

Prevalence of Common Mental Disorders among pregnant women—Evidence from population-based study in rural Haryana, India

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ABSTRACT

Background: Mental disorders during pregnancy is one of the major public health problem because of its effect on both mother and child. **Objectives:** The objective of the study was to assess the burden of common mental disorders (CMDs) among pregnant women in rural Haryana, North India. **Methods:** A community-based cross-sectional study was conducted in 28 villages of rural Haryana in 2016. Pregnant women in the study area with period of gestation 25–34 weeks were enrolled and assessed for presence of CMDs in two phases. Primary Care Evaluation of Mental Disorders—Patient Health Questionnaire was used for screening and Mini International Neuropsychiatric Interview (MINI) for diagnosis of CMDs. **Results:** A total of 457 pregnant women were included in the study. Mean age of pregnant women was 23.9 years (SD- 3.9). Prevalence of CMDs was 15.3% (95% CI, 12.0–18.6). Of these, major depression was 2.8% (95% CI, 1.4– 4.4), and Generalized Anxiety Disorder was 15.1% (95% CI, 11.8–18.4) as per MINI. On multivariate analysis, no statistically significant association was found between CMDs during pregnancy with any obstetric, sociodemographic determinants, and child health outcomes. **Conclusion:** High prevalence of CMDs, especially anxiety, observed among pregnant women in rural area necessitates the need for integration of screening of CMDs during routine antenatal care in India.

Keywords: Common Mental Disorders, India, pregnancy, rural

Introduction

Mental disorders during pregnancy is a major public health problem as it affects the health of both mother and child.^[1] In developed countries, the reported prevalence of mental disorders during pregnancy ranges from 7 to 15%.^[2] The disease burden is higher in low and middle income countries (LMIC) where 15.6% of pregnant women and 19.8% postpartum women were

estimated to be suffering from a mental disorder.^[3] Common mental disorders (CMDs) includes non-psychotic mental health conditions like depressive, anxiety, adjustment, and somatoform disorders that compromise day-to-day functioning.^[4] Prevalence of CMDs is reported to be higher in women than in men.^[5,6]

Recently conducted National Mental Health Survey by National Institute of Mental Health and Neuro-Sciences (NIMHANS) in 12 states of India estimated 10% prevalence of CMDs among adults. MINI (Mini International Neuropsychiatric Interview) was used in the survey. In the survey, current and lifetime prevalence of depression was 2.7% and 5.2%, respectively. The current prevalence of anxiety disorders was 1.2%. The current prevalence of depression among men and women was

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2.4% and 3.0%, respectively.^[7] Similarly, a systematic review of studies conducted among pregnant women in India showed that the prevalence of depression ranged from 10.25% to 55% (1st trimester), 8.4% to 48.4% (2nd trimester), and 11.11% to 30.11% (3rd trimester).^[8]

Pregnant women with CMDs are less likely to seek antenatal care and may have lower weight gain during pregnancy^[1] which increases the chance of complicated delivery^[9] and poor child health outcome such as low birth weight, prematurity, and neonatal mortality.^[10] CMDs during pregnancy may also have adverse effect on neurobiological development of fetus.^[11] When untreated, mental disorder during antenatal period may continue in postnatal period,^[12] thus, resulting in decreased emotional involvement and hostility toward newborn.^[13] CMDs during pregnancy may also be associated with child malnutrition^[14] and have an effect on child's behavioral,^[15] emotional, and cognitive development.^[16]

Facility based studies in India have estimated the burden of CMDs during pregnancy to range from 5.8% to 16%.^[3,17–19] There is scarcity of evidence from community-based study on burden of CMDs among pregnant women in India.^[20] Hence, we conducted present study with the objective to assess the burden of CMDs among pregnant women in rural Haryana, North India.

Methods

Study area

A cross-sectional survey was conducted in Ballabgarh Tehsil of district Faridabad, Haryana. The study area had two Primary Health Centres (PHC) and 12 subcentres which served a population of approximately 97,000 (year 2016) spread over 28 villages. More detailed description of study area is available elsewhere.^[21]

Each subcenter had one male and one female multipurpose health worker (MPW). All the national programs were implemented in the area through the health workers. The MPWs made fortnightly domiciliary visit to provide services and gather health related information. MPWs encouraged women with amenorrhea to visit subcenter to get urine pregnancy test done to confirm their pregnancy status. The pregnancy status was entered in computerized health management information system (HMIS) where all residents of study area were identified by a 13 digit alpha-numeric unique number. HMIS data base served as sampling frame.

Sample size and sampling procedure

We assumed the prevalence of CMDs as 18%,^[22] relative precision of 20% and 95% CI. The desired sample size was calculated as 455. All 28 villages were included in the study. Sample recruitment was done in two phases. In Phase I, all eligible pregnant women at the beginning of the study (339) were included in the study. After completion of data collection in Phase I, remaining 165 pregnant women were selected randomly from the list of all

eligible pregnant women generated by HMIS in phase II. All pregnant women of period of gestation 25–34 weeks eligible to be included in the study. Selected pregnant women were approached at their home for participation in the study. Seriously ill pregnant women, and those who could not be traced on two successive home visits were excluded from this study. Data were collected from May to December 2016.

Study tools

Assessment of CMDs was done using Primary Care Evaluation of Mental Disorders—Patient Health Questionnaire (PRIME MD PHQ) as screening tool, and MINI (version 6.0) as diagnostic tool. Validated Hindi versions of both the tools were used. Information regarding demographic factors, socioeconomic status, obstetric history, sex of the previous child was collected using self-developed pretested semistructured questionnaire. Socioeconomic status was categorized using Uday Pareek Scale for rural population in India.^[23]

PRIME-MD PHQ is used for screening of CMDs using Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM IV). PRIME MD PHQ has been validated in Hindi.^[24] Diagnosis of CMDs was confirmed by MINI (version 6.0) among pregnant women who screened positive by PHQ. MINI is a reliable and valid diagnostic tool^[25] which has been validated in India and its accuracy is comparable to Composite International Diagnostic Interview (CIDI) and Structured Clinical Interview for DSM-IV (SCID).^[25] We used depression, anxiety, and panic disorder module of both PRIME MD PHQ and MINI. PRIME MD PHQ and MINI showed good correlation in India when used simultaneously.^[26]

Investigator (SJ) was trained in administration of PRIME MD PHQ and MINI in the department of Psychiatry by one of the authors (RS) who is a senior psychiatrist.

Information regarding birth weight of the newborn and period of gestation at birth were collected 3 months after the interview, from subcenter records during the follow-up visits by the investigator.

Statistical analysis

Data were entered in Epi info 7.1 and analysis was done using STATA 14. Prevalence of CMDs by MINI was reported in percentage with 95% CI. Chi-square test and *t*-test were used to find relationship with categorical and continuous variable respectively. *P* value less than 0.05 was considered statistically significant. Multivariate logistic regression was done and adjusted OR and 95% CI was calculated for factors with *P* value < 0.25.

Ethical issues

Approval from Institute Ethics Committee of AIIMS, New Delhi was obtained before commencing the study. Written Informed

Consent was obtained from all pregnant women before enrollment into the study.

Results

Total 504 eligible pregnant women were approached for enrollment in the study of which 47 (9.3%) were excluded as they could not be contacted at home. None of the approached pregnant women declined to participate in the study. Thus, a total of 457 (90.7%) pregnant women were included in the study.

The mean age of pregnant women was 23.9 years (SD - 3.9). The mean age at marriage was 19.7 years (SD - 2.3). The mean age at first childbirth among parous women was 20.8 years (SD - 2.3). Detailed information regarding the sociodemographic profile of the pregnant women is given in Table 1.

History of previous abortion was reported by 107 (23.4%) women. Three hundred fifty two (77%) had more than four antenatal care (ANC) visits during present pregnancy. A total of 279 (61%) pregnant women had given birth previously. Out of these, 125 (45%) pregnant women had only female children. Also, 129 (46%) pregnant women had given birth to a female child in their last pregnancy. Twenty pregnant women (5.3%) gave history of death of a child. History of previous lower section cesarian section (LSCS) was given by 23 (8.4%) pregnant women. Out of total, 257 (56%) pregnant women reported tobacco consumption, and 33 (7.2%) reported alcohol consumption in the family.

Prevalence of Common Mental Disorders (CMDs) among pregnant women

Of the 457 pregnant women screened for mental disorders using PRIME MD PHQ, 133 (29.1%, 95% CI – 24.9, 33.3) were positive for Common Mental Disorders (CMDs). Among the 133 pregnant women who were positive by PRIME MD PHQ, 70 (52.6%) were positive for CMDs by MINI which was the diagnostic tool [Figure 1].

Prevalence of CMDs using MINI as diagnostic tool was 15.3% (95% CI – 12.0–18.6). Out of which, 13 (2.8%) were positive for major depression and 69 (15.1%) were positive for anxiety disorders which included Generalized Anxiety Disorder (10.5%) and Panic Disorders (10.7%) [Table 2].

On univariate and multivariate analysis, there was no statistically significant association between CMDs during pregnancy with any obstetric, sociodemographic determinants, and child health outcomes. Prevalence of CMDs was higher in pregnant women aged 20–25 years, who had completed education upto primary level, husband’s education more than higher secondary level, middle class socioeconomic status, pregnant women who were homemaker by occupation, and pregnant women living in extended family. However, none of these associations were statistically significant. Prevalence of CMDs was higher in pregnant women with

Table 1: Distribution of pregnant women by socio- demographic characteristics (n=457)

Characteristics	Frequency	Percentage
Age (in years)		
≤20	69	15.1
21-25	275	60.1
26-30	96	21.1
≥30	17	3.7
Education of the pregnant women		
Less than primary level	63	13.7
Primary level completed	127	27.7
Secondary level completed	88	19.2
Higher secondary level completed and above	179	39.1
Husband’s Education		
Less than primary level	25	5.5
Primary level completed	84	18.4
Secondary level completed	100	21.9
Higher secondary level completed and above	248	54.2
Socioeconomic status (Uday Pareek Scale)		
Upper class	3	0.7
Upper middle class	156	34.1
Middle class	277	60.6
Lower middle class	20	4.4
Lower class	1	0.2
Religion		
Hindu	438	95.8
Muslim	12	2.6
Sikh	7	1.5
Caste		
General	259	56.6
Other Backward Caste (OBC)	98	21.4
Schedule Caste/Schedule Tribe (SC/ST)	86	18.8
Others	14	3.1
Occupation		
Homemaker	441	96.5
Others*	16	3.5
Type of family		
Nuclear	29	6.3
Extended	425	93.0

*Others included - student (7), shopkeeper (4), tailor (2) and teacher (3)

Table 2: Prevalence of CMDs (by MINI) among pregnant women (n=457)

Type of Mental disorder	Frequency	Prevalence	95%CI
Major depression	13	2.8	1.4-4.4
Only anxiety disorder	57	12.5	9.4-15.5
Generalized Anxiety Disorder	48	10.5	7.7-13.3
Panic disorders	49	10.7	7.9-13.5
Both depression and anxiety disorders	12	2.6	1.2-4.1
Overall	70	15.3	12.0-18.6

history of abortion, all female children, and previous male child. However, none of these associations were statistically significant (Data not shown).

A total of 390 (85%) pregnant women delivered newborn with normal birth weight (more than or equal to 2,500 g), and 360 (78.8%) pregnant women delivered at full term (more than or equal to 37 weeks of gestation). The mean birth weight of

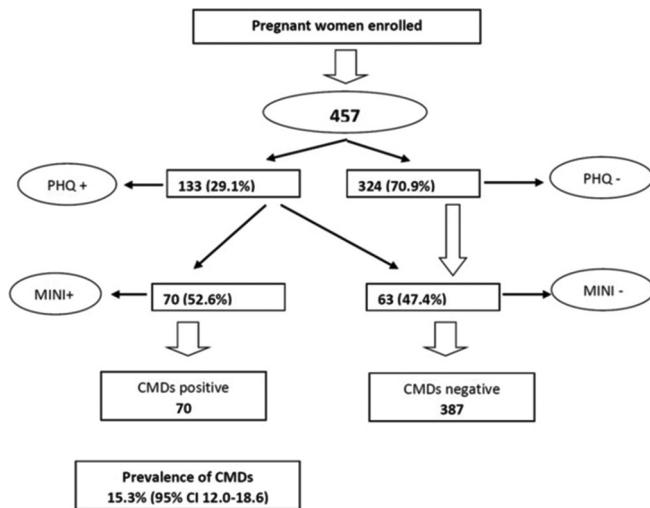


Figure 1: Result of screening (PHQ) and diagnostic test (MINI) administered to pregnant women. CMD- Common Mental Disorders. PHQ- Patient Health Questionnaire. MINI- Mini International Neuropsychiatric Interview

the newborn was 2,800 g (SD – 593 g) and the mean period of gestation was 38.6 weeks (SD – 2.6).

No statistical significance was observed between CMDs during pregnancy and child health outcome such as birth weight and prematurity.

Discussion

About one sixth (15.3%) of the pregnant women in rural Ballabgarh, Haryana, were diagnosed with CMDs by MINI. Anxiety disorder (15.1%) was more common than depression (2.8%) among pregnant women.

MINI is a commonly used diagnostic tool for CMDs and various studies^[25] had used MINI for diagnosis. Other studies like^[22,27–29] have reported higher prevalence of depression among pregnant women as compared to present study. The possible reason for lower prevalence of depression in the present study may be the inability of MINI to diagnose minor depression. Ten pregnant women diagnosed with minor depression by PHQ were not included in final diagnosis. The diverse prevalence of depression can be attributed to different study settings and array of scales used for diagnosis, having different sensitivity and specificity. The prevalence of anxiety disorders in the present study is similar to other community based studies.^[30–32]

We report lower prevalence of CMDs among pregnant women as compared to other facility based studies in India.^[17–19,33] In the present study, pregnant women were interviewed at household level. Hence, there might be a possibility of underreporting of psychiatric symptoms because of lack of privacy and social stigma associated with mental disorders.^[34] Symptoms like decreased interest in everyday work, loss of appetite, disturbance in sleep, etc., might have been considered as normal life process by some pregnant women.^[35]

In a community setting with family member around, when asked about symptoms of mental disorder, pregnant women were likely to give socially desirable response.^[36] Thus, we feel that the observed prevalence of CMDs is conservative. However, we are unable to speculate the quantum of the underestimation.

Various studies have reported single marital status, intimate partner violence, low socioeconomic status, history of mental disorder in family, trauma in the past, previous history of mental disorder as attributing factors for mental disorders during pregnancy.^[27,33,37,38] However, in the present study, we did not find statistically significant association of CMDs with any socioeconomic or obstetric factors. This might be attributable to either inadequate power of the study to detect it or non-existence of such relationships in the study area. Hence, a study with a larger sample size would be required to detect statistically significant association of CMDs with these factors among pregnant women.

Studies conducted by Bindt *et al.*, 2013^[32] and Anderson *et al.*, 2004^[39] found no significant association of prematurity with CMDs during pregnancy, whereas some studies (Nasreen *et al.*, 2010; Rahman *et al.*, 2007; Niemi *et al.*, 2013;) found significant association of CMDs with birth weight and prematurity.^[22,28,29] Study by Spry *et al.*, 2020 found association of CMDs during pregnancy with prematurity but not with low birth weight.^[40] In the present study, we did not find any significant association of CMDs with child health outcomes. Majority of the pregnant women in our study were living in extended family. Family support during pregnancy is an important factor that helps women to cope up with the pregnancy related stress and anxiety and also empowers women making them more engaged in self-care and hence resulting is healthier babies born.^[41] Moreover, the overall prevalence of low birth weight was lower (12%) in the study area when compared to national average (28%).^[42] Antenatal care (ANC) coverage (4 visits) in the study area was significantly more (77%) as compared to national average (27%).^[43] More ANC visits provide more opportunity to pregnant women to receive information and knowledge for managing the pregnancy. Better coping up, family support and good ANC care might have diluted the CMDs impact on newborn outcome.

To the best of our knowledge, this was the first community-based study from India which documented the prevalence of CMDs among pregnant women. Trained investigator and validated study tools ensured better quality of field data. PRIME MD PHQ and MINI were administered by a single interviewer at the same time. Hence, possibility of bias on the part of the interviewer cannot be ruled out completely. However, not all PHQ positive pregnant women were diagnosed as MINI positive. So, contribution of this bias in estimation of burden of CMDs is likely to be low. Another limitation of this study is the lack of privacy during interview. Also, as the pregnant women were assessed in two phases, there is a difference in time frame which may result in some difference in women recruited in two phases.

We recommend integration of mental health care with routine antenatal services at primary health care level in India. National Mental Health Program (NMHP) also states that it is essential to address the growing burden of mental disorder by integrating mental health care at primary care as well as community level.^[44] Primary care physicians can be trained to use screening tools like PRIME MD PHQ which are very easy to use. This will help in detecting CMDs at an early stage and timely referral to the specialist is possible and proper management can be started. Auxiliary Nurse Midwives can also be trained to use these tools at community level for early screening of CMDs.^[45] This should be supported with awareness generating activities at community level to reduce stigma related to mental disorder.

Conclusions

Prevalence of CMDs was observed to be 15.3% among pregnant women at community level in rural Haryana. CMDs during pregnancy was not found to be associated with any of the sociodemographic or obstetric factors.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

References

- Satyanarayana VA, Lukose A, Srinivasan K. Maternal mental health in pregnancy and child behavior. *Indian J Psychiatry* 2011;53:351-61.
- Grote NK, Bridge JA, Gavin AR, Melville JL, Iyengar S, Katon WJ. A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Arch Gen Psychiatry* 2010;67:1012-24.
- Fisher J, Cabral de Mello M, Patel V, Rahman A, Tran T, Holton S, *et al.* Prevalence and determinants of common perinatal mental disorders in women in low- and lower-middle-income countries: A systematic review. *Bull World Health Organ* 2012;90:139G-49G.
- Goldberg D. A dimensional model for common mental disorders. *Br J Psychiatry Suppl* 1996;44-9. PMID: 8864148.
- Van de Velde S, Bracke P, Levecque K. Gender differences in depression in 23 European countries. Cross-national variation in the gender gap in depression. *Soc Sci Med* 1982 2010;71:305-13.
- McLean CP, Asnaani A, Litz BT, Hofmann SG. Gender differences in anxiety disorders: Prevalence, course of illness, comorbidity and burden of illness. *J Psychiatr Res* 2011;45:1027-35.
- National Mental Health Survey. National Mental Health Survey 2015-16, NIMHANS 2016.
- Arora P, Aeri BT. Burden of antenatal depression and its risk factors in Indian settings: A systematic review. *Indian J Med Spec* 2019;10:55-60.
- Alder J, Fink N, Bitzer J, Hösl I, Holzgreve W. Depression and anxiety during pregnancy: A risk factor for obstetric, fetal and neonatal outcome? A critical review of the literature. *J Matern Fetal Neonatal Med* 2007;20:189-209.
- Giang KB, Dzung TV, Kullgren G, Allebeck P. Prevalence of mental distress and use of health services in a rural district in Vietnam. *Glob Health Action* 2010;3:10.3402/gha.v3i0.2025. doi: 10.3402/gha.v3i0.2025.
- Rondó PH, Ferreira RF, Nogueira F, Ribeiro MC, Lobert H, Artes R. Maternal psychological stress and distress as predictors of low birth weight, prematurity and intrauterine growth retardation. *Eur J Clin Nutr* 2003;57:266-72.
- Robertson E, Grace S, Wallington T, Stewart DE. Antenatal risk factors for postpartum depression: A synthesis of recent literature. *Gen Hosp Psychiatry* 2004;26:289-95.
- Oates M. Suicide: The leading cause of maternal death. *Br J Psychiatry J Ment Sci* 2003;183:279-81.
- Surkan PJ, Kennedy CE, Hurley KM, Black MM. Maternal depression and early childhood growth in developing countries: Systematic review and meta-analysis. *Bull World Health Organ* 2011;89:608-15.
- Ramchandani PG, Richter LM, Norris SA, Stein A. Maternal prenatal stress and later child behavioral problems in an urban South African setting. *J Am Acad Child Adolesc Psychiatry* 2010;49:239-47.
- Koutra K, Chatzi L, Bagkeris M, Vassilaki M, Bitsios P, Kogevinas M. Antenatal and postnatal maternal mental health as determinants of infant neurodevelopment at 18 months of age in a mother-child cohort (Rhea Study) in Crete, Greece. *Soc Psychiatry Psychiatr Epidemiol* 2013;48:1335-45.
- Jaju S, Al Kharusi L, Gowri V. Antenatal prevalence of fear associated with childbirth and depressed mood in primigravid women. *Indian J Psychiatry* 2015;57:158-61.
- Ajinkya S, Jadhav PR, Srivastava NN. Depression during pregnancy: Prevalence and obstetric risk factors among pregnant women attending a tertiary care hospital in Navi Mumbai. *Ind Psychiatry J* 2013;22:37-40.
- Johnson AR, George M, Goud BR, Sulekha T. Screening for mental health disorders among pregnant women availing antenatal care at a government maternity hospital in Bengaluru City. *Indian J Psychol Med* 2018;40:343-8.
- Raghavan V, Khan HA, Seshu U, Rai SP, Durairaj J, Aarthi G, *et al.* Prevalence and risk factors of perinatal depression among women in rural Bihar: A community-based cross-sectional study. *Asian J Psychiatry* 2021;56:102552. doi: 10.1016/j.ajp. 2021.102552.
- Kant S, Misra P, Gupta S, Goswami K, Krishnan A, Nongkynrih B, *et al.* The Ballabgarh Health and Demographic Surveillance System (CRHSP-AIIMS). *Int J Epidemiol* 2013;42:758-68.
- Nasreen HE, Kabir ZN, Forsell Y, Edhborg M. Low birth weight in offspring of women with depressive and

- anxiety symptoms during pregnancy: Results from a population based study in Bangladesh. *BMC Public Health* 2010;10:515-23.
23. Parikh U, Trivedi G. *Manual of Socio-Economic Status Scale (Rural)*, Manasayan, Delhi, 1964.
 24. Avasthi A, Varma SC, Kulhara P, Nehra R, Grover S, Sharma S. Diagnosis of common mental disorders by using PRIME-MD Patient Health Questionnaire. *Indian J Med Res* 2008;127:159-64.
 25. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, *et al.* The Mini-International Neuropsychiatric Interview (M.I.N.I.): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry* 1998;59(Suppl 20):22-33;quiz 34-57.
 26. Salve H, Goswami K, Nongkynrih B, Sagar R, Sreenivas V. Prevalence of psychiatric morbidity at Mobile Health Clinic in an urban community in North India. *Gen Hosp Psychiatry* 2012;34:121-6.
 27. Brittain K, Myer L, Koen N, Koopowitz S, Donald KA, Barnett W, *et al.* Risk factors for antenatal depression and associations with infant birth outcomes: Results From a South African Birth Cohort Study. *Paediatr Perinat Epidemiol* 2015;29:505-14.
 28. Rahman A, Bunn J, Lovel H, Creed F. Association between antenatal depression and low birthweight in a developing country. *Acta Psychiatr Scand* 2007;115:481-6.
 29. Niemi M, Falkenberg T, Petzold M, Chuc NT, Patel V. Symptoms of antenatal common mental disorders, preterm birth and low birthweight: A prospective cohort study in a semi-rural district of Vietnam. *Trop Med Int Health* 2013;18:687-95.
 30. Dias FM, Junior CS, Franco GC, Teixeira AL, Ribeiro AM. Pregnancy is associated with psychiatric symptoms in a low-income countryside community of Brazil. *Neuropsychiatr Dis Treat* 2011;7:709-14.
 31. Verbeek T, Arjadi R, Vendrik JJ, Burger H, Berger MY. Anxiety and depression during pregnancy in Central America: A cross-sectional study among pregnant women in the developing country Nicaragua. *BMC Psychiatry* 2015;15:292-8.
 32. Bindt C, Guo N, Bonle MT, Appiah-Poku J, Hinz R, Barthel D, *et al.* No association between antenatal common mental disorders in low-obstetric risk women and adverse birth outcomes in their offspring: Results from the CDS study in Ghana and Côte D'Ivoire. *PLoS One* 2013;8:e80711.
 33. Woldetsadik AM, Ayele AN, Roba AE, Haile GF, Mubashir K. Prevalence of common mental disorder and associated factors among pregnant women in South-East Ethiopia, 2017: A community based cross-sectional study. *Reprod Health* 2019;16:173.
 34. Fabrega H. Psychiatric stigma in non-Western societies. *Compr Psychiatry* 1991;32:534-51.
 35. Knaak S, Mantler E, Szeto A. Mental illness-related stigma in healthcare. *Healthc Manage Forum* 2017;30:111-6.
 36. Latkin CA, Edwards C, Davey-Rothwell MA, Tobin KE. The relationship between social desirability bias and self-reports of health, substance use, and social network factors among urban substance users in Baltimore, Maryland. *Addict Behav* 2017;73:133-6.
 37. Usuda K, Nishi D, Makino M, Tachimori H, Matsuoka Y, Sano Y, *et al.* Prevalence and related factors of common mental disorders during pregnancy in Japan: A cross-sectional study. *Biopsychosoc Med* 2016;10:17.
 38. Heyningen T van, Myer L, Onah M, Tomlinson M, Field S, Honikman S. Antenatal depression and adversity in urban South Africa. *J Affect Disord* 2016;203:121-9.
 39. Andersson L, Sundström-Poromaa I, Wulff M, Aström M, Bixo M. Neonatal outcome following maternal antenatal depression and anxiety: A population-based study. *Am J Epidemiol* 2004;159:872-81.
 40. Spry EA, Wilson CA, Middleton M, Moreno-Betancur M, Doyle LW, Howard LM, *et al.* Parental mental health before and during pregnancy and offspring birth outcomes: A 20-year preconception cohort of maternal and paternal exposure. *EclinicalMedicine* 2020;27:100564. doi: 10.1016/j.eclinm. 2020.100564.
 41. Lee E, Mitchell-Herzfeld SD, Lowenfels AA, Greene R, Dorabawila V, DuMont KA. Reducing low birth weight through home visitation: A randomized controlled trial. *Am J Prev Med* 2009;36:154-60.
 42. UNICEF, India. *Basic Indicators Statistics of India | UNICEF [Internet]*. 2016 [cited 2017 Feb 28]. Available from: https://www.unicef.org/infobycountry/india_statistics.html.
 43. NFHS-4. *National Family Health Survey-4 [Internet]*. 2015. Available from: http://rchiips.org/NFHS/factsheet_NFHS-4.shtml.
 44. *National Mental Health Programme. National Mental Health Programme | National Health Portal Of India [Internet]*. 2015 [cited 2017 May 20]. Available from: https://www.nhp.gov.in/national-mental-health-programme_pg.
 45. Ransing R, Deshpande SN, Shete SR, Patil I, Kukreti P, Raghuvver P, *et al.* Assessing antenatal depression in primary care with the PHQ-2 and PHQ-9: Can it be carried out by auxiliary nurse midwife (ANM)? *Asian J Psychiatry* 2020;53:102109. doi: 10.1016/j.ajp. 2020.102109.