Research Report

PREVALENCE OF POSTPARTUM DEPRESSION AMONG MOTHERS ATTENDING IMMUNIZATION CLINIC IN A PRIMARY HEALTH CENTRE: A CROSS-SECTIONAL STUDY

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Abstract

Background: Postpartum depression (PPD) is one of the common psychopathologies that can have devastating effects on the mother, child, and family. Studies of PPD in primary care settings are sparse. The objectives of this study were to estimate the prevalence of PPD among mothers attending immunization clinics in a primary healthcare setting and to assess the association between PPD and various clinical and socio-demographic variables. **Methods:** A cross-sectional study of 223 postnatal mothers aged 18-40 years was conducted at the Immunization Clinic of an Integrated Family Health Center in Kerala. Sociodemographic and clinical data was collected using a semi-structured, interviewer-administered questionnaire. The presence of PPD was assessed by using the Malayalam version of the Edinburgh Postnatal Depression Rating Scale (EPDS). The association of PPD with various socio-demographic and clinical variables was evaluated. Analysis was done using SPSS version 24. Variables associated with PPD at the univariate level were further included in a multivariate regression analysis to identify the risk factors for PPD. **Results:** The prevalence of PPD was found to be 13.9%. The younger age of the mother, poor social support, nuclear type of family, delivery by Cesarean section (CS), and early postpartum duration had a strong association with and were independent predictors of PPD. The sex of the baby had no association with PPD. **Conclusion:** PPD was found in a significant number of mothers. Considering the high prevalence in community settings, PPD should be viewed as a disorder of public health significance, and routine screening of PPD is needed for early intervention.

Keywords: Postpartum, primary care, depression, EPDS

Introduction

There is an increased vulnerability for psychiatric disorders, especially depressive disorders, in the postpartum period.[1] Postpartum psychiatric disorders can be divided into three categories: postpartum blues, postpartum depression (PPD), and postpartum psychosis.[2] PPD refers to depression occurring after childbirth and is defined as a clinical condition fulfilling the diagnostic criteria for a major depressive disorder and having its onset in the first four weeks of the postpartum period.[3] The majority of the mothers present with depressive symptoms by six weeks postpartum, and if not treated, many women

Table 1. Socio-demographic description of the study sample (N = 223)

Variable		N (%)
Age in years [Mean (SD)]		28.3 (3.5)
Nativity	Urban	83 (37.2)
	Semi-urban	87 (39.0)
	Rural	53 (23.8)
Educational qualification	High school	13 (5.8)
	Higher Secondary	49 (22.0)
	Graduation	79 (35.4)
	Postgraduate	82 (36.8)
Occupation	Unemployed	111 (49.8)
	Skilled worker	80 (35.9)
	Professional	32 (14.3)
Marital status	Married	222 (99.6)
	Separated	1 (0.4)
Type of family	Nuclear	65 (29.1)
	Joint and extended	158 (70.9)
Social support	Good	46 (20.6)
	Average	142 (63.7)
	Poor	35 (15.7)
Alcohol use	In participant	12 (5.4)
	In partner	119 (53.4)

SD – standard deviation

continue to be symptomatic at the end of the first postpartum year.[4] Screening for depression throughout the first postpartum year can identify women who are not symptomatic early in the postpartum period but later develop symptoms.[4] In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders – Text Revision (DSM-5-TR), the specifier – peripartum onset is limited to the onset of depression within four weeks of delivery. Yet, clinically, an onset of depression within the first year of delivery is considered PPD.[5,6]

Although the symptoms of PPD are almost the same as that of major depressive disorder that occurs at times other than the postpartum period, a negative relationship with the child or doubts about the quality of motherhood is generally seen in women with PPD.[7] In addition to affecting the child's physical and psychological health, in severe cases, some mothers may have thoughts of harming their child.[8] Moreover, PPD negatively impacts the mother. A review article by Lindahl et al. (2005) states that although suicide deaths and attempts are lower during pregnancy and postpartum compared to the general population of women, suicides account for up to 20% of postpartum deaths.[9]

The American College of Obstetricians and Gynecologists (ACOG) has recommended screening for PPD with a validated instrument. Screening alone can have clinical benefits, even though the maximum benefit is offered by initiating treatment or referral to mental health care providers.[10]

A variety of biological and psychosocial factors influence perinatal depression. There are several studies about the prevalence and risk factors of PPD, but most of the Indian studies on PPD are conducted either in tertiary health settings[11,12] or in hospital settings.[11,13,14,15] There is a lack of studies in primary care settings. Most of the studies were conducted in the early postpartum period.[11,12,14,16] Hence, this study aimed to assess the prevalence of PPD in mothers between two weeks and one year of delivery attending an immunization clinic in a primary care center designated as an integrated family health center.

Materials and Methods

A cross-sectional study was conducted at the immunization clinic of Integrated Family Health Centre, Pangappara, Thiruvananthapuram. The research proposal was approved by the Institutional Review Board and the Institutional Ethics Committee (HEC No. 08/16/2021/MCT). Permission from the Department of Community Medicine was also obtained. The sample size was calculated to be 223 based on an Indian study by Shivalli and Gururaj (2015) using the formula $4pq/d^2$.[12] The study population included postnatal females aged 18-40 years in the period of postpartum between two weeks and up to a maximum of one year attending an immunization clinic in a family health center in Kerala from October 2021 to October 2022. Every fifth subject attending the immunization clinic on Wednesday and Saturday and meeting

the study criteria was recruited to the study after obtaining written informed consent.

A semi-structured, pre-tested, pre-designed, and interviewer-administered questionnaire was used to collect socio-demographic and clinical variables. Malayalam translated, and back-translated version of the Edinburgh Postnatal Depression Scale (EPDS) was used to assess PPD. The semi-structured questionnaire assessed the sociodemographic and clinical variables.

Edinburgh Postnatal Depression Scale (EPDS)

The EPDS was developed for screening postpartum women for depression in outpatient settings.[17] This scale has already been utilized among numerous populations, including developed countries, and was found to have satisfactory sensitivity and specificity. A threshold score of 12/13 was found to have a sensitivity of 86% and a specificity of 78%.[6] The test can usually be completed in around five minutes. It consists of ten questions. Each response was scored 0, 1, 2, or 3 according to the increased severity of the symptoms. Reverse scoring is done for items marked with an asterisk (*),3, 2, 1, and 0. The total score is calculated by adding the scores for each of the ten items.[17] In this study, the cut-off was taken as 11, with 81% sensitivity and 88% specificity.[18]

Statistical Analysis

Quantitative data were expressed as mean, standard deviation (SD) or frequency, and percentages.   A comparison between groups was made using the Chi-square test. Variables found to be associated with PPD at the univariate level were further included in a multivariate regression analysis to determine the risk factors for PPD. The risk was expressed as odds ratio (OR), and 95% Confidence interval (95% CI) was estimated for the same. Data analysis was done using the Statistical Package for the Social Sciences version 24, available in Central Library, Government Medical College, Thiruvananthapuram.

Table 2. Description of the clinical factors in the study sample (N = 223)

Variable		Frequency (%)
Parity	1	124 (55.6)
	2	86 (38.6)
	3	12 (5.4)
	4	1 (0.4)
Type of delivery	C-section	112 (50.2)
	Vaginal	111 (49.8)
Term of delivery	Preterm	7 (3.1)
	Term	216 (96.9)
Postpartum duration	0.5–3 months	83 (37.2)
	3-6 months	87 (39.0)
	6-12 months	53 (23.8)
Sex of the baby	Male	118 (52.9)
	Female	105 (47.1)
Number of living children	1	128 (57.4)
	2	82 (36.8)
	3	13 (5.8)
Number of children – current pregnancy	Single	221 (99.1)
	Twins	1 (0.4)
	Triplets	1 (0.4)
Antepartum depression	Yes	2 (0.9)
	No	221 (99.1)
Abortion	No	214 (96.0)
	Yes	9 (4.0)
Premenstrual syndrome	Yes	6 (2.7)
	No	217 (97.3)
EPDS Score	<11	192 (86.1)
	≥11	31 (13.9)

C-section - Cesarean section, EPDS – Edinburgh Postnatal Depression Scale

Results

The total sample size was 223. The mean age of the study subjects was 28.3 (SD = 3.5) years. About half of the participants were between 25 and 29 years of age. Among them, the majority (53.8%) belonged to the age group of 25-29 years, and about 35.8 % belonged to the age group above 30 years. All the mothers were married except one who was separated from the partner. Even though around 36.8% of the participants were postgraduates, 49.8% of the mothers were unemployed. Forty-three percent were from semi-urban settings, and 37.2% were from rural populations. Around two-thirds

Table 3. Association of socio-demographic factors with postpartum depression

Socio-demographic variables	Subdivision (N = 223)	PPD Frequency (%)		χ2 (*df*)	P value
		No (n1 = 192)	Yes (n2 = 31)		
*Age in years	<25 (23)	16 (69.6)	7 (30.4)	6.20 (*2*)	0.045
	25-29 (120)	107 (89.2)	13 (10.8)		
	>30 (80)	69 (86.3)	11 (13.8)		
Nativity	Urban (44)	38 (86.4)	6 (13.6)	0.07 (*2*)	0.97
	Semi-urban (96)	82 (85.4)	14 (14.6)		
	Rural (83)	72 (86.7)	11 (13.3)		
Educational qualification	High school (13)	12 (92.3)	1 (7.7)	0.55 (*3*)	0.91
	Higher Secondary (49)	42 (85.7)	7 (14.3)		
	Graduate (79)	67 (84.8)	12 (15.2)		
	Postgraduate (82)	71 (86.6)	11 (13.4)		
†Occupation	Unemployed (111)	96 (86.5)	15 (13.5)		0.31
	Skilled worker (80)	66 (82.5)	14 (17.5)		
	Professional (32)	30 (93.8)	2 (6.3)		
†Marital status	Married (222)	192 (86.5)	30 (13.5)		0.14
	Separated (1)	0 (0.0)	1 (100.0)		
*Type of family	Nuclear (65)	50 (76.9)	15 (23.1)	6.45 (*1*)	0.01
	Joint and extended (158)	142 (89.9)	16 (10.1)		
Alcohol use in participants	Yes (12)	12 (100.0)	0 (0.0)	2.048 (*1*)	0.15
	No (211)	180 (85.3)	31 (14.7)		
Alcohol use in partner	Yes (119)	100 (84.0)	19 (16.0)	0.91 (*1*)	0.34
	No (104)	92 (88.5)	12 (11.5)		
***†Social support	Good (46)	45 (97.8)	1 (2.2)		<0.001
	Average (142)	124 (87.3)	18 (12.7)		
	Poor (35)	23 (65.7)	12 (34.3)		

$χ^2$ – Chi-square value, *df* – degree of freedom, PPD – postpartum depression
* – P value < 0.05, ** – P value < 0.01, † – Fisher's exact – test

(70.9%) of the participants belonged to joint and extended families. Out of 223, 12 women (5.4%) gave a history of alcohol use, while among the partners, 119 (53.5%) reported the use of alcohol. Poor social support was reported by 35 mothers (15.7%), while a majority (63.7%) reported receiving average social support.

Over half (55.6%) of the mothers were primipara, while two-thirds belonged to the first six months postpartum. Eight of the mothers had a previous history of abortion. The majority (96.9%) had a term delivery, and surprisingly, half (50.2%) of the participants had given birth by Caesarean section. Among the babies of the participants, the number of males and females was almost equal – 52.9%

males and 47.1% females (see Tables 1 and 2).

The prevalence of PPD was found to be 13.9%. The association of sociodemographic factors with PPD is listed in Table 3, and that of the obstetric factors is listed in Table 4. Only one mother had a history of depression in the past, and one had a family history of psychiatric illness. On univariate analysis, the factors associated with PPD were age below 25 years, poor social support, nuclear family, Lower Section Caesarean Section (LSCS), and postpartum duration <3 months. Level of education, religion, nativity, parity or the number of living children, previous history of infertility, or termination of pregnancy were not associated with PPD. Fifteen percent of mothers with female children, and 12% with male

Table 4. Association of obstetric factors with postpartum depression

Obstetric variables	Subdivision (N= 223)	Postpartum depression Frequency (%)		P value (Fisher's exact test/ χ^2 test)
		No (n1 = 192)	Yes (n2 = 31)	
Parity	1 (124)	102 (82.3)	22 (17.7)	0.26
	2 (86)	77 (89.5)	9 (10.5)	
	3 (12)	12 (100.0)	0 (0.0)	
	4 (1)	1 (100.0)	0 (0.0)	
Number of children in current pregnancy	Single (221)	191 (86.4)	30 (13.6)	0.26
	Twins (1)	0 (0.0)	1 (100.0)	
	Triplets (1)	1 (100.0)	0 (0.0)	
*†Type of delivery	LSCS (112)	90 (80.4)	22 (19.6)	0.01
	Normal (111)	102 (91.9)	9 (8.1)	
Abortion	No (214)	184 (86.0)	30 (14.0)	1.000
	Yes (9)	8 (88.9)	1 (11.1)	
Term of pregnancy	Preterm (7)	6 (85.7)	1 (14.3)	1.000
	Term (216)	186 (86.1)	30 (13.9)	
*Postpartum duration	2 weeks-3months (83)	61 (73.5)	22 (26.5)	<0.001
	3-6 months (87)	81 (93.1)	6 (6.9)	
	6-12 months (53)	50 (94.3)	3 (5.7)	
Antepartum depression	No (221)	191 (86.4)	30 (13.6)	0.26
	Yes (2)	1 (50.0)	1 (50.0)	
*Premenstrual syndrome	No (217)	190 (87.6)	27 (12.4)	0.004
	Yes (6)	2 (33.3)	4 (66.7)	

*– P value ≤ 0.01, † – χ^2 (df) = 6.20 (1)

children had an EPDS score ≥11. The sex of the baby had no significant association with PPD.

The factors significantly associated with PPD identified in univariate analysis were further subjected to multivariate regression analysis by binary logistic regression to identify the risk factors for PPD. The risk factors thus identified were age below 25 years, poor social support, nuclear family, LSCS, and postpartum duration <3 months (see Table 5).

Discussion

This study aimed to estimate the prevalence of PPD and to assess the association between PPD and various clinical and sociodemographic variables among mothers attending the immunization clinic at a primary healthcare facility. The study included 223 mothers from the immunization clinic who met the inclusion criteria. In this study, the prevalence of PPD was 13.9%.

In a cross-sectional study done in Kerala by Santhosh et al. (2005), among 250 mothers attending the family planning clinics of a maternity hospital during the postpartum period, the prevalence of PPD was found to be 27.60%. The factors associated with PPD in the study included marital discord, lack of family

Table 5. Binary logistic regression model for postpartum depression

Variable	aOR (95% CI)	P value
*Age <25 years	4.30 (1.24 - 14.97)	0.02
*Poor social support	3.90 (1.41 - 10.81)	0.01
*Nuclear family	2.86 (1.11 - 7.39)	0.03
**LSCS	4.52 (1.65 - 12.41)	0.003
**Postpartum duration <3 months	4.02 (1.64 - 9.82)	0.002

LSCS – Lower Section Caesarean Section

* – P value < 0.05, ** – P value < 0.01

support, and lack of physical help during the postnatal period. Also, the sex of the baby did not have any significant association with PPD. Our study was done in a primary care setting, while the study by Santhosh et al. (2005) was done in a tertiary care setting. The difference in the study setting might have contributed to the difference in the prevalence of PPD. However, the factors associated with PPD were similar to those in the current study. This might be due to the similarity in patient characteristics.[11]

A cross-sectional study was done in a tertiary care hospital in Kerala by Shenoy et al. (2019), in which 119 women between 2 to 6 weeks of postpartum period were screened for depression. The EPDS cut-off score was taken as ≥13. Prevalence was found to be 29.4%. The prevalence is significantly higher than the current study. This might be due to differences in study settings and assessment period, as the study was done in the early postpartum period.[13]

In a study done in Karnataka by Shivalli & Gururaj (2012) in a rural tertiary care hospital in Mandya, the prevalence of PPD with EPDS score ≥13 was 31%. Prevalence was significantly higher than the prevalence in the current study, possibly due to the difference in study setting and smaller sample size. The female sex of the baby and complications in pregnancy were found to be independent predictors of PPD, which was different from the current study in which the sex of the baby had no association with PPD.[12]

A prospective observational cohort study was done in a rural area in New Delhi by Shrestha et al. (2015), in which 200 pregnant women were interviewed in the third trimester of pregnancy and then at six weeks postpartum to screen for the presence and severity of depressive symptoms. A cut-off score > 13 was considered positive for depression in EPDS. The prevalence of PPD was 12%, comparable to the current study.[16]

In a community-based, cross-sectional study conducted in 2017 in an urban slum of Bhubaneswar by Mishra et al. (2020), the prevalence of PPD was found to be 8.57% with a cut-off EPDS score of ≥13. The prevalence was comparative, possibly due to the higher EPDS cut-off used. Cesarean section as the mode of delivery was one of the factors associated with PPD in this study, which is similar to our research. Unlike the current study, factors like religion, literacy status, socio-economic status, and sex of the newborn were found to have an association with PPD. This might be due to different sociodemographic factors of the participants in the two states of India.[14]

In a systematic review of articles published from the year 2000 up to 31 March 2016 on the prevalence of PPD in Indian mothers by Upadhyay et al. (2017), the pooled prevalence estimated was 19%. The pooled prevalence was higher, but not significantly so, for studies conducted in hospital settings (23%) than in community settings (17%). The prevalence was comparable to the current study. The financial difficulties, the presence of domestic violence, past history of psychiatric illness in the mother, marital conflict, lack of support from the husband, and birth of a female baby were found to be the risk factors of PPD. This might be due to the difference in geographical location and study design.[15]

In the present study, there was no significant association between the presence of domestic violence and PPD. Multiple existing literature reports that mothers who had encountered domestic violence had screened positive for PPD.[11,15,19] However, we did not use scales to assess this factor. The participants were evaluated in the presence of partners or relatives, which would have resulted in underreporting of partner violence. Even though a past history of depression and a family history of depression are recognized risk factors for PPD, only one patient in the present study gave a positive history of any psychiatric disease in the past and family. Stigma related to psychiatric illness and underreporting due to

the same could not be ruled out.

The importance of lack of social support has already been identified as a significant determinant of PPD in previous studies.[15,20,21] Since most of the mothers were living in a joint or extended family, the presence of supportive family members might have been protective against PPD. Unlike the studies done in Karnataka, Gujarat, and Orissa,[14,16,22] studies conducted in Kerala on PPD,[11,13] including the current study, found no association with the sex of the baby. This may be because the state occupies the top position in the list of Indian states, with women preferring the girl child. Moreover, Kerala tops the Indian states that ensure proper educational avenues for girls and children.[23]

In the current study, both in univariate and multivariate analysis, the age of the mother, social support, type of family, type of delivery, and postpartum duration had a strong association with PPD. They were found to be independent predictors of PPD. Other sociodemographic variables, education, occupation, number of children, obstetric complications, and substance use, had no association with PPD in the current study.

The present study, which enrolled a sufficient sample of postpartum mothers attending the immunization clinic of a primary health center and used validated objective tools, has thus corroborated existing evidence of a relatively high prevalence of PPD and the risk factors associated with it. However, women with severe depression may not bring their children to the immunization clinic. Also, the cross-sectional nature of the evaluation and the nature of the population limits the generalization of the results. A longitudinal community-based study is suggested for a better understanding of the current scenario of PPD.

Conclusion

The prevalence of PPD was found to be 13.9%. Factors that were found to be significantly associated with PPD were the younger age of the mother, poor social support, the nuclear type of the family, and the CS type of delivery. Education, sex of the baby, occupation, number of children, obstetric complication, and substance use had no association with PPD in the present study. PPD should be considered a disorder of public health significance, and screening and early intervention for PPD are suggested.

Future Directions

Future research, which includes preventive interventions targeting the mental health of postpartum mothers, can be undertaken. Longitudinal studies can be done to learn about the course of PPD and its associated risk factors. An initiative should be taken to integrate screening for PPD into routine primary care and to follow up with appropriate referral and treatment.

Acknowledgment

References

1. Shitu S, Geda B, Dheresa M. Postpartum depression and associated factors among mothers who gave birth in the last twelve months in Ankesha district, Awi zone, Northwest Ethiopia. BMC Pregnancy and Childbirth 2019;19:435. Available from: https://doi.org/10.1186/s12884-019-2594-y.
2. Stewart DE, Robertson E, Dennis CL, Grace SL, Wallington T. Postpartum depression: Literature review of risk factors and interventions. Toronto: University Health Network Women's Health Program for Toronto Public Health. 2003. pp. 1-289.

3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, Fifth ed. DSM-5. Arlington, VA: American Psychiatric Association; 2013.

4. Robbins CL, Ko JY, D'Angelo DV, von Essen BS, Bish CL, Kroelinger CD, et al. Timing of postpartum depressive symptoms. Prev Chronic Dis 2023;20:230107. Available from: doi: 10.5888/pcd20.230107.

5. Stone SD, Menken AE, editors. Perinatal and postpartum mood disorders: Perspectives and treatment guide for the health care practitioner. New York: Springer Publishing Company; 2008.

6. Geddes JR, Andreasen NC, Goodwin GM. New Oxford textbook of psychiatry. 3rd ed. Oxford, USA: Oxford University Press; 2020.

7. Hodo DW. Kaplan and Sadock's comprehensive textbook of psychiatry, eighth edition. Am J Psychiatry 2006;163:1458.

8. Beck CT. The effects of postpartum depression on child development: a meta-analysis. Arch Psychiatr Nurs 1998;12:12-20.

9. Lindahl V, Pearson JL, Colpe L. Prevalence of suicidality during pregnancy and the postpartum. Arch Womens Ment Health. 2005;8:77-87.

10. American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 757: Screening for perinatal depression. Obstet Gynecol 2018;132:e208-12. Available from: doi: 10.1097/AOG.0000000000002927.

11. Santhosh K, Vinaychandran S, Narayan KTPD, Mini CH. Postpartum depression and its association with social support: a cross-sectional study at a maternity hospital in Kerala. Kerala Journal of Psychiatry. 2020;33:114-20.

12. Shivalli S, Gururaj N. Postnatal depression among rural women in South India: do socio-demographic, obstetric and pregnancy outcome have a role to play? PLoS One 2015;10:e0122079. Available from: doi: 10.1371/journal.pone.0122079. eCollection 2015.

13. Shenoy HT, Remash K, Shenoy ST. Prevalence and determinants of postnatal depression in a tertiary care teaching institute in Kerala, India. Int J Reprod Contracept Obstet Gynecol 2019;8:3757-65.

14. Mishra K, Mohapatra I, Rout RN. An epidemiological study on depression among women during postpartum period in an urban slum of Bhubaneswar. J Family Med Prim Care 2020;9:4736-40.

15. Upadhyay RP, Chowdhury R, Salehi A, Sarkar K, Singh SK, Sinha B, et al. Postpartum depression in India: a systematic review and meta-analysis. Bull World Health Organ 2017;95:706-17C.

16. Shrestha N, Hazrah P, Sagar R. Incidence and prevalence of postpartum depression in a rural community of India. Journal of Chitwan Medical College 2015;5:11-9.

17. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression: development of the 10-item Edinburgh Postnatal Depression Scale. Br J Psychiatry 1987;150:782-6.

18. Levis B, Negeri Z, Sun Y, Benedetti A, Thombs BD. Accuracy of the Edinburgh Postnatal Depression Scale (EPDS) for screening to detect major depression among pregnant and postpartum women: systematic review and meta-analysis of individual participant data. BMJ 2020;371:m4022. Available from: doi: 10.1136/bmj.m4022.

19. Gaillard A, Le Strat Y, Mandelbrot L, Keita H, Dubertret C. Predictors of postpartum depression: prospective study of 264 women followed during pregnancy and postpartum. Psychiatry Res 2014;215:341-6.

20. Halbreich U, Karkun S. Cross-cultural and social diversity of prevalence of postpartum depression and depressive symptoms. J Aff Disord 2006;91:97-111.

21. Alshikh Ahmad H, Alkhatib A, Luo J. Prevalence and risk factors of postpartum depression in the Middle East: a systematic review and meta-analysis. BMC Pregnancy Childbirth 2021;21:542. Available from: doi: 10.1186/s12884-021-04016-9.

22. Modi VP, Parikh MN, Valipay SK. A study on prevalence of postpartum depression and correlation with risk factors. Annals of Indian Psychiatry 2018;2:27. Available from: DOI: 10.4103/aip.aip_48_17.

23. Literacy in India [Internet]. [place unknown]: Population Census; 2022 [cited 2024 Sep 5]. Available from: https://www.census2011.co.in/literacy.php.