison to NFHS IV it still needs to be lowered.

The mean age was 24. 3 years reflecting the fact that large number of births takes place in this age group as observed by other studies.<sup>14,15</sup>

In the present study, most of the mothers were literates. Increased accessibility, especially to government schools and better facilities, have contributed to the improvement of female enrolment in the schools. NFHS V also reports 68.6 % female literary rate in Andhra Pradesh.

Utilization of services under NHM especially antenatal care has shown improvement. Majority of the mothers in the present study have received four or more antenatal check-ups, similar to other reports,<sup>15</sup> almost 95.5 % of mothers have received more than 100 tablets, and all the deliveries (100 %) were institutional and conducted by skilled attendants, which reflect the increased awareness about antenatal care and utilization of health services and that of Janani suraksh yojana (JSY) scheme among these mothers. Health education by health care providers regarding birth preparedness and planning is also a significant contributor.

A high proportion of mothers (82.5 %) presented with morbidity in the early postpartum period in this study. General complaints such as easy fatigability, headache, pedal oedema, were common along with other complaints, which are obstetric related such as lower abdominal pain, vaginal bleeding, breast-related such as retracted nipple, pain and engorgement, musculoskeletal, GI system related, urinary tract symptoms and psychological symptoms, similar to findings as reported by others.<sup>9,14,16,17,18</sup> Most of the mothers 228 (67.85 %) were anaemic on examination, similar to observations of other studies.<sup>12</sup> Easy fatigability was found to have a statistically significant association with anaemia (P-value 0.000). According to the Global Burden of

Disease 2003, postpartum anaemia is the most important consequence of postpartum haemorrhage.<sup>19</sup> Results of a meta-analysis of health risks revealed that iron-deficiency anaemia was associated with 24 % of perinatal deaths.<sup>20</sup> Anaemia treatment in post-partum period must be emphasized.

Age of the mother was not found to have any association with the occurrence of morbidity although other studies reported it being more among mothers less than 28 yrs. age.<sup>15,17</sup>

In this study, obstetric related morbidity such as PPH, postnatal pain and sepsis, etc. found among 70 % of the mothers, and were almost similar among different socioeconomic classes. Other morbidities such as breast-related and urinary tract related were significantly higher among upper and upper-middle as compared to others. Mothers belonging to upper SE classes were probably more sensitive to the problems and therefore tend to report. Postpartum morbidities were more or less similar in all women with different educational levels. Literacy was not found to be influencing the occurrence of morbidity during the early post-partum period unlike other studies.<sup>9</sup> Musculoskeletal symptoms such as body pains, pain in legs etc. and other morbidities also were similar among all women irrespective of their educational status.

Breast engorgement and urinary tract related complaints were also significantly higher among primiparous than multiparous. Complaints such as engorgement and pain were usually due to either not initiating breastfeeding or wrong feeding techniques. Similar findings were reported in studies by others.<sup>9,10</sup>

Postpartum haemorrhage and hypertension cause 27.1 % and 14.0 % of all maternal deaths worldwide, respectively.<sup>9</sup> Present study shows post-partum morbidities such as postpartum haemorrhage was more among the mothers delivered in government institutions as compared to private institutions. Institutional deliveries carry lower risk of post-partum complications provided appropriate intra natal care is provided. Facilities at Government institutions have to be strengthened. Delivering at home is more likely to have one or more morbidity than those who delivered at home by skilled birth attendants (SBA) followed by healthcare facility. PPH, in many situations, can be prevented by promoting deliveries conducted by SBA ensuring skilled management of the third and fourth stage of labour.

The hygiene standards of patients as well as the hospital environment, and sterilization techniques can attribute to wound infection. By Ensuring strict aseptic environment while delivering MCH services wound infections can be reduced. Episiotomy wound infection and Caesarean wound infection in mothers is also a cause for concern in cases requiring surgical intervention. Foul-smelling discharge was another common complaint with four mothers complaining of fever with lower abdominal tenderness indicating the pelvic inflammatory disease.

As the present study covers the first postpartum week, it is expected that at least two postnatal visits are done by the Health worker. It is observed that only one-third of the

mothers received such service, which is a gap in the service delivery and can contribute to high post-partum morbidity.

## CONCLUSIONS

The incidence of morbidity in the early postpartum period was high, with 80 % of the mothers presenting with one or more morbidities. Obstetric, gastrointestinal & musculoskeletal, and anaemia being common problems highlighting the importance of postnatal visits by health care providers during this period. Factors like place and type of delivery were contributing to the burden of the morbidities. Most of the conditions were the consequence of labour and the kind of intervention given, underlining the quality of care & supervision provided during the intra-natal period, especially in the government set up.

## Limitations

The cross-sectional nature of the data limits our ability to draw any causal conclusions on the relationships found in the current study. A complete examination of the mother, such as pelvic / perineal examination were not done due to issues of privacy / consent.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

Financial or other competing interests: None.

Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

## REFERENCES

- [1] Maternal Health. UNICEF [cited 2019 Nov 28]. <http://unicef.in/whatwedo/1/maternal-health>.
- [2] National Family Health Survey 2015-2016 (NFHS-4): India Fact Sheet. [Cited 2019 Nov 28].
- [3] RGI. Special Bulletin on Maternal Mortality in India 2014-16. SRS Bull 2018;(91):1-3.
- [4] Ronsmans C, Graham WJ, Lancet Maternal Survival Series Steering Group. Maternal mortality: who, when, where and why. Lancet (London, England) 2006;368(9542):1189-1200.
- [5] WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division. Trends in Maternal Mortality: 1990 to 2013.
- [6] Filippi V, Chou D, Barreix M, et al. A new conceptual framework for maternal morbidity. Int J Gynecol Obstet 2018;141(Suppl 1):4-9.
- [7] Ashford L. Hidden suffering: disabilities from pregnancy and childbirth in less developed countries. Population Reference Bureau 2002: p. 6.
- [8] De Bernis L, Dumont A, Bouillin D, et al. Maternal morbidity and mortality in two different populations of Senegal: a prospective study (MOMA survey). Br J Obstet & Gynecol 2000;107(1):68-74.
- [9] Elkhoudri N, Amor H, Baali A. Self-reported postpartum morbidity: prevalence and determinants among

- women in Marrakesh, Morocco. *Reproductive Health* 2015;12:75.
- [10] Eram U, Nawab T, Sultan Z. Common health problems during postpartum period among females in rural areas of Aligarh. *Ann Int Med Dent Res* 2018;4(3):5-8.
- [11] Van Eijk AM, Bles MH, Odhiambo F, et al. Use of antenatal and delivery care among women in rural western Kenya: a community-based survey. *Reprod Health* 2006;3:2.
- [12] Iyengar K. Early postpartum maternal morbidity among rural women of Rajasthan, India: a community-based study. *J Heal Popul Nutr* 2012;30(2):213-225.
- [13] nfhs/NFHS-5\_FCTS/FactSheet\_AP.pdf
- [14] Bibi S, Ghaffar S, Memon S, et al. Severe acute maternal morbidity (SAMM) in postpartum period requiring tertiary hospital care. *Iran J Reprod Med* 2012;10(2):87-92.
- [15] Vallely L, Ahmed Y, Murray SF. Postpartum maternal morbidity requiring hospital admission in Lusaka, Zambia - a descriptive study. *BMC Pregnancy Childbirth* 2005;5:3-8.
- [16] Kabakian-Khasholian T, Shayboub R, Ataya A. Health after childbirth: patterns of reported postpartum morbidity from Lebanon. *Women and Birth* 2014;27(1):15-20.
- [17] Assarag B, Dujardin B, Delamou A, et al. Determinants of maternal near-miss in Morocco: too late, too far, too sloppy? *PLoS One* 2015;10(1):e0116675. <https://doi.org/10.1371/journal.pone.0116675>.
- [18] Singh A, Kumar A. Factors associated with seeking treatment for postpartum morbidities in rural India. *Epidemiol Health* 2014;36:e2014026.
- [19] Allen LH. Anemia and iron deficiency: effects on pregnancy outcome. *Am J Clin Nutr* 2000;71(Suppl 5):1280S-1284S.